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FINANCIAL STRESS IN CORPORATE SECTOR: A STUDY ON INDIA

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Financial Stress in Corporate Sector: A Study on India

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Abstract

Predicting such vulnerabilities in the corporate sector towards likely financial distress has been a matter of research. The analysis of credit stress aims at identifying a stress situation, quantifying its size and significance and eventually charting out the appropriate policy intervention in such cases. Credit stress, accompanied with deteriorating financial conditions can lead to the larger problems of managing debts for firms and may even lead to stress in the banking sector. In this context, an understanding of the overall financial performance of firms becomes necessary, which also includes aspects of credit stress through increased borrowings, rising interest burden and declining profitability.

The purpose of undertaking this study arises from various reports from think tanks and subject experts on increasing indebtedness of the corporate sector globally, indicating increase in corporate leverage and its possible impact on balance sheets of banks, especially in the aftermath of the COVID-19 crisis. Is this the case for India as well? This is the key question the study aims to find answers to.

In the backdrop of overall macroeconomic scenario and key indicators, the study assesses the current scenario of credit stress in the corporate sector by examining key firm level indicators and further observe how this stress has changed overtime. Thus, the study focusses on assessing the vulnerability of the Indian corporate sector using firm level dataset.

Financial Stress in Corporate Sector: A Study on India[1]

BACKGROUND AND OBJECTIVE

The performance of businesses is intertwined with the performance of the overall economy. Shocks to the general macroeconomy can affect the lives of businesses and vice versa. Businesses may be under stress or, in other words, vulnerable to go under, due to financial or economic reasons.

Financial stress is generally understood as the situation of absence of normal profits or returns to factors of production. However, the forces causing these changes are the ones that drive the allocative mechanism of a market economy. Thus, financial stress can be said to be a situation when the capacity of a firm to adjust to the forces causing stress is exceeded. While some amount of stress is essential, too much of the same may lead to misallocation of resources, undesirable structural change, loss of economic and human capital etc.[2] The consequences of deteriorating financial health of firms are that some of them may most likely default on their credit obligations and likely trigger accumulation of bad debts in the banking sector.

Firms may be in economic stress, as opposed to financial stress, wherein it suffers for reasons such as competition, innovation or malfeasance. For example, stakeholders of a company may work at cross-purposes, and even against the interest of the company. A company may suffer when it is not able to sell its products at competitive prices or its cost of capital is high. Poor organisation, inefficient management and malfeasance are other causes of failure of a firm. Competition drives out inefficient firms. Innovation drives out the old order. Economic stress may also be caused due to force majeure conditions such as a natural disaster or a health crisis, such as the ongoing COVID-19 pandemic.

Since the economies are intricately connected in a globalized world, stress in a certain sector in one economy can have a domino effect on sectors forming part of its backward and forward linkages across various countries. There are a number of examples of how crisis in a particular country has translated into crisis at a global level. The long history of financial crises all over the world is replete with instances of crises that differ in forms/types, intensity and underlying vulnerabilities. Reinhart and Rogoff (2009)[3] reported that during 1800-2008, the world has witnessed 270 banking crises and 296 sovereign debt crises spread across a number of countries. More recent periods have also witnessed currency crises, e.g., in Europe in 1992–93, in Latin America in 1994–95 (called the "Tequila crisis") and in East Asian economies of Indonesia, Korea, Malaysia, the Philippines, and Thailand in 1997–98. Banking crises have been witnessed in Thailand in 1997, Germany and Greece in 2008 etc. The sub-prime crisis of 2007-08, which started in the US, assumed global proportions. The Eurozone is struggling to surface itself out of sovereign debt crisis which began in 2011 affecting Greece, Portugal, Ireland, Italy etc. Quite often two or three types of crises are seen to have occurred simultaneously or in quick successions.

[1] This study has been undertaken by Research Division of IBBI for purely academic purpose. This does not represent the views of IBBI.

[2] Jolly, R. W., Paulsen, A., Johnson, J. D., Baum, K. H., and Prescott, R. (1985), "Incidence, intensity, and duration of financial stress among farm firms", American Journal of Agricultural Economics, 67(5):1108-1115.

[3] Reinhart and Rogoff (2009), This Time Is Different: Eight Centuries of Financial Folly, Princeton University Press.

Crises of all types have often had common manifestations in the form of financial market distortions such as the build-up of unsustainable economic imbalances and misaligned asset prices or exchange rates. Incidences of crises have historically involved failures of financial and non-financial institutions/corporations, slowdown or disruption to credit flows or external capital flows in key areas of the economy etc., leading to economic slowdown as a whole.

Predicting such vulnerabilities in the corporate sector towards likely financial distress has been a matter of research. The analysis of credit stress aims at identifying a stress situation, quantifying its size and significance and eventually charting out the appropriate policy intervention in such cases. Credit stress, accompanied with deteriorating financial conditions can lead to the larger problems of managing debts for firms and may even lead to stress in the banking sector. In this context, an understanding of the overall financial performance of firms becomes necessary, which also includes aspects of credit stress through increased borrowings, rising interest burden and declining profitability. Various statistical and econometric models have been developed over time in this regard.

Motivation and objectives

The purpose of undertaking this study arises from various reports from think tanks and subject experts on increasing indebtedness of the corporate sector globally, indicating increase in corporate leverage and its possible impact on balance sheets of banks, especially in the aftermath of the COVID-19 crisis. Is this the case for India as well? This is the key question the study aims to find answers to.

The study assesses the current scenario of credit stress in the corporate sector by examining key firm level indicators and further observe how this stress has changed overtime, what are the likely levels of defaults due to the stress. Thus, the study focusses on assessing the vulnerability of the Indian corporate sector using firm level dataset.

The study is organized as follows. It first presents a literature survey on how an assessment of credit stress has been attempted by various researchers. It also presents the available studies on level of corporate stress globally and in Indian context. The next section informs about the current state of affairs in terms of macroeconomic outlook and corporate sector globally and in India, in particular. It presents the background on supply and demand side of bank credit to corporate sector and sets the context for further research.

The study of credit stress can be carried out by a number of methods, as available from the literature. This study does the following. Firstly, industry wise basic financial ratios are computed to understand the trends of corporate performance using the Centre for Monitoring Indian Economy (CMIE) database and National Stock Exchange (NSE) for listed non-financial companies. Quarterly filings of listed non-financial companies are also analysed using CMIE database to get the latest information on key financial ratios of the companies. Secondly, using CMIE data (for pre-COVID-19 period till FY 2019-20 and Q2 and Q3 of FY2020-21), Altman-Z scores are computed, which is a measure of likely bankruptcy of firms and key results are summarised. Further CMIE data is mapped with the companies which have filed for bankruptcy under the IBC and some key findings are presented.

Finally, the last section summarizes the major findings and suggests some areas of focus for improvements in financial conditions at the firm level.

LITERATURE SURVEY

The literature uses two broad approaches to understanding credit stress in firms at a particular point in time (i) use of financial ratios and (ii) stress testing corporate balance sheets. Financial ratios are a set of indicators that capture a firm's performance on aspects, such as profitability, liquidity or solvency. The most important research work in the area of using financial ratios of companies to assess the health of the corporate sector was done by Beaver (1966)[4] and Altman (1968)[5], which is still evolving and is largely based on market variables. In the absence of information on distressed companies, academic studies have used ratings data available from secondary sources to define distressed companies.[6]

In the second alternative, stress testing of balance sheets involves conducting a scenario analysis by changing a variety of economic variables to ascertain the impact on the firm's performance. In this case, different types of risks are assessed and scenarios are built that include changes in macroeconomic environment such as; growth projections, changes in stock markets, changes in policy rates, and shocks to the economy. A continuous assessment of the firm's performance on either of these measures serves as an indicator for assessment of credit stress at a firm or industry level.

Indian context

The literature on corporate sector stress is found to have analyzed the financial performance of firms in the Indian context in terms of credit risks and defaults, profitability and bankruptcy. Financial stress (or distress as commonly referred) is a term that is inclusive of analysis of credit or debt default (credit stress), declining profitability and the possible chances of firm failure. Studies have specifically analysed credit stress which covers aspects of borrowings, their sources and the firm's ability to meet such debt obligations.

Gupta (2014)[7] evaluated Z-score for emerging markets on a set of firms that defaulted and those which were credit worthy. The author evaluated corporate stress by using a set of ratios of profitability, liquidity, solvency, the original ratios of the Altman's Z-score, productivity ratios, macro-economic variables and industry indicators as predictors of default.

Lindner and Jung (2014)[8] find that the financial performance of India's corporate sector has been under pressure since the global financial crisis. Balance-sheet data on a large cross-section of Indian non-financial corporates show that the growth in their leverage over the period 2001 to 2014 has been associated with a notable increase in the vulnerabilities of firms carrying high interest payment burdens. The authors suggest that the reason for deterioration in financial health can be traced to an increased leverage caused by excess supply of credit by public sectors banks post the global financial crisis and increased reliance on foreign borrowing. Based on four indicators to assess financial health: interest coverage ratio (ICR), profitability, liquidity and

[4] Beaver, W.H (1966), "Financial Ratios as predictors of failure", Journal of Accounting Research, No. 4, pp. 71-111.

[5] Altman, E. (1968), "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy", The Journal of finance, 23(4), pp. 598-608.

[6] Manjusha Senapti and Saptarshi Ghosal (2016), "Modelling Corporate Sector Distress in India", RBI Working Paper, No. WPS (DEPR): 10/2016.

[7] Gupta, V. (2014), "An empirical analysis of default risk for listed companies in India: A comparison of two prediction models", International Journal of Business and Management, 9(9).

[8] Peter Lindner and Sung Eun Jung (2014), "Corporate Vulnerabilities in India and Banks' Loan Performance", IMF Working Paper 14/232.

leverage, the authors found that corporate vulnerabilities are at their highest levels since the early 2000s.

Jugna et. al (2016)[9] examine the changes in credit quality of a large sample of listed Indian corporates. Using multiple indicators, the study suggests that credit quality declined sharply between 2010 and 2015, creating a pool of vulnerable corporate debt. The stress likely reflects a contraction in aggregate corporate growth along with some fall in profitability and imbalanced financing patterns with overreliance on debt. Debt owed by listed firms with ICR of less than 2 has increased between 2008 to 2015. Further the authors find that an increasing proportion of firms are unable to generate income to service modest debt.

