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The COVID19 Crisis in India  
- Impact, Response and  
Recovery

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## Contents

Abstract .....	2
Section I: Situation before the Crisis .....	3
Monetary Developments .....	4
Approach of fiscal policy .....	4
Rise in Uncertainties .....	5
Section II: The COVID Crisis and the Response .....	6
Employment Scheme for Workers? .....	9
Simultaneous Demand and Supply Shock .....	10
Infection Patterns .....	11
Section III: Anticipating the Effects through a Model .....	12
The Stimulus Package .....	14
Impact .....	15
RBI's Response .....	17
Section IV: Stock Market Performance and Discount Rates .....	18
Model to Explain Stock Valuation .....	18
Cost and Return Structure of Corporates .....	20
Section V: Experience of the Recovery .....	21
GDP and GVA Over the Crisis and Recovery .....	21
Index of Industrial Production .....	24
Industry Wise Recovery .....	26
Employment .....	28
Export and Imports .....	34
Section VI: The Financial Sector .....	36
Monetary Developments .....	36
Yields and Credit Flows .....	40
Government Expenditure .....	43
Inflation .....	44
FDI, FII and the "Fisher-Open" .....	49
Section VII: Conclusions and the Immediate Situation .....	51
A New 'Logistic' Inflation in the Offing? .....	53
References .....	55

# The COVID19 Crisis in India – Impact, Response and Recovery

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## Abstract

The situation prior to the COVID, as brought out in Morris, Sebastian (2020), was problematic with major slowdown and heightened uncertainty in the financial sector in the last year before the Crisis.<sup>2</sup> The response of the RBI, free from its conservative shackles, now followed the US into expanding liquidity and supporting the financial sector, in ways that were quite radical for the RBI which even during the Global Financial Crisis (GFC) had to be persuaded to act. There were no arguments against the need to adopt supportive and expansionary monetary measures, and the governor with no doctrinaire blinkers could address the reality. That helped the Indian financial sector and it may well have avoided a deep crisis.

However, the government in its fiscal response was barely adequate. The "20 lakh crore" stimulus was misleading. Only about Rs. 1.72 lakh crore involved expenditures directly or indirectly by raising consumer incomes. The rest were liquidity, credit and guarantee measures, and included a borrowing limit enhancement for the state governments. The response was in sharp contrast to the response to the GFC when the central government took the leadership role to put together a fiscal package and persuade the RBI to expand liquidity, to restore the growth to almost its original level. The administrative measures of territorial lockdowns may have done little to contain the spread, but imposed great hardship on the people, especially the migrant workers, besides curtailing production wantonly.

We estimate the unconditional impact of the crisis (i.e. without the fiscal response) should have taken the economy down from its 2019-20 value to between 3.86 and 12.23%, and conditional on the stimulus to a value of -6.21 to -9.68%, most likely closer to the latter. The very early estimates were somewhat worse, but the Reserve Bank of India (RBI) in responding swiftly and in kind ensured that there would not be a monetary constraint, and hence a simpler expenditure model could be used. The negative impact therefore was unduly larger than what it need have been.

We bring out the performance of the economy over the crisis period and its subsequent recovery. Since the decline over the initial quarter of the COVID crisis was steep, being in the range of 20 to 30%, growth over subsequent quarters or months in relation to the very low levels appear high. The performance of the stock market which is seemingly out of line with the performance of the economy we consider first to explain why there is really no puzzle here, since both the discount rate had fallen considerably owing to the fall in the interest rates over various maturities, and costs such as interest, and tax (corporate) besides labour had fallen. The effect of the crisis was quite severe on the manufacturing sector, and not all segments have recovered. Capital goods and durables have yet to

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<sup>2</sup> The initial analysis in the first half of the paper was presented in two seminars. See Morris, Sebastian (2020a, 2020b and 2020c). See also Morris, Sebastian (2020).

reach their pre-COVID levels. Employment recovery has been most problematic. We bring out the trends in employment, credit, portfolio and direct investments, and also review the monetary developments. This paper is concerned with drawing out the trends and the nature of the recovery. We also examine the details of the government and RBI's response to understand the nature of the recovery.

## Section I: Situation before the Crisis<sup>3</sup>

What was the situation just before the Crisis? We have already brought out the situation in much detail in Morris, Sebastian (2020), but it is nevertheless useful to recall the same:

The Index of Industrial Production (IIP) for Manufacturing after growing at about 5% till 2018, had slowed down to about 3% till mid-2019 to fall to -8% in November /December 2019, rising to 5% just before the crisis. Worst performance was that of the capital goods sector, which reached a (de) growth of -18% over mid to late 2019 recovering to a level of -10% on the eve of the crisis. Only intermediate goods (at 20%) and primary goods (6%) showed a modest recovery. Consumer good never recovered from the delayed effects of the demonetization. See Table 1.

Table 1

S. No.	Groups	Weight (%)	Annual			Monthly	
			2016-17	2017-18	2018-19	Jan 2020	Feb 2020
1.	Mining	14.373	5.3	2.3	2.9	4.3	10.0
2.	Manufacturing	77.633	4.4	4.6	3.9	1.6	3.2
3.	Electricity	7.994	5.8	5.4	5.2	3.1	8.1
4.	General Index (all)	100.000	4.6	4.4	3.6	2.1	4.5
<i>Used based classification</i>							
5.	Primary goods	34.050	4.9	3.7	3.5	1.8	7.4
7.	Capital goods	8.220	3.2	4.0	2.7	-4.3	-9.7
8.	Intermediate goods	17.220	3.8	2.3	0.9	15.9	22.4
9.	Infrastructure / construction goods	12.340	3.9	5.6	7.3	-2.3	0.1
10.	Consumer durables	12.840	2.9	0.8	3.5	-3.8	-6.4
11.	Consumer non-durables	15.330	7.9	10.6	4.0	-0.3	-0.0

Source: [https://economy.mca.gov.in/np\\_Highlights.pdf](https://economy.mca.gov.in/np_Highlights.pdf)

The auto sector, a sector that through its linkages is very important for manufacturing - had seen a precipitous collapse to -30% all the way from the early 2018 (which had seen a bounce back from the demonetization) and bump up end 2019, but still negative (-19%). Container movements had risen to 10% in early 2020 just before the COVID Crisis (to collapse to -20% in the first month of the crisis). Exports had fallen from a high growth of 20% in 2018 (when world demand had been high) to 0%

<sup>3</sup> This section is based on Morris, Sebastian (2020). The present paper may be seen as a sequel to the same.

before the COVID-Crisis and the early COVID Month brought it down to -35%. Electricity consumption fell to 0% in March 2020 and then to a collapse. And capacity utilization was below 45% in the depths of the Crisis.

Consumer Price Index (CPI) inflation as has been the case for long co-moved with food and fuel inflation. Overall core inflation had been falling since 2015 (5.5%) and before, to reach the lows of 4% in June 2017 and again in December 2019 (3.5%). Food inflation had been falling since 2015, but showed a sharp increase in 2019 in the run up to the elections, and thereafter as the spending incl. on Mahatma Gandhi National Rural Employee Guarantee Scheme (MGNREGS) was revived and Direct Benefit Transfers (DBT) introduced, in the face of weakened logistics. And then fell again as MGNREGS post elections was reduced. Real interest rate which have always been higher than 3% may have reached a high level of 4.5% end 2019, but had fallen since but remained at around 2% positive when measured with reference to the core.

#### Monetary Developments

The developments in the monetary side were as follows:

- i. Yields in government bond markets rose during 2018 to reach as high as 8.25% (10 yr) and fell only from later 2018 to mid-2019 and again rose (!) to 7.25% end 2019 to fall thereafter to 6.775%. And the one-year bond fell to 5.1%. But these rates were very high in relation to the global markets, well above the depreciation of the currency, and even with reference to the core inflation in India.
- ii. Corporate bond (AAA) yields began to fall only since late 2018, but remained high with spreads from government bonds increasing. For AA bonds the yields began to fall only from mid-2019.
- iii. With the COVID the "policy rates" repo and reverse repo were brought down sharply by the RBI, however the one-year bond yields while they did decline continued to be above the repo rate with the yield curve steepening even as the 3 month and 1-month t-bills were being collared. Thus, the RBI's Targeted Long-Term Repo Operations (TLTRO) measures to buy long were not yet working.
- iv. Measures of uncertainty had been rising since mid-2019 as the NBFC and banking crisis had not been addressed correctly. After falling a bit in late 2019, just before the eve of the crisis they rose again sharply again. The impact on the corporate bond market was even larger as the yields between longer 10 yr. and shorter duration bonds widened.

The trends and features that were already there before the COVID Crisis need to be recalled. The slowing down of growth had been happening since 2012-13 with only a bump up to the growth in 2018, thanks to the recovery from the demonetization, a higher growth acting through exports of goods and services due to the higher growth of the World economy in 2017 and 2018. The period from 2011-12 may be characterized as the longest period of slow growth since the Great Liberalization of the In 1991-92 and 1992-93.

#### Approach of fiscal policy

Withdrawal of the fiscal stimulus in the wake of the GFC in 2009-10, 2010-11 from 2011-12 onwards, with the added whammy of monetary squeeze as well were the immediate causes for the growth having come down from the high 9% or so from the period of the stimulus: interest rates had risen to very high levels in this monetary squeeze. The RBI was no doubt chasing an "inflation" that had risen over 2011-12. But this was partly a "will-o-wisp" since it was based on the error in the measurement of the house rentals, which pushed up the measured core inflation, and partly an inflation that needed to be accommodated. The RBI had maintained a large positive real interest rate given its inflation

targeting and the erroneous measures of both the core inflation and inflation expectations, as we argued, till almost the very end of the period. The RBI's approach to the taper tantrum in 2013 – allowing the liquidity to dry up – further contributed, by raising bond yields. Since then for almost up to 2016-17 the low-end bond yields were not being collared by the repo, indicating that the repo window was not open enough to render the repo as the policy rate.

