A STUDY OF FRAMEWORK OF IMPLEMENTATION OF COVID EPIDEMIC AND ITS IMPACT ON INDIA
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1. INTRODUCTION

COVID 19 virus epidemic has broken out from Wuhan, China. The disease has spread across all continents and nation-states. India has also geared itself to fight the Corona viral infection ever since the first Corona patient landed in Kerala from Wuhan, China in the month of January, 2020. The contiguous nature of the disease, deadly impact of this virus on humans, inevitability of its spread due to movement of population across countries, continents and cities hardly gave time to the world to make preparations to fight this common enemy. The mankind has further been crippled because till date no medicine, vaccine or any other antidote has been found to treat and cure this viral infection. China, Spain and Italy suffered the most in the earlier phase. Many countries including India have taken to lockdowns for a prolonged period of stay to safeguard their population. India has finally opened up after lockdown 4.0 that ended on 31st May, 2020 to unlock 5.0 phase marking a beginning of resumption of activities to resume in phases

It may not be out of place to mention that Globalization has been widespread among economies of the world. Supply Chains, international trade and also financial markets world over are now more closely linked and integrated than they were in the past.
In today's context, Globalization can be seen as widening and deepening of interdependent relationships among people from different nations. Rise in application of technology, liberalization of cross-border trade & resource movements and expansion of cross-national cooperation has been seen in the new millennium at an accelerated pace. This has created wealth globally benefitting the human population. The COVID pandemic has disrupted the Globalization. It can be foreseen that a new normal will be emerging when the world will come out through this crisis.

WHO has been coordinating international efforts in the fight against COVID. Existence of open institutions, democracies and private sector in developed as well as the emerging economies are also making an immense contribution to fight the pandemic. This study is aimed at understanding the framework in which India is fighting this emergent situation. It can be visualized that the present situation is going to stay for some time. It is distinct from other Disasters. The pandemic has impacted our economy, society and even our foreign relationships. New trends have been seen in these difficult times will be touched in this study. An attempt has also be made in this study to touch the various facets that have impacted our lives as citizens and the challenges that India has encountered in its fight with pandemic. There is now a consensus developing as India moves to unlock 5.0 starting from first, June, 2020 that there has been a lack of collaboration among local authorities, States and Centre. There have been inconsistencies implementation. It is hurting big industries, MSMEs, supply chains and inter-state as well as intra-city movements. Reforms announced by the government may not create demand immediately. There is a shortage of labour as millions have moved back to their villages in UP, Bihar, Jharkhand, MP, Chattisgarh and Rajasthan. As per new reports appearing on 2nd June, 2020 in National dailies, Moody's have downgraded India at these critical times. This has happened to India for the first time in twenty- two years. The investment grading of India is now lowest investment grade. Thirty- five other nations have also been downgraded but India needs to move cautiously in COVID times. In unlock 5.0, India should not loose sight of its Red zones where most of the COVID infections are reported. India lives in a hostile neighbourhood. Its armed forces should continue to remain vigilant to thwart external threats so as to preserve the integrity and sovereignty of India also.

2. LEGAL FRAMEWORK OF COVID 19 FIGHT IN INDIA

2.1 Introductory concepts and important terms related to legal frame work:

The information given below shows in a hierarchy, the Governance mechanism during COVID-19 pandemic as there have been concerns from citizens
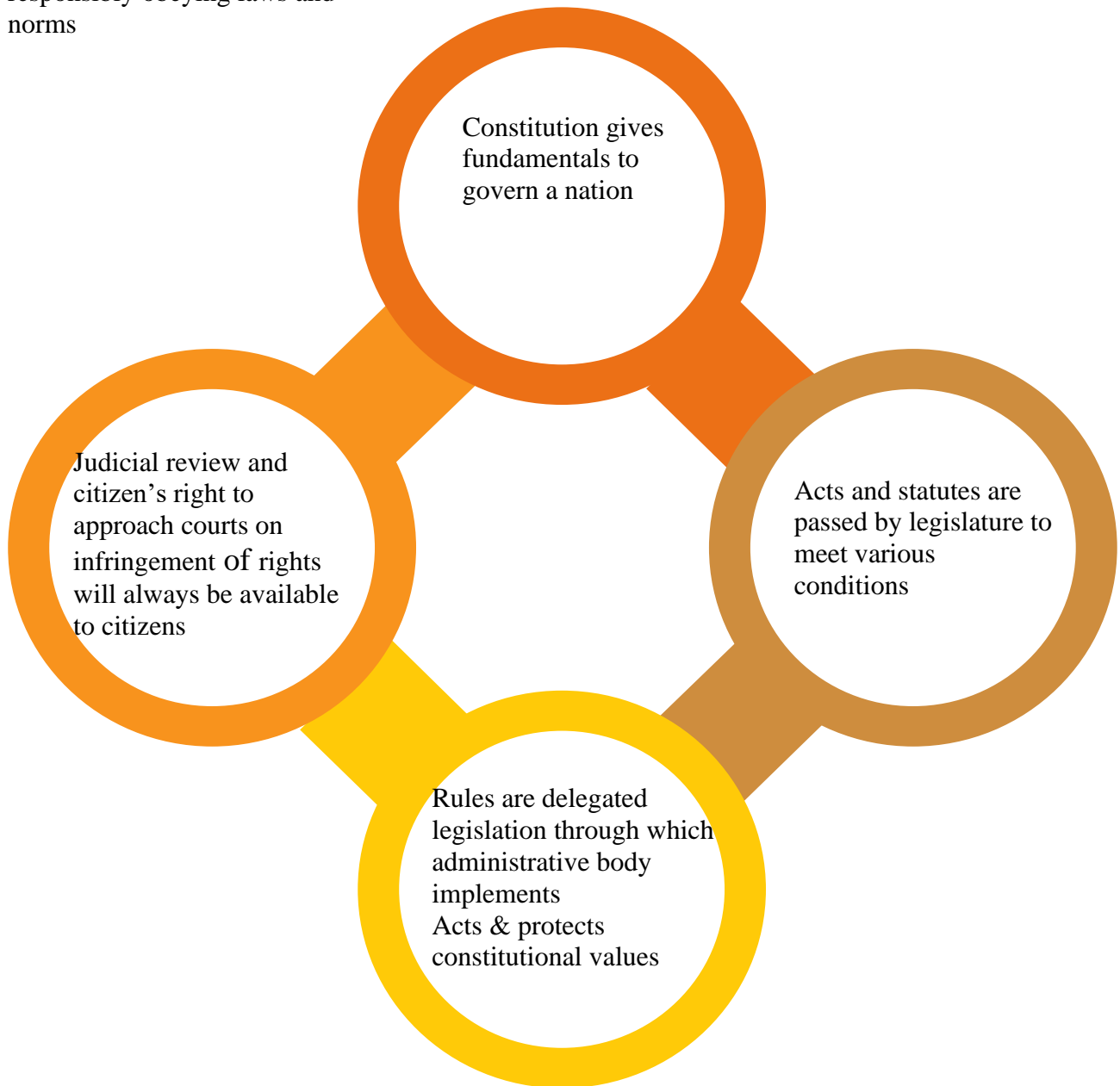
Constitution and Constitutional safeguards through provision of fundamental rights and its values will always remain to protect a citizen.

Acts and Statutes passed by the Competent Legislature. They lay the positive law which make governance possible by maintaining continuity and stability at all times.

Rule-making power of the Executive Arm of Govt. is under delegated legislation. It is given to the Executive by the competent legislature.

Emergency can be invoked in case of external aggression, armed rebellion and financial crisis by the Centre. A State in our Federal structure can be put under President's rule in case the constitutional machinery of that State has broken down upon satisfaction of the Union Government. Parliament has however to ratify the imposition of President's rule in a period of six months from its proclamation. There is no provision of emergency declaration in epidemic spread but entries among the Union list, State list and Concurrent list of our Constitution provide the basis. These entries found place from the Government of India Act, 1935, which forms the basis of our present-day Constitution in far as much so that the spirit of federation with unitary system of government has been drawn from it. Concept of All India Service also drew inspiration to aid to the unitary structure. A strong District Level administration has helped in tackling COVID-19 emergency. External Emergency was last imposed in India as per constitutional provision lastly during Indo-Pak war in 1971 but that situation was distinctly different.

Figure 1.1 The hierarchy of laws is in harmonious action to protect a citizen who is bound to behave responsibly obeying laws and norms

Constitution gives fundamentals to govern a nation

Judicial review and citizen's right to approach courts on infringement of rights will always be available to citizens

Acts and statutes are passed by legislature to meet various conditions

Rules are delegated legislation through which administrative body implements Acts & protects constitutional values
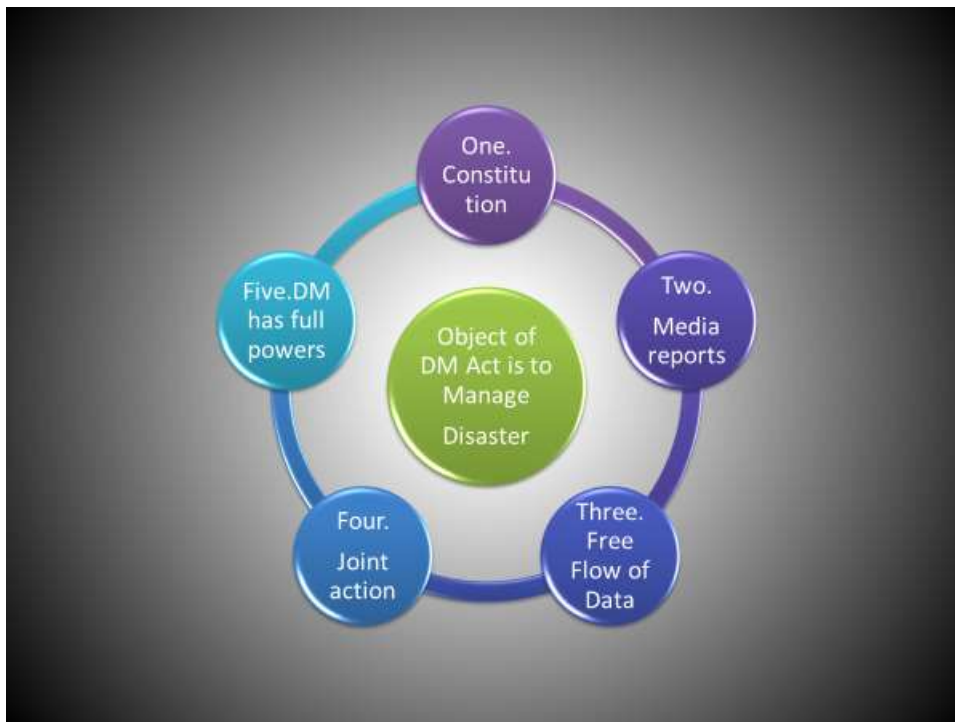
Fig.1.2 Five Pillars of fight against COVID are shown with the object of Act or statute at the Centre. If we dispassionately understand the object of the DM Act then we will understand that state action comes when we violate norms.

2.2 Historical Background of Politics and Constitutional law

> Bubonic plague and Spanish Flue epidemics broke out during British rule at multiple times in the past. It is therefore important to gather lessons from history of our political system to understand the application of laws on epidemics in India. This will give us a better understanding to fight the pandemic in present times.

> The British established an administrative and revenue collection system in India. This was primarily aimed to meet the costs of their military campaigns. They also profited enormously from trade. Controlling the territory of India was therefore important to them.

> The British also established rule of law in India. They integrated the territory of India into a single administrative unit.

> The Governor General-In-Council, who was popularly known as the Viceroy was the agent of her majesty, the queen of England in India. The Viceroy was responsible to the British Parliament through the Secretary of State for India or the Indian Secretary. He was popularly known as the "Bharat Mantri" in India. He was a member of the British Cabinet and the political head of India office responsible for the governance of the British Indian empire, usually known as the Raj or British India

> The Bureaucratic arm, ICS (Indian Civil Service), together with the Railways, the legal system and the Indian Army, are among the most important legacies of the British India. India has further strengthened these institutions to keep itself unified and strong after gaining independence.

> The British ruled India with a firm hand. There governance methods were ruthless as they had to perpetuate their rule to serve their colonial interests. This led to a unitary system of governance in which powers were centralised. India's constitution is also quasi federal and is unitary in its soul as it has its foundations in the Government of India Act, 1935.

> After attaining independence, we have kept the values of constitutionalism alive in our system by retaining the concept of continuity in our Constitution. Continuity here means that all laws earlier in vogue prior to independence also continued to remain valid. They are void to the extent that they are derogatory to the Part III of the constitution that is chapter on Fundamental Rights in accordance with the provisions of Article 13 of India's Constitution

> When it comes to constitutional safeguards, Part III of our constitution which deals with Fundamental Rights assumes significance. This coupled with power of judicial review has guaranteed the protection of Fundamental Rights to the citizens.

The historical background of India's constitutional history has been briefly discussed in the paragraphs above. There has also been a brief discussion on the values enshrined in our Constitution in the above paras. We as a nation are prepared to accept the COVID 19 challenge through the spirit of the preamble of Constitution, which starts with the phrase, **"We the people of India…."**. Our PM has dedicated the COVID fight to save the people with this spirit. This approach is different from earlier precedents of epidemics as we were under the British yoke during those times when the epidemics struck us. Annals of history say that ten million lives were lost in undivided Bengal, Bihar & Odisha due to plague and famine that followed during the period 1897 to 1901. The beginnings of the past century in the shadow of which most of the present-day population born before millennium has lived, was the century that saw its rise and beginning with an epidemic that jolted all continents. It is another fact that we hardly learn lessons from our past and continue to lose opportunities to save our present by learning lessons from the past.

COVID-19 is the first pan India biological disaster being handled by the legal, administrative and constitutional institutions of independent India. This viral infection's entry into India and subsequent spread has created an unprecedented crisis.

Health is a State subject as it is under the State List in our Constitution. Item 6 of the State list reads as, "6. Public health and sanitation; and dispenseries". Quarantine measures that need to be implemented during outbreak of an epidemic emergency are covered under Item 28 of the Union list. This list 28 of Indian constitution reads as, "28. Port quarantine, including hospitals connected therewith; seamen's and marine hospitals." It shows that quarantine measures can be implemented only with the approval of the Central Government. It is through the provision of this list that we could invoke emergency provisions of quarantining patients arriving at our airports and ports and streamline processes to save lives immediately when the COVID knocked doors in the territory of India in January, 2020. Item 23 of the Concurrent list provides scope for social security. The item 23 reads as, "23. Social security and social insurance; employment and unemployment." It is through this provision that states could move forward in the matter of social security. An epidemic of this magnitude has created lot of uncertainties among corona warriors in the health, Police and sanitation fields. Industrial workers, agriculture workers, working professionals and daily wagers in the formal and informal sectors of the economy have been seriously affected by the lockdowns enforced to check the spread of the infection. Further, entry 29 of the Concurrent List of our Constitution reads as, "29. Prevention of the State to another from one state to another of infectious diseases or pests affecting men, animals or plants. This entry of the Constitution has helped in coordination through intervention of the Central Government.

There is no express provision in Indian Constitution to fight an epidemic of such a magnitude. The word epidemic is not explicitly mentioned in the Constitution, the above fields through item 6 of the State list, item 28 of the Union list and items 23 and 29 of the Concurrent list give the necessary powers to fight and frame laws and norms that provide the frame work of the machinery which will combat COVID epidemic nationally. It can be concluded that it will be the duty of the Union as well as the States to fight this epidemic through their joint actions in the true spirit of cooperative Federalism under the boundaries of our Constitution as laid and discussed in brief above.

2.3 Understanding the Acts and statutes that deal with Epidemics and Disasters:

The Disaster Management Act, 2005 and the Epidemic Act 1897 are the two Acts that are driving their force from the above fields that is, Union List, State List, and Concurrent list of the Constitution.

In the past, this provision has been invoked to meet the emergent situations arising out of SARS Outbreak in 2009 but the impact of SARS viral infection was limited in India. The COVID emergency is beyond the competence of the State Governments as our states lack critical health infrastructure and resources to fight an emergency of such an enormous magnitude. It is also a known fact that there is no treatment available for COVID viral infection. We would need global coordination with foreign countries and the WHO which can be taken up by the Central Government only to fight the pandemic. The fight against COVID needed a new approach when it came to India from Wuhan China through a patient dropping at Kerala. PPE Kits, Ventilators, test kits and an integrated approach are necessary to fight it. The Prime Minister of India took the call. It was decided to invoke The Epidemic Diseases Act, 1897. Section 2 of this Act empowers the Central Government to issue advisories and directions. This is how the legal framework in which the fight against COVID virus became germane. By implementation of this Act, Ministry of Health and Family welfare of the Government of India has been issuing advisories and directions to the State governments and they are enforceable inspite of the fact that Health comes under the purview of the State Governments being part of State list. Section 2 A of this Act empowers the Central Government to inspect any ship arriving or leaving any port and the power to detain any person intending to sail or arriving in the country. This provision has immensely contributed in checking

the spread of the virus which has its origin in Wuhan, China and came with travelers arriving at our ports and airports who can be quarantined and detained under this provision of the Epidemic Act. Section 3 of this Act provides for penalties for disobeying any regulation or order made under this Act. These will be in accordance to Section 188 of the Indian Penal Code (Disobedience to order duly promulgated by public servant).

COVID 19 is a rare pandemic which has broken and has shaken all countries to an extent seen rarely in the annals of history. India has also geared itself to the task of fighting the epidemic by invoking various provisions of the above Act and other Act. The Disaster Management Act, 2005 and the Epidemic Act, 1897 are the two laws that have been the major force in our fight against COVID virus epidemic.

VARIOUS SECTIONS OF DISASTER MANAGEMENT ACT & BRIEF DETAILS
Section 2(d) in definition clause defines the meaning of Disaster
Section 2(e) in definition clause defines the meaning of Disaster Management
Section 2(f) in definition clause defines the meaning of "District Authority"
Section 25. makes it compulsory for State Govt. to notify Constitution of District Disaster Management Authority.
Section 30(1) gives Powers and functions of District Authority
Section 30(2) gives functions of the District Authority and says that Without prejudice to the generality of the provisions of sub-section (1), the District Authority may prepare plan etc. These functions are explained in the clauses and are reproduced in the adjacent column.
Section 35. gives wide powers to Central Government to take measures
Section 36 delineates Responsibilities of Ministries or Departments of Government of India as it may consider necessary for disaster management.
Section 51. covers the scope for Punishment for obstruction, etc.
Section 52 deals with offence for Punishment for false claim
Section 53 deals with Punishment for misappropriation of money or materials, etc.
Section 54 deals with Punishment for false warning
Section 55 deals with Offences by Departments of the Government
Section 56 deals with Failure of officer in duty or his connivance at the contravention of the provisions of the DM Act.
Section 57 deals with Penalty for contravention of any order regarding requisitioning
Section 58 deals with Offence by companies
Section 59 deals with Previous sanction for prosecution
Section 60 deals with Cognizance of offences
Section 71 of the DM Act puts a Bar on jurisdiction of court.
Section 73 deals with Action taken in good faith

A plain reading of the Disaster Management Act, 2005 may dishearten a common citizen. We, the citizens of India value our freedom and resist any invasion but the larger object of fighting the epidemic may be our primary task and the DM Act, 2005 and the Epidemic Diseases Act, 1897 will sail us out of the present crisis. Also, India is primarily a market driven liberalised economy. We have been constantly moving up in the ladder of ease of doing business. There are bound to be

fears looming in the minds of informed citizens and they would definitely raise the moot question here asking, can we sustain such a legal environment as is prevalent under the application of DM Act which restricts activities and individual freedom? It can again be reiterated keeping the COVID-19 pandemic in mind that if we continue to keep checks and balances and act proportionally then we would succeed as a nation in our fight against COVID-19 because instantaneously the measures in the DM Act appear to be harsh but the nations like the USA which have tried to create a balance between restrictions and individual freedom are paying a very high price in the form of a high death rate due to COVID infection and have come across Economic problems as well.

These norms are put to another test, Lon Fuller, a famous legal thinker and a critic of legal positivist school of jurisprudence (Science of Law) in his famous book, The morality of Law published in 1963, has enumerated the qualities, which must be present in a law before being characterised as a 'Law'. The most important characteristic is 'inner morality' which must command respect. Fuller enumerated the following qualities, which must be present in a legal system if it is to command allegiance from citizens. We will try to weigh the Disaster Management Act, 2005 on the eight qualities of Law, which it should have in order to qualify as Law. These are tabulated and show that the Actions of India are fairly balanced and meet the requirement.

Fuller's qualities of a Law	Weighing the characteristics of DM Act on these qualities
Laws must not require the impossible.	The DM Act, 2005 is endowed with the spirit of constitution embedded in the preamble, "We the people….". these starting lines strives its citizens to become partners in fight against disasters like COVID-19
Source for Fuller's qualities of Law:	**NK Jayakumar: Lectures in Jurisprudence, Second Edition,2009:Gurgaon,122002, Haryana, India: LexisNexis Butterworths Wadhwa Nagpur.**

Fuller's qualities of a Law	Weighing the characteristics of DM Act on these qualities
Laws must be in existence. They must not exist merely as ad hoc settlement of disputes	India is having a Democratic constitution which is supreme lex. Its values are to be preserved in the Laws that are passed by the Parliament. The object of the DM Act, 2005 is to protect our people from disasters and mitigate its effects.
Laws must be promulgated publicly. They must be known to persons who will be bound by them.	Laws in India are passed by the legislature through open debates in the house and are voted for passing by a bicameral legislature before getting the assent of the President so as to become the Law of the Land.
Laws must be retroactive. They must not affect adversely persons who relied on the law as it was.	Laws are laid positum is the famous maxim in jurisprudence, science of Law. It is a norm which is known to all and is applicable to all with equal force once notified. People ought not to disobey or else they will be met with evil consequences.
Laws must be intelligible and clear	Acts are written laws duly passed and notified and are subject to judicial interpretation by separate entity so DM Act also meets this quality
Laws must be internally consistent through time, i.e. they must not change so that citizens are unable to orient their actions by them.	DM Act meets this quality. It has been enacted in 2005 and is in force in
Laws must be free from contradiction.	Laws meet their object to meet the end of public good. DM Act is free from contradiction and is aimed at aiding and fighting an epidemic like COVID-19 virus pandemic.

It is but for sure that in spite of stray cases and hardships due to economic fallout of lockdown imposed since twenty second March, 2020 till the end of May nearing two months, we, here in India are likely to succeed in our fight against COVID 19, that is the hope and optimism which lies in future.

The Disaster Management Act, 2005 and the Epidemic Act, 1897 are the two laws that have been major legislative forces in our fight against COVID virus epidemic. These two laws are like a magisterial wand. These two inked laws that are taking us further in our battle to fight the pandemic have vested enormous and unusual powers with the District Magistrates.