Senapati and Ghosal (2016)[10] developed a model for estimating the chances of a firm being in state of financial distress in following year. They used a multivariate fixed effect logistic regression model using three financial ratios; long term liabilities to total liabilities, operating profits to total liabilities and current assets to current liabilities.

Recent trends in Corporate sector performance

Solvency risk

Economic downturns generally lead to an increase in insolvency filings.[11] Immediately after the outbreak of the pandemic, in the second quarter of 2020, about 147 companies worldwide with turnover in excess of €50 million became insolvent. This was a 99% increase over the same quarter in 2019. Governments responded quickly to mitigate the risk of insolvency and employed various measures to prevent viable firms from being pushed into insolvency such as increasing the barriers to creditor-initiated insolvency filings, suspending the director's duty to file and associated liability and debt repayment emergency measures. As a result of such mitigating measures, many countries experienced decline in the number of insolvency filings in 2020.[12] Some countries such as Australia, Singapore, Italy and Lithuania have seen almost 50% decline in cumulative number of business insolvency filings from Q2 and Q3 of 2019 to the same quarters of 2020. However, in the USA, Chapter 11 filings rose by almost 45% when comparing Q2 and Q3 2019 to the same period in 2020. Similarly, Chapter 15 filings (filings by foreign companies in US) increased three times from Q1 of 2020 to Q2 of 2020.

As government's forbearance measures are withdrawn gradually in the near term, insolvency filings are likely to rise. The credit insurance company Euler Hermes Global Insolvency Index forecasts a +13% increase in the number of insolvencies worldwide in 2021, compared to 2019, and a +27% increase in 2022 compared to 2019. The risk of insolvency is perceived to be high as the pandemic has affected the cash flows of firms in the short term. Further delayed payments or defaults by one firm tend to have a domino effect on all the firms in a given value chain, exposing them to solvency risk as well. The situation gets particularly severe in today's globalized economy where value chains are interconnected. Firms are facing cash crunch as trade credit (short term credit for working capital need) has become scarce with many firms avoiding the risk of taking on bad debt in these uncertain times.

[9]Ansari, Jugnu and Khandelwal, Khushboo and Prabhala, Nagpurnanand (2016), "Financial Stress in Indian Corporates", Robert H. Smith School Research Paper No. RHS 2773398.

[10] Senapati, M. and Ghosal, S. (2016), "Modelling corporate sector distress in India", RBI working paper.

[11] Marie Christine Apedo-Amah et al., 'Unmasking the Impact of COVID-19 on Businesses Firm Level Evidence from Across the World', Policy Research Working Paper 9434, FCI, World Bank, 2020.

[12] The Calm Before the Storm: Early Evidence on Business Insolvency Filings After the Onset of COVID-19, World Bank's Covid-19 Notes, Finance Series, February 25, 2021.

The pandemic is hitting small and medium enterprises (SMEs) disproportionately hard**.** The IMF projects that the share of SMEs with negative equity (i.e debts more than assets) may rise by 6 percentage points in 2020-21, threatening upto 1 in 10 SME jobs.[13] This increase is similar to that seen in the five years after the global financial crisis, but it may occur in a much shorter time period, in an adverse scenario of extended lockdowns and persistent Micro, Small and Medium Enterprises (MSMEs) are at a greater risk. The study warns that rising insolvency risks among SMEs could take the centerstage and become a persistent drag on the economic recovery.

In India for instance, the RBI permitted lending institutions to grant a moratorium on payment of instalments of term loans due between March 1, 2020, and May 31, 2020, which was later extended till August 31, 2020. The RBI notes that as on August 31, 2020, customers accounting for 40% of outstanding bank loans availed the benefit of moratorium allowed by the RBI for borrowers affected by the COVID-19 pandemic. The number of MSMEs customers that availed moratorium increased to 78 % in August 2020, reflecting the stress in the sector.[14]

Corporate leverage

In view of demand contraction and supply chain disruptions arising from primarily two external factors, namely, COVID-19 and consequential imposition of nationwide lockdown, many companies may have receding top line and bottom line and some of them may default in servicing debt obligations. While the impact of these external variables on the economy is very deep, similar shocks of a comparatively lower intensity in the past have witnessed a sharp increase in corporate and personal insolvencies all over the world.

In the present context, one of the major factors contributing to corporate sector vulnerability is the high levels of debt on corporate balance sheets. A report by the G30 group[15] points out that the global non-financial sector corporate debt levels going into the present crisis, as a percentage of global GDP stood at 91% in the beginning of 2020, as compared to 73% in 2007. Private debt increased by 176% in developed markets and 973% in emerging markets between the period 2005-07 and 2017-19. Thus, the situation of corporate debt is now precarious given that the sector was already on high leverage. Unlike the crisis of the past, the pandemic has directly impacted the balance sheets of corporates with the potential to spill over to the health of the balance sheets of banks and financial institutions.

The IMF's Global Financial Stability Report of March, 2021 notes that the non-financial sector came into the COVID-19 pandemic crisis with historically high levels of leverage, defined as the reliance on debt in relation to income. It holds that it was due to highly accommodative monetary policies pursued by major central banks that had eased financial conditions since the global financial crisis, nonfinancial corporate sector debt increased in both advanced and emerging market economies, reaching a historical high of 91% of GDP at the end of 2019**.**

The COVID-19 shock has further increased non-financial sector leverage across economies by reducing cash flows for the corporate sector and, through its impact on employment, increased the financing needs of households. The unprecedented and warranted monetary and fiscal policy support launched during the containment phase of the pandemic has eased market dysfunction, loosening financial conditions after a sharp tightening in the first quarter of 2020, and maintained the flow of credit to households and firms. Policy support has also enhanced their ability to repay, thus allowing them to avoid having liquidity pressures morph into solvency issues. However, this

[13] Federico J. Diez et. al. (2021), " Insolvency Prospects Among Small and Medium Enterprises in Advanced Economies: Assessment and Policy Options", IMF Staff Discussion Note, SDN/21/02.
[14] RBI Report on Trends and Progress of Banking in India, 2019-20.
[15] https://group30.org/publications/detail/4820

has come at the expense of increased debt levels for most economies. Global non-financial corporate and household debt increased by 11 percentage points and 5 percentage points of GDP, respectively, between the end of 2019 and the third quarter of 2020. While sharp declines in output, particularly in emerging markets, have undoubtedly contributed to the recent increase in debt-to-GDP ratios, there has also been a visible rise in debt levels during the COVID-19 crisis.

A vast body of literature identifies high levels or rapid increases in non-financial sector leverage as key predictors of downside risks to economic growth and financial stress [Verner (2019)[16], Schularick and Taylor (2012)[17] and Kalemli-Ozcan and others (2020)[18]]. To the extent that buildups in leverage are facilitated by easy financial conditions, policymakers grappling with the adverse economic effects of the current crisis may soon face a trade-off associated with their choices. While an accommodative policy stance is appropriate at present to ease financial conditions and stimulate aggregate demand in economies facing recessions and large negative output gaps, continued extraordinary policy support once the recovery looks promising, carried with it the risk of adding to the already elevated leverage vulnerabilities. Furthermore, such extraordinary support could induce excessive risk taking arising from moral hazard under an expectation of continued central bank interventions.

Summing up

Given the current level of corporate indebtedness, if debt on the balance sheets of corporates grows further, coupled with slow recovery of income, higher volumes of debt will become difficult to manage. As government support will eventually wane, the credit pressure on corporates could increase thus leading to higher solvency risk translating into higher default rates and rising NPAs for banks. This would have a bearing on investments and long-term growth of the economy.

From the aforesaid analysis it is expected that a major wave of corporate insolvencies is yet to materialize going forward. There are multiple factors that have kept insolvencies at bay till now, as detailed above.[19] One of the most important factors has been the Government fiscal support that has concealed the scale of the challenge. As this wears off, an increase in insolvencies could be expected. Another important factor has been the changes made by the Governments in their insolvency regimes that have frozen the initiation of insolvency proceedings. Once these temporary measures lapse, the rate of insolvencies may see an increase. Regulatory forbearance such as tolerating high NPA levels in the short term and emergency debt repayment measures have masked the insolvency challenge ahead.[20] Most of the firms have been able to survive the brunt of the crisis by running down on their existing cash buffers. However, as indicated by a Bank for International Settlements (BIS) study, if 2020 revenues fall by 25% and firms are not able to roll over debt, cash buffers and revenues will not to be sufficient to service debt and meet operating costs in more than half of the sampled corporates across 26 countries. Further, it is not clear till what time the companies will be able to manage with lowered operating expenses (reduced salaries, overheads etc.).

[16] Verner, Emil. 2019. "Private Debt Booms and the Real Economy: Do the Benefits Outweigh the Costs?" MIT, Sloan School of Management.

[17] Schularick, Moritz, and Alan M. Taylor(2012), "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008." American Economic Review 102 (2): 1029- 61.

[18] Kalemli-Ozcan, Sebnem, Luc Laeven, and David Moreno (2020), "Debt Overhang, Rollover Risk, and Corporate Investment: Evidence from the European Crisis", NBER Working Paper 24555.

[19] Special Report, G30 Working Group on Corporate Sector Revitalization (2020), Reviving and Restructuring the Corporate Sector Post-Covid : Designing Public Policy Interventions.

[20] The Calm Before the Storm: Early Evidence on Business Insolvency Filings After the Onset of COVID-19, World Bank's COVID-19 Notes, Finance Series, February 25, 2021.

The World Bank[21] too has pointed out that the slew of measures described above have only postponed *a rise in insolvency filings and not avoided it.* Taking a cue from previous crisis such as the global financial crisis of 2008, the World Bank paper indicates that build-up of NPAs following a crisis generally takes a few quarters (about 11 to 13 quarters) before they peak. The build-up of NPAs eventually lead to a rise in insolvency filings. Corporate vulnerability is at an all-time high due to slump in sales and additional borrowings on books to meet liquidity shortfalls.

The IMF has warned that the number of bonds with a BBB- rating and a negative outlook has tripled globally since last year.[22] Corporate vulnerability is particularly severe in emerging markets where firm's liquidity challenges have been found to be more acute.[23] Such liquidity challenges can easily translate into rising unemployment, as was seen at the time of the Great Depression, and the more recent unemployment rate in OECD[24] countries which has gone up by nearly one-third from March, 2020. As insolvencies will increase going forward, some jurisdictions may be tempted to prolong emergency legal interventions. This could have negative economic effects in the medium and long-term.[25]

In this backdrop of rising corporate solvency risk and possible surge in insolvencies going forward, it is pertinent to undertake a study of the financial health of the Indian corporate sector to gauge the scale of corporate stress built up since the pandemic and enable timely formulation of appropriate policy and mitigation plan.