The overriding pursuit of the fiscal deficit targets by the central government was certainly an important factor putting downward pressure on demand. The government's spending may have been constrained by the high growth that the new national income GVA 11-12 series showed. This was as much as 1.5% above the reality, at least in the first five years of the series. Added to that was the delay in spending in the first two years of the Modi government that resulted in significant underspending to add to the recessionary pressure. MGNREGS expenditures remained constrained till just a wee bit before the 2019 elections, and after the elections was scaled down to be at a low Rs. 20,000 crore. The budget for 2020-21 on the eve of the COVID Crisis provided for a mere Rs. 20,000 crore. Only the new Direct Benefit Transfers, the continuing expenditures on the National Highway Development Programme (NHDP) and the Prime Minister's Gram Sadak Yojana (PMGSY) kept the economy going at the modest growth rate. Private investment cycle did not revive and continued to be muted growing far slower than ever since the GL, from 2011-12 onwards. Demonetization further contributed to the recessionary pressure but not as much as was expected since the decline in consumption expenditures following the decline in the incomes of the unorganized/informal sectors was much delayed.

GST raised the "effective" tax to GDP ratio quite significantly given the difficulty of avoidance of tax. This happened over a period of around 18 months since its introduction. The "effective indirect tax rate" had therefore increased, and this put the economy into a slowdown with the growth falling from mid-2018 onwards until the eve of the COVID Crisis to reach a low 4%. There was no recognition that the higher effective tax rates should have been accompanied with either lower rates or enhanced spending elsewhere. The government congratulated itself on the increase in the tax to GDP ratio, and placed demands on the tax authorities at a time when the nominal GDP was rising by a mere 9% or so, resulting in continuation and perhaps heightened high handed behavior on the part of the tax department and to increasing uncertainties which made "animal spirits" lose its last breadth on the eve of the crisis.

Unfortunately, the government with a view to revive private investments, on Sept 20, 2019 announced a major reduction in the corporate tax rate from about 30% to 22% making the effective tax rates about 25% when the cess and other distortions are considered. For new companies the reduction was from 25 to 15% making the effective rate fall by 10% to about 17%!<sup>4</sup> In an environment when demand was sluggish and uncertainties high to which the government too was contributing, this tax cut could not have done anything to private investment at least not in the immediate term. The corporate sector made windfall gains, the market capitalization went up. But obviously as was expected by nearly all commentators, there was no spur to investment. Around Rs. 1.45 lakh crore was the give away. The same had it been spent on actual expenditures, or laid out in the form of a (time barred) investment tax credit overriding MAT could have had a more positive impact on investment spending.

#### Rise in Uncertainties

Policy uncertainties especially on the more important auto sector with regard to the future with an early rumor that government would ban diesel soon sent shivers down the industry. Higher initial cost of purchase on account of tripling of insurance was also a dampener in the demand for cars. Government was also prone to knee-jerk responses. Tax authorities continued with tax terrorism.

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<sup>4</sup> See Business Today (2019)

despite the explicit promise that tax terrorism would be a thing of the past, made by the Finance Minister of Modi-L.

Uncertainties went up and the most important reason for the same was that the problems of the banking sector – especially their need to shore up their net worth – was addressed in part, and only with much delay. The RBI's attempt to work through the banks by increasing the liquidity available to them and the policy rates, would not immediately affect the longer duration (5 yr) government yield, not to speak of the corporate longer duration bond yields or the expectations. Sustained low policy rates with ample liquidity and belief that the same would continue for a while is important. As said before the very interest rate targeting which makes the RBI respond to inflation (the short period variance here being entirely due to commodity prices) rather than the expected inflation in the core, is not conducive to formation of expectations of the long period rates especially on a movement to a lower level. Thus, the measure of the slope of the yield curve rose during the first three months of 2020 on the eve of the crisis, when the RBI had been on a path of rate reduction.

By end-March end despite the 1-month TB rate falling, the long run rates did not fall, not to speak of the corporate bond yields. Thus, it was clear that the RBI would have to act directly on the financial intermediaries if not on the non-financial corporations shoring up their liquidity and hence their solvency over the crisis. But the reaction of the RBI was to work through the standard routes of the repo and reverse repo. That the 1-month TB bill rate fell below the reverse repo meant that this was a real reduction rather than a reduction with credit rationing under the repo window as the RBI had been wont to do earlier.

## Section II: The COVID Crisis and the Response

This time around despite the crisis that should have led to massive capital flight from India (any developing country), two important difference from the GFC may have prevented any significant contagion. The COVID crisis was universal, with all including the developed countries facing it, a little earlier no doubt. The developed countries led by the US and UK, where it hit early (other than Italy and Iran), responded quickly and without hesitation with ample liquidity and a lowering of the policy rates. They were able to bring out the change in expectations rather soon. This may have resulted in a pressure for inflows, and the RBI by buying up dollars was able to maintain M1 and M3 on trajectory. The Net Foreign Assets (NFA) had been falling in the immediate pre COVID months.

The only problem with the initial measures of the RBI was that the liquidity flow to the NBFCs and the productive sector was delayed somewhat, which it could have done by acting directly instead of through the banks. The measures to put a moratorium on loan repayments warded off a crisis that could have widened quickly. The large liquidity measures which resulted in the fall of low-end rates and the introduction of longer duration repos at lower rates, meant that the beginnings of the expectations that higher end yields would fall in sync was on, to shore up the economy.

The lockdowns were more knee-jerk and poorly implemented. It could not have been otherwise given the essential weakness of the police and territorial administration to strategise. The Prime Minister's initiative to have a complete switch off of all lights, on 5<sup>th</sup> April 2020 precisely at 9:00 pm, to use the occasion to build "unity" and consciousness among the people with regard to the crisis may have worked in the long run, but immediately the prospects of a near disaster was in the offing. It was avoided by the quick response in gearing up by the electricity system engineers after the PM had

blissfully announced the “people’s measure” a couple of days before. Engineers realized that the measure could bring down the load by as much as 15% over minutes, which no system could have handled on automatic controls. A shutdown in one area could have led to cascading effects.

Mercifully, the engineers were all on-site at power plants, at key switchyards and load dispatch centers. With (redundant) communication arrangements and they were able to meet the situation both the switching off and the (re)switching on of the lights. Actually, as it turned out, the load fell by more than 20% to about 32% since many enthusiastically switched off not only fans and lights but also other devices (some fearing high voltage and frequency variations), and not only at homes but in commercial organizations as well. Within the IIT Bombay Power Group this episode was widely discussed, with some expressing shock that a risk of such a nature was imposed for pure symbolic value. See also Gothwal, Anshuman (2020).

Earlier on 22<sup>nd</sup> March the PM had asked people to “clap, blow conch or ring bell for 5 minutes to commend the efforts of those fighting the pandemic” (Bhaskar, Utpal (2020)). These occasions allowed people to gather to only enhance the spread of the virus, which by then was known to be highly contagious. Mercifully though, except in Gujarat and Mumbai, the virus may not have been seeded this early in India.

The lockdown (the first of many) from March 25 all the way to April 14, and then extended in many parts was quixotic to say the least. Even chemical plants were hastily shut, without the usual precautions, so that in their reopening many months later, many lives were lost in explosions and leaks. Reports indicated that there were accidents reported from most chemical clusters with large plants, Gujarat and Andhra most notably. At least 75 people were killed and over a 100 injured according to the Global Workers Union due to the hazards faced in restarting these plants. Continuous process industries should never have been shut anyway. Cf. Thakur, Jaya (2020) and Hindu Business Line (2020). In a country like India, the deaths would be significantly in excess of the reported deaths, since many of the chemical plants are in the small-scale sector, where safety is hardly a priority. The latter source also seemed to think that 75 was only a conservative estimate of the deaths.

The actual conduct of the lockdowns may have resulted in quicker spread of the virus. Lockdowns meant that entire habitats were shut, with local authorities vying with each other to shut everything including even basic transportation and even sale of essential items. When within a week these had to be allowed, shops could not be kept open for more than a few hours. This forced people to come out at the same time to crowd around shops to actively spread the disease. To the police, shutting down precisely at the end of the period was all that they were worried about. All over the country the crowding to buy essential goods was amplified by the fact that in most places shops and convenience stores were allowed to be open for a few hours—usually less than 4. It was not surprising that the Indian administration responded so inately.

In larger markets in densely populated areas, people could not have spaced themselves to keep distance between them. The crowding due to the limited timings was so complete, that even if one person had the virus it would have spread to many in the scores or hundreds. Therefore, wherever the seeding had been done (Gujarat, Maharashtra, Delhi—with much international movement in the months before March) the spread was accelerated over what it need have been.

It was also an opportune period for street and traffic police to enhance their ‘haftas’. They were hardly bothered about ensuring social distancing. But were keen to catch people in cars even a couple when without a mask/ or a mask not exactly on the face. All because they could extract heavy ‘haftas’, while crowding went around among poorer people whose small purses did not merit their attention.

Except in Kerala, there was little attempt to do contact tracing. Lockdowns could have been local and more specific had contract tracing been done. Instead from the very beginning it was city and nationwide, and territorial rather than functional.

Given the territorial orientation of the administration, the extreme loss in production, and the wastage of perishable agricultural products was considerable. City prices for perishables and soon even for non-perishables, rose while the rural prices were depressed leading to a fracture in the markets.

The RBI though understood the same correctly and did not respond to this "inflation", but the markets basing itself on the past behavior of the RBI to respond to every movement in commodity prices, for a while thought otherwise. The COVID Crisis was both a supply side and a demand side crisis. But in India the production shortfalls were enhanced due to the totality and territoriality of the shutdowns. For quite a while the "essentiality" of the service or the consumption was the only criteria for allowing their supply or movement. Soon enough as stocks got over, movement of goods had to be allowed, and later inputs to essential services and goods with much reluctance on the part of the authorities.

A section of the middle classes (those with government jobs and on permanent contracts) had a gala time in having three month long 'near' holidays, some 'working' from home. Others on daily contracts suffered hugely. Senior government officers worked without a break. Gated communities behaved as if in a dystopian world to put those dependent on daily work to tremendous hardship. The tragedy was that the administration and the police being influenced in their actions and rules from this kind of immediate knee-jerk reactions of the salaried middle class, did large damage to the economy but particularly to the those dependent upon daily work.