2.4. Assessment of Performance of laws in COVID 19 pandemic through examples:

The country was divided into three-colour grading system of Green, Orange and Red zones. Red zones were the zones where the situation was alarming and all the activities were barred but as the lockdown proceeded certain activities like construction were permitted in Orange and Green zones which had less prevalence of COVID cases. Reasi and Ramban are adjacent districts in the Union territory of Jammu and Kashmir. The Deputy Commissioner of Reasi Distt. permitted construction of projects whereas the DC of Ramban Distt. withheld permission.There were many such instances of inconsistencies in decisions at the end of DMs.In Chattisgarh, for example, to requisition a hotel, the Disaster Management Act was used and for shutting the shops, the officers used Epidemic Diseases Act,1897.

The Disaster Management Act gives sufficient powers to the DM to implement Central and State government guidelines. The District Magistrates are further empowered as the head of the District Disaster Management Authority. Elected representatives are only co-chairpersons in the said authority. The DM has got more powers than he has in usual times when the Disaster Management Act is in vogue. The second piece of legislation that has been used today is the Epidemic Diseases Act, 1897. It is an archaic yet a stringent law. Besides, the DMs during this emergency have also used some provisions of the IPC, the notable is the Section 188 of the IPC to levy a fine of Rs. 500 for not wearing masks in a few states.

The supporters of the legal framework in vogue during the COVID Pandemic argue that there are enough reasons for giving more responsibility to the Executive arm of the Government. It does not matter in crisis even if the law is of imperial origin. There appears to be a logic in this proposition that in such extraordinary situations powers in a district will have to be given to an officer and not to a local MLA or a Minister. It is based on an assumption that we need to trust our Permanent Executive. Our "steel frame" that is the strong 'Civil Service' is competent to meet such an emergency situation. If any DM turns arrogant and misuses powers then he can be transferred overnight as was done in the case of the District Magistrate of Gautam Budha Nagar in UP whose acts and omissions were examined by the CM UP himself as he paid a visit to the district headquarters himself, reviewed the issues and took an on the spot decision of transferring the DM Shri BN Singh, IAS and replaced him with another officer.

While every order issued by the DMs in COVID related matters mentions the relevant law, the Police Personnel enforcing those might add more miseries to the citizens. People who were coming out of their houses during lockdown were mercilessly beaten with lathies by the Police personnel. Media reports have shown a significant number of such incidents which can hardly be put under the carpet.

It has been reported in the New Delhi Edition of The Economic Times, dated 22 May, 2020 that in New Delhi itself, which is the Capital city, there has been a confusion in Stores as the guidelines issued by the Ministry of Home Affairs are subjected to different interpretations. The newspaper reports that the Central Government may have allowed stores selling non-essential items, including fashion and lifestyle, to open up in many parts of the country after May, the seventeenth during lockdown four but there is a wide variation in the local interpretation of rules that has sparked crackdowns by law enforcement agencies and has led to general confusion. Some enforcing authorities at local level have enforced the norm that Shopkeepers cannot use Air Conditioners even though temperatures are touching a range of forty degree to Forty- five degree

Celsius in India. Quite a few of the shopkeepers are forced to restrict up to five customers at a time in a space where more can be accommodated while observing social distancing. The shops in New Delhi have been shut for about two months, they were allowed to open in the post lockdown 3.0, in lockdown 4.0 of the COVID-19 that has started on May, 18, 2020 but District Magistrates and the Police have been issuing their own diktats on the ground based on the guidelines. Local authorities have barred H&M Store in Ludhiana, Jalandhar and Dehradun from switching on the AC over concerns that the cooling system could spread the virus. On the other hand, they can be used in its Delhi and Ahmedabad outlets with directions to outlets to maintain the temperature at twenty-six degree Celsius, people having knowledge have intimated this fact to the correspondents of the national dailies and the same have been published in the Newspapers. These incidents show the arbitrariness of public authorities. The Stores have also to restrict the number of customers to five in any given time at the outlets that are sixteen thousand to twenty thousand square feet in area. As appearing in the newspaper reports, H&M has taken a policy decision to abide by the norms as issued by the local authorities that is based on interpretation of the MHA's guidelines, they have cited health and safety of their employees and customers as their "top priority". Ambivalence in interpretation of orders/guidelines of the MHA by the local authorities although remains on ground posing challenges to the commercial activities. The positive part of the story is that commercial establishments have intimated that they are following the guidelines of the local authorities. Arvind Fashion's owned Unlimited and Tata's Westside outlets in Chennai are keeping the doors of their stores open and have arranged for large fans as they have been prevented from using ACs. All kinds of issues are happening in various parts of the country like use of ACs or five customers norm, these are making retailers crazy. As reported by the national daily, the Economic Times, the CEO of an Indian retail Group asking not to be named said, "everyone is interpreting the guidelines differently". In Bengaluru, standalone stores of Lifestyle and Shopper's Stop Department chains have failed to get permission to re-open as authorities have deemed them to be Malls. The MHA's guidelines stipulate that Malls won't be allowed to open for business yet it is a dampener and that is compounded further by different local authorities who are taking to interpretation of norms arbitrarily. It is to be understood that subjecting guidelines/norms to varying interpretations is hitting the businesses inspite of the fact that India has opened up from Eighteenth May, 2020 in lockdown 4.0.

Even while accepting the coercive character of law, it is important to note that law does not operate as an exclusively coercive mechanism. If law must be effective as a method of social control, it must have legitimacy and value consensus as the root of legitimacy. Law will not gain acceptance if carried out arbitrarily and will attract attention of judicial review. In these times, the constraint is that a serious health emergency as COVID can close or impair the functioning of courts also. It may leave a citizen helpless. **A Free Press which is known as the Fourth Estate** is doing a commendable job to point the helpless situation of the citizens. Apart from vagaries in application of laws, Police atrocities, lack of access to health care or poor quarantine infrastructure are also reported by the media. This mechanism will help in   protecting life and dignity of our citizens through arbitrary measures that are taken in an extraordinary situation as this health emergency.

If a system does not bind itself to its values and creates uncertainties due to excessive arbitrariness then faith in the institutions gets eroded. A systematic decay will creep in our political system, governance and justice delivery system. It will dent the strength of a citizen's voice. Democracy will be at peril in practice during the times of fight in a health emergency.

2.5 Force majeure clause and frustration of contracts:

The Force Majeure clause, Doctrine of Frustration of Contract and Restitution of a Contract is explained as follows

COVID 19 has led to Lockdowns and has put restrictions of movement. This has caused disruptions in commercial and business avtivities in many countries. It is an accepted fact that due to COVID pandemic, there has been an adverse impact on business operations. Contract Agreements are being studied by organisations to examine the covenants for assessment of contractual obligations and the costs that have suddenly come due to COVID pandemic.The companies and businesses are looking on Force majeure clause of the contract agreements that they have entered in with parties to contracts in their various business dealings.

Force majeure events, Frustration of Contracts and restituion of Contract are coming in performance and discharge of contracts creating difficulties for the parties to the contract

3. HOPE LIES IN IT AND NEW INNOVATIONS TO STABILISE LIFE IN COVID TIMES

3.1 Learnings from thinking of IT leaders in USA and finding solutions in Indian context: -

Several examples will be taken from recent developments in Information Technology field in USA to visualize the development and growth of IT and its products in post COVID-19 times. A country like USA has been at the forefront of also be summarized to understand where India was in pre-COVID-19 times and where it should be in IT initiatives in post COVID-19 future.

T**he vision of USA brought in practice through US Tech. Giants is being encapsulated in nutshell below to setup benchmarks for Indian milieu: -**

Challenge	Situation before COVID-19 emergency	Possibility difficult times as COVID-19 may generate
Moment of severe scarcity	Google has realized that dot com crash in the past made it come out stronger. That period inspired Google to solve problems by working in constraints.	COVID times would spur innovation as a new crisis has emerged. Google Inc. will emerge stronger.
Be it distant learning or delivery, Google innovated	Google hangout meets and Google classroom provided a solution to distance learning.	This moment of crisis will give an opportunity to company's like Google to think creatively & think ahead.
Collaborations with companies	Strategic moves were made in the past by Tech. Giants of USA but business interests and future vision were taken into account.	Google Inc. has collaborated with Alphabet recently. The big IT giants in USA have also realized that they might be competitors in normal times but they need to come together in times of crisis since COVID emergency is a larger crisis.
Contact tracing	USA is a democratic society. It has a proactive independent judicial arm. Doctrine of proportionality and invasion on an individual's privacy would have prevented a contact tracing application or software in apple's smartphones for people in normal times.	Google recently in post COVID outbreak situation has announced a partnership with Apple to build contact-tracing software for people's smartphones, which could notify them if they have recently encountered someone who tested positive for COVID-19. While that technology could stem future outbreaks, it also has raised privacy concerns in USA. Google has dealt with these concerns and has found solutions by putting privacy first. It's up to the user to decide to consent. It's transparent. They can choose whether or not to use it and there is no personally identifiable information or location data coming to Apple and Google as part of this.
Steps that have been taken to	Normal times give us a greater peace of mind, tools	"Infodemic"is a deluge of misinformation, spreading mostly online, that competes

combat a deluge of misinformation that WHO has rightly called as "Infodemic".	and interventions to analyse a piece of information. Free flow of information itself protects any misconception because views and counterviews flow before conclusions are drawn. That has been the strength of a democracy and Google.	with real news about COVID-19. How do you fight something like that at an individual level? For a company like Google, supporting trustworthy institutions and sources has always been critical. In some ways, that's easier right now because there is a shared sense of what is objectively right. And one can look to scientists, one can also look to health authorities, and that helps an individual to converge on facts. At the same time, major platforms, including Google and YouTube, have had to rely more on AI to police content, especially as they figure out how to have human moderators work from home. Could that make it easier for bad information to get through? It's a risk. But a company like Google, are being more conservative too, in the sense that, early on, that Google has prioritized information on Google and YouTube from authoritative sources: health organizations, journalistic organizations and so on. Google did not allow advertisements related to the coronavirus for a while, because the Company leaders weren't sure of their ability to moderate the content. But as Google employees were able to get into a better work- from-home process, they have been turning the dials up— which is important, by the way. Google Chief Sunder Pichai admitted in an interview that he would however want to give more people a voice
Pandemic has hit local news organisations hard. which potentially leave communities without access to reliable information	Freedom of press and people's voice is protected in a democracy. Fourth Estate as it is called grows at both the national and local levels. It is the financially weaker local news organisations that suffer in crisis and may create an information vacuum locally in a county or a small population of USA.	Google's Chief has assured that they are working on some programs to support the Alphabet with Grants, as they have historically through their Google News initiative but, he also observed that the Google needs to figure out healthy sustainable journalism at the local level, and there is more work to be done.
Information on testing sites	An individual can take recourse to various sources and media in normal times to	At one of his first coronavirus briefings, President Trump announced that Google was going to build a resource to help

	search for an entity as testing site.	people find testing sites. Such measures can help the community in fighting COVID-19 emergency.
Companies can do good to the society in COVID times	Companies were proactive in the past also prior to COVID times. The concepts of CSR and shared value for stakeholders has already gained momentum.	A company as Google have to make sure that they are doing good in society— whether it is helping companies and schools stay connected or committing a $ 250 million advertisement Grant given by Google to help organizations like the WHO disseminate important information on COVID-19. The Google Chief has also rightly observed that he thinks it is a testing time for a company like Google, the company will have to pass over and over again.
Will more of us be remote?	It is a part of human nature to be not only flexible but also act flexibly. Having said that, a question comes to an individual's mind, can we do things more flexibly because we've done it face-to-face before in our company's environment. IT infrastructure has built a foundation and in the changed circumstances, we need this foundation on a continual basis. The answer is yes, absolutely.	The COVID-19 crisis will change the way we work. When we look at the extent to which people commute and the toll it takes on their families and so on and so forth, it can be thought that we can come up with better solutions, lockdown time during this outbreak can give insight into this possibility. If this is taking as something very likely and an acceptable fact then it has to be accepted that not everyone has access to the same at-home technology and Internet service, which puts certain workers—and students— at a serious disadvantage. This fact can not be overlooked.
It is an accepted fact that not everyone has access to the same at-home technology and Internet service, which puts certain workers— and students— at a serious disadvantage. How do we bridge the gap between the advantaged and disadvantaged?	People could always have taken recourse to other modes in case IT was not available to them in normal times because physical movement and other conventional modes of communication were always available.	USA is having several projects under way, including a partnership with California Governor Gavin Newsom and T-Mobile to get wi-fi hot spots and Chromebooks to underserved communities and school districts in California. It is to be understood that when big companies like the Google and the US 2021 Administration think on effective utilisation of IT and augmenting IT infrastructure and also expanding its reach to the more underprivileged then it cannot be mere talks at the end of US administration and its IT companies but there would be a way forward to move about in related infrastructure, there's got to be a clear plan to provide both broadband and wireless connectivity to

		rural places and underserved communities.

In USA's context Sunder Pichai, Chief of Google, in an interview to the Time magazine has recently on putting before him a question, What, if anything, gave him a hope that some good might come out of all this?

His answer was inspiring and positive. He said, "Collective action is the most powerful resource USA is having, and it's actually working. Yes, there are issues, but there is more coordination. How do we prevent future pandemics? How do we solve climate change? How do we tackle AI safety? All of them will involve us coming together in some way or another. And that's what gives me hope for the next generation. His observations are true and are applicable to situation here in India as well.

3.2. We are not behind in our fight to COVID through IT:

Arogya Setu (Aa, in Hindi stands for without, Rogya in Hindi stands for disease and Setu in Hindi stands for bridge). This software application has been developed by the National Informatics Centre, MeitY (Ministry of Information Technology, Govt. of India). It is a Sanjivani to India. The stated purpose of this application is to spread awareness of COVID 19 and to connect COVID related health services to the people of India. It also shares best practices and advisories to keep the citizens informed. It is a tracking app which uses the GPS of a smartphone and Bluetooth features to track the Corona virus infection. It is available on both Android and iOS mobile Applications. With Bluetooth, it tries to determine the risk if one has been near (within six feet) of a COVID infected person, by scanning through a database of known cases across India using location information, whether the location one is in belongs to one of the infected areas based on the data available. This app is an updated version of Coronakavach which has since been discontinued.

Privacy concerns on Aarogya Setu:

Privacy focused groups such as IFF (Internet Freedom Foundation) have questioned the Aarogyasetu app. These concerns relate to information collection, institutional divergence, transparency and audibility. This has come amidst the claim of the Government that it has "privacy by design approach" inherent in it. There is no information as to which Ministry or Department will have access to data.

In India's case there seems to be institutional divergence when compared with international examples. Privacy issue is an overstated apprehension in India's context because in India, the Disaster Management Act and The Epidemic Act give administrative power to District administration. This is rightly so because the "steel frame" as it is called is comprehensively linked with the centres of power and delivery systems. This is visible as well and can be seen in the response to COVID with the District Magistrates in the forefront. Hence, it can be concluded that these apprehensions on Privacy are overstated and have not been linked with the state of public administration delivery systems in India.

Fig. 3.1. Corona Warriors of India in action: India salutes them. Govt. has provided a e-platform through a web site www.covidwarriors.gov.in

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Organization Wise Covid Warriors Data - Total for All Organizations- 15896093

Organization	Total Numbers	Organization	Total Numbers
MBBS doctors	927000	MBBS Students	153656
Nurses	1748363	Dentists	217000
Pharmacists	1125222	AYUSH	832445
CPSEs Hospitals	201	ESIC Hospitals	49
Railway Hospitals	50	Ordnance and HAL Hospitals	13
Port Hospitals	12	LAB volunteers	43736
Ex-Servicemen	179918	NYKS	3554912
NSS	2581794	NCC	62024
PMKVY - Trained Health Professionals	108189	Trained Healthcare Workers under DAY NULM	45385
Trained Workers under DDU GKY	43944	Psycho Social Care	116346
Panchayat Secretary	237917	Gram Rozgaar Sewak	172959
ASHA	1007045	Anganwadi	2543113
Veterinary Doctors and Para Vet	83256	Allied and Healthcare Professionals	5813
Postmen and Gramin Dak Sewak Delivery Agents	105731	Civil Defence	57394
Home Guards	108694	Fire Services	23211
NGOs			

Fig. 3.2. Dashboard of covidwarriors.gov.in gives the data base of COVID warriors. We have created it in a short time.
Let us be reminded of our Fundamental Duties entered through the forty second amendment of our constitution. A few of them are depicted pictorially to embolden us in the times of COVID Pandemic. IT can be a powerful force to carry the message.

Fig. 3.3. Humanity is yet to find an antidote to COVID-19 infection. Scientific community of India is also engaged in a tireless battle. Part IV A, under head Fundamental Duties of Constitution through Directive Principles of State guides us through Section 51A, which through clause h) states, **" to develop the scientific temper, humanism and the spirit of inquiry and reform"**.

Fig.3.4. A united nation can alone win fight against COVID pandemic. Article 51A (e) is also one guiding principle. It states, " to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religeous, linguistic, and regional or sectional diversities; to renounce practices derogatory to the dignity of women. Article 51A(d) states, " to defend the country and render national service when called upon to do so. IT can be a powerful force to carry these messages

3.3. Comparison of India with Developed Countries like USA in efforts towards IT support for fighting COVID

Parameter	USA	India
Distance learning or delivery	Apps such as zoom, Google hang out meets and google class room are being used by the US universities due to a very high spread of Corona at an unprecedented scale.	In India, academic institutions like schools in urban centres and institutions of higher learning adopted virtual mode of teaching to keep the academic session ending April, May on track. and
Contact tracing software for smartphones	Google with Apple has developed the software. Owing to privacy concerns, it has been left to an individual to download the same. This technology can stem outbreaks in future.	India has launched its own app Aarogya Setu. It is presently being subscribed by over 10 million subscribers and the user base is continuously increasing. It has made travel safe for Indian citizens. It has checked the spread of the virus.
Checking of infodemic. The word here refers to a deluge of misinformation	Google's collaboration with Alphabet and other infotech companies will check the deluge in USA. However, USA has Doctrine of Proportion in place that has been pronounced by the US Courts. Acts of States of USA &US administration can be challenged in the US Courts as	Daily press briefings by the Joint Secretaries of Ministry of Health & Family Welfare and the Ministry of Home Affairs and sharing of all statutory orders on website has checked the "infodemic." Through Section 67 of the DM Act, 2005, Direction can be given to media for observing restraint in communication, through warnings,

	being out of proportion by the citizens. Due to an open democratic structure and Federal structure as against a quasi- Federal structure with unitary structure & primacy of Parliament and the Central Government, exact comparison on legal measures between USA on issues of infodemic are not feasible.	etc.—The National Authority, the State Authority, or a District Authority may recommend to the Government to give direction to any authority or person in control of any audio or audio-visual media or such other means of communication as may be available to carry any warning or advisories regarding any threatening disaster situation or disaster, and the said means of communication and media as designated shall comply with such direction
Augmenting IT infrastructure and reaching to underprivileged	Bigger Companies like Google Inc. and US Administration and to provide both broadband and wireless connectivity to rural places and underserved communities	India has also been trying to increase the internet penetration. To further augment reach to student population, India working on an assumption that in the likelihood of COVID emergency to remain for some time, the govt. has recently declared that separate TV Channels will be commissioned from class 1 to 12 i.e. 12 channels to enable continuation of education, should our formal system suffer due to lockdowns.

Corporate India has suddenly come to a situation to deal with cyber issues at a scale that is unprecedented due to lockdowns in COVID times. When employees had to shift to working from home suddenly, the companies had to very quickly evolve technologies and protocols to secure the working environment to prevent unauthorized access to proprietary intellectual property and client data. For tech companies that work with sensitive data belonging to their clients and for financial services firms and banks, which deal with very sensitive information, the past few weeks have meant intense sprints in inventing new ways of working securely while working remotely.

The weakest link in the whole game-the typically poorly secured home network data used by multiple devices, some of which are prone to hacking, in sharp contrast to work places that spend a lot of resources securing networks and data.

Acutely aware of this reality, hackers of all hues and levels have swooped down on users and networks, in an unprecedented global stress test of vulnerability. Phishing attack, a relatively unsophisticated but nonetheless successful method, have spiked, while the more sophisticated and lucrative attack on company networks to access user data also underway. A veritable cat- and mouse game between hackers and enterprise security professionals is playing out at scale.

"A wide variety of devices use home networks and not all of them are strong. Let's stay your TV uses Wi-Fi and network computer by the TV. Office computers hardened to prevent this."

Due to the lockdown, companies have had no choice but to shift work to home. That means sensitive data was now going to travel on the same networks used to play games, watch TV, synchronize up with smart devices such as Alexa or Google Home and stream music and TV content. Remote devices have always been a weak point in security. Cloud based data protection services have seen an 80% to 90% increase in requests for data recovery. Companies are now scrambling for security experts to bolster defences as global hackers see an enormous opportunity-every employee working from home is a potential vulnerability to be targeted with malicious code.

Within offices, often companies debar use of smartphone recording devices, as well as pen and paper for some particularly sensitive process. At homes, companies have no control on physical security and no choice but have employees use their Wi-Fi network to communicate. You had to weigh the risk of not doing business versus doing business. Infosys has nearly quarter million employees. The company has obtained approval of the clients to allow Infosys employees working on their projects to work from home. In many cases, these clients of Infosys are global customers whose projects are being undertaken by the Infosys. Ninety-percent of the strength of Infosys has been working from home during lockdown period. Infosys setup a 24 by7 helpdesk for employees, upgraded remote access concurrency by 5x, bandwidth 10x and established a number of gateways to establish virtual private network (VPN is a dedicated tunnel to connect to office servers or cloud) link to office servers from two to around a dozen. These steps taken by the Infosys that there was no latency and speeds were as good as in office. The shift was well coordinated. Similar steps were taken by other IT companies and even startups. The employees could work from home with their individual safety in COVID-19 times when the disease was spreading and deaths were being reported. This however, enhanced the risk of viruses bringing down networks by giving opportunities to hackers for hacking into employee systems. Such cases multiplied giving a new set of problems to Infosys and IT companies.