STATE OF AFFAIRS

Global Macroeconomic Outlook

As the year 2019-20 was ending, the outbreak of the COVID-19 pandemic posed unique challenges to the health sector, economy, and financial markets globally. It had adverse impact on the macroeconomic trends in all economies, necessitated structural changes in economies and societies, extinguished several jobs and posed corporate solvency challenges. Governments and policy makers acted swiftly to mitigate the adverse effects of the health crisis with fiscal and monetary packages to the tune of nearly USD 10 trillion, which is three times more than the response to the 2008–09 financial crisis.[26] The IMF estimates a contraction in global economic growth of -3.5% in 2020[27], thus indicating that the present health crisis is the worst recession since the Great Depression, and far worse than the Global Financial Crisis.

However, the recent vaccine approvals and administration of the same in several economies coupled with additional fiscal support from governments, has raised hopes of economic recovery in 2021. The global economy is now projected to grow 5.5% in 2021 and 4.2% in 2022, revised

[21] Ibid.
[22] Global Financial Stability Update, IMF, January 2021.
[23] Marie Christine Apedo-Amah et al., Unmasking the Impact of COVID-19 on Businesses Firm Level Evidence from Across the World, Policy Research Working Paper 9434, FCI, World Bank, 2020.
[24] http://www.oecd.org/sdd/labour-stats/unemployment-rates-oecd-update-november-2020.htm
[25] The Calm Before the Storm: Early Evidence on Business Insolvency Filings After the Onset of COVID-19, World Bank's Covid-19 Notes, Finance Series, February 25, 2021.
[26] "The $10 trillion rescue: How governments can deliver impact", Mckinsey & Company Report, June 2020, https://www.mckinsey.com/~/media/McKinsey/Industries/Public%20Sector/Our%20Insights/The%2010%20trillion%20dollar%20rescue%20How%20governments%20can%20deliver%20impact/The-10-trillion-dollar-rescue-How-governments-can-deliver-impact-vF.pdf
[27] World Economic Outlook Update, January 2021, IMF.

up 0.3 percentage point relative to the previous forecast.[28] While the global economy is getting back on track, countries and regions are moving at different speeds. With passage of time, as certain sectors will adapt to the 'new normal' of less contact-intensive activities and roll out of vaccines will give way to strengthening contact-intensive activities again, the economic recovery is expected to gain momentum in the second half of 2021 as per the IMF. However, economies still need to be wary of potential surging of infections (including new variants of the virus), lockdowns, delays in vaccine distribution, and threat to employment and incomes due to potential surge in corporate and household insolvencies[29], to ensure a sustained recovery and curb the damage caused from sharp contraction in 2020.

Outlook for India

India's real GDP growth rate contracted by 7.3% in FY 2020-21 (grew by 4.2% the previous FY), the first contraction since 1980-81. All components of domestic demand were driven down, except government final consumption expenditure, which provided sustained support to aggregate demand. On the supply side, activity in manufacturing, construction and transportation witnessed a fall due to sector-specific impediments. Industrial GVA decelerated sharply in 2019-20 to 0.8 % from 4.5 % last year. It further contracted by 7.4% in 2020-21. The deceleration was broad-based. With dwindling confidence and imposition of lockdown, the demand for nonessential items has fallen. The index of industrial production shrank by 8.6% in 2020-21, following a negative growth of 0.8% the previous year. The manufacturing sector, which constitutes three-fourths of industry, saw a fall of 8.4%. In tandem with the slowdown in the industrial sector, services sector growth decelerated to 8.5% in 2020-21.[30] Credit growth decelerated to 5.4 % in 2019-20 and further to 2.5 % in 2020-21. Gross non-performing assets (GNPA) ratio stood at 7.5% in 2020-21, according to RBI's FSR, July, 2021.

However, in line with global output recovery, the IMF has projected India's growth to be 12.5% in 2021, indicative of a stronger-than-expected recovery in 2020 after nationwide lockdowns and restrictions were eased, and 6.9% in 2022.[31] Similarly, the provisional estimates of India' real GDP growth for 2020-21 by NSO indicate a better than expected contraction of -7.3 % owing to factors such as good agricultural output and higher government expenditure.[32] RBI's stress tests indicate that the GNPA ratio of all scheduled commercial banks (SCBs) may increase from 7.5% in March, 2021 to 9.8% by March, 2022 under the baseline scenario and to 11.22% under a severe stress scenario.[33]

Health of corporate sector

Global outlook

As corporates continue to overcome the aftermath of the crisis, the S&P Global Ratings[34] has projected that more downgrades are likely in corporate credit ratings. As per estimates, corporates and governments have a negative bias to the tune of 36% indicative of downward ratings in 2021. In fact, 9% of non-financial corporates are vulnerable to default and have been placed in the 'CCC'[35] category. As per this study, default rates are expected to increase and will continue to

[28] World Economic Outlook Update, January 2021, IMF.
[29] Global Financial Stability Report Update, January 2021, IMF.
[30] RBI Annual Report 2020-21.
[31] IMF, April, 2021.
[32] Government of India, Ministry of Statistics and Programme Implementation, Press Note dated May 31, 2021
[33] RBI, Financial Stability Report, July 202.
[34] "Global Credit Outlook 2021: Back on track?", S&P Global Ratings, December 3, 2020.
[35] An obligation rated 'CCC' is currently vulnerable to nonpayment and is dependent upon favorable business, financial, and economic conditions for the obligor to meet its financial commitments on the obligation. In the event of adverse business, financial, or economic conditions, the obligor is not likely to have the capacity to meet its financial commitments on the obligation.

remain high in the near term. This is different from previous trends wherein in the aftermath of crisis, default rates would rise sharply to a peak and then decline rapidly.

Credit downgrades will however vary across sectors. While some sectors have not been adversely affected by the pandemic (utilities, telecoms), others are facing existential crisis (shop-centred discretionary retail, leisure and hotels, airlines). There is a wide gap in the revenue and debt-EBITDA ratios of the most affected and least affected sectors. S&P Global Ratings have estimated the revenues of most affected sectors to have contracted by 14% while for least affected sectors the contraction has been limited to 2% only. The median debt-to-EBITDA ratio for companies most affected has risen to 5.4 from 4.4, versus only 4.0 to 4.5 for those least affected.

RBI estimates

The RBI's FSR of January, 2021 informs that the private corporate business sector had been experiencing a deterioration in performance even before the pandemic. This became accentuated with the outbreak of COVID-19. However, the brunt of the pandemic's impact was mainly concentrated in Q1:2020-21, with a steep contraction in sales of listed private manufacturing companies standing at (-)41.1%. Signs of recovery became visible in Q2 of 2020-21, when the sales growth was (-) 4.3%. A number of cost cutting measures were taken by corporates, as reflected in a larger reduction in expenses relative to sales. Following this, the manufacturing sector posted improvements in operating profits and in debt servicing, and saw consequent improvements in their ICR. The FSR notes that although profit margins improved across sectors, manufacturing companies reduced leverage during H1:2020-21 vis-à-vis the previous half-year and built-up precautionary cash positions, as reflected in the unaudited balance sheets of 1,249 listed private manufacturing companies. Further, their investment in fixed assets remained subdued.

RBI's FSR of July, 2021 reports that after the deterioration in H1:2020-21, private corporate activity revived during H2:2020-21 after gradual opening of economy. Nominal sales of 724 listed private companies increased by 6.8% and 31.7% in Q3 and Q4 of FY 2020-2021. IT sector experienced 6.5% growth in sales during Q4, while non-services IT and manufacturing recorded the maximum contraction.

Credit downgrades

According to ICRA[36], in the first quarter of financial year 2021, the top five sectors (in terms of the count and the proportion of entities in the sector) that saw negative rating were textiles, real estate, hospitality, auto ancillaries and construction. The study by ICRA has indicated about 20 downgrades on an average per day as Indian corporates continue to face the brunt of the crisis, in spite of pick-up in demand. As per S&P Global ratings, about 35% of credit ratings of India Inc. either have a negative outlook or are on credit watch with negative implications. Between April to October, 2020, nearly 3,910 firms were downgraded, while only 661 were upgraded. The reason why incremental number of downgrades from April to October, 2020 declined was due to the regulatory measures taken by the regulators to protect the credit profile of firms - such as moratorium on debt servicing permitted by the RBI and temporary relaxation in default recognition norms of credit rating agencies allowed by SEBI.

Even before the outbreak of the pandemic, India's corporate sector was experiencing substantial downgrades.[37] India Ratings and Research's (Ind-Ra) corporate finance rating remained in the

[36] https://www.financialexpress.com/industry/around-3910-downgrades-in-fy21-reflect-vulnerability-in-corporate-credit-profile/2107459/

[37] India Ratings and Research, Ind-Ra's FY20 Transition and Default Study, Special Report, September, 2020.

negative territory in FY20. During 2019-20, the number of issuers downgraded was more than double the number of issuers upgraded. Ind-Ra's overall corporate finance ratings' annual default rate[38] increased to 4.90 % in FY20, highest in a decade. Industry-wise distribution of Ind-Ra's FY20 downgrades shows that the highest percentage of downgrades was in the Food, Beverages & Tobacco sector followed by Construction and Engineering and Metals and Mining. These corporate rating downgrades were largely on account of stretched working capital cycles of corporates, lower profitability, and deterioration in the credit metrics.

Performance of capital markets – an aberration

The global stock market showed remarkable resilience in the face of the crisis, growing by 20% from February, 2020 to February, 2021.[39] While the first month of the crisis saw historical falls in stock markets across the globe, signs of recovery emerged by March, when governments started responding with various emergency health and fiscal measures.[40] Seven months into the crisis, nearly half of the sectors bounced back except for the banking sector which was still 19% lower than the pre-pandemic levels. By October, 2020 the worst hit industries regained their market losses on the back of news of vaccine approvals and output recovery projections. Industries that were not adversely affected by the crisis continued to advance strongly. The gap between the best and worst-performing sectors has since grown from 27 percentage points in mid-March, 2020 to 80 percentage points by mid- March, 2021. Overall, the market rose by USD 14 trillion with 40% of the total gains being contributed by a group of some 25 mega companies.