Vast hordes of migrant workers began to move back to their homes, often trekking, hitchhiking and cycling over large distances – even the most basic of transport had been shut- in the millions. And reports of these endless stream of workers on the march and on cycles on empty roads and along railway tracks with no trains began to come in. Only then did the administration became aware of the extent of the migrant labor in India's production. It was to the yeoman efforts of a large number of NGOs and groups of do-gooders which emerged spontaneously to feed the migrant workers, and give them rations, that a human tragedy was averted. Even their meagre savings were of little help since the lockdowns meant that the usual cheap eateries and restaurants from where these mostly male workers ate were shut. The government did not even have a sense of the order of the numbers involved.

There had been many studies and reports on migrant workers, both official and secondary. However, the government being entirely territorial in its thinking, could not have contended with the aspect of migration, being constrained by the "model" of a worker domiciled in a particular place, with a firm address, and living with his family. For a comprehensive study of migration in India, see Tumbe, Chinmay (2018). One of the ways of reducing union activity was by resorting to migrant workers. The combination of the schism in the labor market (an elite organized work force with long term contracts or permanency and an "organized" labor market with no formal contracting, and where wages were paid by the day) and the great regional disparity in industrial development and economic development (as between say Bihar and Orissa on the one hand) and Maharashtra, Haryana and Gujarat on the other, had in the era of rapid growth since the GL resulted in vast migration and growth of informal arrangements by both government and PSUs not to speak of the private sector. (Unni, Jeemol, 2018). The construction industry was almost entirely based on unorganized workers on daily wages, and

predominantly of migrant labor from the poorer parts of the country. All these facts had been widely known, but not for the government – not even the labor departments.<sup>5</sup>

The potential of the workers to carry the disease back to the villages and the interior with very inferior medical facilities was very high but mercifully for the country the seeding of the disease among the workers even in the locales in states like Maharashtra, Gujarat, Delhi and Haryana was low.

The ludicrousness of the territoriality was on display when in the vast agglomeration of Delhi, the borders between Delhi proper, New Delhi Municipal Corporation (NDMC) area, UP and Haryana were all closed, and even doctors and nurses had great difficulty in crossing! And it took many months for a resolution! People one side of a road seeking to access or provide services just across these "borders", in another state were put to much hardship.

Once the universal lockdowns were lifted, lockdowns on the diktat of local authorities began. Movement was also restricted given the territoriality. Areas open, with input-output relations with each other's, could not restart production. Many of the industrial clusters including the auto clusters hoping to start had to shut again even if their vendors were in open areas, since the material would have to pass through areas under lockdown which essentially meant no movement. In some instances, employers waited for the migrants to return but they could not have given the restrictions on movement, and the free or all erection of barriers.

Since the seeding of the virus had just about started, preparations could have been made, and the approach coordinated for efficacy, before rushing into a thoughtless universal lockdown, whose dimensions only defined only as the chaos unfolded. The opportunity to strategize the response was missed. The migrant labor movements were entirely chaotic. So was the organization of the medical system. Here though, the valiant personal response of doctors and nurses, but also ward boys and drivers helped to mask the disorganization and lack of control of the medical system as such. Indeed, the person dependency of the Indian "system" in contrast to the system dependency in many of the advanced countries may have been an advantage in these initial days, when the learning had yet to happen. Doctors and nurses were overworked, but continued to serve with few breaks. Many who had been shabbily treated by the government and were in dispute with the government, when they were bought back, worked without salaries for months on end, on the promise of a notoriously fickle governments to keep to their promises. Would the "system" be able to cope up in the face of continued rise of the infections and fatalities?

#### Employment Scheme for Workers?

The issue of migrant labor and their movement could have been addressed. Much of the movement of the labor to their villages and home towns in East and Northern India from NW India (centered around Delhi) and South India (especially Kerala, Karnataka and Tamil Nadu) and West (Maharashtra and Gujarat) happened when the main transport systems – railway and buses were shut. The government had no clue of the extent of migrant labor.

Many, including the author argued very early for a quickly putting together an employment /hold out scheme on the lines of MGNREGS with somewhat higher wages in the urban and industrial areas in the destination states. At least in the more important industrial clusters, and for construction sites this

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<sup>5</sup> It did not shock me when a certain industry leader from Jharkhand called me to say that it was now that he and the labor department of Jharkhand became aware that there were more than half a million migrants from Jharkhand who had been working in Gujarat alone. Gujarat itself may have housed nearly 2.0 million migrants from outside the state on the eve of the pandemic.

could have been instituted. Indeed, construction particularly could have been kept open, and the associated services and industry – cement, movement by trucks also.

Migrant labor is typically on daily contract even if they are work on the same site for many months and even for years on the same project or in the same company. Many are hired through labor contractors, and the hiring is on requirements that can change by the day! So much for the lamented lack of labor market flexibility in India. So, a lockdown of the total kind which happened threw all workers on to the streets. Many, whose employers /contractors were willing to pay them subsistence wages over the lockdown, nevertheless had to move. These workers were dependent on canteens and messing arrangements run by informal businesses on site, which were all closed by "order" of the state, forcing even these workers to begin the long hike back home.

Of course, most could not have afforded the maintenance of two households, now that they had no incomes, and could only think of going back home to save on expenses. That the workers could not hold on for even a month without income speaks of the precarious nature of their income, and points to the small differences in wages rates that attract blue collar and informal sector migration.

It was only much later that the government could even think of allowing rations to be drawn by migrant workers, or even of food packets for them. NGOs and do-gooders, some restaurant owners, in a large measure took care of the migrant workers food needs along their arduous hike routes, often when under attack of insensitive policemen. In the decision maker's mind-space there is no place to understand the life of a migrant workers. The lifestyle of the urban middle-class formal employee, or one with fixed contracts, or the urban shopkeeper with his home close by are the only "models" they harbor. Actually, Hawking by people who come from far and stay in hovels, or return back to cheaper locations is very large especially in the larger cities.

#### Simultaneous Demand and Supply Shock

The COVID Crisis even early on was realized to be different from the GFC. It was there everywhere in a matter of months, and lockdowns or restrictions of some kind were in place almost universally except in China. That significant production would be lost was obvious. In India given the severity and the total aspect of the lockdowns production was expected to suffer even more. Production restrictions in the rest of the world can clearly be expected to manifest itself in falling demand operating through the exports of goods and services, and this is true for all countries, so that the demand effects were to be a minimum of 15%<sup>4</sup> and most likely at double this level, given the feedback effects. However, unlike the GFC, the uncertainty was not quite fundamental, since the impact of the virus on human lives was miniscule and not enough to affect production had it been spread uniformly over a couple of years (that the pandemic was expected to last). But pandemics are never uniform and their bunching with a Verhulst expansion (exponential growth and decline as immunity builds up) results in overcrowding of facilities, and many deaths happening together. The lockdowns and restrictions, are necessitated by a society that lives in the media, because otherwise governments would be seen to be doing nothing or to be "killers". Thus, emotive and hasty reactions are inevitable anywhere, as well as panic reactions too in the face of uncertainty. In India it was imperative for the government to be seen to be doing something, and the severe lockdowns pacified the middle classes whose weight in public opinion is all too often out of proportion to their numbers. Hence the output over much more than a quarter was expected to be nearly lost.

It is to the credit of the government that the summer harvest went almost as usual with no interruptions so that storable products – grains, potatoes, and such commodities were unaffected.

<sup>4</sup> On account of 2 months production losses, and with a multiplier of 2, around 30%.

The movement from the farms to the granaries was smooth and without interruptions. Meats, and vegetables suffered, but in emergencies most Indians can make the quick transition to living off staples with very little vegetables, and meats to go by. Milk production too was unaffected with the dairies, led by Amul showing the way. There was not even one day when milk was not available in most Indian towns and habitats. It was only to be expected that the fracture in supply chains on vegetables would drive a local (urban) inflation and that too only temporarily. The shut down on of travel, hotels and tourism was nearly total all over the world. In India the share of these sectors is significantly lower. So had the lockdowns not been severe and of the nearly total type the impact due to the supply disruptions in a more scientific and coordinated approach to the COVID crisis could have been expected to be lower.

#### Infection Patterns

The rise in infections follows the standard Verhulst pattern of growth and then decline. However mutant variations could create secondary waves. In India the original seeding was in Delhi, Mumbai and Kerala, and possibly in Ahmedabad and Pune, from where the spread would have taken place. The Indian population is sharply divided into class groups that cross interact only in a limited way, and social greetings involve minimal touch, and the use of public transport except in Delhi and Mumbai is minimal by people coming in from abroad. Contact tracing in the initial days rather than complete lockdowns, with personal and para-transport being kept open would have worked to slow down the growth to a rate that was manageable by the medical system. The data on Indian infections even as late as October of 2020 did not show the pattern of a decline in the rate of growth of the cases, suggesting that the period of seeding of different weakly interacting populations would go on in a phased-out manner than all together as smaller countries and those with interactive population would show.

First would be the urban populations centered around the early infection areas, next the second order towns, and much later would the rural hinterland come to be affected. With the ban on public transport this would surely have been the case. But the permission to hold political meetings and religious gatherings possibly negated all the possible gains in terms of slowing the spread that was won at great cost to the economy, with seeding taking place in the deep hinterland. The fear that the migrating workers would seed rural India very quickly was real then, but with the benefit of hindsight this was not to be, since the movement had happened well before there was a significant prevalence of the virus in the main urban and industrial areas which had attracted the migrants, in the west, north-west and southern parts of India.

From the standpoint of the impact on the overall economy the Crisis and the lockdowns was expected to result in vast cutback of production, fall in exports, and demand constraints forcing closure of many industries involving the gathering of many people in one place -restaurants, travel services, hotels, public entertainment, sporting etc., with the spending multiplier effects. Since the initial impact was both on the supply and on demand the overall impact using standard multiplier models would be problematic. Nevertheless, broad estimates of the overall magnitude of the impact, without any government or central bank response (other than that to shore up the payments mechanism) is necessary to assess the measures, including the stimulus undertaken by the government in conjunction with the central bank. We had earlier brought out that it was the fiscal stimulus of the governments in China and India that allowed these economies to come back on track with almost the same growth rates as before the GFC, and not due to any special nature of these economies.