	Virus rises as COVID spreads
January, 2020	**Coronavirus-themed emails distribute malware and Trojans especially targeting banking operations.**
February 2020	**Phishing emails claiming to be from centres for Disease Control steal email credentials. Malware from North Korea posing as a document with information on South Korea's response to COVID-19 infects systems.**
March 2020	**Spam emails come camouflaged as a list of precautions against the coronavirus disease. Application masquerading as an interactive map showing the spread of the virus globally spies on users via microphone, cameras. New ransomware strain CovidLock, is distributed as a coronavirus tracking app. Number of attacks on networks of Indian companies double between January and March 2020.**
April 2020	**Attacks increase manifold as hackers find more vulnerabilities to target millions working from home.**

==As COVID-19 virus engulfed humanity, Attack area in cyber space saw spreads. A few reported cases are given below==

- **Employees of Technology Services heavy weight Cognizant fell to a ransomware attack.**

- **Hackers put records of 22 million users of online learning platform on sale.**

- **The frequency and sophistication of cyber attacks have also risen over weeks. Corona-viruses themed e mails popped in boxes in January, 2020. These were used to distribute malware and Trojans.**

- **COVID-19 was declared as a pandemic by the WHO on 11 March, 2020. The months of March and April saw a spurt in phishing attempts. Phishing is an attempt to steal information by sending a trustworthy email. These were fed by people's fears and curiosity to know about Corona virus. The number of malicious registered as CovidCare, Cornacare, Covid 19 and various related combinations.**

- **According to IBM-X Force, IBM's threat intelligence group, since February, 2020, spam exploiting the novel coronavirus has jumped by 6000%, mainly in the area of phishing emails, malware (software designed to give unauthorized access to a computer) and spam.**

- **IT security solutions provider K7 computing said, Kerala, in India recorded the highest number of cyberattacks in India**

- **In India, tier-2 and tier-3 cities saw increased cybercrime activity.**

- **Netrika Consulting India is a New Delhi based companies empanelled with Computer Emergency Response team of India (the, national agency for responding**

to cybersecurity incidents). It has intimated that there has been 35% increase in cyberattacks in India.

- **In India, the organisations have moved to a hybrid model, home and office combination, the surface of attacks has increased.**

- **Network policies in Indian companies and organisations were not designed for uncontrolled devices. With 'bring in your own device' becoming prevalent in employee functioning, lines started blurring. This aspect has to be factored by organisations who permit work-from-home. Previously, IT departments were concentrating only on controlling virtual environment of a company's offices, now they will have to consider employees working in thousands of locations. For example, insurance aggregator, Policy Bazar has to cover 13,000 of its employees working from diverse locations and this figure was 200,000 for TCS who have been using Wi-Fi to access cloud and office servers. That has multiplied the challenge of securing the businesses. Policy Bazar has data of millions of customers, while TCS handles data of several hundred of its global clients, these include many fortune 500 companies also. The present health pandemic has given a fertile ground to hackers and has been a nightmare for enterprise administration.**

- **Employees are collaborating over cloud, sharing files, communicating on third-party platforms such as Zoom, and using a host of data analytics, graphics, design, HR, sales, and project Management programs in thousands of locations across India Inc. Companies should tap a range of tools to sniff out attacks at an early stage. Artificial intelligence and machine learning can also be used in this endeavour.**

FIG. 3.5. SALE OF CYBER SECURITY PRODUCTS IN $ MILLION, FIGURES OF 2022 ARE PROJECTED

■ Data security ■ Endpoint security ■ Id. & access mgmt. ■ Network security ■ Security IDR ■ Total

2019
- 1029
- 333
- 257
- 83
- 241
- 115

2022
- 1644
- 504
- 394
- 130
- 406
- 210

2019   2022
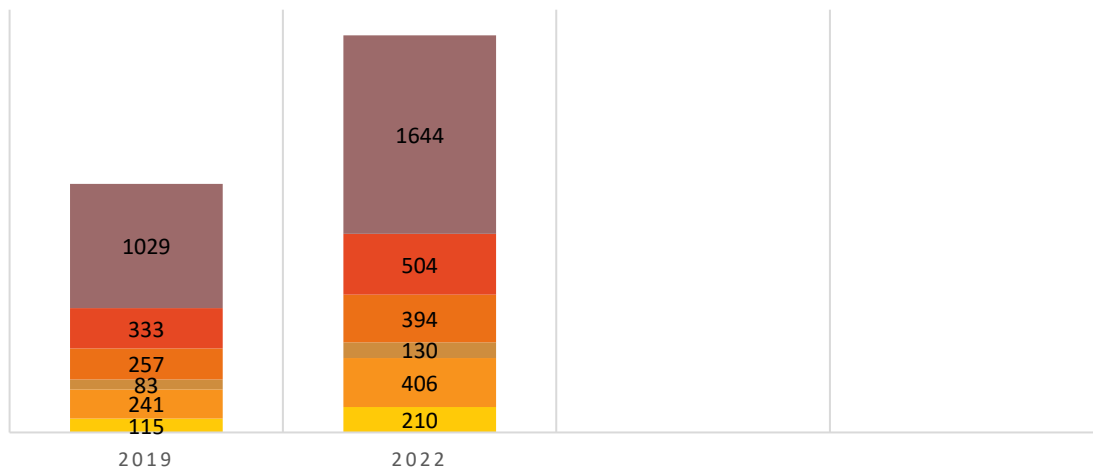
FIG. 3.6. SALE OF CYBER SECURITY SERVICES IN $ MILLION, FIGURES OF 2022 ARE PROJECTED

■ Security consulting   ■ Security implementation   ■ Security testing
■ Security operations   ■ Incident response   ■ Total
■ Column5
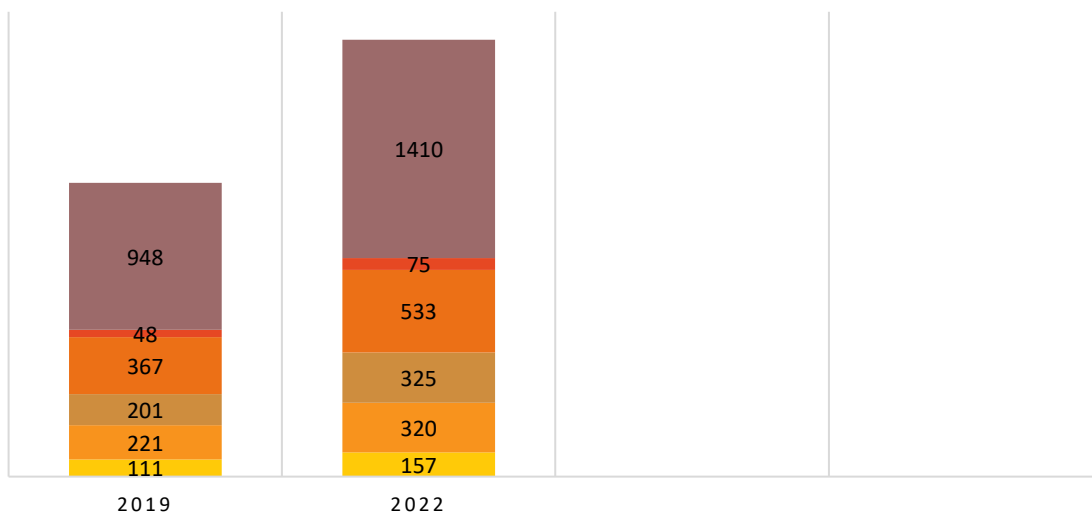
	2019	2022
Total	948	1410
Incident response	48	75
Security operations	367	533
Security testing	201	325
Security implementation	221	320
Security consulting	111	157

■ BFSI ■ IT/ITES ■ Govt. ■ Others ■ Total

	2019	2022
Total	1977	3053
Others	630	949
Govt.	395	581
IT/ITES	434	713
BFSI	518	810
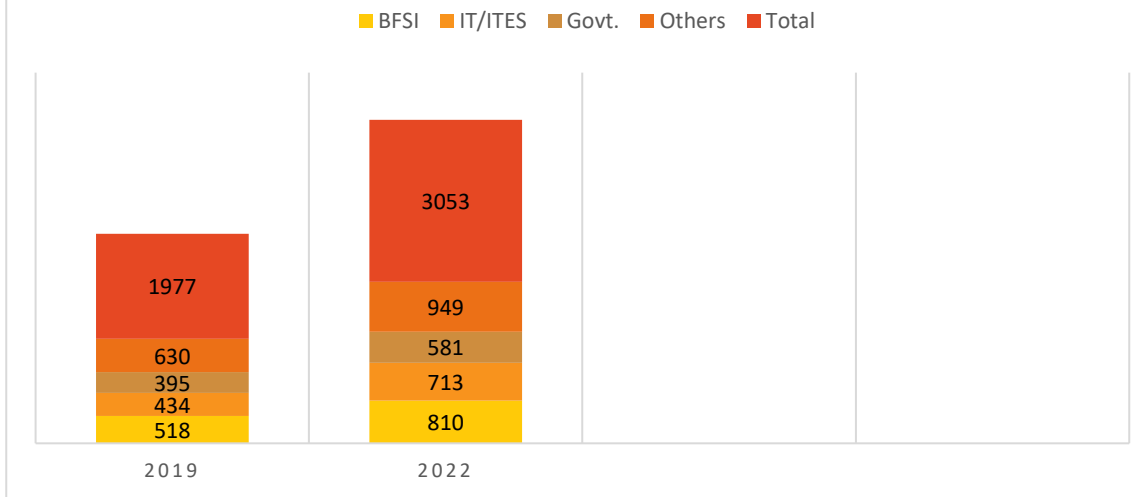
Securing Code @ Home, List of things that companies must do to secure their workforce

- Sensitizing employees to be aware of threats, using endpoint security that is using updated antivirus, antispam software, using secure collaboration tools, evaluating threat management, understanding that cloud and SaaS (software as a service) are here to stay and taking advantage of dedicated tools such as Quad9. The last measure protect the computers from connecting to unknown malicious domains (like fake covid9 cues.

- A VPN is the most secured way to connect to enterprise cloud or office servers. Zscalar VPN, and firewall protection is being used by companies. With VPN, an employee is

virtually in his office, but a lot depends on What VPN solution enterprises invest in? There are multiple VPN vendors such as Cisco, Checkpoint and Paloalto offer differing solutions. Apart from basic hygiene of changing passwords frequently, investing in a good VPN is a must. There are hundreds of VPN providers. Enterprises should opt for ones which have no-log policy (where the VPN provider does not collect transmitted information and offer bank-grade encryption.

- Companies are also relying on multi-factor authentication (enterprise version of how credit cards use two-factor authentication), disabling software downloads, routinely updating and patching machines (much like frequently washing hands and wearing masks to keep COVID-19 at bay, updating home routers with the latest firmware, disallowing the downloading of corporate files via cloud to personal devices and are staying alert to unusual activities.

- Many Companies are also insisting that employees use company's mobile device management protocols. This arrangement ringfences, monitors and manages office work from personal tasks on the same device. Employees are using apps and programs from all over, cyber criminals are however having more oportunities, making an organisation's threat vector broader than ever. Companies need to harden the systems and structures for remote working environments.

- Tech Mahindra has enabled two-factor authentication with VPN and the data traffic movement is encrypted. Any software that an employee needs to download has to be approved by tech teams as per the new policy now prevalent in COVID times in Tech Mahindra. Use of masking software has also gone up. These software blank out all information except what is required by a specific user- enforcing an almost need-to-know basis protocol. It has been out for over a decade, particularly, in banks and BPO companies. There will be more amplified use of "masking control" in near future.

- At Policy Bazar, VPN access has been limited to employees who genuinely need it.The company has also reduced the size of applications as different employees had different bandwidth issues.

- At Reliance Securities, broking and distribution arm of Reliance Capital, any change in access to data files has to have a business justification. WFH means more dependence on emails to communicate and hackers can send across mails to look like official mails. This situation calls for more safeguards, that calls for log monitoring, full tracking of actions of users and also making sure that no document is trashed unshredded.

- Despite all checks and precautions, attacks do happen. Major cyber-attacks can cripple companies and even countries. A few years back, hackers had brought down power grid of Ukraine. A 2018 ransomware attack targeted Maersk operations in Ukraine-it originated from an employee using an infected USB and quickly spread across the world, crippling operations of the world's largest shipping line.

- New features such as machine learning based algorithms and artificial intelligence are also being employed by the companies to detect malicious activity. Elliptical cryptography is another means and a way forward. A person who works on the data does not know what the data is to maintain integrity and confidentiality of data.

<mark>Who can be contributors to cyber security?</mark>

- **Telecom companies can play a larger role in securing networks.**

- **Once traffic is handed over it is the telecom companies' responsibility, it has not only to do package inspection but has also to ensure security of the network and to provide end-to-end connectivity. These two factors are constantly improving.**

- **In COVID times, Multinationals have been better equipped for transition to WFH since many of their offices in Europe and USA have already been availing the facility of flexibly WFH as a policy. For instance, Dell Technologies had already set in a goal as early as year 2013 that by the year 2020, half of its workforce should WFH.**

- **Risks of cyberattacks to companies' data and networks will be enhanced if WFH will be encouraged in future by them. The companies alone will have to prepare themselves.**

Indian IT companies like Infosys and TCS are facing uncertainties because their business in Europe and the USA have been hit. Clients in these countries are facing difficulties in payments or maintain order flow

A SUMMARY OF WFH SECURITY THREATS			
Phishing emails offering fake medical advice and counterfeit COVID trackers deploy ransomware on devices	**Hackers posing as users and employees trick IT staff to gain network access**	**Hackers spreading COVID-19 discount codes to proliferate spread of malware and malicious toolkits**	**Making home Wi-Fi network vulnerable by using it for work and personal downloads, entertainment etc.**

WFH: MANAGING THREATS

Short term	**Secure VPN, identity management, endpoint security, Employee awareness, mobile device management, frequent patching**
Medium term	**WFH guideline, institutionalize insider threat analytics, strengthen security operations centre, privilege user access management**
Long term	**All the above, implement critical effective crisis response and management**

Virtual shield	
1) Companies are evolving new protocols to mitigate risks as India Inc. during lockdown and for a future that lies is preparing to WFH.	7) Create 24 by 7 employee help desks
2) Shift in security approach from network centric to identity centric is now being contemplated by the companies.	8) Limit information available to users
3) Companies should issue dedicated work devices. These devices should not have private download rights. These devices should be monitored.	9) Use masking software to blank out crucial information
4) Ringfence office applications or work via virtual desktop infrastructure	10) Use AI/ML to respond to unusual network and usual behaviour
5) Use of multifactor authentication to log in should be adopted	11) Move towards "low touch" so employee would need minimum information to work with
6) VPN-only connectivity route to the office servers	12) Employee education about latest cyber threats and attacks

Demand for cyber security personal will grow to keep the increasing threats at bay,	Manpower requirement in cybersecurity field
There is a freeze on hiring at insurance aggregator Policy Bazar. There is one big exception, the company is looking to hire a head of IT security. Now with WFH, around 10 million policies being sold a year and also there is a network of 10,000 agents of the insurance aggregator who would work remotely in changed circumstances. The company would definitely need a hand who would understand the scale and plan mitigation of threats. Even as jobs dry up in India Inc., demand for cloud security professionals, network forensic experts, internet of things tester, identity and access management professionals and security architects is actually booming	In the year 2020, employee base having cyber security services talent is 1,30,000 or more. New roles and cross functions emerge
India needs 1million experts and has less than 10 thousand who can secure networks. The problem is compounded by the fact that most companies are looking for experienced hands rather than freshers who will learn the tricks on the job.	Overall cyber security employee base is estimated to be 2,50,000-3,50,000
Cyber breaches have increased up to 30-35% in April, 2020 due to COVID situation. There are multiple problems like fake versions of apps and unpatched VPNs. The companies need more hands to monitor and plug gaps, and hence demand will scale	More than 35% companies are re-skilling their security workforce. 60% companies have prioritized hiring skilled talent for performing security operations

4. MODELLING MARKET RISKS DURING PANDEMICS

4.1 Flash back a century, to the Spanish flu

The raging Covid-19 pandemic has whetted researchers' interest in pandemic modelling. The interest is partly because modelling multiple factors that link the pandemic to market performance is challenging. Usually, researchers have to also contend with uncertainty over the quantum and timing of policy interventions. Moreover, pandemic effects are linked to health system responses, immunity that people might develop over a period, and the possibility of a vaccine. These reactionary measures are uncertain, with no dependency on the past actions, and hence challenging to model.

Credit rating agency CRISIL in a paper, has tried to address some of the challenges around modelling market risk factors and has compared market situations between the two pandemics ie. the Spanish Flu and COVID-19 pandemic.

Of all the pandemics in the past century, Covid-19 has striking parallels with the Spanish flu (1918-1920), not just on the health and epidemiological side, but also in how financial markets have reacted to the two pandemics. Therefore, the CRISIL have tried to identify risk comparison metrics – for use in market risk and stress-testing practices – for evaluating the severity of Covid-19, using the Spanish flu as a frame of reference.

Given the similarities and differences between the two, it is important to compare market behaviour during these pandemics to understand the factors present at the time better.

Only a few indicators were available during the Spanish flu to indicate market performance and reaction. If we look at the foreign exchange asset class, forex rates were fixed for most currencies during the Spanish flu, making any comparison inherently flawed. Prices prior to 1957, when the Commodity Research Bureau index – a representative indicator of global commodity markets was launched – are unreliable.

However, the Dow Jones Industrial Average (DJIA), which was trading at the time of the Spanish flu, does provide a reliable indicator, and CRISIL have used this as a central measure of comparative performance between the two periods. As such, equity is typically the quickest to react to pandemics compared with other asset classes.

The statistical parameters such as annualised volatility over 30 days, peak-to-trough fall, peak volatility, and correlation checks to compare the two pandemics have been used. These parameters provide a comprehensive overview of index performance during pandemics, because they capture multiple parameters to gauge the indicator performance, e.g. uncertainty over a period, market correction, uncertainty during the peak of a flu, maximum drawdown of the DJIA index, and correlation between the death rate and index performance. How Covid-19 compares on different counts?

Volatility comparison in the DJIA index: During Covid-19, the market reacted with a significant jump in volatility, as panic selling was seen among traders. Increased trading volumes of volatility-linked products, rapid central bank intervention, and algorithmic trading also led to increased market volatility. During the Spanish flu, there were three waves of the virus outbreak, which resulted in three virus peaks. The DJIA's behaviour and performance during each of these three peaks were notably different. CRISIL have considered the largest Spanish flu wave that manifested during September to December 1918.

We see that the volatility in the DJIA during Covid-19 months is more than 5x higher than that observed during the Spanish flu period. This is specifically attributed to increased interconnectedness of global supply chains, higher speed of communication, and a more voluminous (and hence liquid) stock market.

Peak-to-trough fall: The Spanish flu pandemic peaked during the second wave (September-November 1918), leading to a very high mortality rate. This was also coupled with the post-world war recession. During this period, the DJIA initially increased, but declined after October 1918. During this virus peak, the peak-to-trough fall was 10%. For Covid-19, we are not certain when the virus peak will be reached, though estimates suggest the peak could be over in certain countries. The peaks are expected at different time periods in different countries. Between December 2019 and April 23, 2020, the DJIA had a peak-to-trough fall of 37%. This is about 4 times higher compared with that during the Spanish flu pandemic. Since April, 10, 2020, the DJIA has been flat and has not seen much movement.

Spanish flu – the three waves (1918-1919)
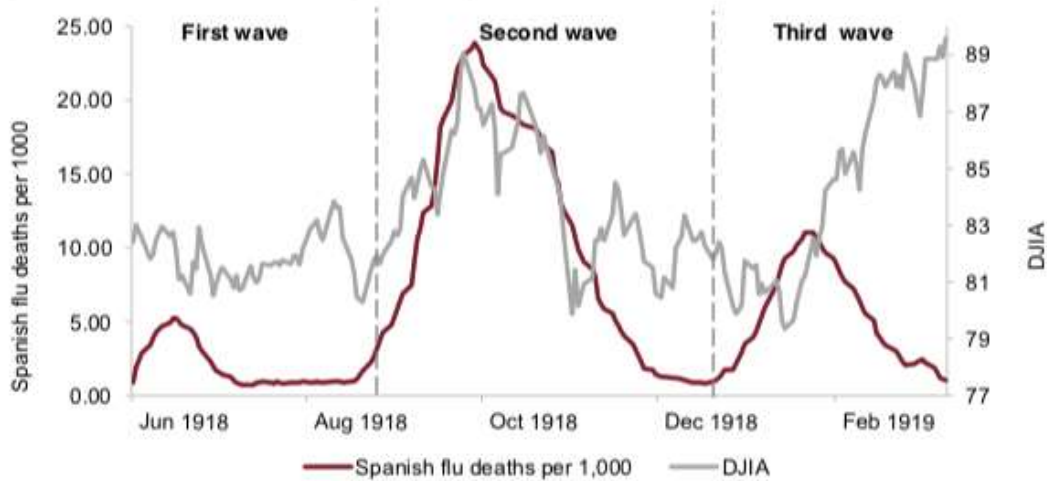
Annualised volatility over 30-day periods during the two pandemics
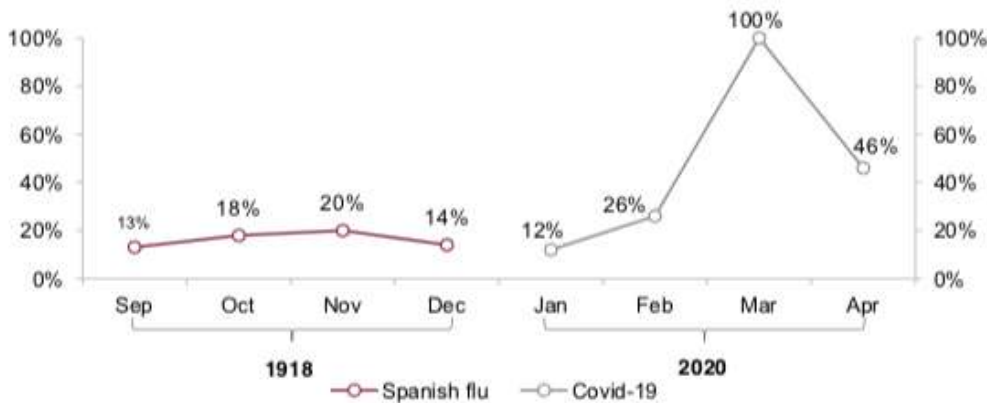
Fig. 4.1. History can give insight to present fight against COVID

Fig. **4.2. Peaks and troughs**.