Stock market performance has been disconnected from performance of real economy for three reasons[41] (i) the stock market has formed a long-term perspective as regards effect of the pandemic on market prices. In the long term, the market expects restoration of GDP levels and profits to pre-pandemic levels; (ii) the market has valued some individual companies and not the market as a whole. For example, oil and gas companies, banks, travel companies have performed low, whereas pharmaceuticals, technology, media, telecommunications companies have performed fairly well. The good performers have been valued to such an extent that the aggregate value of the stock market has remained resilient. This is especially true in the case of technology companies; (iii) Companies that generally affect employment levels or GDP levels do not make up a major part of the market indices. In fact, many such companies are not even listed companies.

Exposure of banks to corporate sector

Since corporate stress and ensuing defaults on debt obligations have a direct bearing on NPA levels of the banking sector, it is important to understand the degree and scale of exposure of the banking sector to corporate sector in India from both demand and supply side of credit.

Demand side

Table 1 presents the pattern of financing of the Indian corporate sector in respect of 3952 non-financial and non-government listed companies from the CMIE database. The data indicates that use of internal sources of funds by companies has been around 43% since 2011 to 2020 and that

[38] Annual Default rate represents proportion of default ratings in the year as a percentage of the total number of non-default ratings outstanding at beginning of the year.

[39] 'Four regions, four stories of recovery and resilience'. Mckinsey & Company, March 24, 2021, https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/four-regions-four-stories-of-recovery-and-resilience

[40] 'The impact of COVID-19 on capital markets, one year in.', Mckinsey & Company, March 10, 2021. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-impact-of-covid-19-on-capital-markets-one-year-in#

[41] https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/wall-street-versus-main-street-why-the-disconnect

of external sources has been 57% of the total sources of funds. Within the external sources of finance, borrowings from banks and financial institutions has been the favoured option among corporates. The use of corporate bonds and debentures has been subdued pointing to limited penetration of these markets in the country.

Table 1: Pattern of Sources of Funds for non-financial and non-government listed companies

(% of total sources of funds)

SOURCES OF FUNDS / FY	2011-12 to 2013-14	2014-15 to 2016-17	2017-18 to 2019-20
INTERNAL SOURCES	43.00	43.76	43.02
EXTERNAL SOURCES	57.00	56.24	56.98
(a) Equity capital	9.07	8.86	9.43
(b) Borrowings	26.65	26.06	24.70
Debentures/Bonds	3.11	3.81	4.26
From banks and FIs	13.66	13.23	10.81
(c) Trade dues and other current liabilities	21.27	21.32	22.85
TOTAL	100.00	100.00	100.00

Source: CMIE Database

Thus, to summarize, the patterns of firm financing over the last two decades shows that: (a) Indian firms use equity financing (retained earnings and fresh issue of equity) more than debt financing; (b) Credit from banks is the largest source of external finance and (c) borrowings from corporate bond markets has been at low levels throughout the period under consideration.

Supply side

The trends in growth of bank credit of scheduled commercial banks (SCBs), shows a downward movement from 2011-12 to 2014-15, a small increase in 2015-16, followed by a drastic fall in 2016-17. It again increased substantially during 2017-2019 and fell to 6.1% in 2019-20 and further to 5.6% in 2020-21 (Table 2). Non-food credit growth slumped to half its rate in 2019-20 compared to the previous year, reflecting weak demand and risk aversion among banks. This saw a further downturn in 2020-21, witnessing a growth of only 4.9% (Table 3). The unabated weakening of economic activity, coupled with deleveraging of corporate balance sheets and risk aversion by banks due to asset quality concerns, was accentuated towards the close of 2019-20 by the pandemic producing a reduction in the incremental credit-deposit ratio from 77.7 in 2018-19 to 76.4 in 2019-20 and further to 72.7 in 2020-21. The credit-to-GDP gap, has been wide, ranging from 50-53% over the period 2011-12 to 2019-20. It remained wide during 2019, reflecting the slack in credit demand. Data on sectoral deployment of bank credit for March 2020 points to a broad-based slowdown. Credit growth to industry fell sharply from 6.9% in 2018-19 to 0.7% in 2019-20 and further to 0.4% in 2020-21.

Table 2: Growth rate of bank credit, non-food credit, credit-deposit ratio and credit-GDP ratio (%)

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Bank Credit	17.0	14.1	13.9	9.0	10.9	4.5	10.0	13.3	6.1	5.6
Credit-Deposit Ratio	78.0	77.9	77.8	76.6	77.7	72.9	75.5	77.7	76.4	72.7
Credit-GDP Ratio$	52.8	52.9	53.4	52.4	52.6	50.9	50.4	51.5	51.0	56.4

Notes: $: GDP data from 2011-12 onwards are based on new series i.e., base: 2011-12. GDP refers to GDP at Current Market Prices.

* Figure updated for 2020-21 from RBI's Financial Stability Report, Issue No. 23, July, 2021.

Source: Appendix Table 4 – Money, Inflation and Credit, RBI Annual Report, 2020-21

Table 3: Sectoral Deployment of Non-Food Gross Bank Credit (Y-o-Y growth) (%)

SECTOR	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Non-food Credit (1 to 4)	**13.6**	**8.6**	**9.1**	**8.4**	**8.4**	**12.3**	**6.7**	**4.9**
Agriculture & Allied Activities	12.9	15.0	15.3	12.4	3.8	7.8	4.2	12.3
Industry (Micro & Small, Medium and Large)	12.8	5.6	2.8	-1.9	0.7	6.9	0.7	0.4
Services	16.1	5.7	9.1	16.9	13.8	17.8	7.42	1.4
Personal Loans	12.5	15.5	19.4	16.4	17.8	16.4	14.99	10.2

Source: RBI Handbook of Statistics, RBI Annual report 2020-21

Asset quality of banks

The GNPA ratio of all SCBs which was 9.3% in March 2019 came down to 8.4% in March 2020 and to 7.5% in March, 2021 (Table 4). A reduction in the overhang of 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 end of 2018-19, 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. GNPA and net NPA ratios stood at 7.5% and 2.4%, respectively, at the end of March 2021. GNPA ratio may increase up to 9.8% by March 2022.[42]

The slippage ratio, defined as new accretion to NPAs in the quarter as a ratio to the standard advances at the beginning of the quarter, contracted sharply for consecutive half-years to 0.15% in September 2020 (Table 5) with the decline spread across all bank groups. The annual slippage ratio of all SCBs, measuring new accretions to NPAs as a share of standard advances at the beginning of the year, fell to 2.5% in 2020-21 The improvement was aided significantly by the regulatory dispensations extended in response to the COVID-19 pandemic.

Table 4: Gross NPA ratio *(percent)*

	Public sector banks	Private sector banks	Foreign banks	All SCBs
Mar-19	12.2	4.8	3.0	9.3
Sep-19	12.3	5.1	2.9	9.3
Mar-20	10.8	5.1	2.3	8.4
Sep-20	9.7	4.6	2.5	7.5
Mar-21	9.5	4.8	2.4	7.5

Source: RBI, FSR, July, 2021

Table 5: Quarterly Slippage Ratio *(percent)*

	Public sector banks	Private sector banks	Foreign banks	All SCBs
Mar-19	0.64	1.31	0.25	0.85
Sep-19	0.94	0.84	0.36	0.88
Mar-20	0.56	0.45	0.30	0.51
Sep-20	0.13	0.19	0.07	0.15

Source: RBI, FSR, January, 2021

Among the broad sectors, asset quality, year-on-year, improved noticeably in the case of industry, agriculture, and services in September 2020 over March 2020, with a decline in GNPA ratio (Table 6). There was marginal increase in GNPA ratios in agriculture, services and retail sectors in March, 2021.

[42] RBI, FSR, July, 2021.

Table 6: Sector-wise GNPA ratio

(percent)

	Mar-19	Sep-19	Mar-20	Sep-20	Mar-21
Agriculture	9.1	10.1	10.5	9.6	9.8
Industry	16.7	17.3	13.6	12.4	11.3
Services	6.7	6.3	7.5	6.9	7.5
Retails	1.9	1.8	1.8	1.7	2.1

Source: RBI, FSR, July, 2021

Outstanding credit of SCBs

An analysis of outstanding credit of scheduled commercial banks to public sector's financial and non-financial corporations and private sector's financial and non-financial corporations shows that private non-financial corporations have major share of outstanding credit of scheduled commercial banks (Table 7). Public and private limited companies could be a major source of risk arising of worsening corporate balance sheets. Literature relates the Indian corporate vulnerabilities to increased level of nonperforming and restructured loans in the banking system. (Lindner and Jung, 2014)[43].

Table 7: Outstanding Credit of Scheduled Commercial Banks to Public Sector and Private Corporate Sector

(% Share of total outstanding credit)

	Mar-14	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21
	Public Sector							
Public Financial Corporations	1.84	2.38	1.89	1.94	2.32	2.91	2.77	3.11
Public Non-Financial Corporations	13.13	12.57	11.76	12.88	12.24	10.91	10.72	9.83
	Private Corporate Sector							
Private Financial Corporations	5.27	7.71	8.75	5.08	5.15	6.03	5.43	5.95
Private Non-Financial Corporations	33.25	32.31	31.38	30.53	28.59	27.28	25.21	22.33
Total credit to Corporations	**53.48**	**54.97**	**53.78**	**50.44**	**48.29**	**47.13**	**44.14**	**41.22**

Source: RBI: *Basic Statistical Returns of Scheduled Commercial Banks in India – Various Volumes, RBI, FSR, July, 2021*

Summing up

Debt financing by corporate sector is not very high in India as compared to global levels. As indicated in Table 1, Indian firms use equity financing more than debt financing. In general, the credit-to-GDP ratio is not high, ranging between 50-56% since 2011-12 (Table 2). The credit to deposit ratio also does not show any major trend since 2011-12, being in the range of 72-78%. The outstanding credit of SCBs to the corporate sector (public as well as private sector) is not very high, standing at 41 % of total outstanding credit as of March, 2021 and is showing a declining trend since 2017-18 (Table7).

Thus, leverage is not very high in India as compared to advanced countries. Thus, credit stress is not expected to be as high as in many countries. This aspect is further analyzed using firm level data.