### Section III: Anticipating the Effects through a Model

Very early, we had used an extended expenditure multiplier approach to assess the likely impact starting from a 15% decline in the exogenous components of demand, including net exports, and with the government spending remaining the same as what was budgeted. This is the base case. Then we considered various possible modifications to the same, such as a fall in autonomous consumption, and various responses of the government. The multipliers were estimated. And the impact of the COVID was estimated as also the fiscal stimulus required to moderate the fall in the GDP. Here we report the results of the analysis.

We start with the standard market clearing equation of income from production being cleared through equality with expenditure:

Thus,  $y = c + i + g + exp - imp$ , where  $y$  is the GDP and  $c, i, g, exp, imp$  are consumption, investment, government expenditure, exports and imports respectively (including of non-factor services), and  $CrT$  the current transfers from abroad.

Now we may write

$exp = X_0$ ,  $i = Z_0$ , and  $g = G_0$  as on the eve of the crisis, obtained from the data.

Similarly,  $imp = M_0 + m \cdot y$ , the standard import demand function, where  $M_0$  is the exogenous term in the estimate for the import function in the year before the COVID (2019-20), assuming that March is normal).  $M_0$  and  $m$  are estimated from the data for the previous 5 years, such that the overall imports are the same as that given by the estimated function for the year 2019-20.

$y_d$ , the disposable income of consumers. And  $y_d = A_0 + b \cdot y_d$ , with the estimates of  $A_0$  and  $b$  being determined by considering the last five years data with the overall consumption expenditure being as on the year before the COVID Crisis.

Now,

$y_d = y + NFI + CrT - depr - i\>t - ct - pt - re$  where  $NFI, CrT, i\>t, ct, pt, re$  are the net factor earnings from abroad, the current transfers from the rest of the world, the indirect business taxes, corporate taxes, personal taxes and retained earnings of corporates. Furthermore, we may write

$$i\>t = b_0 \cdot y$$

$$ct = b_1 \cdot (y - depr - i\>t)$$

$$depr = d \cdot y$$

$$pt = b_2 \cdot (y - i\>t - ct - re) \text{ the assumption being that NFI is not taxed.}$$

$$re = s \cdot (y - depr - i\>t)$$

Putting the values above into equation for disposable income, we get

$$y_d = y \cdot (1 - b_0 - (1 - d - b_2) \cdot (b_1 - b_2 \cdot (b_1 + s) + s) - b_2 \cdot (1 - b_0)) + NFI + CrT$$

$$\text{Renaming } 1 - b_0 - (1 - d - b_2) \cdot (b_1 - b_2 \cdot (b_1 + s) + s) - b_2 \cdot (1 - b_0) = \theta$$

$$c = A_0 + b \cdot \theta \cdot y + b \cdot NFI + b \cdot CrT, \text{ so that}$$

$$y = \left( \frac{c}{1 - b \cdot \theta + m} \right) \cdot [A_0 + b \cdot NFI + b \cdot CrT + G_0 + Z_0 + X_0]; \text{ where the first term is the multiplier.}$$

Since government investment spending is a policy variable while private investments are "exogenous", we separate  $Z_c = Z_{op} + Z_{pg}$  where  $Z_{op}$  and  $Z_{pg}$  are respectively private and public sector capital formation.

The above can be estimated under various assumptions for  $A_z$ ,  $NFI$ ,  $CrT$ ,  $G_c$ ,  $Z_{pg}$ ,  $Z_{op}$  and  $X_c$ , through which the expected shocks would acts on the real sector. The values of  $b$ ,  $b_0$ ,  $b_1$ ,  $b_2$ ,  $s$  and  $d$ , being estimated using the past 5 years data as an average or regression value. Then the exogenous or autonomous variables can be changed under the growth as usual, COVID1, COVID2 and Stimulus cases to both arrive at rough estimates of the expected GDP under various scenarios. The fiscal deficit and other such values can then be calculated for each of the scenarios. Table 2 below reports the value of the parameters used, derived from a variety of approaches that included regression, average values for the previous three years, a previously available value, or value for 2019-20.

Table 2

Table 2. Values of parameters used in a model of demand determination of the short period GDP			
Parameter	Formula /Regression equation	Symbol	Value
Indirect business tax to GDP ratio (average of previous two years)	$ibt/y$	$b_0$	0.0946
Corporate taxes: $((GDP-Depreciation - Indirect Business Taxes)$ [latest available value 2018-19]	$ct/(y - depr - ibt)$	$b_1$	0.0481
Personal income taxes: net/Disposable income of Households before net personal taxes [latest available value 2016-17]	$pt/(y - ibt - ct - re)$	$b_2$	0.0343
Retained earnings of corporates: $(GDP-Depreciation - Indirect Business taxes)$ [latest available value 2018-17]	$re/(y - depr - ibt)$	$s$	0.1147
Marginal propensity to import [Regression estimate based on last 10 years data]	$Imports = M_0 - m \cdot y$	$m$	0.1700
Autonomous imports [Regression estimate based on last 10 years data for marginal propensity]	$Imports = M_0 - m \cdot y$ $M_0$ such that $Imports = \text{value for 2019-20}$	$M_0$	3.804 trillion Rs
Depreciation rate = Consumption of fixed capital /GDP at market prices (average of last three years)	$depr/y$	$d$	0.10
Marginal propensity to consumer [Regression value of last 10 years data]	$\Delta pfc = b \cdot \Delta y_d$ $y_c = y - depr - ibt - ct - pt$ $+ NFI + CrT$	$b$	0.7621
Modifier of consumption propensity	$1 - b_0 - (1 - s - b_2) \cdot \frac{(b_1 - b_2)}{(b_1 + s) + s} - b_2 \cdot (1 - b_0)$	$\theta$	0.7689
Govt (consumption) expenditure: [Value for 2019-20]		$G_0$	23.988 trillion Rs
Autonomous consumption base	Estimated such that estimated GDP is the same as GDP19-20	$A_z$	0.001 trillion Rs
Investment spending [2019-20]	Gross capital formation for 2019-20 (both public and private) of which	$Z_c$	61.590 trillion Rs
	— Public capital expenditure	$Z_{pg}$	36.267 trillion Rs
	— Private capital expenditure	$Z_{op}$	25.323 trillion Rs

Exports	Exports of goods and services for 2019-20	$X_0$	39.011 trillion Rs
Net foreign incomes from abroad	Value for 2019-20	$NFI$	-2.215 trillion Rs
Current transfers from abroad	Value for 2019-20	$CrT$	5.120 trillion Rs

Various simulations and scenarios were considered and the results are reported in the Table 4.

Item 1 of the table refers to the simulation that calibrated the model to determine the autonomous consumption to fit the actual GDP data of 2019-20 (the very quick estimates that was available then from the Centre for Monitoring the Indian Economy (CMIE). Had there been no COVID and the exogenous variables including private investment government capital formation and government consumption expenditure grown at 5% (a reasonable expectation that was close to the budget estimates for 2020-21) the growth would have been 5% and the fiscal deficit within 3.5% -item [2].

Shocks to the system arise from changes in the values of the exogenous variables  $X_0$ ,  $Z_{GP}$ ,  $M_0$ ,  $NFI$ , and  $CrT$  from their expected values had there been no COVID.

Although autonomous consumption is not treated as an exogenous variable, in this case there could be consumption shocks coming from a fall in the consumption function (not induced consumption) as for instance when lockdowns impose wage losses. Autonomous consumption estimate for the base that gave consistent estimates with the data for 2019-20 is given in the Table 3.

Once the income is determined under various scenarios, the fiscal deficit was estimated as the difference between government expenditure (consumption + capital) + Interest payments – taxes collected which could also be estimated as in the table. This would be the fiscal deficit of the center and states put together, and is close to the budget estimates of 2019-20 though not to the revised estimates as they became available much later. The interest payments had to be estimated for 2019-20 based on the data estimated from Public Finance Statistics 2018-19, which was available in the public domain. This was done as a step up in nominal growth, though better estimates could have been done by working with government debt.

### The Stimulus Package

Following the US which announced a stimulus package of about 10% of GDP, government of India too announced measures to address the situation. The US in its announcement had added the credit, direct expenditure and transfer measures together. The government of India claimed a Rs. 20 lakh crore effort to support the economy over the crisis. This would have been some 9.85% of the GDP of 2019-20. The figure of 20 lakh crore is difficult to verify through adding up the individual announcements. We put together all the measures announced over nearly 5 presentations by Ms. Nirmala Sitharaman, the Finance Minister. These are reported in Annex Table 1. We classified the measures into purely policy changes with no immediate effect on either demand, credit or liquidity. These measures could have effects on the potential output raising the same, but since the COVID reduced demand they are not material to the stimulus as such, unless they could spur private investment. Their inclusion in the table is to ensure that we have referred to nearly all the measures announced, including some which had been announced in the budget a wee bit before the COVID crisis happened. The remarks column provides the details of its nature, and possible impact, with quantitative estimates wherever possible. Each measure has been categorized as being either liquidity, credit, or funded fiscal and guarantee, illegitimately adding up all these (as the government did following the US and other countries), since these are very different in their nature and impact,

we could account for a "total" measure of Rs. 22,442 lakh crore or Rs. 22,442 trillion, which is 11% of GDP. The fiscal funded measures were again sub classified into "direct expenditure" and "transfers or subsidies" to people and productive units. The direct fiscal expenditure which we may consider as an expansion in spending due to government expenditure (both investment and consumption of government) amounted to Rs. 1,435 trillion or 0.70% of the economy. The transfer measures were estimated to be Rs. 2,397 or about 1.18% of the economy since the transfer measure would be equivalent to a direct initiating expenditure of the same into the marginal propensity to consume (0.762), the two together constitutes a stimulus of Rs. 3,26 trillion. Distinguishing between capital spending and revenue direct spending for the immediate impact is not necessary since the known larger impact of capital spending would be over a longer period. The dates mentioned in the table are a day following the announcement typically.