Peak-to-trough fall during Spanish flu and Covid-19 (%)
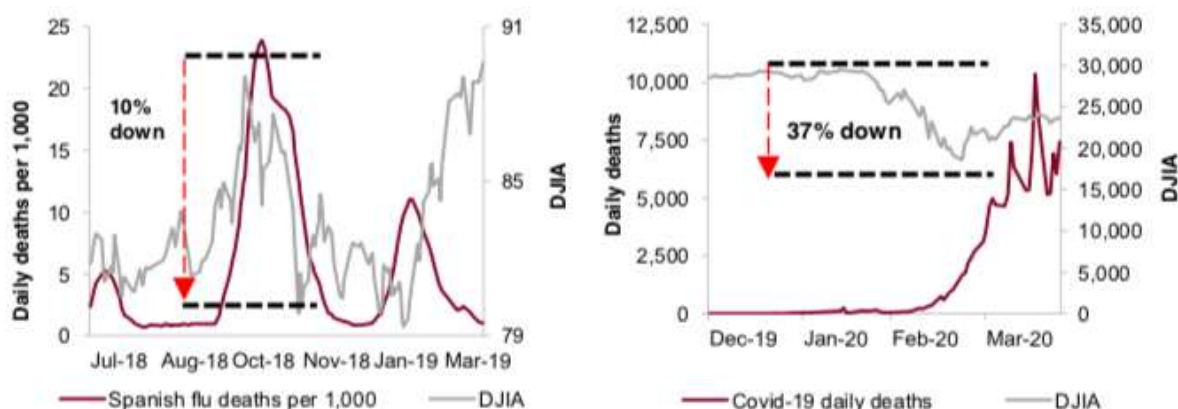
Volatility during the second peak of Spanish flu: The Spanish flu peak for the second wave occurred around November 1918. If we look at the volatility metric one month prior to the peak (i.e., over a 30-day period), it was 0.18 on an annualised basis. If we look at the Covid-19 data, the annualised volatility over a 30-day period (March 23 to April 23, 2020) is 0.62. This higher volatility could be attributed to uncertainty over when the Covid-19 curve would flatten and lack of clarity on policy intervention at that time.

- Correlation check: As per our calculations, the correlation coefficient between Spanish flu deaths and DJIA data series was found to be 0.68. Despite this, it is difficult to establish a correlation between the data series. During the first wave, World War I had a major impact on stock prices; the world war had ended during the second wave, and the Spanish flu impact was largely offset by euphoria about war conclusion. For Covid-19, the correlation coefficient between Covid-19 deaths and the corresponding DJIA series is -0.55, implying they are negatively correlated, which is on expected lines. This is

41

explained in Fig. 4.3 below

Correlation comparison between the pandemics and DJIA
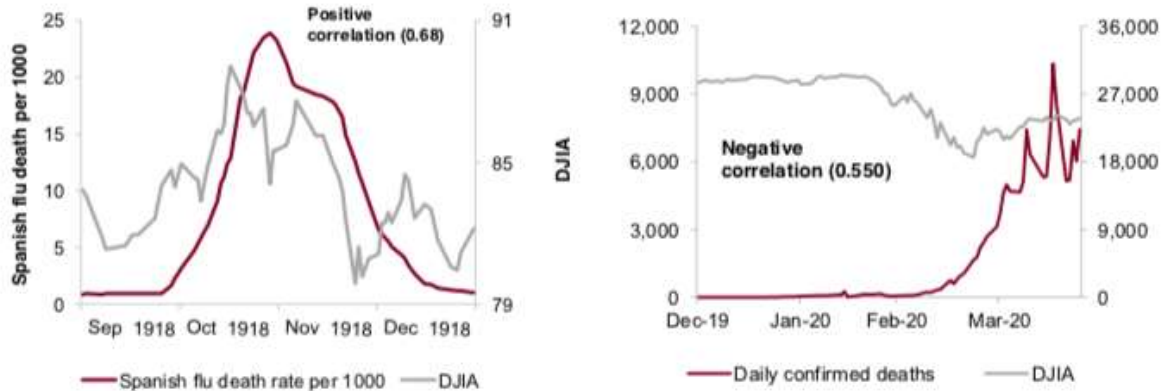
- Tail effect: The Spanish flu hit the countries when stock prices were low. As per researchers, the Spanish flu had a mild impact on the aggregate US economy, and much of the impact on the economy was due to the world war. Economic recovery is linked to increased output, which was witnessed a few months after the pandemic ended.

- On the contrary, Covid-19 hit the economy when equity indices were already booming and the cyclical impact was waiting to hit, as some economies had already moved into a slowdown phase. Abysmally low GDP estimates have worsened further, and the unemployment rate is likely to soar in the coming quarters as Covid-19 continues to spread.

- Due to Covid-19, the impact on equity prices was more than 30%, and this is comparably reasonable given higher liquidity, better information flow, and a higher number of participants in the market today. But at the end of the day, we should not forget that Covid-19 deaths are not anywhere close to the Spanish flu deaths, and the equity markets have already recovered to an extent.

- The 1918 pandemic was associated with sizeable declines in the real rate of return on stocks and short-term bills. This could be attributed to the high inflation rate during the pandemic. Primarily, it was due to the timing of the flu with respect to the economic and financial cycles. In the case of Covid-19, we expect the inflation to rise in the post-recovery period, when governments plan for fiscal stimulus in their respective economies.

4.2 The implications for market-risk management:

Higher volatility may mean higher capital charges due to market risk: High volatility could lead to a spike in capital requirement related to market risk.

Pandemic might mask model deficiencies: Covid-19-related volatility has resulted in a significant increase in the trading books' capital requirement. Volatility has led to a higher number of VaR back-testing exceptions for banks and the usage of a VaR multiplier to cover model deviations. Capital calculation has been impacted, as several banks have seen actual or hypothetical P&L movements compared with their model-predicted VaR estimates. Under the current regime, it is difficult to point out model deficiency, as the impact is due to extreme volatility and not due to model deficiency. This has led to VaR multiplier becoming pro-cyclical in nature and putting pressure on capital requirement. Such pro-cyclical nature of the VaR multiplier has led to all banks being gauged on the same scale, while model deficiencies differ from bank to bank. Pro-cyclical market-risk capital measures give banks less leeway to act as intermediaries, hindering firms from accessing financing and risk-management services they need.

Scenarios for stress testing: It will be a herculean task for banks to consider all the potential Covid-19 scenarios to model market risk. However, they should consider a good number of possible scenarios, ensuring that extreme situations and intermediate expectations are modelled, while modelling pandemic impact on their capital requirement based on market risk. An effective approach for banks would be to divide their analysis over short, medium, and long term.

Market-risk model changes: Increased volatility in interest rates and FX may lead to MTM losses for banks. Banks might need to reassess their market-risk models and update them to include Covid-19 scenarios. Scenario analysis for a change in the interest rates and credit spreads is needed for banking books. Given the high volatility, there should be a reallocation of limits on trading-book sensitivities. For the calculation of stressed VaR, a reassessment of the stress period is required. Banks should communicate to their regulators if the market-risk capital is adversely affected due to Covid-19 implications and differs much from market-risk models.

Pandemic risk resiliency plan: Pandemics call for a resiliency plan to sustain financial institutions' assets. The below chart can be helpful in charting out a strategy for a risk-resiliency plan.

Time Horizon	Stress Scenario Parameters
Short-term	• Performance of highly impacted sectors should be considered. These include hospitability, oil and gas, travel and tourism and supply chain shocks. • How does MTM movement impact capital requirement? • Number of times Var estimate is breached. • Sentiment analysis. • Short-term policy responses (e.g. fiscal stimulus). • Post-pandemic market response. • COVID-19 mortality rate.
Medium term	• Scenario analysis based on macroeconomic parameter projections, such as GDP growth and purchasing manager's index (PMI). • Sentiment analysis • Medium-term policy responses. • Inflation, unemployment rates.
Long-term	• Long-term policy responses • Operational risk from COVID-19 • Failure of banks triggered by the pandemic.

==Each of these parameters can be considered under multiple scenarios==

Scenarios	Global Mortality rate	Global GDP Drop	Market crash since Dec. 2019	Global unemployment rate	Worst hit sectors	Sovereign default/hair cut
Baseline	1-1.5%	-3%	-23%	5%	Aviation, tourism	NA
Medium	2-2.5%	-5.5%	-35%	6.5%	Aviation, tourism, automotive, oil and gas, real estate/infrastructure, MSMEs	5% countries have been impacted: Italy, Greece
Severe impact	3-3.5%	-7%	-38%	8%	Aviation, tourism, automotive, oil and gas, real estate/infrastructure, MSMEs	15% countries impacted: Greece, Spain, Italy.

Market risk model changes
- Increased volatility in interest rates and FX may lead to MTM losses for Banks. Banks might need to reassess their market risk models and update them to include COVID19 scenarios. Scenario analysis for a change in interest rates and credit spreads is needed for banking books. Given the high volatility, there should be a reallocation of limits on trading book sensitivities. For the calculation of the stressed VaR, a reassessement of the stressed period is required. Banks should communicate to their regulators if the market-risk capital is adversely affected due to COVID 19 implications and differs much from market-risk models.

Pandemic risk resiliency plan
- Pandemics call for a resilency plan to sustain assets of financial institutions. The below chart is helpful in charting out a strategy for a risk resilency plan.

Fig. 4.4. Market risk model changes and Pandemic resiliency plan

Fig. 4.5 Line of action to be taken is explained in block diagram above.

<mark>Closing thoughts</mark>

- The market impact of a pandemic is mostly a knee-jerk reaction, which then gets shaped by policy responses, outbreak propagation velocity, and multiple other policy factors.

- The two pandemics discussed here have a high degree of similarity and impact on banks from a market-risk perspective. But while the Spanish flu did not result in widespread pandemic modelling at banks, the situation in 2020 is quite different.

- Pandemic scenario modelling indicates how a pandemic affects the assets of banks and helps institutions prepare through limited planning for future pandemics.

Scenarios	Global Mortality rate	Global GDP Drop	Market crash since Dec. 2019	Global unemployment rate	Worst hit sectors	Sovereign default/hair cut
Baseline	1-1.5%	-3%	-23%	5%	Aviation, tourism	NA
Medium	2-2.5%	-5.5%	-35%	6.5%	Aviation, tourism, automotive, oil and gas, real estate/infrastructure, MSMEs	5% countries have been impacted: Italy, Greece
Severe impact	3-3.5%	-7%	-38%	8%	Aviation, tourism, automotive, oil and gas, real estate/infrastructure, MSMEs	15% countries impacted: Greece, Spain, Italy.

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Fig. 4.6 COVID 19 CREATED Supply and Demand shocks in one fell blow

Supply and demand shocks in one fell blow

Supply shocks are due to-

Factory shutdowns, labour shortage, disruptions in input supply and drying of cash flows.

Demand side shocks are due to-

Lower discretionary spending, weaker global demand, loss in income/employment and weaker sentiment.
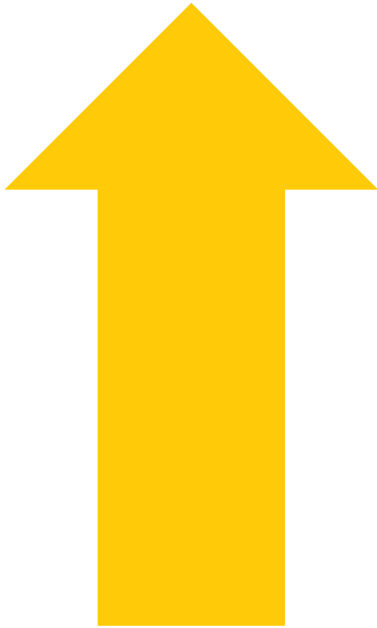
The pandemic first created a supply shock, as disruptions in global supply chains and factory shut downs affect the economies contemporaneous ability to produce goods and services.
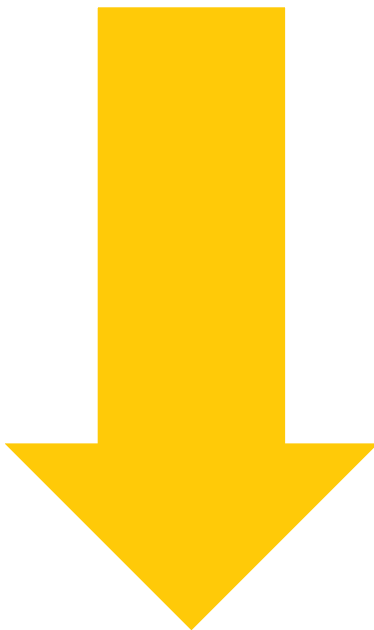
The impact on demand is more complicated. In the short run, the perceived supply shortage could have induced consumers to hoard products, creating excess demand. However factory shutdowns and resultant layoffs and income losses will ultimately weigh on demand also.

Fig.4.7. Impact on supply and Demand

5. FISCAL STIMULUS OF THE CENTRAL GOVT. IN AFTERMATH OF COVID

 The post COVID Fiscal stimulus declared by the government came through a series of press conferences by the Finance Minister

First cut was declared on 14 th May, 2020 and its highlights are given below: -

Scheme	Amount (in Rs. Crore)	Who funds	Impact on union Budget
MSMEs			
Collateral free automatic loan	3,00,000	Banks/NBFCs	- Interest/principal fully paid by govt. - No immediate cash outflow - Cost will depend on the guarantee needed
Subordinate debt for stressed MSMEs	20,000	Banks	Rs. 4000 crore as support to CGTMSE*
Fund of funds to provide equity for MSMEs	50,000	Govt. other investors	Rs. 10,000 crore *Credit guarantee fund trust for Micro & small enterprises
PF Relief for Business and Workers			

Govt. to pay PF for both	Rs. 2500 crore	Govt.	Rs. 2500 crore
Lower PF contribution of 10%	6750	No funds needed	No allocation needed from the government
NBFCs			
Special liquidity scheme for NBFCs/HFCs/MFIs	30,000	Govt.	Security fully guaranteed by govt. for Rs. 30,000 crores
Partial credit guarantee scheme	45000	Banks	No allocation is needed from the Union Budget. Cost is based on guarantee invoked.
Power Discoms			
Liquidity injection	90,000	PFC/REC	No cost to centre. States to provide guarantee
Tax Payers			
TDS/TCS rate cut by 25% of existing rate	50,000	No funds neeeded	
Total	Rs. 5.94 L crore		

IMPACT OF FIRST STIMULUS	
Significant relief for MSMEs and NBFCs	Credit flow to economy will get a lift
Govt guarantee will ensure resumption of funds flows	Liquidity measures to prevent distress
NBFCs will have direct govt. support	Provident fund support may lead to fewer job losses and provide for social security in a health emergency like COVID.

FINE PRINT OF FIRST STIMULUS	
Most of the package comprises guarantee and liquidity	Cash component of the package is less than Rs. 50,000 crore
Cost of guarantees will be with a lag, and is usually a small percentage of the total	Impact on fiscal deficit not significant yet
	About Rs. 7 L crore stimulus remains after first declaration on 14 th May by the FM

The second cut of stimulus is given in the table on the next page

SECOND CUT OF FINANCIAL STIMULUS FOCUSED ON BOTTOM OF THE PYRAMID			
Social Spread	Amount	What it means	Budget Impact
1. Free food for migrant workers	Rs. 3500 crore	5 kg grain/person, 1 kg chana per month for 2 months	Farmers get more and cheap credit to tide over the crisis.
3.Cheap rental housing for migrant workers/urban poor		Govt. funded Housing to be used for this under the PPP mode, Incentives for industry/states to build such houses on own land	Boost to construction activity. Street vendors get funds to start again. Migrant workers get food and sustenance through MGNREGA
3.Cheap loan for small businesses	Rs. 1500 crore	2% interest subvention on Mudra shishu loans (upto Rs. 50,000)	
4.Loans for street vendors	Rs. 5000 crore	Working capital loan upto Rs. 10,000	This stimulus is largely in terms of Bank credit.
5. Job creation using CAMPA funds	Rs. 6000 crore	Compensatory Afforestation Mgmt. & Planning authority	It has a small immediate cost on govt
6. Credit for farmers	Rs. 30,000 additional+ Rs. 2 L crore concessional credit	Farmers to be provided with Rs. 30,000 crore additional working capital from NABARD. 2 L crore concessional credit through Kisan Credit card	

7. Affordable Housing scheme extension	Rs. 70, 000 crore	Subsidy scheme extended till March, 2021. 2,50,000 families to benefit. Rs. 70,000 crore investment seen.	

The second tranche was given by the FM on 15th May, 2020. It gave helping hand to our poor. These were welfare measures to improve the lot of farmers, street vendors and the urban poor. This second instalment of economic measures aimed reviving the economy that has been grounded by the COVID-19 pandemic.

The third tranche of stimulus package focused on Agriculture and once the vision is realized, predictable pricing will be on cards, farmers will have freedom to sell produce, private funds for infrastructure will be infused. The new Central Law will allow farmers to strengthen infrastructure and logistics to help value addition.

The Essential Commodities Act will be amended to deregulate trade in cereals, edible oils, oilseeds, pulses, onion and potato, and stock limits for these will be imposed only in exceptional circumstances. A new central law will be formulated to provide barrier free inter-state trade of farm produce and more freedom for farmers to sell directly or even online.

"Why should a farmer be restricted to sell to a licensed entity? There should be no barriers to his trade, he should be allowed to trade.

THIRD TRACHE OF STIMULUS PACKAGE IS AIMED AT OPENING THE FARM GATE, FUNDING SUPPORT, Rs. 1.50 L CRORE	
1. Agri Marketing Reforms • New Central Law will be enacted to bypass Mandis. • Framework of e-trading will be developed	• The free- flow of agriculture commodities will be allowed by protection through Law and barrier-free inter-state trade will be ensured by law to promote market forces.
2) Revamp of Essential Commodities Act. • Will deregulate cereals, edible oils, oilseeds, pulses, onion &potato.	• Stock limits will exist only during national calamity, famine.

Fig. 5.1 How will it help?

Farmers will get freedom to sell produce.

Would be shielded from sudden price, stock curbs.

Create support infra for farm produce

Private sector can invest in support infra. Startups can now make a foray in farm sector.
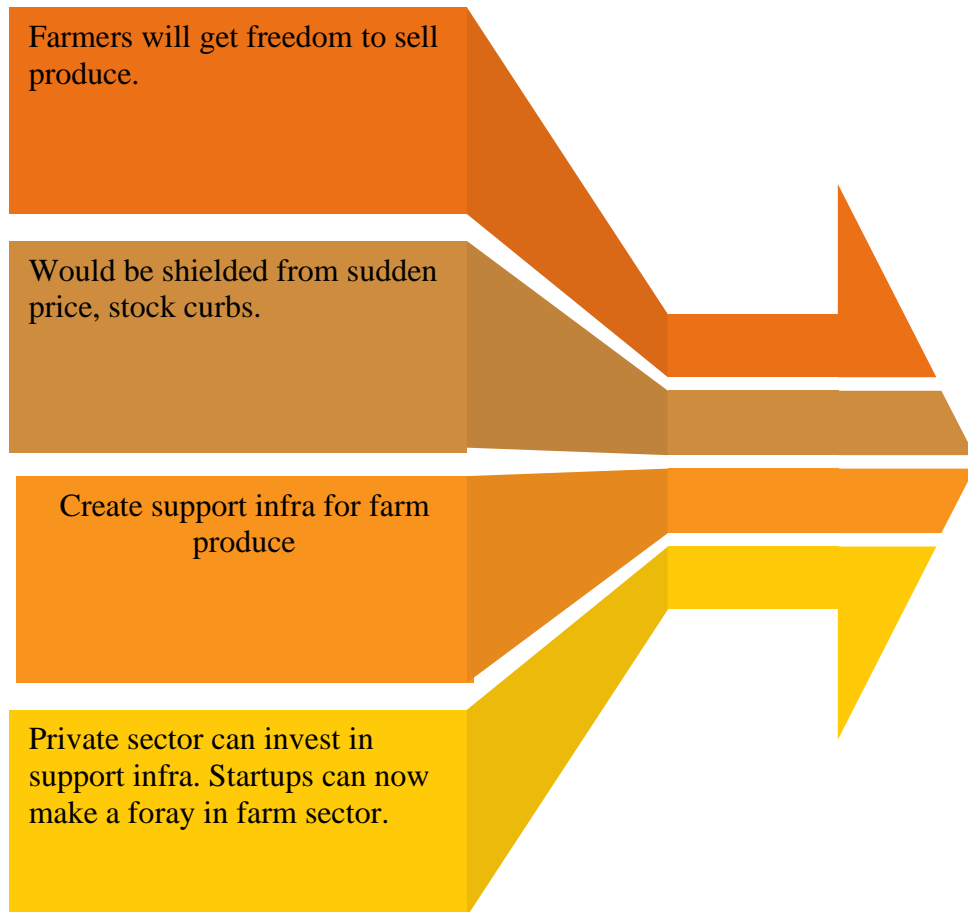
The fourth tranche introduced the concepts of changes in IBC and funding push for MGNREGA

Rural Boost	Stimulus for States
Additional Rs. 40,0000 Crore for MNREGA	States can borrow upto 5% of their GSDP from 3%
IBC Untangled	Private Push for PSUs
No fresh insolvency to be initiated for 1 year under the IBC	Maximum 4 PSEs allowed in strategic sectors Non- strategic PSUs to be privatised
Integrated Public health	Health Reforms
Labs in all Districts	Boosting research via national institutional Platform

==**The Stimulus is more for Supply and less for Demand**==.

The Government has said that the economy has got a push worth more than Rs. 20 Lakh crore. However, experts have rightly analysed that most of it is in the form of guarantees, and unlike many other economies, there is not much direct cash support or demend cash. Recovery from COVID shock will take longer.

> ==**Rs.20.97,503 crore**== **is the size of the stimulus. This includes Rs. 801503 crore worth of measures already**

==**WHAT THE ENTIRE STIMULUS PACKAGE DELIVERS ON**==

REFORMS

A. **New Definition of MSMEs**

B. **Agri Marketing Reforms**

C. **Costs, minerals, liberalisation**

D. **Higher FDI in Defence Production**

E. **New Discom Privatisation**

F. **New Policy for PSUs**

LIQUIDITY

A. **Collateral free loans/equity for small businesses**

B. **Special liquidity and partial guarantee for NBFCs**

C. Funds for discoms;PF relief

D. Rs. 2.3 lakh crore extra credit to farmers

INFRASTRUCTURE PUSH

A. Affordable rental housing scheme for migrants

B. Extension of middle income housing scheme

C. Agri infrastrucutre fund

D. Higher VGF for social infrastrucutre

HELPING STRESSED BUSINESSES

A. Relaxation in insolvency laws

B. Liquidity support/refunds

C. Funds for stressed NBFCs

Fig. 5.2. Words of FM give the true essence of the spirit behind the stimulus package.

. In its declaration of 16 March, 2020.It asked the banks to review business continuity plans, evaluate risks. It announced measures to infuse Rupee liquidity through LTRO and Dollar liquidity through Dollar-Rupee swap. The RBI asked banks to assess the balance sheets and asset quality implication of COVID-19. It also promised use of weapons from its arsenal to counter slowdown. RBI in the first stage wanted to stabilize the currency market and long term repo operations for ensuring liquidity. RBI doubled down on efforts to ensure adequate liquidity by announcing long-term repo operations (LTRO) of as much as Rs. 1 lakh crore. This was aimed to help banks to borrow three- and five-year money at a repo rate of 5.15%.