[43] Lindner P. and S. Jung, 2014, "Corporate Vulnerabilities in India and Banks' Loan Performance," IMF Working Paper (232).

FINANCIAL RATIOS ANALYSIS

As a first step in analysing credit stress, this section presents the broad trends of financial performance of firms across various industries by examining some key financial indicators that are commonly used for the purpose. Thus, this section presents a visual inspection of the broad indicators of financial performance to understand stress in firms.

Operational and profitability indicators

Overall outlook of corporate sector- from CMIE database for listed companies, using quarterly P&L accounts data (Complete data available for 2249 listed companies after removing outliers (+/- one SD), we examine the rates of growth of key performance parameters of listed companies, viz. sales growth, growth in profits before depreciation, interest and tax (PBDIT); growth of profits after tax (PAT) and that of operating profits (OP) of the firms. The findings are presented in Table 8.

The data shows that all indicators are on an improvement path in the December, 2020 compared on a year-on-year basis.

Table 8: Operational and profitability indicators

Criteria (% Growth of)	Quarter-on-Quarter				Year-on-year			
	Sep-19	Dec-19	Sep-20	Dec-20	Sep-19	Dec-19	Sep-20	Dec-20
Sales	-4.46	2.30	50.93	14.25	-3.82	-3.05	-6.86	4.02
PBDIT	-7.03	1.25	82.35	18.42	-1.16	-0.16	2.59	19.99
PAT	2.37	-7.86	824.66	34.60	2.58	-6.74	-0.14	45.88
Operating Profits	-10.62	2.38	117.66	23.39	-2.18	0.03	1.58	22.42

Performance of NSE Listed Companies

Most recent trends in growth rates of listed indicators for non-financial companies listed on NSE (constituting NSE 50 and NSE 500 companies) is presented in Tables 9 and 10 on year-on-year basis and quarter-on-quarter basis. There has been across the board improvement in net sales, PAT, OP and PBDIT from March, 2019 onwards. Rate of growth of net sales are continuing to improve to levels that existed before December, 2019. Profitability of companies has also significantly improved post September, 2020.

Table 9: Operational and profitability indicators of NIFTY50 companies

(set of 39 companies, excluding financial companies)

Y-O-Y									
Criteria *(% Growth of)*	**Mar-19**	**Jun-19**	**Sep-19**	**Dec-19**	**Mar-20**	**Jun-20**	**Sep-20**	**Dec-20**	**Mar-21**
Sales	25.84	8.05	-4.03	-3.53	-6.40	-34.14	-9.97	-1.91	15.28
PAT	13.12	-12.84	-4.31	0.85	-52.27	-40.47	19.79	29.67	180.72
Operating Profits	10.65	-4.50	-7.12	1.97	-33.46	-30.99	13.51	21.03	99.87
PBDIT	12.63	-0.71	-1.70	4.81	-20.82	-20.23	11.31	17.37	66.13
Q-O-Q									
Sales	-0.21	-3.38	-5.37	5.73	-3.18	-32.01	29.35	15.20	13.79
PAT	16.60	-20.20	3.44	4.78	-44.82	-0.47	108.16	13.42	19.46
Operating Profits	5.44	-2.96	-6.09	6.11	-31.19	0.64	54.48	13.14	13.63
PBDIT	4.23	-1.21	-3.17	5.12	-21.26	-0.47	35.12	10.84	11.45

Table 10: Operational and profitability indicators of NIFTY500 companies

(set of 391 companies, excluding financial companies)

Y-O-Y									
Criteria (% growth of)	**Mar-19**	**Jun-19**	**Sep-19**	**Dec-19**	**Mar-20**	**Jun-20**	**Sep-20**	**Dec-20**	**Mar-21**
Sales	20.07	7.10	-1.73	-2.76	-5.80	-35.32	-12.22	-2.03	13.27
PAT	7.12	-8.56	-4.50	-1.69	-51.65	-53.15	18.16	37.48	183.65
Operating Profits	9.98	-2.16	-7.04	0.02	-32.53	-37.14	13.57	24.48	92.78
PBDIT	13.39	3.46	0.10	4.35	-20.24	-25.28	10.70	19.04	61.02
Q-O-Q									
Sales	0.70	-4.14	-2.37	3.18	-2.45	-34.19	32.50	15.16	12.79
PAT	18.30	-20.33	-0.94	5.30	-41.82	-22.81	149.84	22.53	20.03
Operating Profits	8.89	-6.48	-7.56	6.25	-26.54	-12.88	67.01	16.46	13.77
PBDIT	7.86	-3.51	-4.46	4.95	-17.56	-9.61	41.55	12.86	11.51

Financial ratios

Further, the financial performance of companies can be examined through various financial ratios which measure the solvency and liquidity aspects. An analysis is carried out using CMIE database for listed non-financial companies having complete data for three years and September, 2020 quarter. This is a set of 1450 companies using the following ratios:

Solvency risk measures: Solvency is the ability of a company to meet its long-term debts and other financial obligations. Solvency is one measure of a company's financial health since it demonstrates a company's ability to manage operations into the foreseeable future. The measures useful in this context are debt-asset ratio (DAR), ICR and debt-equity ratio (DER). DAR and DER are also measures of leverage of the firm.

The optimal DER varies by industry, but it should not be above a level of two. As regards DAR generally, a ratio of 40% or lower is considered ideal, while a ratio of 60 % or higher is considered poor. An ICR below one, or a lack of profitability, does not indicate that insolvency is imminent. Firms can have investments that are liquid or can be easily used as collateral for borrowing, open credit lines, or other sources of funding which could carry them through. Nevertheless, low levels of ICRs are found to be a good indicator of systemic vulnerabilities.

Liquidity risk measures: These provide short to medium term outlook on risk when a company cannot meet its short-term debt obligations. The commonly used measures include current ratio (CR) and quick ratio (QR).

Vulnerable debt or default risk: Measures used to understand the level of debt "vulnerable" or "at risk" of default, are the ICR and QR ratios. Firms with ICR < 1 AND QR < 1 for three consecutive years are identified as being *very vulnerable* to default while firms with ICR <1 or QR< 1 for three consecutive years are considered as being *vulnerable* to default.

Debt/EBITDA is a ratio measuring the amount of income generated and available to pay down debt before covering interest, taxes, depreciation, and amortization expenses. Number of corporates and amount of debt with excessive leverage are identified for whom debt-to-EBITDA is greater than 5.

The results are presented in Tables 11 and 12.

Table 11: Financial ratios analysis for 1450 listed non-financial companies

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Full data set- number of companies (Latest year debt- Rs Cr.)**	**Number of companies (Latest year debt Rs Cr.)**	**% of total number and (debt)**
Solvency Ratios			
Debt-asset ratio >0.4	1450 (Rs 1463305.93)	143 (Rs 423285.89)	9.86% (28.93%)
Debt-asset ratio >0.6		13 (Rs 4664.5)	0.90% (0.32%)
ICR < 1		20 (Rs 9395.29)	1.38% (0.64%)
Debt-equity ratio > 1		211 (Rs 541752.04)	14.55% (37.02%)
Debt-equity ratio > 2		49 (Rs. 151087.99)	3.38% (10.33%)
Liquidity risk measures			
Current ratio <1	1450 (Rs 1463305.93)	133 (Rs 839036.83)	9.17% (57.34%)
Current ratio <1.33		404 (Rs. 991839.88)	27.86% (67.78%)
Quick ratio < 1		610 (Rs 1087462.02)	42.07% (74.32%)

Table 12: Debt at risk

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Full data set- number of companies (Latest year debt in Rs. cr)**	**Number of companies (Latest year debt in Rs. Cr.)**	**% of total**
ICR< 1 and QR < 1 *(very vulnerable)*	1450 (Rs 1463305.93)	17 (Rs 4339.19)	1.17% (0.30%)
ICR <1 or QR< 1 *(vulnerable)*		613 (Rs 1092518.12)	42.28% (74.66%)
Debt-to-EBITDA >5 (*Excessive leverage)*		61 (Rs 34227.91)	4.21% (2.34%)

From the above analysis, it is found that of the 1450 companies, about 17 companies with debt amounting to Rs. 4339 crore are *very vulnerable* to default having ICR and QR less than one for past three years and September, 2020 quarter. Whereas, 613 companies, with a total debt of Rs. 10.9 lakh crore, are *vulnerable* to financial stress with either ICR or QR less than one.

Number of corporates with excessive leverage, identified as those with debt-to-EBITDA >5, are 61 with debt of Rs. 34,228 crore.

Table 13 and figures 1 and 2, report the changes in the number of companies and their debt, overtime, based on these ratios. This is reported for 1381 companies for which complete data is available. It is seen that the number of companies on the wrong side of the financial ratios that are being examined, are very low and so the percentage of debt owed by such companies in stress, in terms of one ratio or another. However, the number of companies in the excessive leverage category increased in September, 2020 as compared to March, 2020. These will be the firms that may be in stress due to the COVID-19 after effects.

Table 13: Trends in financial ratios

Criteria	2017-18	2018-19	2019-20	Sept-2020
	Number of companies			
Debt-Asset ratio>0.6	37	24	31	35
ICR < 1	84	87	156	264
Debt- equity ratio > 2	111	94	98	83
Current ratio <1.33	729	693	662	492
ICR< 1 and QR < 1	77	80	137	174
Debt-to-EBITDA >5	197	166	211	726
% of total debt				
Debt-Asset ratio>0.6	2.00	0.60	2.00	3.75
ICR < 1	9.78	3.87	6.69	9.39
Debt- equity ratio > 2	16.47	15.03	15.33	15.53
Current ratio <1.33	80.36	85.80	82.61	78.12
ICR< 1 and QR < 1	9.60	3.23	4.43	5.41
Debt-to-EBITDA >5	16.04	29.38	12.78	86.74

However, the average of leverage ratios of the sample firms over the period have been well below the possible danger levels as shown in Table 14. As an exception, the average debt- EBITDA ratio shows an increase in Sept, 2020.