We plug the value of the fiscal stimulus into the model for three possible scenarios with respect to COVID. These are negative shocks of 10% (0.90), 15% (0.85) and 20% (0.80) to the exogenous variables, both export and import related, net factor incomes and current transfers from abroad and private investment. Government investment and government final consumption expenditure even without the COVID stimulus is assumed to continue at 1.05 times the level for 2019-20 for 2020-21 the COVID year. With the COVID related stimulus as estimated in the Annex Table 1, the government expenditures rise and so also does the expenditure on account of transfers through a positive policy that raises the consumption function. The results –GDP levels at 2019-20 prices, growth rates, fiscal deficit as % of GDP and overall government expenditure excluding interest payments as a proportion of GDP we give in the table. See Table 3 below for a summary of the measures announced by the government.

Page 8

Table 3: Summary of Measures Announced by the Government and the RBI with their Immediate Expected Impact (Rs in Billion)

Date /Authority	Liquidity Measures	Credit Measures	Fiscal Total Cost	Subsidies and Transfers	Direct Expenditure	Guarantees	Total of Measures
	A	B	C	C(i)	C(ii)	D	A+B+C+D
c. March 24-27 (RBI)	5200						5200
Measures by Government							
c. March 26 2020		40	1797	1797			1837
c. May 13		7400	577	542	35	890	8867
c. May 15		1000	500		500		1500
c. May 16			558	58	500		558
c. May 17		4080	400		400		4480
Grand Total	5200	12520	2832	2397	1435	890	22442
Total as % to GDP	2.35%	6.14%	1.88%	1.18%	0.70%	0.44%	11.00%

NB: Pure policy measures, and others like moratorium on loans (while they would have credit /income implications) are not covered here. See Annex Table 1 for details.

#### Impact

We also report the simulations for a 1, 2, 3 and 4% fiscal stimulus in terms of direct expenditures or its equivalent. See Table 4 below:

Table 4: A Simulation of the Economy under Various Level of Shocks, and Fiscal Stimuli

Item	Shock level on exogenous variables	Fiscal stimulus (% of GDP 2019-20)	Fiscal factor (Ratio in 20-21 to 19-20)	GDP at 2019-20 prices (Rs. trillion)	Nominal GDP rate over 2019-20 (% pa)	Real GDP growth rate over 2019-20 (% pa)	Fiscal deficit (% to GDP)	Government expenditure excl. interest (% to GDP)
<i>2019-20 Base Year (Pre COVID -in Simulation and calibration)</i>								
1			1	203.847	7.45	4.00	3.50	18.50
<i>2020-21 without COVID assuming</i>								
2		0.00	1.050	214.040	9.50	5.00	3.88	18.50
<i>2020-21 with COVID Shocks at various levels</i>								
3	0.90	0.0	1.050	192.846	-0.90	-5.40	6.51	20.34
4	0.85	0.0	1.050	185.781	-4.36	-8.86	7.52	21.32
5	0.80	0.0	1.050	178.716	-7.83	-12.33	8.61	22.16
<i>2020-21 with COVID shocks at various levels, and various levels of fiscal stimulus</i>								
6	0.90	1.0	1.104	196.226	0.76	-3.74	7.40	21.22
7	0.85	1.0	1.104	189.161	-2.70	-7.20	8.42	22.02
8	0.80	1.0	1.104	182.097	-6.17	-10.67	9.53	22.87
9	0.90	2.0	1.158	199.606	2.42	-2.08	8.25	21.88
10	0.85	2.0	1.158	192.542	-1.05	-5.55	9.29	22.69
11	0.80	2.0	1.158	185.477	-4.51	-9.01	10.41	23.55
12	0.90	3.0	1.212	202.987	4.08	-0.42	9.08	21.52
13	0.85	3.0	1.212	195.922	0.61	-3.89	10.13	22.34
14	0.80	3.0	1.212	188.857	-2.85	-7.35	11.26	23.21
15	0.90	4.0	1.266	206.367	5.74	1.24	8.88	23.14
16	0.85	4.0	1.266	199.303	2.27	-2.23	10.94	23.96
17	0.80	4.0	1.266	192.238	-1.20	-5.70	12.08	24.94
<i>2020-21 with COVID shocks at various levels and the actual response of the government in 5 "tranches" considered together</i>								
18	0.90	1.6	1.138	196.251	1.75	-2.75	7.91	21.62
19	0.85	1.6	1.138	191.167	-1.71	-6.21	8.95	22.42
20	0.80	1.6	1.138	184.122	-5.18	-9.68	10.06	23.28

Without fiscal stimulus the economy would most probably have declined by over 10% most probably by 12% or so since the effect of the COVID on the economy was most severe in India, due to the near totality of the lockdowns, the migration of workers which was expected to delay restarting etc. Elsewhere the simulation based on a negative shock of 15% on the exogenous variables would have been the most expected impact. The stimulus as it unfolded amounted to 1.6% of GDP much lower than the immediate requirement of 2% that I had estimated with the first impact being expected to be no more than a negative 10% shock (assuming the loss of a month of output). But as it soon became apparent that the economy had to face a more protracted and dysfunctional lockdown making it reasonable to assume a COVID negative shock of between 15 and 20%, closer to the latter. Thus, then

without the fiscal measures the economy would have declined by 12.3% and with the measures it was expected to decline by between 5.21 and 9.68 %, and closer to the latter say 9%.<sup>7</sup>

The government's measures over the first round in March were modest but addressed the poor, women, senior citizens, farmers etc. with largely transfers of around Rs. 1.79,700. In the subsequent three rounds amount of around Rs. 50,000 were announced and it was only in the last round (two months after the crisis) that the MGNREGS enhancement of Rs. 40000 crore announced. It had in the budget of 2020-21 reduced the MGNREGS allocations by nearly Rs. 9500 crore to Rs. 61,500 crore. The MGNREGS which had been put in place over the previous decade or more was a set programme helping to mitigate rural distress, and had performed very well during the global financial crisis.

Measures of direct cash transfer would be equally effective as the MGNREGS. However, those announced on 13<sup>th</sup> May which were essentially in the nature of support to capital formation would have been constrained by demand and (or) delayed in the realization of expenditures. See items 56, 58 to 63 and 66). However, we have included the same in the fiscal stimulus. The government announced various credit measures to help smaller businesses items 37 to 39, which while very important in allowing the units to survive the crisis, should not be considered as part of the stimulus (spending) acting to enhance demand.

Clearly much larger fiscal stimulus would have been necessary to keep the decline to under 6%. A stimulus of 4% of GDP given early was amply justified. It would have raised the fiscal deficit to a manageable 12% of GDP, which would have fallen sharply as well once the economy bounced back with a growth next year 2021-22 so as to rise at 5%-10% over the pre-COVID level.

#### RBI's Response

The measures by the RBI were quick and served to hold the financial sector in place and prevent illiquidity and temporary shortage of demand (stoppage of revenue flow) due to the lock downs and the demand for certain services – such as hotels and restaurants, travel services, theatres, malls, etc. from having a cascading effect. It boldly cut the repo rate by 75 basis points to a low 4.4% which was "real" since repos were available on tap. It reduced the reverse repo by 90 basis points to 4%, to disincentivize the banks from taking recourse to the reverse repo instead of deploying the same to support businesses. Along with that the MSF rate was reduced to 4.65%. The repo windows were also opened wide, unlike in the past, so that now the low-end bond yields were below the repo and close to the reverse repo as the system was awash with liquidity.

Instead of merely dealing at the short end of the market, the RBI used Targeted Long-Term Repo Operations (TLTRO) of nearly Rs. 1 trillion, for up to three years to bring down the yields in the mid-maturity bonds including that of the corporate triple A rated bonds. A measure similar to this should have come during the NBFC crisis! The reduction in the CRR by a good 1% (from 4 to 3%) had the potential to greatly increase the money multiplier, one the credit flow and purchase of securities and bonds of business began. The minimum required CRR reduced from 90% to 80% for three months to reduce the matching of reserves to deposits/ loans. Actually, this measure that creates the control over money rather cumbersome, could have been avoided and replaced with much larger TLTRO and larger repo operations and lower rates, and open market operations. Deferments of the order of 3 months in case of loans, and other payments due to banks were allowed and these measures were very significant in helping especially worthy businesses to tide over the crisis. The quantum of TLTRO

<sup>7</sup> As it happened and as the data became available the economy was estimated to have shrunk by 8%. But these are the early estimates, and revision in either direction is possible. Our own simulations are based on considering the month of March of 2019-20 as a normal month, and since the growth reported in 2020-21 is over a year that had March as a weak month, some discrepancy with the reported growth being somewhat better is likely.

was Rs. 1.00 lakh crore. The reduction in the CRR was from 4 to 3%, though the money creation would have been less than the implied by 3% rate since the money multiplier would have fallen in the circumstance of high-risk perception by banks and FIs. The borrowing limit for the MSF itself was raised from the usual 2% of SLR securities held to 3%.

Most of the other measures amounted to moratorium related. In quantitative terms the total implied liquidity creation (actually potential) was Rs. 3.94 lakh crore, and the credit potential was Rs. 5,458 lakh crore. Guarantees of various types mostly initiated by the government amounted to another 1,790 lakh crore. See Annex Table 1 for the details of the measures and the comments on each of the measures.

## Section IV: Stock Market Performance and Discount Rates

One of the important issues raised in the media, and of concern to policymakers as well is the performance of the stock market. Stock markets all over the world zoomed after end March having fallen to their lowest level c. March 23 in nearly all emerging markets. Almost immediately thereafter and almost with a week of the fall most stocks began to recover with rapidity and with few breaks reached very high levels even surpassing the pre-COVID levels by a wide margin. The Indian market even more than other emerging country markets seemed overvalued in the analysis of many.

However, the rise of the market can to a large extent be accounted for the sharp fall in the discount rates. In the Indian case since the economy from mid-2018 onwards until the start of the COVID, may have been depressed due to high discount rates and to low earnings growth in the face of rather tight monetary policy that we saw with hardly a break from almost 2011-12 which had killed the capital cycle as we had argued in Morris, Sebastian (2020). Since 2019 after Mr. Shaktikanta Das became the new RBI governor, the implicit liquidity rationing (in the low end bond yields being above the repo) was no longer there, and the effective rates began to come down. With the COVID Crisis the RBI came out to expand liquidity and lower rates decisively. It also used TLTROs to lower the divergence between yields of corporate and government bonds. These brought the discounting rates down.