To ensure smooth functioning of the currency market, RBI conducted a Dollar-Rupee swap so that a shortage of Dollars does not lead to an abrupt slide in the Indian currency. The Central Bank auctioned in March itself, $ 2billion, it got bids for as much as $4.67 billion. RBI's decision to ensure additional liquidity through LTRO and swap transactions ensured the twin objectives of further compression in term of structure of interest rates and ensuring Dollar liquidity. RBI Governor said, "A second round of effects of the pandemic could operate through a slowdown in in domestic economic growth. It would obviously be a result of synchronized slowdown in global growth and as a part of that, growth momentum in India will also be impacted somewhat. India is relatively insulated from global value chain. To that extent impact on India will be less. But India is integrated to global economy, so there will be some impact." Several areas of the economy could already feel the impact of COVID crisis by March, 2020. Sectors such as tourism, airlines, hospitability and domestic trade and transporters suffered losses even in the month of March.

- Sectors most affected due to COVID lockdown are Construction, Real Estate, Aviation and Agro-Chemicals. Companies will have to bear the burden of fixed costs, including interest payments, salaries and other fixed payments and overheads. There will be a dire need for short term borrowing on the part of these companies to meet working capital requirement.
- Employee cost accounts for nearly two-thirds of the fixed costs. The Union Government has issued an advisory with the lockdown 1.0 setting in requesting the companies not to cut salaries during lockdown. This would have a higher impact on sectors with greater dependence on employees for revenue generation. These include Information Technology (IT) sector also, which spends upwards of forty percent revenue on salaries. Sectors such as Capital Goods, hospitability and auto ancillaries, where salaries account for 8-10% of the topline.
- In the case of IT firms, another adverse factor is the expected delay in payments from the overseas clients given that the sector earns over its two-thirds of revenue from exports. However, a weaker rupee, which improves export realizations, may offer some cushion, the rupee depreciated by 5% against the US Dollar since the beginning of the current year 2020.
- Interest payments will hit debt-heavy sectors such as construction, agro-chemicals and capital goods. A few companies like Reliance and PVR have invoked force majeure clause of their contractual obligations to reduce liability towards rentals and payment to suppliers during lockdown. The rising burden of fixed costs would affect cash flows thereby increasing the need for short-term borrowing to meet working capital requirements. The samples total debt was Rs. 25.5 lakh crore in FY19. Of this, a quarter was in the form of short-term borrowings.

- A tighter working capital scenario would have a significant impact on sectors such as Capital Goods, construction, entertainment, consumer durables given their lower ability to convert operating profit before depreciation (EBDITA) into operating cash flow (OCF). The EBIDTA-OCF ratios for these sectors are between 0.04 and 0.25, which is quite low. In addition, the funding challenges for companies would worsen if the payments from debtors remain fluid. For example, the debt level of auto ancillary sector may double if Pandemic and slowdown subsists. The effect on companies has been severe and they are looking towards the government for support.
- The good news so far is that working capital of companies did not stretch before the lockdown 1.0 due to the muted demand. This may help bankers to extend higher working capital limits. In addition to low fixed costs, it is also important to look at companies which have high cash in their books since these companies will be highly resilient in the present crisis.
- Before the lockdown 1.0, banks charged interest on working capital at the end of every month and companies had to pay in the same month.
- Now to reduce the stress during the lockdown, banks have deferred interest payments for three months but they will charge simple interest on the payment during June. Banks are also sanctioning emergency working capital limit up to 10% of the sanctioned limit before the lockdown but only to companies which have AA credit rating and never were under SMA-1(Special-mention account-1) or SMA-2 categories.
- Companies in FMCG and consumer staples are placed well in terms of lower fixed costs. Sectors with High working capital requirement. **Fig. 5.3. below shows effect on variables**

Source: ETIG database
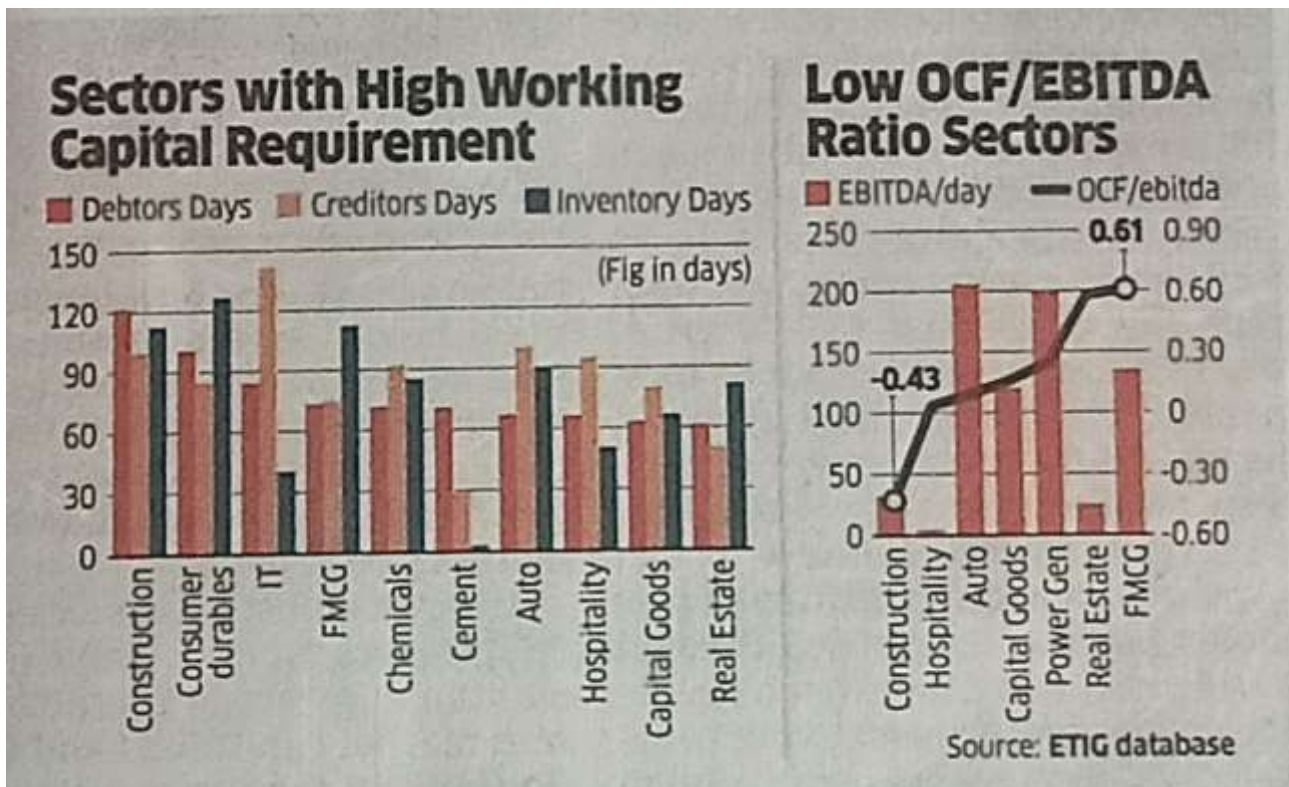
Create demand, Rescue Economy. The latest projections, like those by SBI, show catastrophic economic contraction in FY 21. There is still time to avoid or largely mitigate this- through an avalanche of government spending aimed squarely at creating demand.

Demand is consumption and investment. Sixty percent of India's GDP is private consumption. Investment has been anaemic much before COVID. The pre-COVID slowdown happened principally because consumption growth had slowed down in India's economy. The COVID crisis has savaged consumption further. It has also made investment even more risky because businesses will produce more only if there is a consumption demand. The Government is the only economic agent that can create demand on a massive scale.

Put it this way, without higher demand, guaranteed loans for MSMEs will be of little use to them. Why will they take on debt when there are no customers? Plus, businesses' need direct support, like the government buying corporate bonds. Only then will investment jobs pick up.

So, how does government create demand, some calculations are given below

Forget fiscal prudence. The government should aim for extra spend of 9-10% of GDP. It should go for debt monetization. **Big heads of this spend should be, direct income transfer,** wage support, infrastructure spending, buying even larger scale of NBFC/ Bank assets, buying of corporate bonds.

Here are some numbers. Direct support: Income transfer through DBT is Rs. 2 lakh crore+ wage support for informal sectors of Rs. 1.5 lakh crore=Rs. 3.5 lakh crore
Asset and corporate equity buying: Rs. 2 lakh crore for buying NBFC/Bank assets+ NIIF buying equity of Rs. 2 lakh crore=Rs. 4 lakh crore

Corporate bond buying: Government should set up SPV that issues bonds. With that cash SPVs buy corporate bonds and create a liquid market for them. This will definitely attract other buyers. Experts estimate bonds of Rs. 10-12 lakh crore can be bought and traded.
Housing help: Rs. 25,000 crore for NBCC to finish projects.

Smart tax cuts: Lower GST on products like auto sector to boost demand. Small income tax cuts will not be of much help as they will be saved by the investors.
Risks?
1) Risk of economic catastrophe is now higher than risk of economic instability in future.
2) This can be analysed by debt/GDP ratios
3) If we agree to sharply higher Debt/GDP ratio, meaning a higher fiscal spend now, will produce higher nominal growth in near future and that will reduce Debt/GDP ratio over time.
4) Conversely, lower fiscal spend and therefore lower Debt/GDP ratio will produce nominal growth, which is much worse for debt management in medium term.

6. ILLUSTRATIVE CASE OF LARSEN AND TOUBRO LTD. TO MEASURE RISKS

General Risks

Nature of Risks	
Geo-political Risks	Slow global GDP growth, Armed conflicts(Iran-US armed conflict), volatility in Oil prices and trade wars between Us and China has affected growth in FY2018-19. Black swan events like Covid health emergency can further make economic scenario gloomy in FY 2019-20 and beyond
Underperformance of Key Sectors	Growth in key sectors like power, nuclear, defence, railways highways and Metal& Minerals can be affected by low budgetary allocation, slow pace of decision making, lack of investment demand, green initiatives and delay in giving statutory clearances. The company has diversified into a conglomerate to reduce these risks
Competition	Competition from foreign and domestic players has increased leading to less attractive commercial terms and demand of shortened time duration which the company is mitigating through its rich experience, quality, technology, cost effectiveness and project management expertise
Reputation and Brand	Code of conduct, internal controls, knowledge sharing across organisation, compliance policy help in maintaining Brand image.
Cybersecurity	IT systems are increasingly getting inter-connected. Safety can be enhanced through expenditure in mitigating breach and training of personel in organisation

Other Operational Risks

Nature of Risks	Remarks
Execution Challenges	
Counter Party Risks	The Company partners with different contractors(JV/consortium projects) based on technical requirements/local market conditions. The partners financial strength and financial strength is crucial for project success. Past learnings are incorporated in covenants
Working Capital Challenges	Project Delays and adverse contractual payments shrink working capital which are mitigated by strict monitoring and control
Claims Management	The company maintains strong documentation with claims of clients/subcontractors/vendors and follows up

Financial Risks

Nature of Risks	Remarks
Capital structure, Liquidity & interest rates risks	The Company maintains a conservative Capital Structure. The USD remained strong. INR depreciated in line with other emerging market currencies and growth concerns continued, inflation in India broadly remained contained. Lower liquidity requirement in FY18-19, slower consumer demand, sluggishness in investments in private sector, stress in banking sector were causes of concern. The surplus available was used to feed subsidiaries and acquisition of IT Company Mind Tree was pursued by acquisition to increase presence in services business.
Foreign Exchange and Commodity Price Risks	The business of the Company are exposed to foreign exchange rates and commodity prices. Additionally, the company has exposure to foreign currency denominated financial assets and liabilities, commodity risks are managed by and large through price variation clauses, while the foreign exchange rate risks and residual commodity risks are managed by treasury products. Despite currency weaknesses and volatility in financial market robust risk management processes of the company have kept financial costs under control.

Fig.6.1

Growth drivers of Infrastructure Industry in India

Business details of L&T Ltd.

Fig. 6.2. L&T is into heavy Engineering Business.

LARSEN & TOUBRO LTD.

Business verticals

- Buildings & Factories
- Transportation Infrastructure
- Heavy Civil Infrastructure
- Water & Effluent Treatment
- Power T&D
- Power
- Heavy Engineering
- Defence Engineering
- Electrical & Automation

Subsidiaries, JVs & Associates

- L&T Hydrocarbon Engineering
- Financial Services
- IT & Technology Services
- Infrastructure SPVs (BOTs)
- Realty Development
- MHPS JVs (Boilers & Turbine MFG.)
- Other Manufacturing & Fabrication Subsidiaries
- Services and other Subsidiaries & Associates

Fig. 6.3. Business Verticals, &Subsidiaries of L&T Ltd.

L&T CONSOLIDATED - SEGMENT-WISE EBIT (SEGMENT RESULTS)

Legend: 2017-18, 2018-19

Segment	2017-18	2018-19
Infrastructure	5440	5389
Power	164	130
Heavy Engineering	205	487
Defence Engineering	120	472
Electrical & Automation	669	850
Hydrocarbon	772	1178
IT & Technology Services	2147	3084
Financial Services	1441	3053
Developmental Projects	196	314
Others	1183	776

₹ crore

Total Segment wise EBIT (segment results) 2017-18 : ₹ 12336 crore and 2018-19 : ₹ 15733 crore

Fig. 6.4. Infrastructure, IT& Technology Services and Financial Services formed the major chunk of L& T activities during FYs 17-18 and 18-19 EBIT wise.
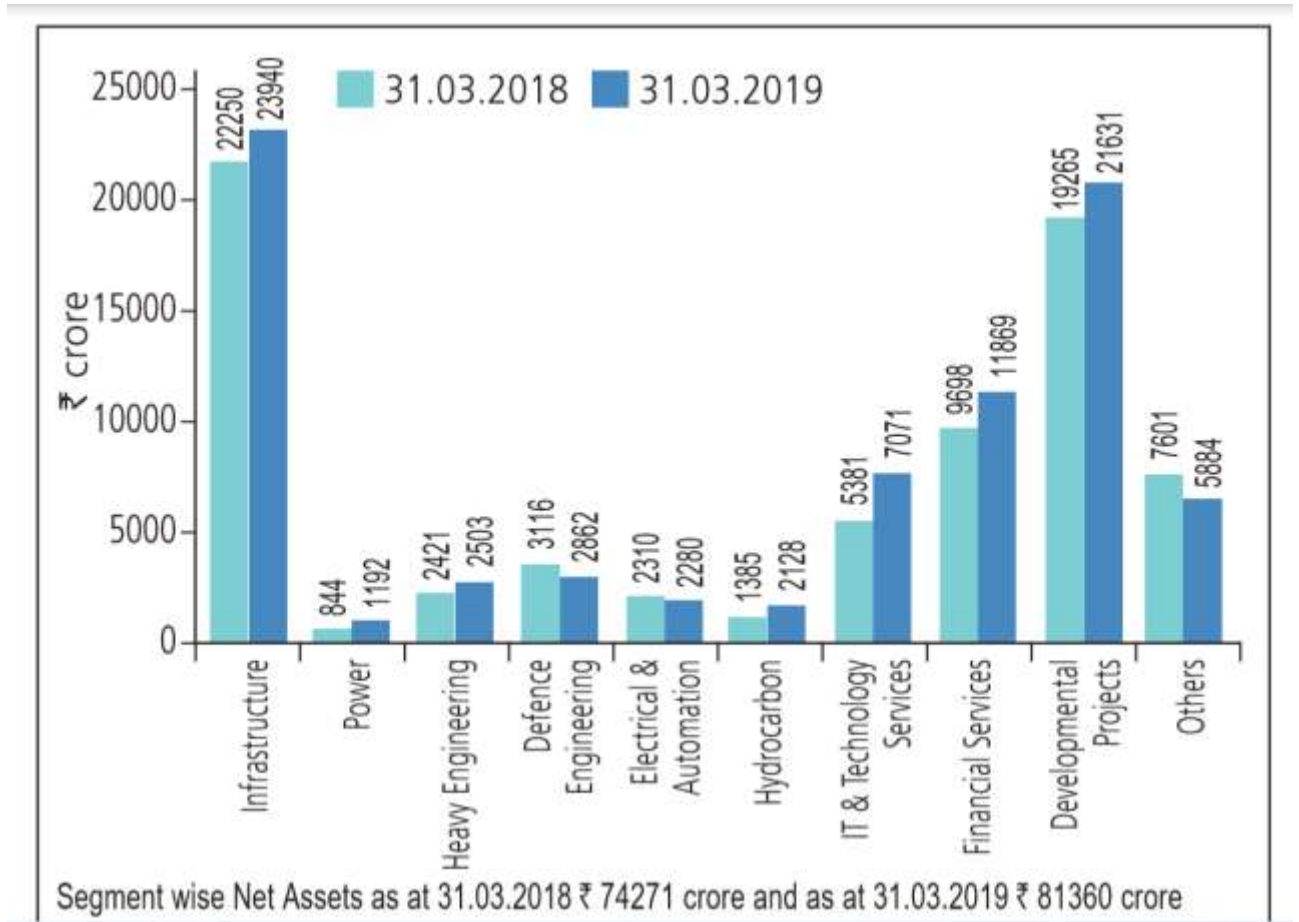
Fig. 6.5. Infrastructure, IT& Technology Services, Financial Services and Developmental Projects formed the major chunk of L& T activities under segment wise net assets during FYs 17-18 and 18-19.

L&T CONSOLIDATED - PBDIT AS % OF NET REVENUE FROM OPERATIONS
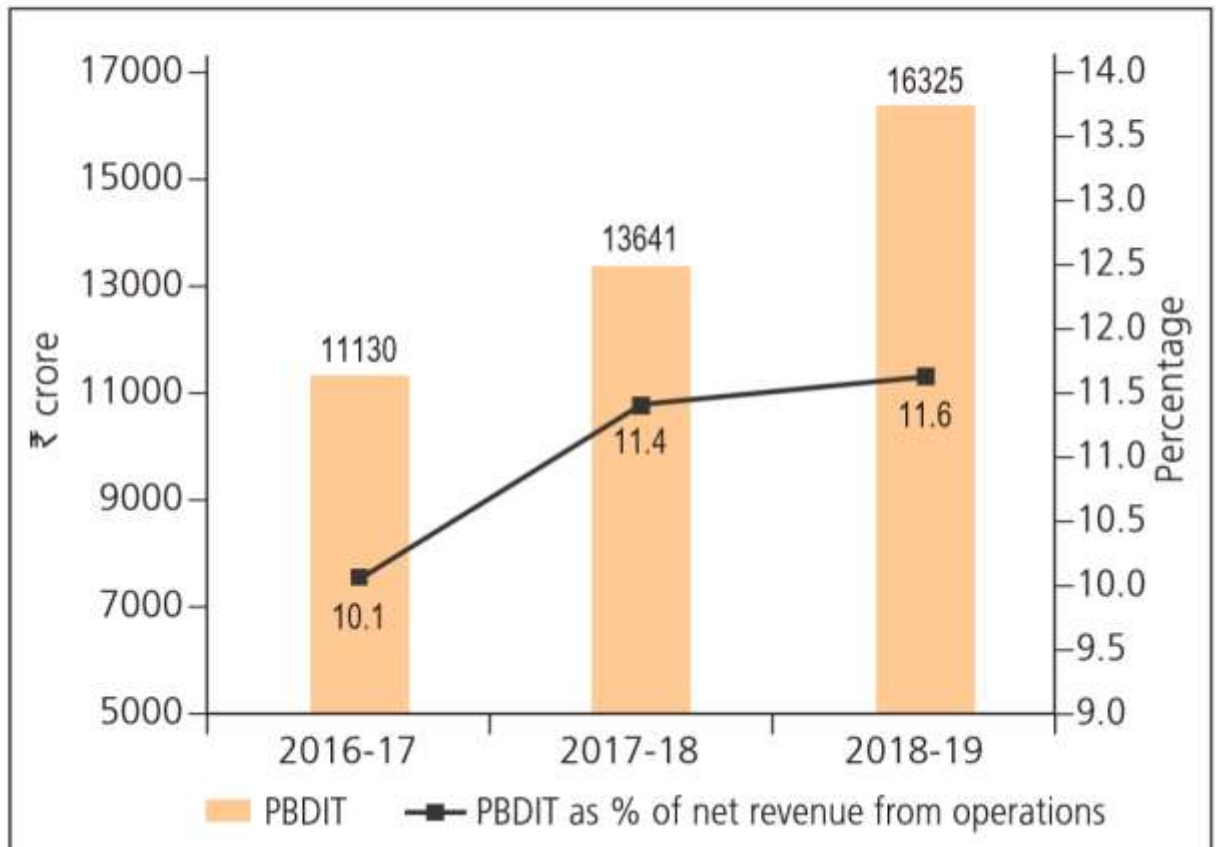
Fig. 6.6. Consolidated PBDIT position

L&T CONSOLIDATED - PAT AND RONW %
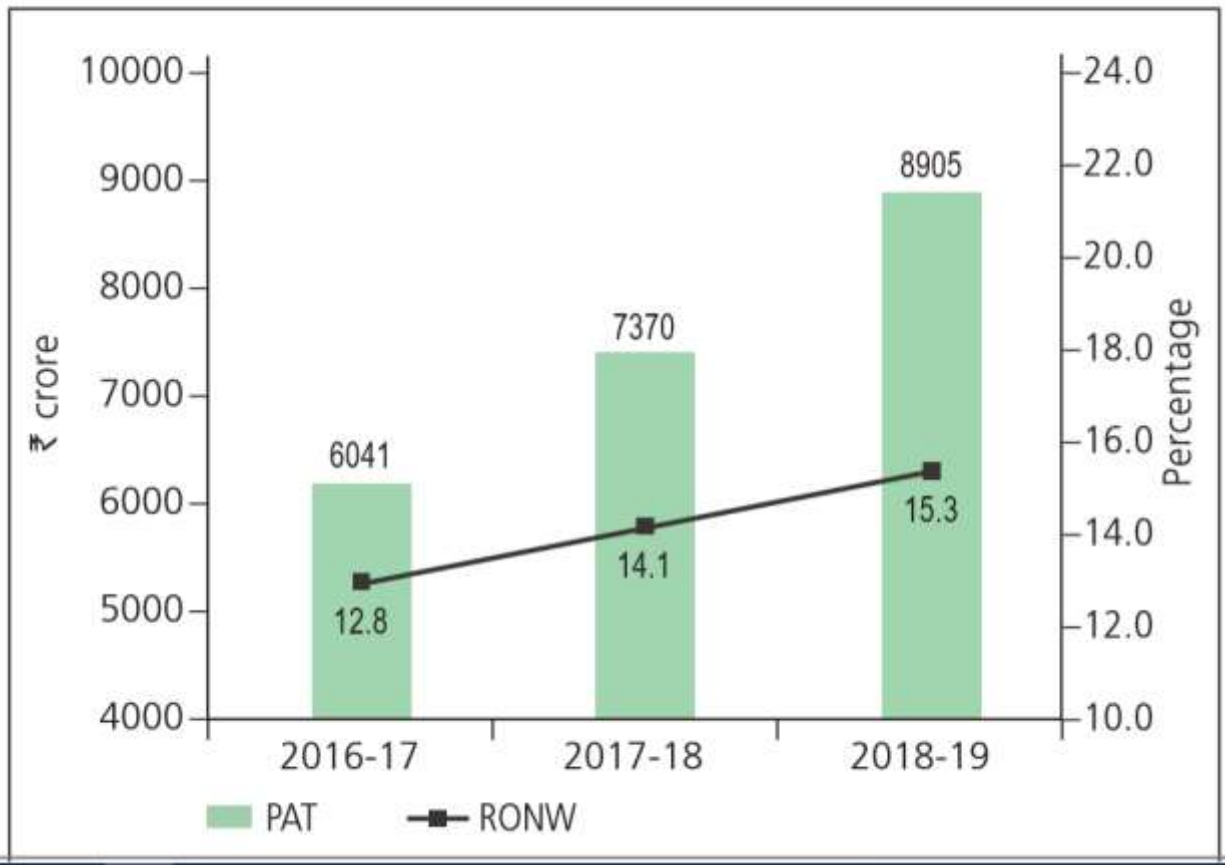
Fig. 6.7. Consolidated PAT and RONW position