Table 14: Average leverage ratios

	2017-18	2018-19	2019-20	Sept-2020
Debt equity ratio	1.03	0.96	0.78	0.94
Debt assets ratio	0.24	0.23	0.23	0.21
Debt-EBITDA ratio	2.00	2.41	2.65	11.36

Figure 1: Financial ratio analysis: Number of companies

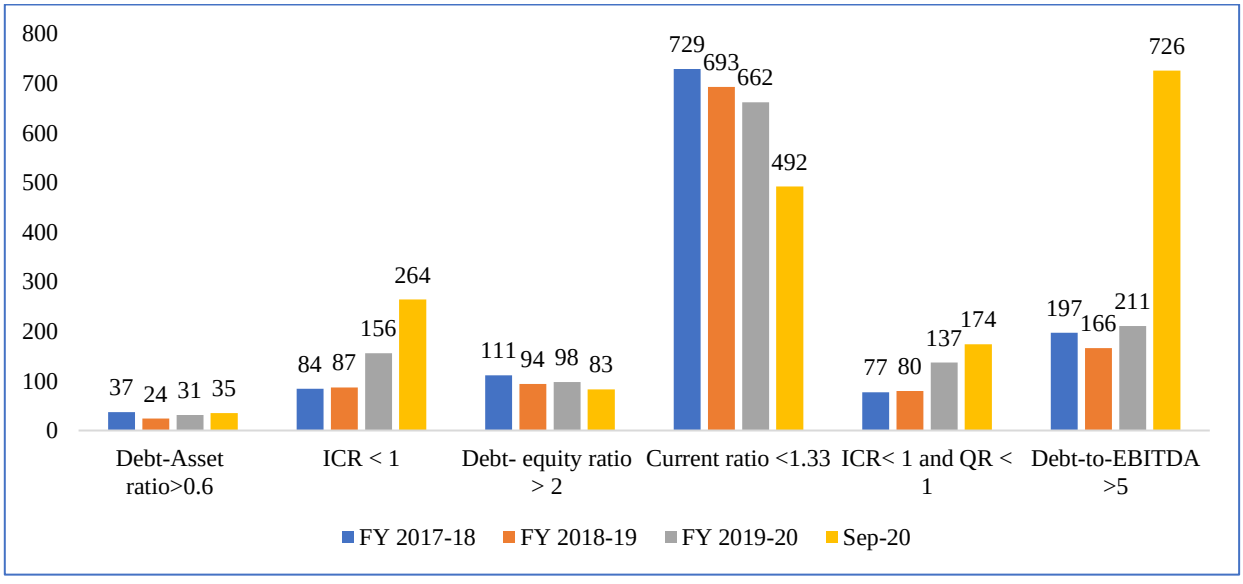
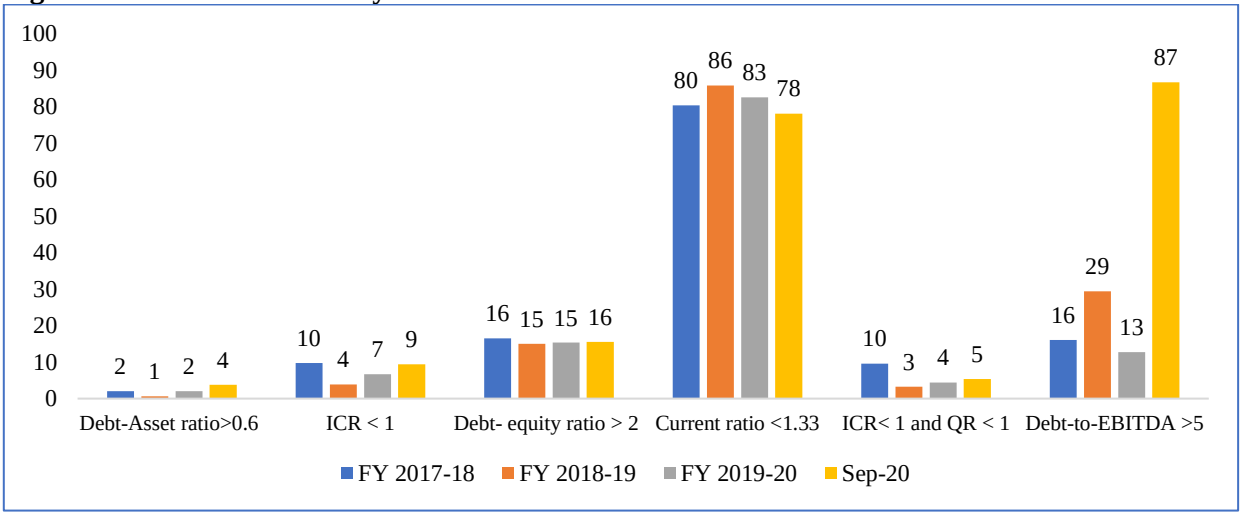


Figure 2: Financial ratio analysis: % of total debt



Sectoral Analysis of 1450 listed and non-financial companies

Further to the financial analysis of 1450 non-financial listed companies, a sectoral analysis is also attempted. Table 15 shows the sectoral diversification of 1450 companies analyzed for the study. Around 58.90% companies out of 1450 consists of manufacturing companies. Similarly, other sectors such as Real Estate, Construction, Electricity consists of 12.41%, 3.79% and 2.48% respectively. Sector-wise financial ratios are presented in Table 16 to Table 23.

Table 15: Sectoral distribution of companies

Sectoral Distribution	Total Number of companies in a sector	% of total number of companies
Manufacturing	854	58.90
Real Estate, Renting and Business Activities	180	12.41
Construction	55	3.79
Whole Sale & Retail Trade	76	5.24
Hotel & Restaurants	17	1.17
Electricity	36	2.48
Transport, Storage & Communication	38	2.62
Others	194	13.38
Total	1450	100.00

Table 16: Financial ratios analysis for 854 listed non-financial manufacturing companies

(Total Debt in Sep 2020 is Rs. 742646.52 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
Solvency Ratios				
DAR >0.4	83	45501.08	9.72	6.13
DAR >0.6	8	1828.65	0.94	0.25
ICR < 1	7	5503.28	0.82	0.74
DER > 1	125	146606.86	14.64	19.74
DER > 2	27	4098.62	3.16	0.55
Liquidity risk measures				
CR <1	65	450365.83	7.61	60.64
CR <1.33	226	532008.44	26.46	71.64
QR < 1	385	620881.95	45.08	83.60

From the results for manufacturing companies, it is seen that about 45% of the companies have QR<1 and 26% have CR< 1.33 indicating short-term liquidity risk for such companies. Number of manufacturing companies with adverse ICR is only 7 and DER>2 is only 27 indicating a better solvency position of the manufacturing companies in the data set.

Among various sectors for which key financial ratios have been calculated, we find that in most sectors solvency risk is low. Liquidity risk is relatively high in construction, wholesale and retail trade and hotel& restaurants sector.

Table 17: Financial ratios analysis for 180 listed non-financial companies in Real Estate, Renting and Business Activities sector

(Total Debt in Sep 2020 is Rs. 92896.80 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
Solvency Ratios				
DAR >0.4	12	2034.51	6.67	2.19
DAR >0.6	0	0	0.00	0.00
ICR < 1	3	479.3	1.67	0.52
DER > 1	19	9671.47	10.56	10.41
DER > 2	3	249.68	1.67	0.27
Liquidity risk measures				
CR <1	9	35052.5	5.00	37.73
CR <1.33	43	48966.67	23.89	52.71
QR < 1	52	56252.43	28.89	60.55

Table 18: Financial ratios analysis for 55 listed non-financial companies in Construction sector

(Total Debt in Sep 2020 is Rs. 25295.47 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
SOLVENCY RATIOS				
DAR >0.4	3	2851.47	5.45	11.27
DAR >0.6	1	2569.42	1.82	10.16
ICR < 1	3	1136.41	5.45	4.49
DER > 1	5	6474.67	9.09	25.60
DER > 2	1	2569.42	1.82	10.16
Liquidity risk measures				
CR <1	7	3552.42	12.73	14.04
CR <1.33	18	17295.03	32.73	68.37
QR < 1	22	15590.07	40.00	61.63

Table 19: Financial ratios analysis for 76 listed non-financial companies in Wholesale and Retail Trade sector

(Total Debt in Sep 2020 is Rs. 33594.07 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
Solvency Ratios				
DAR >0.4	9	7335.32	11.84	21.84
DAR >0.6	1	74.21	1.32	0.22
ICR < 1	1	441.41	1.32	1.31
DER > 1	15	7844.59	19.74	23.35
DER > 2	4	754.58	5.26	2.25
Liquidity risk measures				
CR <1	7	677.59	9.21	2.02
CR <1.33	25	21751.26	32.89	64.75
QR < 1	38	20966.6	50.00	62.41

Table 20: Financial ratios analysis for 17 listed non-financial companies in Hotels and Restaurant sector

(Total Debt in Sep 2020 is Rs. 4361.51 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
SOLVENCY RATIOS				
DAR >0.4	5	2952.36	29.41	67.69
DAR >0.6	0	0	0.00	0.00
ICR < 1	3	1224.82	17.65	28.08
DER > 1	5	2952.36	29.41	67.69
DER > 2	2	465.69	11.76	10.68
Liquidity risk measures				
CR <1	6	3175.16	35.29	72.80
CR <1.33	11	4042.15	64.71	92.68
QR < 1	10	3961.75	58.82	90.83

Table 21: Financial ratios analysis for 36 listed non-financial companies in Electricity sector

(Total Debt in Sep 2020 is Rs. 350969.86 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
Solvency Ratios				
DAR >0.4	7	313668.94	19.44	89.37
DAR >0.6	0	0	0.00	0.00
ICR < 1	0	0	0.00	0.00
DER > 1	7	315744.46	19.44	89.96
DER > 2	2	138136.2	5.56	39.36
Liquidity risk measures				
CR <1	9	304553.78	25.00	86.77
CR <1.33	14	313854.81	38.89	89.43
QR < 1	13	310203.41	36.11	88.38

Table 22: Financial ratios analysis for 38 listed non-financial companies in Transport, Storage and Communication sector

(*Total Debt in Sep 2020 is Rs. 70262.36 crore)*

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
Solvency Ratios				
DAR >0.4	1	34384.14	2.63	48.94
DAR >0.6	0	0	0.00	0.00
ICR < 1	0	0	0.00	0.00
DER > 1	4	34932.36	10.53	49.72
DER > 2	1	336.05	2.63	0.48
Liquidity risk measures				
CR <1	4	2242.34	10.53	3.19
CR <1.33	12	4827.89	31.58	6.87
QR < 1	9	3269.44	23.68	4.65

Table 23: Financial ratios analysis for 194 listed non-financial companies in Other sector

(Total Debt in Sep 2020 is Rs. 143223.18 crore)