Globally, in the US the injection of liquidity was stupendous and the yields on longer term government bonds could be halved. These are relevant since lower yields in the US *ceteris paribus* would drive capital flows outwards to other countries including into India. As India also lowered playing its role as an important moderately sized economy, both the domestic yields and the US yields would affect the valuation of stocks. Approximately 40% of the stock of the NSE listed companies that was in float was held by foreign investors as on 30<sup>th</sup> June 2019.<sup>8</sup> Hence it would be more appropriate to consider the effect of interest rate (yield changes) in the US markets not only through the impact such changes would have on capital flows but also in itself.

### Model to Explain Stock Valuation

We considered a model in which the 1-yr 5-yr and 10-yr bond yields in both the US and India, and the corporate AAA yields in India (S rates) were used together in a factor analysis to extract the three top components (PC1, PC2 and PC3). Similarly, the growth in the Indian economy was proxied by one factor (PC1\_G) extracted from growth rate of exports, imports and index of industrial production.

<sup>8</sup> On this day the Foreign Portfolio Investment (FPI) holdings amounted to 19.62 % of the market cap and 23.18% of the free float, (p. 40 of NSFI database (2019)). This amounted to Rs 29.36 lakh crore, well above 10% of India's GDP.

Since in a valuation of stock takes place over a time horizon of the discounted earnings at these discount and growth factors, a direct regression of the market capitalization on these variables is appropriate. The exchange rate would be important for the foreign investors. We have used the same as it is rather than work out the depreciation, since it is the level that would influence the valuation for foreign investors. We have also used the square of the discount rate factors, since in a model of finite horizon valuation the exponential of the (growth-discount) X horizon can be replaced by its Taylor approximation to three terms and the result would include square terms in the discount rate. Interaction factors have not been considered, since the object is not to make a forecast of the market capitalization as much as to argue that the fall in the discount rates and the current growth of the economy accounts for much of the market capitalization.<sup>3</sup>

Monthly data covering the period from around 1999 was used with some data points missing. The data was sourced from the Federal Reserve Data (FRED) and from the CMIE. The results are reported in the Table 5 below.

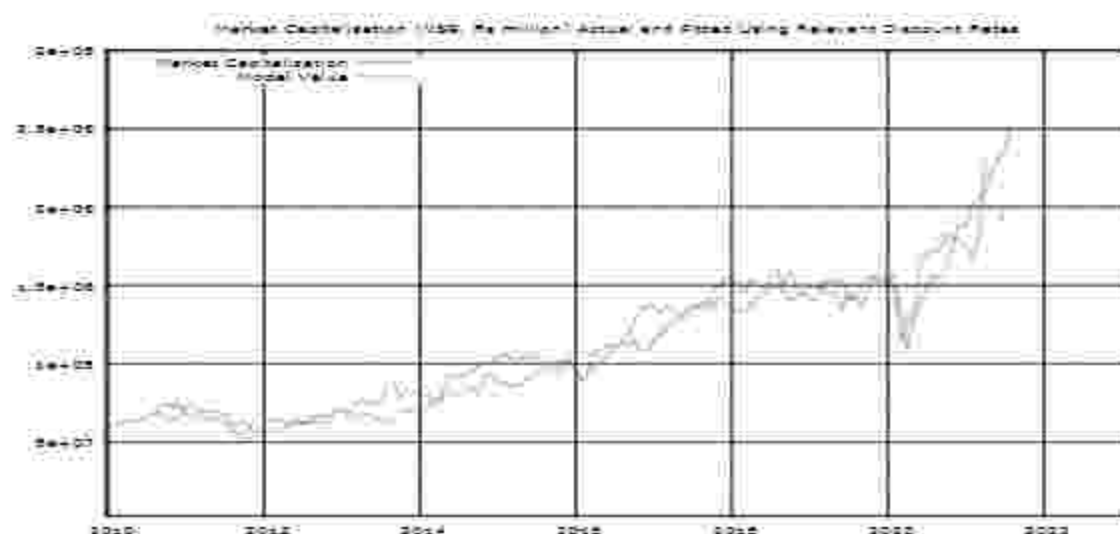
Page 3

Table 5: Regression Results - Market Capitalization of the National Stock Exchange (NSE) (CMIE) on Certain Variables Reflecting Discount Rates, Exchange Rate and Growth of the Economy					
	Coefficient	Std. Error	t-ratio	P-value	Sign.
Constant	-1.29E+07	1.51E+07	-0.86	0.3939	
PC1	-5.28E+06	8.16E+05	-7.69	3.84E-12	***
PC2	1.13E+07	1.51E+06	7.45	1.42E-11	***
PC3	8.08E+05	1.11E+06	-3.83	0.0002	***
Exchange rate	1.95E+06	2.40E+05	8.11	4.07E-13	***
PC1_G	4.83E+06	7.26E+05	6.66	7.88E-10	***
PC1 <sup>2</sup>	1.06E+06	1.27E+05	4.69	7.11E-06	***
PC2 <sup>2</sup>	-5.20E+05	7.05E+05	-0.74	0.4625	
PC3 <sup>2</sup>	-2.47E+06	1.30E+06	-1.90	0.0601	*
PC1_G <sup>2</sup>	2.34E+04	7.70E+04	0.30	0.7618	
Mean dependent variable	1.09E+08 S.D. dependent var			41869524	
Sum squared residues	2.28E+16 S.E. of regression			13568460	
R-squared	0.902088 Adjusted R-squared			0.894981	
F(9, 124)	126.938 P-value(F)			3.46E-58	
log-likelihood	-2385.658 Akaike criterion			4791.316	
Schwarz criterion	4820.295 Hannan-Quinn			4803.092	

Observe that the fit is good and all factors are as expected with the model being able to explain as much as 89% of the variation in the market capitalization. We may also infer the same from the graphs of the fitted value of the market capitalization considered alongside the actual values. See Figure 1.

<sup>3</sup> Besides these, other factors that anticipate the better environment for investment and growth in manufacturing in India due to the China plus factor and improvement in the investment climate would also have been expected by the market.

Figure 1



### Cost and Return Structure of Corporates

Besides change in valuation of the same earnings driving the price of stock, reductions in the tax and the interest share of earnings could also increase the price of stocks, and hence of the market capitalization. Observe first that while the growth (over 8 quarters before COVID) in profit before depreciation, interest and tax had grown in a wavering manner, and had declined to negative rates in the immediate pre-COVID quarters. Similarly post COVID the profit after tax (4 quarter average) grew much more rapidly than before. The share of interest has gone down in PBDIT due the lowering of rates which would have brought down the cost of borrowing. The share of taxes in PBT has also gone down post COVID. During the COVID quarters the profit being small, the share of taxes would balloon given Minimum Alternative Tax (MAT) and because the Indian tax regime is not strictly a fixed proportion of the PBT, there being exemptions as well. See Table 6.

Table 6

	Interest Share in PBDIT	Depreciation Share in PBDIT	Other Provisions Share	Share of PBT in PBDIT	Share of Tax Provision in PBT	Share of PAT in PBT	Share of PAT(Net of Provisions and Extraordinary Items) in PBT	Growth rate of PBDIT	Growth rate of PBT	Growth rate of 4-quarter moving Avg. of PAT
2018:1	24.2	29.0	2.0	48.7	48.7	49.9	108.4	4.0	2.7	-10.5
2018:2	17.9	21.7	0.4	60.4	33.0	66.8	64.6	30.3	48.4	15.0
2018:3	20.3	24.0	0.5	55.6	36.0	64.1	71.1	20.7	33.5	18.8
2018:4	19.4	24.7	0.5	56.0	32.3	67.4	67.8	4.7	1.4	25.2
2019:1	22.0	28.2	5.0	49.8	26.9	73.5	82.7	14.8	21.3	20.9
2019:2	19.8	26.9	0.1	53.3	31.7	68.2	70.2	-1.1	-13.6	6.1
2019:3	32.2	43.9	3.8	23.9	103.7	-4.0	200.8	-38.6	-123.1	-20.7
2019:4	21.6	30.6	0.5	47.5	31.3	68.4	75.0	-2.4	-18.8	-37.0
2020:1	41.0	53.6	3.8	5.1	305.3	-204.0	575.7	-48.3	-274.5	-82.9

2020-2	38.2	52.0	1.3	9.9	133.7	-37.4	312.8	-61.4	-230.1	-155.7
2020-3	17.8	26.4	0.7	55.8	23.0	75.2	68.9	51.8	137.6	-37.0
2020-4	16.6	25.5	1.1	57.8	27.3	72.3	78.7	20.8	40.6	35.4
2021-1	13.7	22.0	0.4	64.3	24.2	75.8	70.1	91.3	343.9	197.6
2021-2	11.7	22.3	0.1	68.0	25.0	75.0	73.3	28.7	218.7	105.9
Average (2018-1 to 2019-4)	22.2	28.6	1.6	49.2	43.0	56.8	92.3	4.1	-6.0	2.4
Average (2020-1 to 2020-2)	39.6	52.9	3.5	7.5	219.3	-120.7	444.2	-54.8	-252.3	-119.3
Average (2020-3 to 2021-2)	15.0	24.1	0.6	61.0	24.9	74.6	72.8	48.7	185.2	71.5