L&T CONSOLIDATED - SEGMENT-WISE EXTERNAL REVENUE 2018-19

₹ crore

- Infrastructure — 72418, 51%
- Power — 3971, 3%
- Heavy Engineering — 2174, 1%
- Defence Engineering — 3752, 3%
- Electrical & Automation — 5787, 4%
- Hydrocarbon — 15132, 11%
- IT & Technology Services — 14371, 10%
- Financial Services — 12638, 9%
- Developmental Projects — 5068, 4%
- Others — 5696, 4%
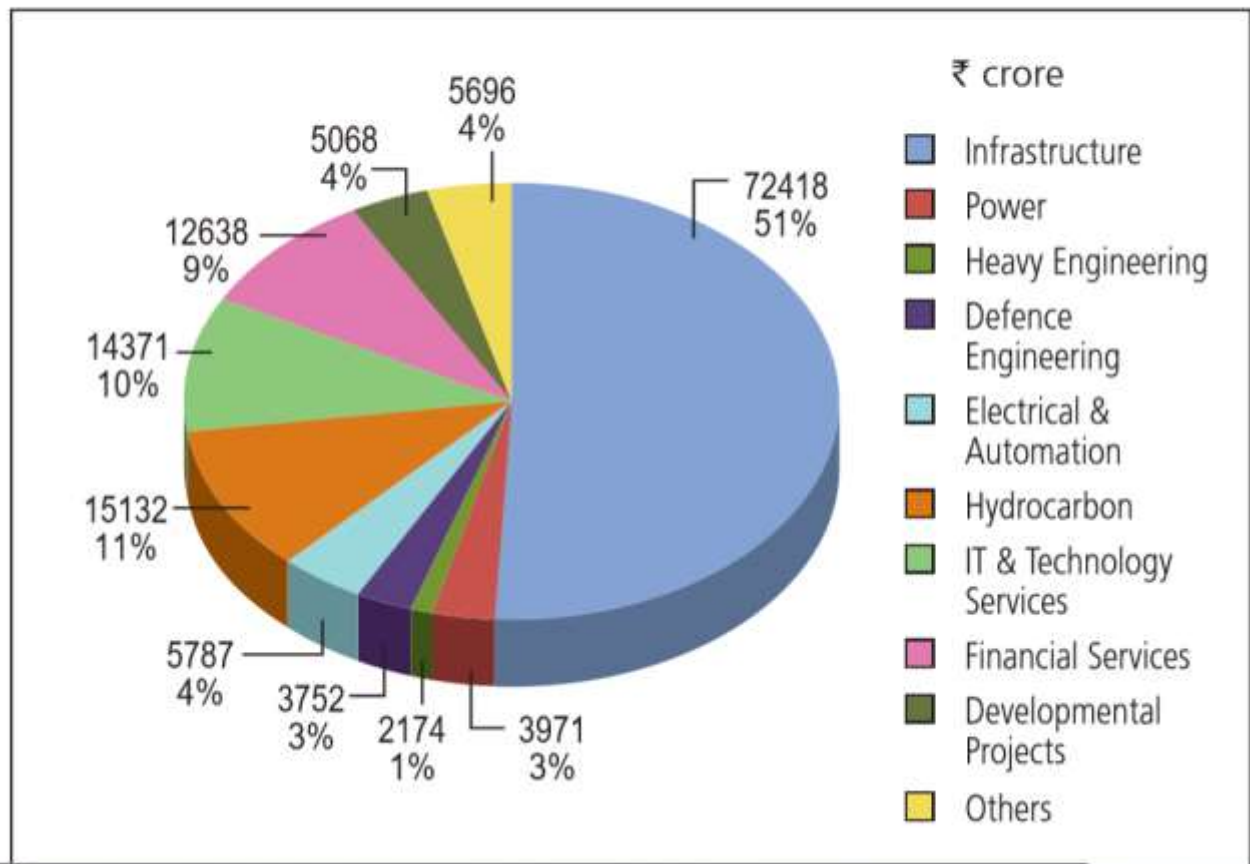
L&T CONSOLIDATED - SEGMENT-WISE ORDER INFLOW 2018-19

₹ crore

- Infrastructure
- Power
- Heavy Engineering
- Defence Engineering
- Electrical & Automation
- Hydrocarbon
- IT & Technology Services
- Financial Services
- Developmental Projects
- Others

95743 — 54%
27871 — 16%
14371 — 8%
12638 — 7%
5068 — 3%
5142 — 3%
6017 — 3%
3016 — 2%
4049 — 2%
2919 — 2%
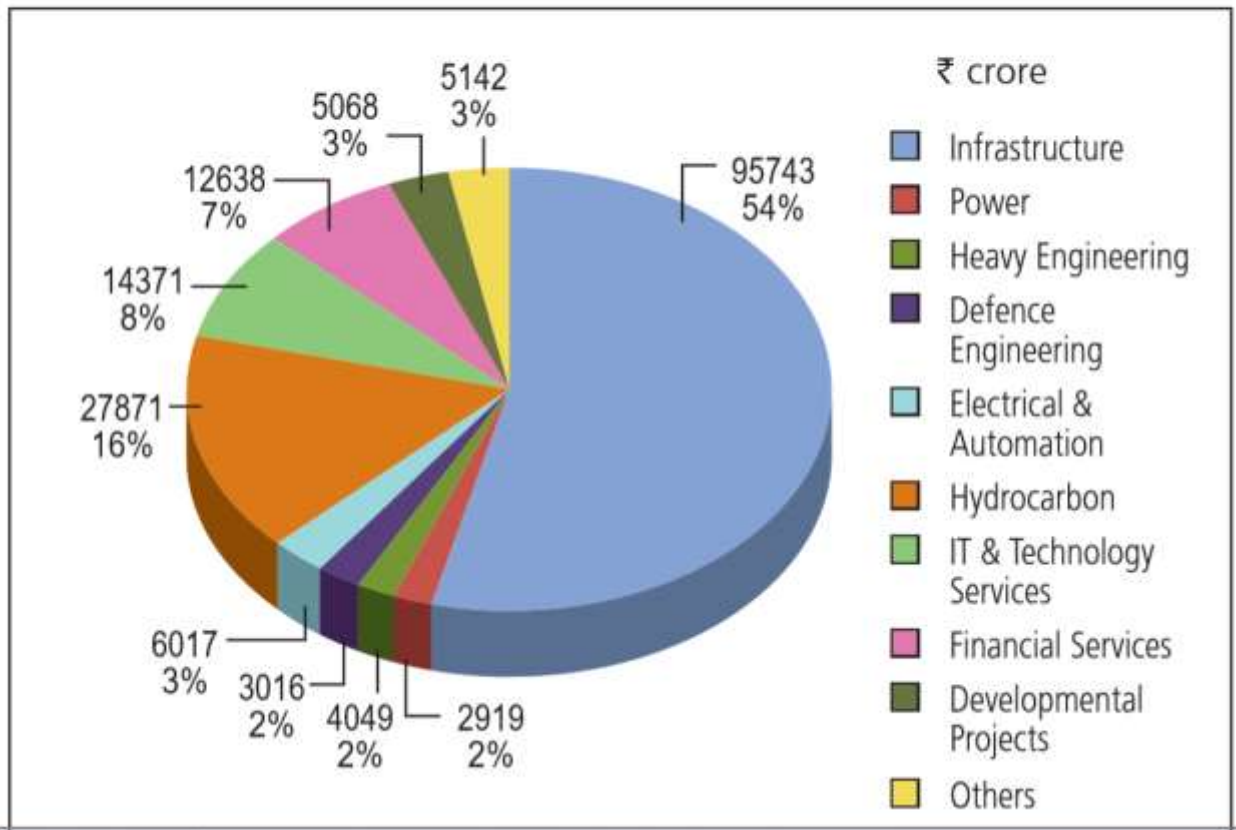
Fig. 6.8. Order inflow, segment wise
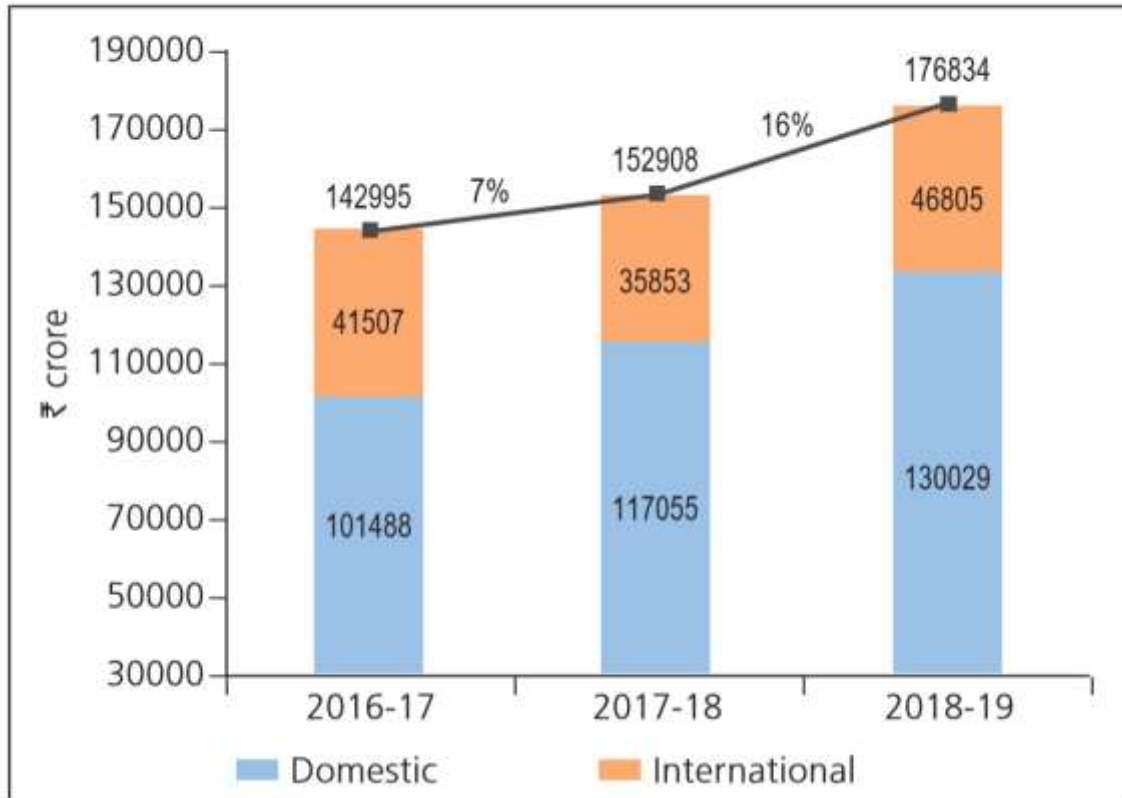
Fig. 6.9. Order inflow, Domestic and International

1. **Infrastructure push being promoted by government will lead to growth in infrastructure sector once Unlock 5.0 phase initiated by Govt. with effect from 1 June, 2020 is stabilized and post-COVID reconstruction of economy will accelerate**

2. **COVID-19 has led to market crash. The share of Larson and Toubro Ltd. has also got a beating.**

3. **Infrastructure push as planned and promoted by the government will help in raising the value of stock of Larson and Toubro Ltd. The investor should at least hold the stock for a period of 1 year to two years and should desist from burning his figures in the stock market for short-term gains.**

4. **Topline that is revenue growth of the company has been consistent and bottom line that is profit after tax has also been consistently showing robust growth.**

5. **The order book during FY2018-19 saw growth due to overseas assignments but government's infrastructure push envisaged in post- corona period will boost the company's prospects.**

6. **Immediately after lockdown declaration in March, 2020 L&T Ltd. sold bonds to double its cash reserves to Rs. 25,000 crore. The company has hundreds of crore of bills coming up for payment in an uncertain for operations. The Company has planned to raise Rs. 25,000 crore for a year. The tenures of the bond are 6.6% t0 8%. Companies like L&T prefer to stay in cash because their toplines are under threat in the present environment. L& T has a treasury as big as a bank and raised money in different tenures to match payment liabilities. Liquidity measures such as long-term repo operations (LTRO), which has a global exposure in project execution. This is required from point of view of global standstill. CRISIL has graded L&T as AAA top notch for its various NCD issues. CRISIL's rating continue to reflect L&Ts dominant position in the Engineering and construction market in India, a diversified revenue profile, adequate financial risk profile, and strong flexibility.**

7. **As per disclosure in the Annual Report, 2018-19 of the company, pursuant to section 186 of the Company's Act, an amount of Rs. 38507.25 crore has been shown as given to subsidiaries, associates in the form of guarantees. Loan given to L&T SPECIAL Steel and Forgings Pvt. Ltd. for Rs. 1507.65 crore is before adjusting for impairment of Rs. 263 crore.**

EV/EBIDTA calculations of Larson and Toubro Ltd. (FY2018-19, annual statement)	All amounts in Rs. Crore
Par value of share in Rs.	2
Shareholder's equity=number of outstanding shares*market value of shares	1402729385
Number of outstanding shares	876.9
Market value of share on a day in NSE	
Market capitalization of Larsen and Toubro Ltd.	123005.34
Enterprise value= Market cap.+ Borrowings-cash and cash equivalent	
Borrowings	10191.57
Cash and cash equivalents	6509.49
EBIDTA=Net income+ Interest expenses +Taxes+ Depreciation and amortization	
Gross Revenue	89756.7
Expenses	81013.46
Net Income	8743.24
Interest expense	1641.39
Taxes	2540.47
Depreciation and amortization	1067.95
Enterprise value (Market-cap.+Borrowings-cash and cash equivalent)	126687.42
EBIDTA	13993.05
EV/EBIDTA	**9.054**
Effective tax rate (%)	**27.56**

Fig. 6.10 Key success parameters of L&T Ltd.

Strategies adopted by key players

LARSEN & TOUBRO
- The company selected countries and regions with the maximum congruence to its strengths and the most favourable logistics. The Middle East and China have been identified as prime centres for expansion for manufacturing and projects businesses. L&T seeks to ramp up its presence in these markets through a slew of new projects and business initiatives that will add breadth and depth to the existing association with the industry and infrastructure of the GCC countries and other states in the region. L&T is setting up a Modular Fabrication Yard in Oman that will build equipment for offshore applications and for the hydrocarbon sector.
- Global sourcing policy is another key area that has given a thrust to its international strategy. With a steady rise in material costs, the company has placed sourcing teams in China, Europe and Russia.

BHEL
- To expand nuclear energy portfoilo, efforts to increase scope by offering products beyond conventional island in Nuclear business are under way.
- Considering the National Action Plan on Climate Change targeting 15 per cent of electricity generation from renewables by 2020, BHEL is looking towards expanding its capacity to manufacture photo voltaic modules and cells.
- BHEL's collaborative initiatives to address the growing demand potential in Railway Transportation including Metro and Suburban Railways include initiative with Indian Railways for setting up a greenfield Mainline Electrical Multiple Unit (MEMU) Coach Factory in Rajasthan

GMR
- GMR Energy Limited (GEL), a subsidiary of GMR Infrastructure Ltd (GIL) and TNB Repair and Maintenance Sdn Bhd (TNB Remaco) have signed an MoU to collaborate and set up an O&M joint venture. As per the three-year MOU, GEL and TNB Remaco will identify business opportunities in the high-potential Indian market and provide operation and maintenance services to the power plants. hrough this JV, GEL and TNB REMACO will extend their technical expertise to the several power plants in India. The company is planning to expand its airport vertical and consolidate the energy business along with divesting its highway projects.

adani Adani Ports and Special Economic Zone Ltd
- Adani Ports and Special Economic Zone (APSEZ) Ltd aims to complete expansion of Adani International Container Terminal Pvt. Ltd (AICTPL) at Mundra port by 2017 to create a transhipment hub for the Middle East, South Asia and India. Adani Ports has also secured a contract from Tamil Nadu State Electricity Board for shipment of coal, adding muscle to its coastal shipping plan.

Source: Company websites, Media sources, TechSci Research

Fig. 6.11. Strategies of players in Infrastructure sector

7. POSITION OF INDIAN STATES IN COVID AFTERMATH

7.1 All states are not in the same boat in COVID aftermath:

COVID 19 virus epidemic has broken out from Wuhan, China. The disease has spread across all continents and nation-states. Many countries across the globe have taken to lockdowns for a prolonged period of stay. India has also geared itself ever since the first Corona patient landed in Kerala from Wuhan, China in the month of January, 2020. The brief developments are given below:-

- India has entered the fourth phase of the lockdown starting from eighteenth of May, 2020. Lockdown 1.0 (March 25- April 14), Lockdown 2.0 (April 15-May 3) were more stringent as 'non-essential' activities came to a standstill. Lockdown 3.0 (May 4-May 17) allowed some easing with red, orange, and green zoning as per virus spread. With lockdown 4.0 (From May18-May 31), India has gone through a sixty-eight-day duration of lockdown.

- At the All-India level, the virus spread and lockdown, and restrictions have pummeled economic activities. While all states were near- uniformly hit during the first and second lockdown phases, the third and fourth lockdowns impacted them differently.

- There were- as per Lockdown 3.0- eight States in which the share of districts classified under the red zone is higher than the national average. These states account for approximately sixty percent of India's GDP and approximately fifty eight percent of workforce. Of these-
    - Maharashtra, Gujarat and Tamil Nadu, being most dependent on output from industry and services, are more vulnerable to output losses as they may face restrictions.
    - Andhra Pradesh, Rajasthan and Uttar Pradesh are fiscally more vulnerable to output losses as they are vulnerable to restrictions.
    - Andhra Pradesh, West Bengal and Tamil Nadu have higher share of informal workforce, they are hence vulnerable to job losses.

- GDP growth has been projected in the range of -6.8% as against 4.2% earlier by various agencies. There may be
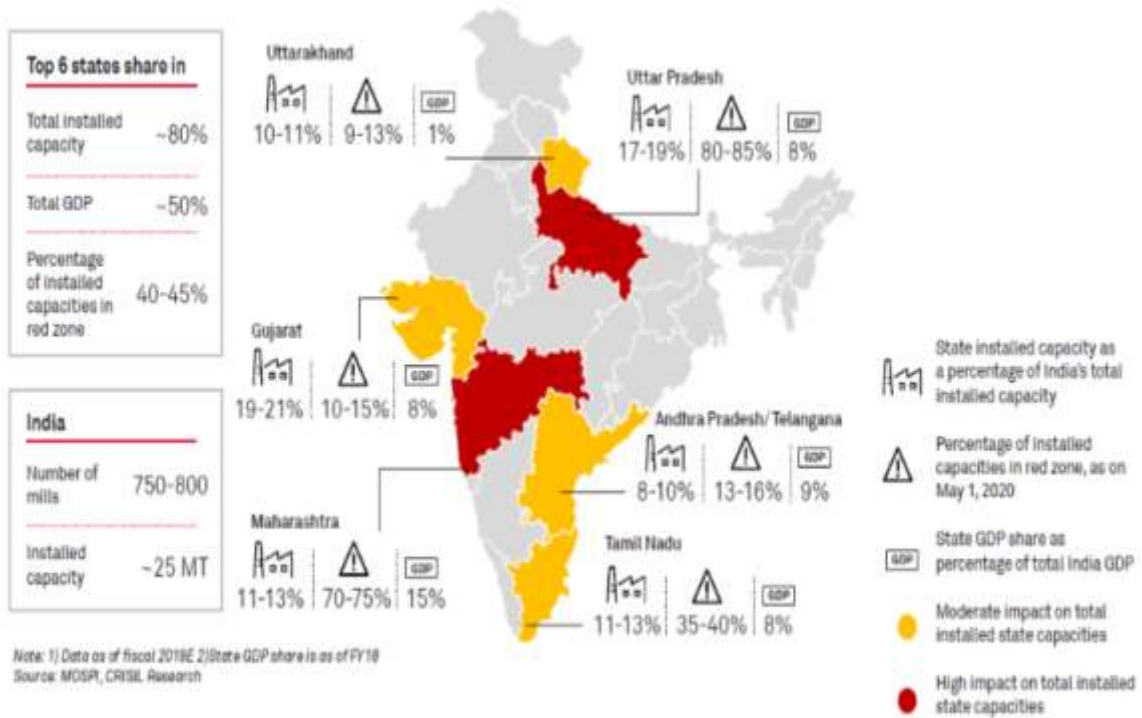
Figure 7.1 Important states which need attention