Criteria *(For 3 consecutive FYs and Sept 2020 quarter)*	**Number of Companies**	**Debt in Sep 2020 in Rs. Cr**	**% of total number of Companies**	**% of Total debt**
Solvency Ratios				
DAR >0.4	23	14558.07	11.86	10.16
DAR >0.6	3	192.22	1.55	0.13
ICR < 1	3	610.07	1.55	0.43
DER > 1	31	17525.27	15.98	12.24
DER > 2	9	4477.75	4.64	3.13
Liquidity risk measures				
CR <1	26	39417.21	13.40	27.52
CR <1.33	55	49093.63	28.35	34.28
QR < 1	81	56336.37	41.75	39.33

Sectoral distribution of Debt at Risk

It is observed that out of 17 companies with debt amounting to Rs. 4339 crore which are very vulnerable to default, having ICR and QR less than one for three consecutive FYs and September 2020 quarter, three companies in the Hotel and Restaurants and Construction sector have a pending debt of around 28.23% and 26.19% respectively, whereas five companies in manufacturing sector have a debt of 11.11%. (Table 24)

Table 24: Sectoral distribution of Debt at Risk, where ICR< 1 and QR < 1

Sectoral Distribution	**Total Number of companies in a sector**	**% of total number of companies**	**Debt (Rs. in crore)**	**% of Total debt**
Manufacturing	5	29.41	482.02	11.11
Real Estate, Renting and Business Activities	2	11.76	444.46	10.24
Construction	3	17.65	1136.41	26.19
Whole Sale & Retail Trade	1	5.88	441.41	10.17
Hotel & Restaurants	3	17.65	1224.82	28.23
Electricity	0	0.00	0	0.00
Transport, Storage & Communication	0	0.00	0	0.00
Others	3	17.65	610.07	14.06
Total	17	100	4339.19	100

Similarly, Table 25 represents that out of 613 companies which are vulnerable to financial stress with either ICR or QR less than 1, approx. 63% companies in the manufacturing sector have a defaulting debt of Rs. 625903.21 crore which amounts to 57.29% of the total debt. Around 2% companies in the Electricity Sector have debt at risk amounting to 28.39% of the total debt.

Table 25: Sectoral distribution of Debt at Risk, where either ICR< 1 or QR < 1

Sectoral Distribution	Total Number of companies in a sector	% of total number of companies	Debt (Rs. in crore)	% of Total debt
Manufacturing	387	63.13	625903.21	57.29
Real Estate, Renting and Business Activities	53	8.65	56287.27	5.15
Construction	22	3.59	15590.07	1.43
Whole Sale & Retail Trade	38	6.20	20966.6	1.92
Hotel & Restaurants	10	1.63	3961.75	0.36
Electricity	13	2.12	310203.41	28.39
Transport, Storage & Communication	9	1.47	3269.44	0.30
Others	81	13.21	56336.37	5.16
Total	613	100	1092518.12	100

Further, it is observed that number of corporates with excessive leverage, identified as those with Debt-to-EBITDA >5, are 61 with debt of Rs. 34,227.91 crore. 55.74% of the companies in manufacturing sector have the excessive leverage with 30.11% of the total debt. Approx. 5% of the companies in Electricity sector and 13% in other sectors have a debt at risk of 27.24% and 26.89% respectively. (Table 26)

Table 26: Sectoral distribution of Debt at Risk, where Debt-to-EBITDA >5

Sectoral Distribution	Total Number of companies in a sector	% of total number of companies	Debt	% of Total debt
Manufacturing	34	55.74	10306.12	30.11
Real Estate	5	8.20	721.92	2.11
Construction	4	6.56	3509.63	10.25
Whole Sale & Retail	5	8.20	699.35	2.04
Hotel & Restaurant	2	3.28	465.69	1.36
Electricity	3	4.92	9322.13	27.24
Transport Storage & Communication	0	0.00	0	0.00
Others	8	13.11	9203.07	26.89
Total	61	100	34227.91	100

Thus, it can be stated that the companies in the manufacturing sector have been hit the worse. The financial stress in this sector is the most. Next to manufacturing, Hotel & Restaurants, Real Estate, Construction and Electricity sector have a risky financial position.

Based on the overall assessment of performance of firms across sectors and given the fact that various ratios used here do not provide a definitive analysis of the level of stress is the corporate sector, the study proceeds to quantify the credit stress of firms by using Altman-Z scores, which uses a set of indicators that are representative of various aspects of financial strength.

ALTMAN-Z SCORES

Altman's Z-Score model is a numerical measurement that is used to predict the chances of a business going bankrupt in the next two years. Altman (1968) calculated bankruptcy probabilities using ratio analysis for the data on US manufacturing companies. This ratio analysis was based on the understanding that a distressed company will exhibit quite different ratio measurements than their counterparts. The ratios measuring profitability, liquidity and solvency were found to be the most significant indicators. Using Multiple Discriminant Analysis (MDA), Altman converted the linear combinations of independent variables in scores (called Z scores) so that they could be classified into one of the two groups of bankrupt and non-bankrupt company. The Z-score was found to accurately determine the bankruptcy in most of the cases. He found that the bankruptcy could be predicted up to two years prior to actual failure.

Z Score Formula and Indicator Threshold Z Scores:
For Manufacturing Companies[44]

Z Score = (1.2*A) + (1.4*B) +(3.3*C) + (0.6*D) + (0.999*E)
where
A = (Current Assets- Current Liabilities) / Total Assets
B = Retained Earnings/ Total Assets
C = EBIT / Total Assets
D = Market value of equity / Total liabilities
E = Net Sales or Revenue / Total Assets

A Z-score that is lower than 1.8 means that the company is in financial distress and with a high probability of going bankrupt. On the other hand, a score of 3 and above means that the company is in a safe zone and is unlikely to file for bankruptcy. A score of between 1.8 and 3 implies that the company is with a moderate chance of filing for bankruptcy.

Threshold Z Score for Indicator Classification:

Z score Value	**Indicator**
<1.81	Distress
1.81 => Z score <=2.99	Grey
> 2.99	Safe

Non-Manufacturing Companies

Z Score = (6.56*A) + (3.26*B) + (6.72*C) + (1.05*D)

Threshold Z Score for Indicator Classification:

Z score Value	**Indicator**
<1.1	Distress
1.1 => Z score <=2.6	Grey
> 2.6	Safe

[44] Manufacture Sector includes all sectors with Industrial Classification as Manufacturing as per Latest Company Master Details available. All industrial classification other than "Manufacture" have been included under "Non-Manufacture".

Analysis based on CMIE database

The Z-scores are calculated for **2801 companies** using the CMIE. The results show that:

(a) the percentage of companies under stress have been in the range of 26% to 30% since 2014-15 till 2019-20 (Table 27).

Table 27: Z-score analysis using CMIE database (*Number)*

	2015	2016	2017	2018	2019	2020	2021*
Distress	1193	1187	1226	1219	1135	1273	73
Grey	854	869	867	882	913	836	75
Safe	754	745	708	700	753	692	60
	As % of total companies						
Distress	43	42	44	44	41	45	35
Grey	30	31	31	31	33	30	36
Safe	27	27	25	25	27	25	29

* Data for March 2021 is available for 208 companies.

(b) For 2801 companies in the sample for which complete data series is available, **figure 3** maps their movement over time on the basis of Z-scores. Each row informs how the status of these companies has changed since the beginning of the period of the row. Overall, the number of companies in distress in terms of the Z-score have increased from 1193 in 2015 to 1273 in 2020.

(c) The data in Table 28 shows the analysis of Nifty 500 & Nifty 50 companies excluding financial companies. The analysis of FY 2020-2021 is solely for representational purposes as the data available for March 2021 is limited. The percentage of Nifty500 & Nifty50 companies under stress have been in the range of 33 to 39% and 22 to 38% respectively from 2015 to 2019. The stress level of Nifty 500 and Nifty 50 companies marginally increased to 39% and 38% respectively in 2020 (Table 28).

Table 28: Z-Score analysis of Nifty 500 and Nifty 50 companies using CMIE database

Nifty500 companies (set of 385 non-financial companies)

	2015	2016	2017	2018	2019	2020	2021*
Distress	147	150	147	148	138	155	32
Grey	138	127	147	148	144	149	33
Safe	100	108	91	89	103	81	24
As % of total companies							
Distress	36	33	38	38	37	39	37
Grey	26	28	24	23	27	21	27
Safe	38	39	38	38	36	40	36

* Data for March 2021 is available for 89 companies.

Nifty50 companies (set of 37 non-financial companies)

	2015	2016	2017	2018	2019	2020	2021*
Distress	15	14	15	16	14	16	6
Grey	8	10	13	11	12	14	4
Safe	14	13	9	10	11	7	4
As % of total companies							
Distress	22	27	35	30	32	38	29
Grey	38	35	24	27	30	19	29
Safe	41	38	41	43	38	43	43

* Data for March 2021 is available for 14 companies.

(d) From the 4357 companies already undergoing corporate insolvency resolution process (CIRP) under the IBC, Z-scores are available for 1135 companies of which 490 are manufacturing companies and 645 are non-manufacturing companies. It is seen that in 2019, 413 of the 463 manufacturing companies and 427 of the non-manufacturing companies had Z-scores below the thresholds (i.e. 74% of the companies for which Z-score is available) indicating financial stress and likely bankruptcy of the companies in 2019 (Table 29).