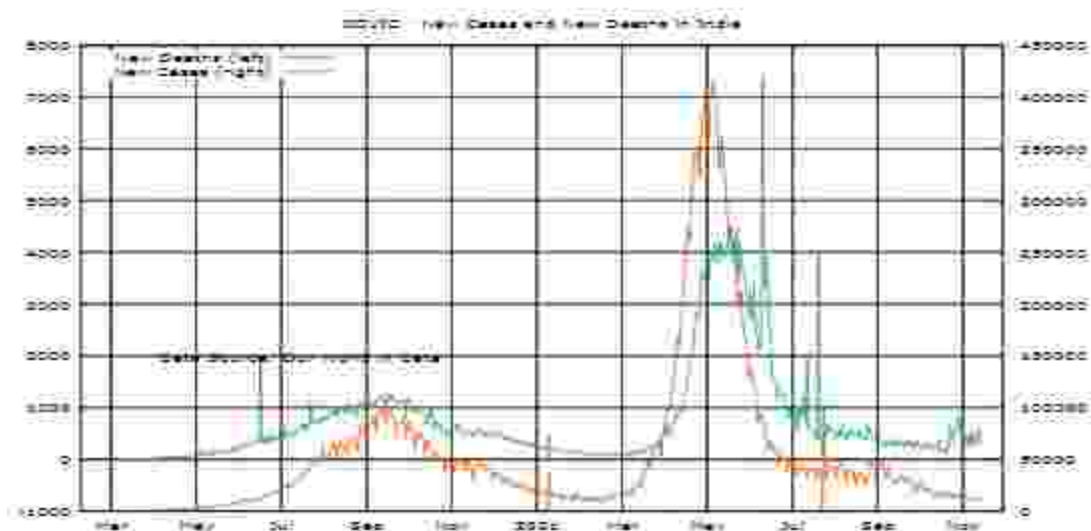
## Section V: Experience of the Recovery

### GDP and GVA Over the Crisis and Recovery

The pandemic's impact was extended over two quarters in a severe way due to the nature of the lockdowns as mentioned before. Observe from Table 7 that the real GDP over the first two quarter of FY 2020-21 fell to Rs. 26.95 and 32.97 trillion in 2011-12 prices from 35+ levels in the same quarter previously giving a YOY growth rates of -28.01 and -7.73. In the second quarter the COVID continued to rage but the lockdowns were less severe and so output fell only by 7.73%. The remaining two quarters of FY 2020-21 were muted with growth of 0.46 and 1.63% over the same quarters in the previous year. The sharp rise of 18.34% in the first quarter of 2021-22 is misleading since the YOY growth is over the first quarter of FY2020-21 which was the worst COVID quarter as we saw before. The recovery in GDP by the first quarter of FY2021-22 still is nevertheless less than for the same quarter in FY2019-20. Indeed at 32.68 versus 35.67 it is almost 9% below! Thus the recovery as revealed by the GDP is modest and so date had not taken the GDP to levels reached before the COVID.

The third wave of the COVID which saw heightened numbers of deaths in the 1<sup>st</sup> and 2<sup>nd</sup> quarters of 2021, (see Figure 2.) and hence the recovery could have been muted due to both lack of demand and the impact of the lockdowns which were so far less dysfunctional with most productive facilities being open though the options for sale were limited. Agriculture output was not expected to be affected, and as such it makes sense to look at the non agricultural GVA. It fell sharper by 30.71 % in the first COVID quarter. And as is to be expected the bounce back was also sharper, but the absolute values till 2021-2 were still lower than values of the corresponding quarters pre COVID, even two years earlier.

Figure 2



Observe also that the decline in manufacturing GDP is the sharpest, and its recovery also quicker as is to be expected. The figures for the rolling one year growth (YOY) show that by 2021:2 the economy other than agriculture had made a modest turn to a positive growth. The YOY for the year as a whole -7.16 and quarter of 2021:2 is still more than 10% points below its level in 2019; it would take a quarter more i.e. only by 2021:3 would GDP on a rolling year basis have caught up with its previous highest level which was in the immediate pre-COVID quarter. See Table 7.

Table 7

Trajectory of GDP11-12 (at Constant 11-12 Prices, Rs. Trillion) and its Main Components Over COVID 19 and Recovery

Year	GDP	GVA	GVA Agriculture	GVA Industry	GVA Services	GVA Non-Agriculture	GVA Non-Agr (Rolling 4 quarters)	YOY Growth Rates (% per annum)							
								GDP	GVA	GVA Agriculture	GVA Industry	GVA Services	GVA Non-Agriculture	GVA Non-Agr (Rolling 4 quarters)	GVA Non-Agr (Growth Rates FY over Previous 4 FY)
2017:01	32.38	29.02	4.50	9.39	15.02	24.42	95.02	5.10	6.61	7.32	5.77	6.74	6.37	7.57	
2017:02	31.46	28.38	4.43	9.01	14.94	24.28	97.18	5.93	4.88	5.81	-0.21	7.51	4.69	6.61	
2017:03	31.97	29.47	4.49	9.19	16.79	25.98	98.50	8.18	5.39	6.57	6.48	4.57	5.23	5.85	
2017:04	32.85	30.33	4.81	9.38	16.14	24.52	100.16	6.46	6.71	6.67	7.15	6.37	6.97	5.79	
2018:01	35.16	31.17	4.97	10.19	15.91	26.20	101.94	8.56	7.14	7.55	9.09	5.77	7.06	5.98	6.06
2018:02	33.84	31.49	4.35	9.74	17.40	27.14	103.84	7.19	6.64	5.08	7.81	6.91	7.24	6.63	
2018:03	34.05	31.28	3.66	9.58	17.98	27.63	105.40	8.19	6.00	4.70	8.93	6.35	5.17	5.35	
2018:04	34.98	31.96	5.92	9.77	16.28	26.04	107.02	6.14	5.28	1.86	5.14	6.59	6.04	6.68	
2019:01	37.11	32.70	4.84	10.61	17.15	27.76	108.57	5.68	4.80	-0.43	3.07	7.47	5.76	6.30	6.60
2019:02	35.67	33:05	6.49	9.30	18.66	28.56	109.99	9.13	4.64	3.19	1.67	6.95	5.09	5.75	
2019:03	35.62	32.71	3.79	9.48	19.45	28.93	111.28	4.50	4.46	3.46	-1.80	7.85	4.59	5.35	
2019:04	36.08	33:05	6.12	9.52	17.41	26.62	112.17	3.13	3.94	3.36	-2.60	6.73	3.33	4.70	
2020:01	33.33	33:90	5.26	10.38	18.24	28.62	113.03	1.96	3.60	6.59	-2.20	6.18	3.06	4.02	4.95
2020:02	26.95	25.66	4.65	6.35	14.65	21.01	105.48	-28.01	-25.31	3.47	-44.37	-24.16	-30.71	-4.19	
2020:03	32.37	30.32	3.90	9.10	17.22	26.42	102.97	-7.73	-7.59	2.99	-3.04	-12.14	-9.06	-7.77	
2020:04	36.14	33:39	6.40	9.79	17.20	26.99	103.04	0.46	-1.05	4.43	2.67	-1.71	0.25	-8.49	
2021:01	33.98	35.16	5.45	11.20	18.62	29.71	104.13	1.63	3.65	3.06	7.63	1.49	3.76	-8.20	-7.16
2021:02	32.38	30.48	4.86	9.19	16.33	25.61	106.74	-18.34	-21.20	4.42	37.34	10.82	19.82	3.05	-10.85*

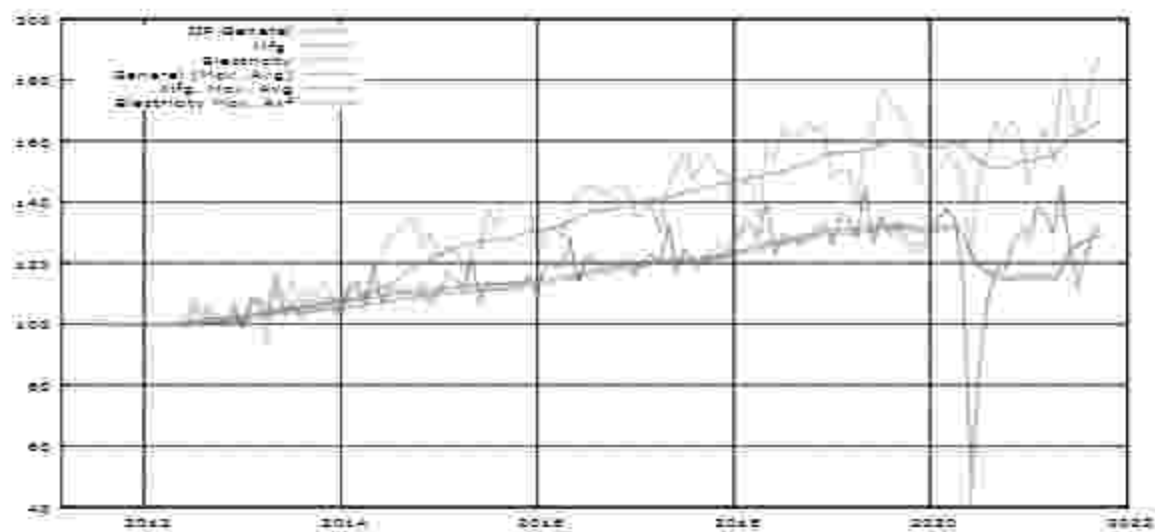
\*YoY in relation to two years before

### Index of Industrial Production

We now use monthly data to build a picture of the COVID and its recovery in the Industrial sector. Instead of computing growth rates which are confusing given the (low) base effect of the bounce back, we consider the rolling (moving average value) of many variables or the log of the same. The seasonality is removed over a 12-period average, and the absolute values on a log scale would work. In some cases, the absolute values are not given on a log scale, when the same reduces the visual range of movement. When the rolling value crosses the previous high then we are sure the recovery has been full. The slope of the line can sense to give an idea of the speed of recovery that is not so deeply subject to the base effect. When the rolling value on a log scale shows a slope that is about the same as before the COVID, or the trend is inferred to be higher after crossing the pre COVID value, then we know that the series in question has actually improved its growth over the pre COVID period. Had we waited till the bounce back period was over we could have used the usual YoY growth rates, and seen them after the bounce back over a few months move on to their new trend growth rates.