Fig. 7.2. The Data is transparently displayed on the dashboard of Ministry of health &family welfare, Govt. of India, the update of 31May 2020 is given below.
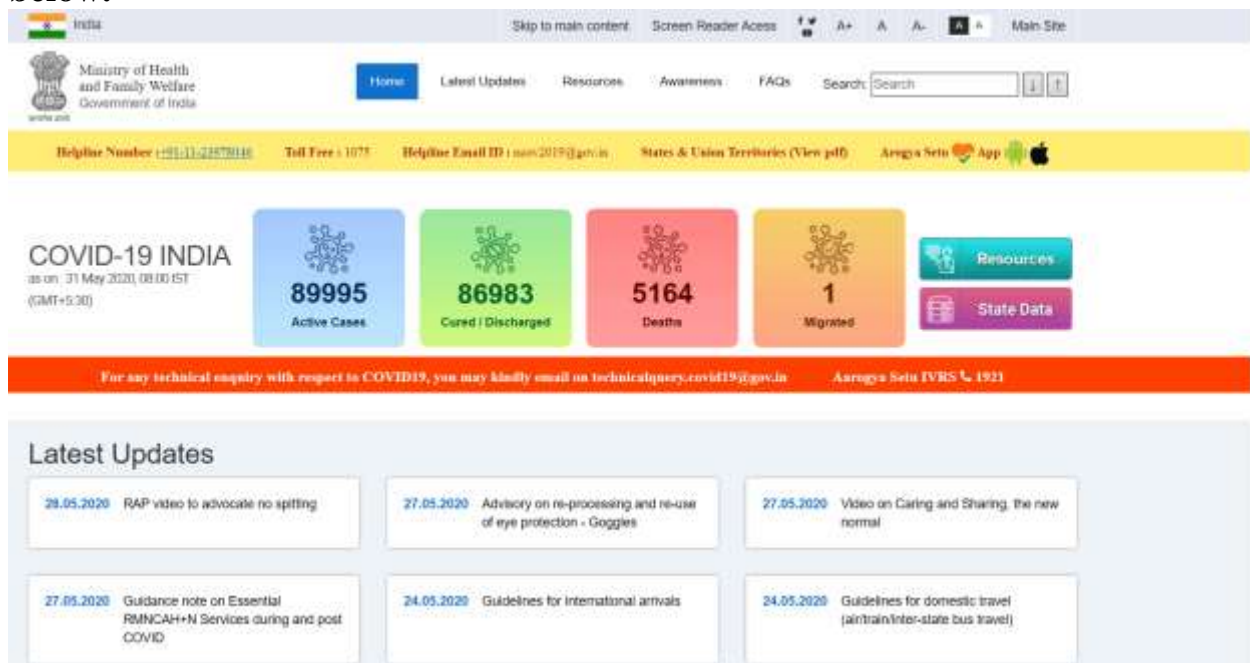
S. No.	Name of State / UT	Active Cases*	Cured/Discharged/Migrated*	Deaths**	Total Confirmed cases*
	Status, COVID, 31 May, 2020, source, Ministry of health &family welfare website, Govt. of India				
1	Andaman and Nicobar Islands	0	33	0	33
2	Andhra Pradesh	1220	2289	60	3569
3	Arunachal Pradesh	3	1	0	4
4	Assam	1018	163	4	1185
5	Bihar	1998	1618	20	3636
6	Chandigarh	96	189	4	289
7	Chhattisgarh	344	102	1	447
8	Dadar Nagar Haveli	2	0	0	2
9	Delhi	10058	8075	416	18549
10	Goa	29	41	0	70
11	Gujarat	6106	9230	1007	16343
12	Haryana	932	971	20	1923
13	Himachal Pradesh	197	111	5	313
14	Jammu and Kashmir	1405	908	28	2341
15	Jharkhand	302	256	5	563
16	Karnataka	1877	997	48	2922
17	Kerala	624	575	9	1208
18	Ladakh	31	43	0	74
19	Madhya Pradesh	3104	4444	343	7891
20	Maharashtra	34890	28081	2197	65168
21	Manipur	54	8	0	62
22	Meghalaya	14	12	1	27
23	Mizoram	0	1	0	1
24	Nagaland	36	0	0	36
25	Odisha	762	1050	7	1819
26	Puducherry	37	14	0	51
27	Punjab	222	1967	44	2233
28	Rajasthan	2685	5739	193	8617
29	Sikkim	1	0	0	1
30	Tamil Nadu	9024	12000	160	21184
31	Telengana	1010	1412	77	2499
32	Tripura	96	172	0	268
33	Uttarakhand	642	102	5	749
34	Uttar Pradesh	2834	4410	201	7445
35	West Bengal	2851	1970	309	5130
	Cases being reassigned to states	5491			5491
	Total#	89995	86984	5164	182143

Top 10 states on the basis of active cases as on 31st May 2020

Row Labels	Sum of Active Cases*	Sum of Cured/Discharged/Migrated*	Sum of Deaths**	Sum of Total Confirmed cases*
Bihar	1998	1618	20	3636
Delhi	10058	8075	416	18549
Gujarat	6106	9230	1007	16343
Karnataka	1877	997	48	2922
Madhya Pradesh	3104	4444	343	7891
Maharashtra	34890	28081	2197	65168
Rajasthan	2685	5739	193	8617
Tamil Nadu	9024	12000	160	21184
Uttar Pradesh	2834	4410	201	7445
West Bengal	2851	1970	309	5130
Grand Total	**75427**	**76564**	**4894**	**156885**

Source: website of Ministry of Health & Family Welfare, Govt. of India (www.mohfw.gov.in)

Top ten states have 75427 cases out of total 89995 in the entire country on 31st May, 2020. This is 83.81% of that of the entire country. Maharashtra was at the top followed by Tamil Nadu and New Delhi. Gujarat is at fourth spot. On the last day of lockdown 4.0 that is 31 May, 2020, as both Centre and State Governments prepared for a phased unlocking of curbs to get the economy up and running again. India, on this day saw its highest ever jump with 8237 cases being reported during the day. With total of 1,85,061 cases reported till date on Sunday the 31st May, 2020, India zoomed past Germany which had 1,83,426 cases. India has decided to open and the new phase has been called as 'unlock 5.0'. The period of more than two months of lockdown saw harsh measures being undertaken by the government. Lockdown and suspension caused labour distress. Reports of jobless people walking on highways was a distressing site to watch on media. The running of Shramik trains has provided much needed succour to the migrant population. This lockdown

scenario gave to us a 'worst case scenario simulation', which might have been backed by powerful institutions. The biggest lesson that has been learnt is that the situation needs to be tailored to local situations. It not to be a blanket preposition. India has not done badly. India did open up in phases as per local requirements on recommendations of CMs. A series of video conferences with the PM and CMs has kept ideas to flow in these times of crisis.

18 states may lose more than 10% of their GDP

Negative GDP growth tipped in 2020-21

- -6.8% GDP growth estimated in 2020-21 as against 4.2% earlier.

- Gross State Domestic Product(GSDP) loss in 2020-21due to COVID-19 is 13.5% of GSDP. Loss in nominal GDP is Rs. 30.3 lakh crore, which means revised figure to be Rs. 194.6 lakh crore.

- 50% of the loss is in red zones. The combined loss of Red and Orange zones will be about 90% of the total loss. Green zone districts, where 80% of the population is located in rural areas and which are almost open for all activities, will account for the remaining 10% loss. Maharashtra, Gujarat and Tamil Nadu have very large number of cases.

Fig. 7.3. States that have major contribution to Economy have cities in red zones

Why unemployment rate is falling in some states but rising in others

More than two months under lockdown has sent unemployment soaring and forced migrant workers to return home. The unemployment rate initially rose in major states like Maharashtra and Delhi, and has remained considerably high since, but the exodus of migrant workers has also led to a spike in joblessness in their home states. Though the unemployment rate has stabilised over the past month, the decline in labour force participation is a worrying sign. **Atul Thakur** takes a look at CMIE's statewise unemployment data

60% joblessness in Jharkhand

Six out of every 10 jobseekers were unemployed in Jharkhand in May. The unemployment rate was more than 40% in Bihar and Delhi. All major states reported high levels of unemployment. The rate is far higher than that of last year's, and is largely linked to the recent shock to the economy from the lockdown

CHANGE SINCE FEB 2020

STATES WITH OVER 40% UNEMPLOYMENT RATE IN MAY

Jharkhand	Bihar	Delhi
59.2	46.2	44.9
11.8	10.3	14.8

STATES THAT REPORTED BETWEEN 20% AND 40% UNEMPLOYMENT RATE

Haryana	Telangana	Punjab	Tamil Nadu
33.7	34.8	33.6	33
25.8	8.3	11.0	2.1

30.7 %-POINT INCREASE SINCE APRIL

16.8 %-POINT DECREASE SINCE APRIL

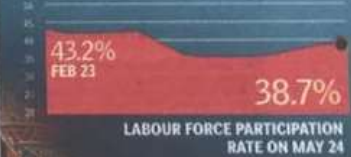### Jump in unemployment in migrants' home states
Punjab saw the biggest spike, followed by states like Telangana and Madhya Pradesh

States with industries saw the most drop
Between the peak of the lockdown, unemployment fell in states with a strong industrial presence. This could be attributed to the exodus of migrants, who ceased to be a part of the state's job market. TN saw the largest decline since April, followed by Odisha (14.2), Karnataka (9.4) and Haryana (7.5)

Himachal	Madhya Pradesh
28.2	27.5
16.8	4.6

Kerala	Uttar Pradesh	Karnataka
26.5	20.8	20.4
7.6	9.0	3.6

STATES THAT HAVE LESS THAN 20% UNEMPLOYMENT RATE

Andhra Pradesh	West Bengal	Maharashtra	Rajasthan
17.5	17.4	16.5	14.1
5.8	4.9	4.6	15.2

0% May saw no change, but it's over three times that of February's 4.9%

Gujarat	Chhattisgarh	Assam	Odisha
13.6	11.3	9.6	9.6
6.4	8.4	4.4	11

14.2 %-point drop since April could be due to workers leaving the state

STATES WITH INDUSTRIES
HOME STATES OF MIGRANT WORKERS

Graphics: Sajeev Kumarapuram
Source: CMIE

Unemployment rate has stabilised nationally
After a spike in last week of March, the national unemployment rate appears to be stable, which could be attributed to movement of migrant workers

7.4% FEB 23
24.3% UNEMPLOYMENT RATE ON MAY 24

Decline in labour force participation worrying
Many have withdrawn themselves from the labour market. Labour force participation rate — the ratio of people in the working age to those employed/actively seeking jobs — has declined. Recessions tend to reduce this rate as there are far fewer jobs available

43.2% FEB 23
38.7% LABOUR FORCE PARTICIPATION RATE ON MAY 24

JOB LOSSES MAY HAVE NARROWED

Though unemployment rate has remained at around 24% in May, the labour force participation rate seems to be regaining a substantial part of the lost ground — it reached 38.7% by end-May after falling to as low as 35.4% in April. In April, about 122 million people lost their jobs. But, not all of them kept looking for new jobs. The number of unemployed people actively seeking jobs increased by only 53 million. What happened to remaining?

The data suggests they were willing to work but did not actively look for jobs, possibly because they were discouraged by the large scale loss of employment.

The numbers of such people swelled by 77 million — from 12 million in 2019-20 to 89 million in April.

Data from May seems to suggest there has been a migration of labour from the 'willing but not looking for jobs' category to the 'willing and looking for jobs category'. Discouraged workers seem to be coming back to look for jobs.

Excerpted from an article by **Mahesh Vyas**, CEO of CMIE, in their latest publication on unemployment

GOVERNMENT OF TAMILNADU

Fig. 7.4. Exodus of workers is worrying as they are becoming potential carriers and a new set of problems since labour is a factor of production

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8. MEASURING THE IMPACT OF COVID 19 ON POPULATION THROUGH SAMPLE SURVEY

8.1 Preliminary details of the survey:

A study on awareness on Corona virus was undertaken through a sample survey. The simple random sample was selected in such a way that every possible sample with the same number of observations is equally likely to be chosen. The response rate to the survey was high because of sensitivity in the population on COVID related matters. The questionnaire had questions related to age group, profession, gender and COVID related matters. Descriptive statistics deals with methods of organizing, summarizing, and presenting data in a convenient and informative way. One form of descriptive statistics uses graphical techniques that allow statistics practitioners to present data in ways that make it easy for the reader to extract useful information. Tools like excel and SPSS will be used to analyse variables and relationship among them.

This questionnaire has been created to conduct an academic study on how much the participants are aware about the Corona Virus epidemic. It will also help in seeking their perception on outbreak of such great magnitude. A Disclaimer was made out in the questionnaire itself that the data collected from this Google form will be solely used for the purpose of academic study. It will not be shared with anyone.

8.2 Output of SPSS:

4.Has Covid epidemic significantly affected your life?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	8.9	9.1	9.1
	2	2	4.4	4.5	13.6
	3	9	20.0	20.5	34.1
	4	10	22.2	22.7	56.8
	5	19	42.2	43.2	100.0
	Total	44	97.8	100.0	
Missing	System	1	2.2		
Total		45	100.0		

5.Do you see hope of medical treatment in near future?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	33	73.3	75.0	75.0
	2	11	24.4	25.0	100.0
	Total	44	97.8	100.0	
Missing	System	1	2.2		
Total		45	100.0		

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	2.2	2.2	2.2
	Less than one year	16	35.6	35.6	37.8
	More than two years	6	13.3	13.3	51.1
	Never	3	6.7	6.7	57.8
	One year to two years	19	42.2	42.2	100.0
	Total	45	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	24.4	24.4	24.4
	Yes	33	73.3	73.3	97.8
	Yes, but not soon.	1	2.2	2.2	100.0
	Total	45	100.0	100.0	

e responses are given below: -

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		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	8.9	9.1	9.1
	2	2	4.4	4.5	13.6
	3	9	20.0	20.5	34.1
	4	10	22.2	22.7	56.8
	5	19	42.2	43.2	100.0
	Total	44	97.8	100.0	
Missing	System	1	2.2		
Total		45	100.0		

Correlations

		4.Has Covid epidemic significantly affected your life?	6.What will be the time horizon in which mankind will get treatment in the form of medicine?
4.Has Covid epidemic significantly affected your life?	Pearson Correlation	1	-.153
	Sig. (2-tailed)		.320
	N	44	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	Pearson Correlation	-.153	1
	Sig. (2-tailed)	.320	
	N	44	45

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Correlations

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Descriptive Statistics

	Mean	Std. Deviation	N
4.Has Covid epidemic significantly affected your life?	3.86	1.287	44
5.Do you see hope of medical treatment in near future?	1.25	.438	44

91

Correlations

		4.Has Covid epidemic significantly affected your life?	5.Do you see hope of medical treatment in near future?
4.Has Covid epidemic significantly affected your life?	Pearson Correlation	1	-.069
	Sig. (2-tailed)		.662
	Sum of Squares and Cross-products	71.182	-1.605
	Covariance	1.655	-.038
	N	44	43
5.Do you see hope of medical treatment in near future?	Pearson Correlation	-.069	1
	Sig. (2-tailed)	.662	
	Sum of Squares and Cross-products	-1.605	8.250
	Covariance	-.038	.192
	N	43	44

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Descriptive Statistics

	Mean	Std. Deviation	N
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5.Do you see hope of medical treatment in near future?	1.25	.438	44

93

Correlations

		4.Has Covid epidemic significantly affected your life?	5.Do you see hope of medical treatment in near future?
4.Has Covid epidemic significantly affected your life?	Pearson Correlation	1	-.069
	Sig. (2-tailed)		.662
	Sum of Squares and Cross-products	71.182	-1.605
	Covariance	1.655	-.038
	N	44	43
5.Do you see hope of medical treatment in near future?	Pearson Correlation	-.069	1
	Sig. (2-tailed)	.662	
	Sum of Squares and Cross-products	-1.605	8.250
	Covariance	-.038	.192
	N	43	44

CORRELATIONS
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Correlations

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Descriptive Statistics

	Mean	Std. Deviation	N
4.Has Covid epidemic significantly affected your life?	3.86	1.287	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	1.91	.874	45

Correlations

		4.Has Covid epidemic significantly affected your life?	6.What will be the time horizon in which mankind will get treatment in the form of medicine?
4.Has Covid epidemic significantly affected your life?	Pearson Correlation	1	-.153
	Sig. (2-tailed)		.320
	Sum of Squares and Cross-products	71.182	-7.409
	Covariance	1.655	-.172
	N	44	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	Pearson Correlation	-.153	1
	Sig. (2-tailed)	.320	
	Sum of Squares and Cross-products	-7.409	33.644
	Covariance	-.172	.765
	N	44	45

CORRELATIONS
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@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo

96

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Correlations

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Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.

Syntax		CORRELATIONS
		
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Descriptive Statistics

	Mean	Std. Deviation	N
5.Do you see hope of medical treatment in near future?	1.25	.438	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	1.91	.874	45

Correlations

		5.Do you see hope of medical treatment in near future?	6.What will be the time horizon in which mankind will get treatment in the form of medicine?
5.Do you see hope of medical treatment in near future?	Pearson Correlation	1	.480**
	Sig. (2-tailed)		.001
	Sum of Squares and Cross-products	8.250	8.000
	Covariance	.192	.186
	N	44	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	Pearson Correlation	.480**	1
	Sig. (2-tailed)	.001	
	Sum of Squares and Cross-products	8.000	33.644
	Covariance	.186	.765
	N	44	45

**. Correlation is significant at the 0.01 level (2-tailed).

DESCRIPTIVES VARIABLES=@4.HasCovidepidemicsignificantlyaffectedyourlife
@5.Doyouseehopeofmedicaltreatmentinnearfuture
 /STATISTICS=MEAN STDDEV VARIANCE RANGE MIN MAX SEMEAN KURTOSIS
SKEWNESS.

Descriptives

Notes		
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[DataSet2] D:\zzz\covid2.sav

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Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
4.Has Covid epidemic significantly affected your life?	44	4	1	5	3.86	.194	1.287	1.655	-.970	.357	-.003	.702
5.Do you see hope of medical treatment in near future?	44	1	1	2	1.25	.066	.438	.192	1.196	.357	-.599	.702
Valid N (listwise)	43											

DESCRIPTIVES
VARIABLES=@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo
 /STATISTICS=MEAN STDDEV VARIANCE RANGE MIN MAX SEMEAN KURTOSIS
SKEWNESS.

Descriptives

Notes

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	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo /STATISTICS=MEAN STDDEV VARIANCE RANGE MIN MAX SEMEAN KURTOSIS SKEWNESS.
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[DataSet2] D:\zzz\covid2.sav

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	45	3	1	4	1.91	.130	.874	.765	.818	.354	.196	.695
Valid N (listwise)	45											

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Crosstabs

Notes

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	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
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	Cells Available	174762

[DataSet2] D:\zzz\covid2.sav

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Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
4.Has Covid epidemic significantly affected your life? * 5.Do you see hope of medical treatment in near future?	43	95.6%	2	4.4%	45	100.0%

4.Has Covid epidemic significantly affected your life? * 5.Do you see hope of medical treatment in near future? Crosstabulation

Count

		5.Do you see hope of medical treatment in near future?		
		1	2	Total
4.Has Covid epidemic significantly affected your life?	1	3	1	4
	2	1	1	2
	3	7	2	9
	4	7	2	9
	5	15	4	19
Total		33	10	43

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.871ª	4	.929
Likelihood Ratio	.744	4	.946
Linear-by-Linear Association	.198	1	.656
N of Valid Cases	43		

a. 7 cells (70.0%) have expected count less than 5. The minimum expected count is .47.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.142	.929
	Cramer's V	.142	.929
N of Valid Cases		43	

CROSSTABS
 /TABLES=@4.HasCovidepidemicsignificantlyaffectedyourlife BY
@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo
 /FORMAT=AVALUE TABLES
 /STATISTICS=CHISQ PHI
 /CELLS=COUNT
 /COUNT ROUND CELL.

Crosstabs

Notes

Output Created		27-May-2020 09:59:34
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	N of Rows in Working Data File	45
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=@4.HasCovidepidemicsignificantlyaffectedyourlife BY @6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo /FORMAT=AVALUE TABLES /STATISTICS=CHISQ PHI /CELLS=COUNT /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.016
	Elapsed Time	00:00:00.015
	Dimensions Requested	2
	Cells Available	174762

[DataSet2] D:\zzz\covid2.sav

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
4.Has Covid epidemic significantly affected your life? * 6.What will be the time horizon in which mankind will get treatment in the form of medicine?	44	97.8%	1	2.2%	45	100.0%

4.Has Covid epidemic significantly affected your life? * 6.What will be the time horizon in which mankind will get treatment in the form of medicine? Crosstabulation

Count

		6.What will be the time horizon in which mankind will get treatment in the form of medicine?				Total
		1	2	3	4	
4.Has Covid epidemic significantly affected your life?	1	0	3	0	1	4
	2	0	1	1	0	2
	3	6	2	0	1	9
	4	0	9	1	0	10
	5	9	5	4	1	19
Total		15	20	6	3	44

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.625[a]	12	.017
Likelihood Ratio	29.642	12	.003
Linear-by-Linear Association	1.011	1	.315
N of Valid Cases	44		

a. 18 cells (90.0%) have expected count less than 5. The minimum expected count is .14.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.748	.017
	Cramer's V	.432	.017
N of Valid Cases		44	

CROSSTABS
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@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo
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Crosstabs

Notes

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Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.

Syntax		CROSSTABS
		
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		  /CELLS=COUNT
		  /COUNT ROUND CELL.

Resources	Processor Time	00:00:00.000
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	Cells Available	174762

[DataSet2] D:\zzz\covid2.sav

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
5.Do you see hope of medical treatment in near future? * 6.What will be the time horizon in which mankind will get treatment in the form of medicine?	44	97.8%	1	2.2%	45	100.0%

5.Do you see hope of medical treatment in near future? * 6.What will be the time horizon in which mankind will get treatment in the form of medicine? Crosstabulation

Count

		6.What will be the time horizon in which mankind will get treatment in the form of medicine?				Total
		1	2	3	4	
5.Do you see hope of medical treatment in near future?	1	14	16	3	0	33
	2	2	3	3	3	11
Total		16	19	6	3	44

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.193[a]	3	.004
Likelihood Ratio	12.537	3	.006
Linear-by-Linear Association	9.917	1	.002
N of Valid Cases	44		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is .75.

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Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.548	.004
	Cramer's V	.548	.004
N of Valid Cases		44	

FREQUENCIES VARIABLES=@4.HasCovidepidemicsignificantlyaffectedyourlife
@5.Doyouseehopeofmedicaltreatmentinnearfuture
@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo
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 /ORDER=ANALYSIS.