Table 29: Z-scores and companies under CIRP

No of companies in CIRP as on March, 2021			4357			
Altman's Z-Score available (as per MCA data)			1135			
w/w Manufacturing			490			
w/w Non-Manufacturing			645			
Manufacturing Companies						
Score	**2015**	**2016**	**2017**	**2018**	**2019**	**Remarks**
Z < 1.81	359	373	388	410	413	Distress
1.81 =< Z =< 2.99	89	80	69	57	52	Grey
Z > 2.99	42	37	33	23	25	Safe
Non-Manufacturing Companies						
Score	**2015**	**2016**	**2017**	**2018**	**2019**	**Remarks**
Z < 1.1	350	375	379	405	427	Distress
1.1 =< Z =< 2.6	144	116	118	98	105	Grey
Z > 2.6	151	154	148	142	113	Safe

Figure 3: Movement of 2801 listed companies on the basis of Z-scores

2015		2016			2017			2018			2019			2020		
		Safe	Grey	Distress	Safe	Grey	Distress	Safe	Grey	Distress	Safe	Grey	Distress	Safe	Grey	Distress
Safe	754	614	117	23	537	168	49	506	180	68	510	172	72	465	184	105
Grey	854	118	598	138	137	523	194	143	490	221	172	482	200	152	427	275
Distress	1193	13	154	1026	34	176	983	51	212	930	71	259	863	75	225	893
		Safe	745		586	134	25	536	161	48	528	159	58	477	174	94
		Grey	869		98	601	170	116	543	210	163	507	199	141	450	278
		Distress	1187		24	132	1031	48	178	961	62	247	878	74	212	901
					Safe	708		578	105	25	552	117	39	493	151	64
					Grey	867		99	630	138	162	563	142	149	480	238
					Distress	1226		23	147	1056	39	233	954	50	205	971
								Safe	700		601	76	23	531	124	45
								Grey	882		125	656	101	119	553	210
								Distress	1219		27	181	1011	42	159	1018
											Safe	753		597	129	27
											Grey	913		78	615	220
											Distress	1135		17	92	1026
														Safe	692	
														Grey	836	
														Distress	1273	

CONCLUSIONS

Corporate sector health before the onset of the pandemic

On the macroeconomic front, in the run up to the pandemic, bank credit to the industrial sector was slowing down. The outstanding credit of SCBs to the corporate sector was about 41.22% of total outstanding credit as of March, 2021. As per FSR of July, 2021,GNPA ratio may increase from 7.5% in March, 2021 to 9.8% by March, 2022.The health of the corporate sector was showing signs of stress in general. The Altman-Z scores for 2801 listed companies shows that 40-45% of them were in distress since 2015. 25 -27% were in safe zone and the financial health of the rest was uncertain (results of March 2021 are solely for representational purposes since the analysis is done on 208 companies).

Corporate sector health post the pandemic

Regulatory forbearance policies have helped to mitigate the impact of COVID-19 pandemic on the financial health of corporates to a large extent. The economic environment following the COVID-19 pandemic is showing signs of recovery from Q3 FY21. Net Sales, profit after tax and EBITDA are showing improvements for a sample of listed non-financial companies from CMIE database, NSE 50 and NSE 500 companies. Across the broad sector, asset quality improved for industry, agriculture and services sectors in September, 2020 as compared to March 2020, with some deterioration in March, 2021.

In a set of 1450 listed non-financial companies, only 17 companies are very vulnerable to default having ICR and QR less than one for past 3 years and Sept, 2020 quarter. 613 companies, with a debt of Rs. 10.9 lakh cr, are vulnerable to financial stress with either ICR or QR less than 1. Since balance sheet data is not available after 2019-20, the Z-score cannot be calculated at present.

It is important to note that the focus of this study is restricted to the listed non-financial companies since the data for unlisted companies in CMIE database is insufficient. This is one of the limitations of the study.

Overall mitigating factors

The above results needs to be seen in the backdrop of overall corporate debt financing pattern in India. Debt financing by corporate sector is not very high as compared to global levels. As indicated in Table 1, Indian firms use equity financing more than debt financing. Table 30 informs about development of financial markets in various countries.

Table 30: Development of financial markets in various countries

Data for 2019 as % of GDP

Country	Market capitalisation of listed companies	Domestic credit to private sector by banks	Corporate debt market penetration *
Brazil	64.54	63.93	99.05
China	59.63	165.39	18.86
India	**75.98**	**50.15**	**17.16**
Malaysia	111.00	120.84	44.50
United States	148.15	51.94	123.47

**For 2018*

Source: World Bank database

In each of the jurisdictions, except India, debt finance (corporate debt and domestic credit) far exceeds equity financing implying that corporates are more leveraged. Thus, Indian corporates are not very highly leveraged.
The credit by banking sector to GDP ratio is also not high, ranging between 50-56% since 2011-12 (Table 2). The credit to deposit ratio also does not show any major trend since 2011-12, being in the range of 72-78%. The outstanding credit of SCBs to the corporate sector (public as well as private sector) is not very high, standing at 41% of total outstanding credit as of March, 2021 and is showing a declining trend since 2017-18 (Table7).

This study indicates that businesses in India have shown resilience in the face of the COVID-19 crisis, backed by generous government financial and fiscal support. Corporates are already showing signs of recovery with improvement in sales and profitability after the Government eased restrictions and lifted lockdowns. However, the threat of corporate stress turning into insolvencies still exists, especially for those sectors that were most affected by the pandemic. Further, as government stimulus will withdraw gradually, it is not clear if the corporates will have adequate resources to tide over the repercussions of substantial contraction in 2020.

There are a number of studies by World Bank and IMF, as detailed in literature survey, indicating increasing levels of corporate stress and a likely increase in insolvencies. However, in the Indian context, based on the mitigating factors, as listed above, as compared to advanced countries, corporate level stress is not expected to be too high.

However, there is a need to prepare for early interventions to address impending corporate stress. It would be extremely crucial to triage corporates into those that need aid and those who do not for efficient allocation of resources to those who need it the most.

Appendix 1

Definitions of variables

Debt to Equity Ratio

The Debt to Equity ratio (also called the "debt-equity ratio", "risk ratio", or "gearing"), is a leverage ratio that calculates the weight of total debt and financial liabilities against total shareholders' equity. This ratio highlights how a company's capital structure is tilted either toward debt or equity financing. It is widely considered one of the most important corporate valuation metrics because it highlights a company's dependence on borrowed funds and its ability to meet those financial obligations. **The optimal D/E ratio varies by industry, but it should not be above a level of 2.**

Debt to Assets Ratio

The Debt to Assets Ratio is a leverage ratio that helps quantify the degree to which a company's operations are funded by debt. In many cases, a high leverage ratio is also indicative of a higher degree of financial risk. This is because a company that is heavily leveraged faces a higher chance of defaulting on its loans. It is legally obligated to make periodic debt payments regardless of its sales numbers. During slow sales cycles or difficult economic times, a highly levered company may experience a loss of solvency as cash reserves dwindle.

The debt to assets ratio can also be thought of as the amount of a company's assets that have been financed by debt. It can provide insights on past decisions made by management regarding the sources of capital they selected to pursue certain projects. By extension, we can also consider the debt to assets ratio as being an indirect way of measuring mana**gement's usage of its capital structure to fund NPV-positive projects.**

A lower debt-to-asset ratio suggests a stronger financial structure, just as a higher debt-to-asset ratio suggests higher risk. Generally, a ratio of 0.4 – 40 % – or lower is considered a good debt ratio. **A ratio above 0.6 is generally considered to be a poor ratio, since there's a risk that the business will not generate enough cash flow to service its debt.** A firm may not be able borrow if ratio percentage starts moving towards 60%.

Current Ratio

The current ratio, also known as the working capital ratio, measures the capability of a business to meet its short-term obligations that are due within a year. The ratio considers the weight of total current assets versus total current liabilities. It indicates the financial health of a company and how it can maximize the liquidity of its current assets to settle debt and payables. The Current Ratio formula can be used to measure a company's liquidity. **A good current ratio is between 1.2 to 2, which means that the business has 2 times more current assets than liabilities to covers its debts.**

Quick Ratio

The Quick Ratio, also known as the Acid-test or Liquidity ratio, measures the ability of a business to pay its short-term liabilities by having assets that are readily convertible into cash. These assets are, namely, cash, marketable securities, and accounts receivable. These assets are known as "quick" assets since they can quickly be converted into cash. The higher the ratio result, the better a company's liquidity, and financial health; the lower the ratio, the more likely the company will struggle with paying debts. **The ideal quick ratio which is considered to be normal is 1.**

Interest Coverage Ratio
The Interest Coverage Ratio (ICR) is a financial ratio that is used to determine how well a company can pay the interest on its outstanding debts. The ICR is commonly used by lenders, creditors, and investors to determine the riskiness of lending capital to a company. The interest coverage ratio is also called the "times interest earned" ratio. The ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) by the company's interest expenses for the same period. **Generally, an interest coverage ratio of at least 2 is considered to be good for a company. ICR below 1 indicates a company's inability to meet its current interest payment obligations and thus, that company is not considered in good financial health.**

Net Sales: expression used is ntrm_net_sales
Net sales is a sum of income generated from sales of goods, non-financial services, mining, construction, utilities (water, gas and electricity), trading activity, job work and after sales. Net sales also include export income. There are very few companies which disclose their export earnings on quarterly basis. Net sales also include fiscal benefits received by the companies.

PBDIT: expression used is ntrm_pbdit
(ntrm_interest_exp + ntrm_depreciation + ntrm_pat + ntrm_total_tax_prov + ntrm_tax_exp_discont_oper)
EBITDA, or earnings before interest, taxes, depreciation, and amortization, is a measure of a company's overall financial performance and is used as an alternative to net income in some circumstances. The earnings, tax, and interest figures are found on the income statement, while the depreciation and amortization figures are normally found in the notes to operating profit or on the cash flow statement.
EBITDA=Net Income +Interest +Taxes +Depreciation +Amortization

PAT: expression used is ntrm_pat
Net profit is the amount of money earned by a company in a given period after all expenses have been deducted from total income. When a company makes a loss, .i.e. when expenses exceed income, the net profit is prefixed with a negative sign.

Operating Profit: expression used is ntrm_pbdit_net_of_peoi
Level 1: (ntrm_pbdit_net_of_pe - other_income_excl_extra_ord_inc)
Level 2: ((ntrm_after_tax_profit_loss_contin_oper + ntrm_interest_exp + ntrm_depreciation + ntrm_total_tax_prov - ntrm_extra_ordi_inc + ntrm_extra_ordi_exp) - (ntrm_oth_inc - ntrm_extra_ordi_inc))
The term "operating profit" refers to an accounting metric measuring the profits a company generates from its core business functions, where the deduction of interest and taxes is excluded from the calculation. This operating value likewise excludes any profits earned from the firm's ancillary investments, such as earnings from other businesses a company may be partially vested in.
Operating profit can be calculated using the following formula:
Operating Profit = Operating Revenue - Cost of Goods Sold (COGS) - Operating Expenses - Depreciation – Amortization
Operating profit is also referred to as operating income, as well as earnings before interest and tax (EBIT) — although the latter may sometimes include non-operating revenue, which is not a part of operating profit. If a firm does not have non-operating revenue, its operating profit will equal EBIT.