Frequencies

Notes

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	N of Rows in Working Data File	45
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=@4.HasCovidepidemicsignificantlyaffectedyourlife @5.Doyouseehopeofmedicaltreatmentinnearfuture @6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo /PIECHART FREQ /ORDER=ANALYSIS.
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[DataSet2] D:\zzz\covid2.sav

Statistics

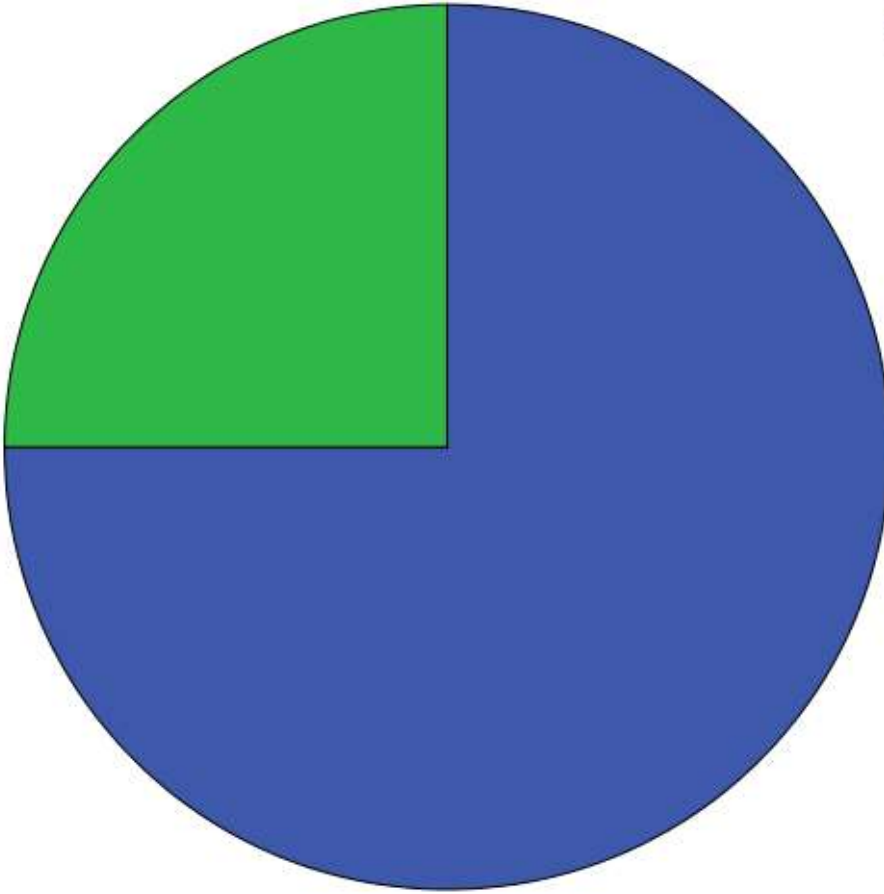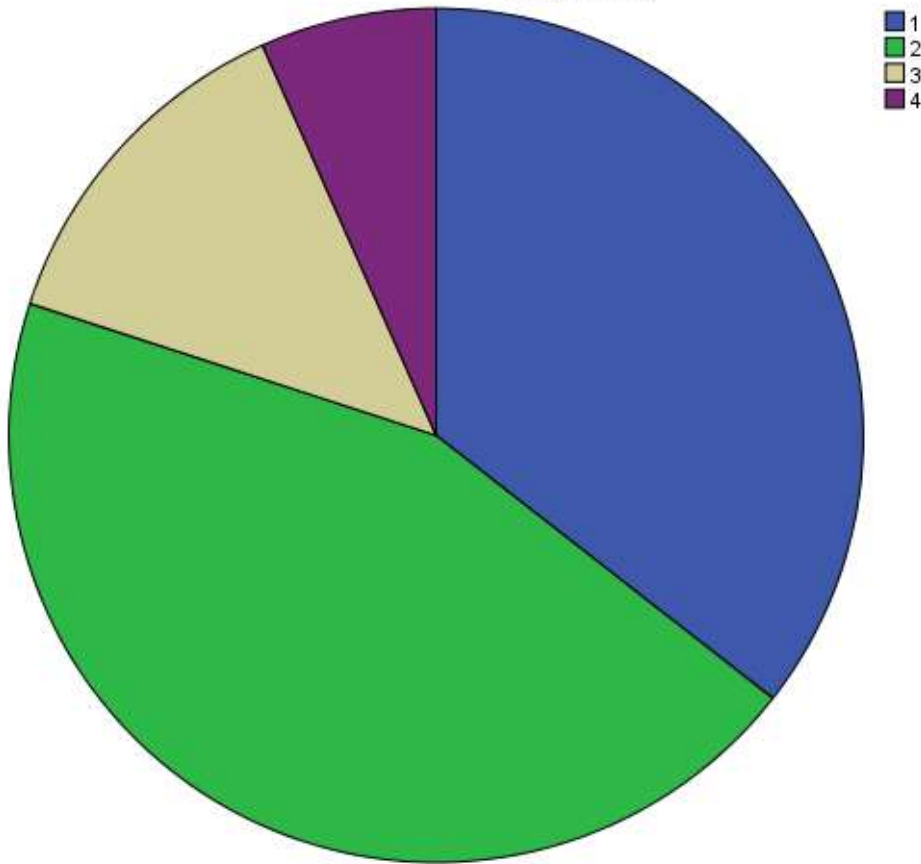|		4.Has Covid epidemic significantly affected your life?	5.Do you see hope of medical treatment in near future?	6.What will be the time horizon in which mankind will get treatment in the form of medicine?
N	Valid	44	44	45
	Missing	1	1	0

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Frequency Table

4.Has Covid epidemic significantly affected your life?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	8.9	9.1	9.1
	2	2	4.4	4.5	13.6
	3	9	20.0	20.5	34.1
	4	10	22.2	22.7	56.8
	5	19	42.2	43.2	100.0
	Total	44	97.8	100.0	
Missing	System	1	2.2		
Total		45	100.0		

5.Do you see hope of medical treatment in near future?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	33	73.3	75.0	75.0
	2	11	24.4	25.0	100.0
	Total	44	97.8	100.0	
Missing	System	1	2.2		
Total		45	100.0		

6.What will be the time horizon in which mankind will get treatment in the form of medicine?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	35.6	35.6	35.6
	2	20	44.4	44.4	80.0
	3	6	13.3	13.3	93.3
	4	3	6.7	6.7	100.0
	Total	45	100.0	100.0	

Pie Chart

4.Has Covid epidemic significantly affected your life?
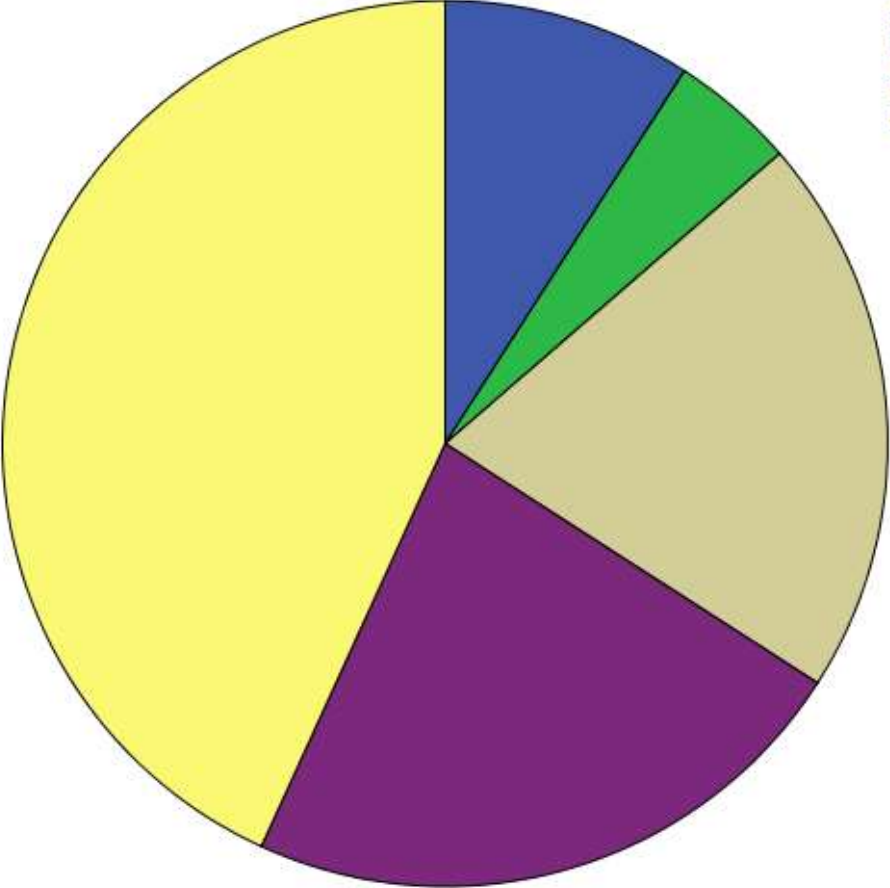
5.Do you see hope of medical treatment in near future?

Legend:
- 1 (blue)
- 2 (green)

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6.What will be the time horizon in which mankind will get treatment in the form of medicine?


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DATASET CLOSE DataSet2.
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@6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo
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  /STATISTICS DESCRIPTIVES
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Correlations

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	N of Rows in Working Data File	45
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.
Syntax		CORRELATIONS /VARIABLES=@5.Doyouseehopeofmedicaltreatmentinnearfuture @6.Whatwillbethetimehorizoninwhichmankindwillgettreatmentinthefo /PRINT=TWOTAIL SIG /STATISTICS DESCRIPTIVES /MISSING=PAIRWISE.
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[DataSet3] D:\zzz\covid2.sav

Descriptive Statistics

	Mean	Std. Deviation	N
5.Do you see hope of medical treatment in near future?	1.25	.438	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	1.91	.874	45

Correlations

		5.Do you see hope of medical treatment in near future?	6.What will be the time horizon in which mankind will get treatment in the form of medicine?
5.Do you see hope of medical treatment in near future?	Pearson Correlation	1	.480
	Sig. (2-tailed)		.001
	N	44	44
6.What will be the time horizon in which mankind will get treatment in the form of medicine?	Pearson Correlation	.480	1
	Sig. (2-tailed)	.001	
	N	44	45

8.3 Analysis of frequency output:

 Out of a sample population of forty- five respondents, twenty nine were males and sixteen respondents were Females that is 64.44% of respondents were males and 35.6% respondents were Females.

Question 4, the respondents were asked to submit response as to how COVID affected their lives on a scale of one to five. A score of one was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected. 42.2% of respondents felt that the COVID times have significantly affected their lives. Only 8.9% felt that their lives were very less affected. The remaining respondents were in between.

Question 5 was on the likelihood of medical treatment. The respondents were asked a question as to Do you see hope in medical treatment in future? In response, 73.3 % of them replied in the affirmative.

On question 6 as to What will be the time horizon in which mankind will get treatment? The response of the sample population was fairly optimistic on the time horizon of discovery of treatment. 35.6% of respondents were optimistic of treatment to be discovered in less than one year's time. Another, 42.2% of respondents were optimistic of treatment in one to two years' time. 13.3% were slightly pessimistic, they were hopeful of treatment but were of the view that it will take more than two years' time to come about. A small percentage of 6.7% were not so optimistic and they believed that the treatment will never come about.

 In the matter of correlation between question 5, Do you see hope in medical treatment in future? and question no 6, as to What will be the time horizon in which mankind will get treatment in the form of treatment? Being two variables,

The null hypothesis for a two-tailed significance test is

H_0: The population correlation coefficient is zero
 i.e. is there is no correlation.
Or alternatively,
H_1: The population correlation coefficient is not zero; a non-zero   correlation.

 In the matter of correlation between question 4, wherein the respondents were asked to submit response as to how COVID affected their lives on a scale of one to five. A score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected and the other variable, that is question 5 asking the respondents that Do you see hope in medical treatment in future? The null hypothesis has been set in follows.

H_0: The population correlation coefficient is zero between variables has COVID significantly affected your life (Q4) and Do you see hope in medical treatment in future? (Q5) i.e. is there is no correlation.
Or alternatively,
H_1: The population correlation coefficient is not zero between variables has COVID significantly affected your life (Q4) and Do you see hope in medical treatment in future? (Q5); a non-zero correlation.

The two-tailed Pearson Correlation (2-tailed) is -0.069. Hence there is no correlation.

On the strength of correlation, when $0.1<|r|<0.3$ then there will exist a weak correlation, when $0.3<|r|<0.5$, there will be medium/moderate correlation and when $0.5<|r|<…$a no. larger than 0.5, than there will exist a large/strong correlation, because, in this case, $0.480 <0.5$, there is a medium/moderate correlation.

The null hypothesis is as follows: -

 H_0: The population correlation coefficient is zero between variables. The respondents were asked to submit response as to how COVID affected their lives on a scale of one to five. A

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score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected(Q4) and the other variable, that is in question 6, as to What will be the time horizon in which mankind will get treatment? (Q6) i.e. is there is no correlation.

<p align="center">**Or alternatively,**</p>

H_1: The population correlation coefficient is not zero between variables. The respondents were asked to submit response as to how COVID affected their lives on a scale of one to five(a score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected, Q.4) and the other variable, that is in question 6, as to What will be the time horizon in which mankind will get treatment? The alternative is a non-zero correlation.

In the matter of correlation between question 4, wherein the respondents were asked to submit response as to how COVID affected their lives on a scale of one to five. A score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected and the other variable, that is in question 6, as to What will be the time horizon in which mankind will get treatment? The two-tailed Pearson Correlation is - 0.153, this shows that the two variables are negatively correlated with a weak negative correlation because when $0.1 < |r| < 0.3$ then there exists a weak correlation because magnitude of number 0.153 <0.3, that is the upper limit for a weak negative correlation.

H_o: The population correlation coefficient is zero between variables. Do you see hope in medical treatment in future? (Q5) and What will be the time horizon in which mankind will get treatment? (Q6); i.e. is there is no correlation.
Or alternatively,
H_1: The population correlation coefficient is zero between variables. Do you see hope in medical treatment in future? (Q5) and What will be the time horizon in which mankind will get treatment? (Q6); i.e. is there is non-zero correlation.

The correlation coefficient is 0.480. This is between 0.3 and 0.5, hence the correlation coefficient in this case is of medium strength as can be inferred. SPSS table above.

In the case of Chi squared test of association, null hypothesis assumes that there is no association between variables. Alternative hypothesis assumes that there is an association between the variables at a degree of freedom. If p value is greater than alpha equal to 0.05, which is the significance level then the null hypothesis is rejected.

The following data as extracted from SPSS run is reproduced below

	6.What will be the time horizon in which mankind will get treatment in the form of medicine?				
	1	2	3	4	Total
5.Do you see hope of medical treatment in near future? 1	14	16	3	0	33
2	2	3	3	3	11
Total	16	19	6	3	44

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.193[a]	3	.004
Likelihood Ratio	12.537	3	.006
Linear-by-Linear Association	9.917	1	.002
N of Valid Cases	44		

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is .75.

	6.What will be the time horizon in which mankind will get treatment in the form of medicine?				
	1	2	3	4	Total
5.Do you see hope of medical treatment in near future? 1	14	16	3	0	33
2	2	3	3	3	11
Total	16	19	6	3	44

	Value	df		Asymp.sig.(2sided)
Pearson Chi-square	13.193	3		0.04

In Chi-squared association, null hypothesis assumes that there is no association between variables. Alternative hypothesis, assumes that there is an association between the variables at degree of freedom.

H$_0$: Assume that there is no association between What will be the time horizon in which mankind will get treatment in the form of medicine? i.e. (Q6.) And Do you see hope of medical treatment in near future? (Q5.)

Or alternatively,

H$_1$: Assume that there is an association between What will be the time horizon in which mankind will get treatment in the form of medicine? i.e. (Q6.) And Do you see hope of medical treatment in near future? (Q5.)

Here, Pearson Chi-square value is 13.193 df is 3 as shown in the table above at a level of significance α(Alpha) is equal to 0.05. Here, p value is 0.04, which is less than alpha value 0.05,

we reject the null hypothesis for a degree of freedom ὰ(alpha)=0.05. **It means alternative hypothesis is true and there is an association between two variables**.

Similarly, for second case of Chi-Squared association,

H_o: **Assume that there is no association between as to how COVID affected their lives on a scale of one to five. A score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected(Q4) and the other variable, that is in question 6, as to What will be the time horizon in which mankind will get treatment? (Q6).**

Or alternatively,

H_1: **Assume that there is an association between as to how COVID affected their lives on a scale of one to five. A score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected(Q4) and the other variable, as to What will be the time horizon in which mankind will get treatment? (Q6).**

Here, Pearson Chi-square value is 24.625 df is 12 at a level of significance σ(Alpha) is equal to 0.05. Here, p value is 0.017, which is less than alpha value 0.05, we reject the null hypothesis for a significance level ὰ(alpha)=0.05. **It means alternative hypothesis is true and there is an association between two variables.**

Similarly, for the third case of Chi-Squared association,

H_o: **Assume that there is no association between as to how COVID affected their lives on a scale of one to five. A score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected(Q4) and And Do you see hope of medical treatment in near future? (Q5.)**

Or alternatively,

H_1: **Assume that there is an association between as to how COVID affected their lives on a scale of one to five. A score of 1 was given to those who felt very less affected and a score of 5 was given to those who felt that they were significantly affected(Q4) And Do you see hope of medical treatment in near future? (Q5.)**

Here, Pearson Chi-square value is 0.871 df is 4 at a level of significance σ(Alpha) is equal to 0.05. Here, p value is 0.929, which is greater than alpha value 0.05, we, therefore do not reject the null hypothesis for a significance level ὰ(alpha)=0.05. Therefore, it can be inferred that there is no association between the two variables.

9.CONCLUSION

The Government never lost its eyes from the objective of not only kickstarting the economy but also created a vision of greater freedom to markets and economy through declaration of policy changes also. Adverse circumstances will lead to hardships but will also give us new lessons to move ahead with frugality and chart out new courses and territories. The resolve to make India more self-reliant, reducing dependencies on imports and undertaking research and innovation will further get a boost. The spirit of enterprise and hard work of our people will give a new place to India in the comity of nations and India's economy will also see resurgence. India will rise and become a global destination.

Difficulties which India is facing are elaborated below

Lockdown measures in India were timely and we coordinated steps well ineffective imposition of Lockdown. The Epidemic Diseases Act, 1897 and The Disaster Management Act, 2005 were invoked to fight COVID-19 pandemic. India's COVID warriors have been in the forefront of this fight. The untiring efforts of these people has kept the life safe for the majority of population. The fight is long but is beset with hope that the cure to the infection will be discovered by the scientists in the near future through an ante dote in the form of a medicine or a vaccine.

India's Banking sector was already weakening. Bad loans issues were already confronting the banking sector. Lockdowns, pandemic, disruption in supply chain and loss of sentiment will play and is likely further to aggravate matters. There will be a weakness in demand, it will further reduce output and weaken economy in COVID times and yet problem of default in loan payment is further likely to compound with banks.

Lockdown forced Labour to migrate in large numbers from cities back to their villages. Once the Industrial activity started with UNLOCK5.0 starting from first of June 2020, labour shortages were witnessed in industry. The surplus labour in Rural areas will have another dimension for the States to deal with.

The stimulus announced by the Government is more to tackle supply side issues and reforms to make economy progressive but has not done much to arrest fall in GDP, Medium and Large Industry and Service Sector which has suffered the most due to pandemic.

Health is a State Subject. The States of India lack resources to fight the challenge of COVID spread. CMs are also asking for greater share through Central Government's help because their GST and excise revenues are already under strain.

COVID19 is pivotal for India's $190 billion IT and allied sector as it employs 4.3 million people. Uncertainty in Europe and USA due to Pandemic has made their business suffer.

Geo-political issues in the region have created difficulties. Interference of Pakistan in the Internal Affairs of India by subversion has gone unabated in J&K even in COVID pandemic. Border tension with China has also led to uncertainties in geo-politics in these times.

Hope lies in positive steps being taken even during pandemic

The Government of India after much thought and assessment has brought in a stimulus package aimed at bringing in policy changes. It aims at- helping the poor, giving push to various sectors as MSME, real estate, mineral & exploration, agriculture sector, and helping every beleaguered citizen by declaring that income tax payments will be given deferment as a temporary reprieve. Besides, fiscal policy changes and RBI's intervention will help the industry immensely, although the Industry leaders expect more from the Government. They are also rightly concerned over restrictions and differing interpretations of norms and consequent problems they have been facing at the hands of local authorities due to varying interpretations of the guidelines. Lockdown 1.0 to Lockdown 4.0 was undertaken by the government in four phases. Each lockdown saw its own changes to meet the needs by creating a balance between human safety and requirements to run the basic amenities.

The present COVID times are a temporary phase, new alignments and a transformed trade regime is foreseeable with greater cooperation among open societies and democracies. This will happen sooner than most pessimists think. Pessimists would still argue that the vast volume of exports necessary to become the world factory are infeasible in the wake of COVID-19 pandemic here un India. But they forget that no shock ranging from the black death pandemic of the fourteenth century to Spanish flu and great depression of the twentieth century to 9/11 terrorist attacks on the USA has been able to bottle up trade for long.

The measures provided by the government are- abundant liquidity and lower policy rates, it has now made sense for the issuers to borrow more. Debt costs are another area of opportunity for companies with a healthy balance sheet. For AAA rated companies, funding cost has come down. Reliance industries has raised Rs. 21,500 crore through bonds in three tranches in April and May, 2020. Among other companies who have either raised debt or have announced their intention to do so are Larsen & Toubro (Rs.9000 crore), TATA Steel (Rs.7000 crore), Cipla (Rs.3000 crore), Adani Enterprises (Rs. 1000 crore) and Future Retail (Rs. 650 crore). Vedanta Resources meanwhile, raised around $ 1 billion globally to fund the de-listing of its Indian subsidiary. The total bond issuance in the first month of the lockdown was Rs. 50,000 crore. It would be prudent to assume that some of the larger issuers might have borrowed in excess of their requirements as a contingency against the unknown. This will be of help in uncertain times.

Reforms relating to the Essential Commodities Act, agricultural marketing and legal framework for farmers to engage with processors, aggregators, large retailers and exporters represent the deepest reforms in agriculture to date for which this government needs to be congratulated. Yet, it is difficult to overlook the fact that even these reforms cannot make India's poorest farmers prosperous. Seventy million or forty eight percent of all land holdings in India are smaller than an area of half hectare, with an average size of just 0.23 hectare. Persistent efforts need to be made by the Government to further move in progressive policy regime in these matters. The possibility of exit offered by these reforms need not translate into actual exit, endeavour should be to create the availability of well-paid jobs in industry and services sectors.

India can create jobs in large numbers by replacing China as the world's factory of light manufacturers. This will not happen in a day but we should continue to make pursuit to remain competitive. Till now, corporate India has displayed resilience to navigate through a dark phase. Hope of India Inc. is the 1.3 billion strong Indian market, it will not be adequate now. India should align itself geo-politically and geo-economically to get mileage and must place itself strategically in the new world order

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COVID 19 is pivotal for India's $190 billion IT and allied sector as it employs 4.3 million people. Adoption of cyber security, cloud migration and virtualization would increase. It is also anticipated that global companies would look for partners to build efficiencies and control costs

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