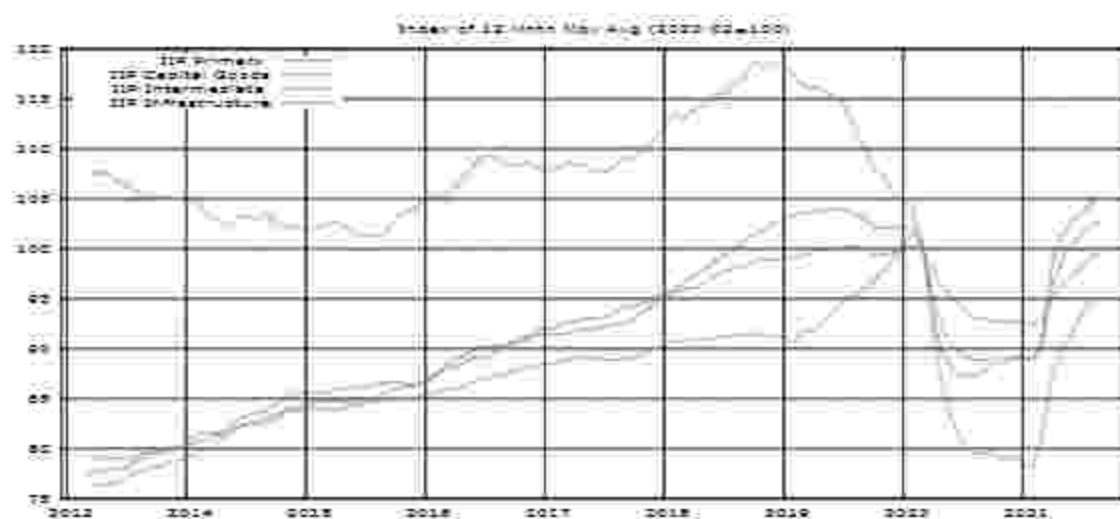
Observe from Figure 3 that electricity production has almost fully recovered and is on the path of its original trend of growth (it had seen a stagnation over the period from 2019 onwards). However, IIP General and Manufacturing which had stagnated from 2019, is a wee bit short of its pre-COVID level, and would take some more months before it reaches its trend level of about 135. The second wave of the COVID which began in mid-June 2021 has clearly affected the speed of recovery and from September onwards the recovery should be very fast to make up for the loss during the second wave. The second wave did not see the dysfunctional lockdowns that the early first wave saw, hence we do not see a deep decline on average, even though there was a decline during the second wave.

Figure 3



Observe from Figure 4 that the capital goods sector declined most and the recovery too has taken it to levels much short of the pre-COVID level not to speak of the trend level had there been no COVID. It is only in the case of infrastructure and intermediate goods that the pre-COVID level had been crossed, with only infrastructure having reached its trend level. Primary goods has just reached the pre-COVID level.

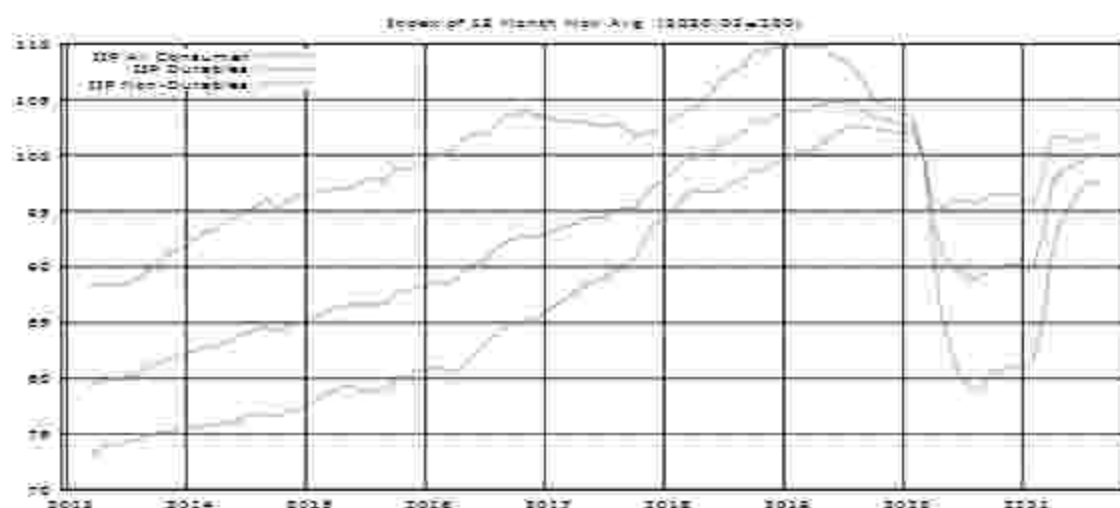
Figure 4



In this figure we have re-indexed the moving average values to 2020:02=100. Capital goods were 5 % below the immediate pre-COVID level 18 months after the start of the COVID. Thus, the beginning of the long delayed investment cycle was not as yet evident from the data till October 2021.

Observe from Figure 5 that Consumer Durables unlike Non-Durables had dipped steeply during the COVID Crisis (discretionary spending being put off during a crisis), but has not bounced back till October 2021. There is still a distance of around 2.5 % with reference to the rolling annual average as end March 2020, and at least an additional gap of 5% to reach the trend level implied by the average growth over the period from 2012:04 onwards. However, it is also useful to remember that as brought out in Morris, Sebastian (2020), Consumer Durables had fallen sharply over the immediate pre COVID period for a variety of reasons, including the vast uncertainties let loose on the automobile markets. Non-Durables have almost reached their pre COVID values but there is still some distance to get back to the trend.

Figure 5



### Industry Wise Recovery

A more detailed segment wise consideration of the recovery trajectory is given in Annex Table 2. The most relevant rows are the last two which bring out the recovery rate and the original trend growth rate over the period 2012:04 to 2020:03 which is the pre-COVID period. The recovery is over the period 2020:10 to 2021:09 i.e. for the latest available year. These have been compared to the previous non-COVID full year that one could legitimately consider which is 2019:04 to 2019:09 and 2019:10 to 2020:03, so that seasonal factors are not intrusive. We may think of the same as a rolling year to rolling previous year. The growth measure is log of (average values over the recovery/average values over the previous non-COVID year). The trend growth rate is estimated by regressions of the log of the deseasonalized monthly values of IIPs, with the estimated coefficient multiplied by 12 to be the trend growth rate in the pre COVID period from 2012:04 to 2020:03. The table also reports various quarterly average values over the COVID and the recovery. The months of 2020:04, 05 and 06 are taken together as the COVID quarter. Nearly all pre COVID trend growth were significant.

For convenience we have reported the trend growth rate (2012:04 to 2020:03), growth rate YoY of the Crisis quarters (2020:04 to 2020:06), the recovery over the latest quarter (5<sup>th</sup> quarter since the COVID i.e. from 2021:07 to 2021:09) and the latest full year of recovery (2020:10 to 2021:09) over the same months considered as an average of the previous non COVID Months (2019:04 to 2020:03) which is not YoY but growth over a 1.5 years of rolling years. We could have divided the same by 1.5 years but since the discussion is primarily on getting back to the pre COVID levels, rather on getting back to the trend level we have reported the same as it is. The annualized values of the same after adjusting for the gap of 18 months between the two periods considered are also reported in Table 8. The table brings out trend growth rates prior to COVID, the decline over the COVID quarter (YOY) the 5<sup>th</sup> Quarter (2021:07 to 2021:09) recovery YOY (both annualized and not annualized) and the full rolling year (2020:10 to 2021:09), over previous non COVID full year (2019:04 to 2020:03).

The observations are quite revealing. The manufacturing IIP showed a decline of nearly 26% over the COVID quarters, and in the latest rolling year it shows a recovery 0.2% (non-annualized) over the pre-COVID quarter. The General IIP is slightly better on both counts. The recovery has been positive and over 2% or more (non-annualized) in the case of Food, Chemicals, Pharmaceuticals, Rubber products, Products of basic metal industries, Electrical Equipment, and Other Manufacturing. Of these Pharmaceuticals, Basic Metal Industries had been growing over the period from 2012:04 to the eve of the COVID Crisis. Thus, perhaps there is a new-found dynamism to the Chemical sector that has happened since the COVID, since the COVID recovery has been quite significant and is now above the trend growth rates. Not all sectors that had grown rapidly over the pre-COVID period from 2012:04 onwards (Wearing Apparel, Computers and related Electronic Products, Other Transport Equipment, Furniture, have recovered well. They continue to lag and have not gone anywhere close to their original growth trajectories.

Food had declined by only 16% and has recovered to levels marginally above the pre-COVID levels, but not beverages and tobacco. These are entirely accountable by the nature of demand and the lockdown, with beverages (but not tobacco) being hurt by the fact that it is only recently that restaurants have been open.

Petroleum products and Coke, which reflect the movement in the economy, shows a delayed fall as the refineries began to exceed the stocking capacity, and production today has yet to fully recover.

Besides Beverages and Tobacco, the recovery has been weak in Wearing Apparel, Leather Products (essentially shoes etc.), Printing and Recorded Media, Paper, and Furniture. These are consumer products generally and the fact that they have lagged (the recovery levels are below the pre COVID

year by more than 10% non-annualized), implies that either demand has not come back fully or that there continues to be difficulties in sale and purchase. That schools have opened only recently would have affected the recovery of printed materials.

Among the industries with high pre-COVID growth rates – Wearing Apparel, Pharma, Basic Metal, Other transport equipment, and Furniture – only Pharma and Basic Metals have recovered fully, Furniture and Wearing Apparel being closely related to discretionary consumption has not shown an improvement even to the pre COVID rates, which were all below 1%.

Among those industries which had low or negative growth in the pre-COVID period – Tobacco, Beverages, Paper, Printing, Rubber based, Electrical and Other Mfg.– Electrical and Other manufacturing shows an improvement.

Thus, we can make the conclusion that much of the industrial sector is yet to recover from the COVID Crisis. Rubber, Chemicals, Electrical, and Other manufacturing shows a new dynamism, while Pharma which was dynamic even before continues to be dynamic having more than fully recovered.

The newly dynamic segments warrant further discussion. We believe that there is scattered evidence that in these industries the post COVID scenario of China+, China-E would have helped.

Table 8

	Pre-COVID trend growth rates (1) (%)	Crisis quarter YOY (%) (2)	5th Quarter Recover Y (3)	5th Quarter Recover YOY (4)	Recovery of rolling year ending 2021:09 (5)	Recovery of rolling year ending 2021:09 (annualized) (6)	Average of Pre-COVID rolling year ending 2020:03 (7)	Average of Year ended 2021:03 (8)
Food	2.2%	-16.2%	0.8%	0.4%	-2.0%	1.3%	123.7	126.2
Beverages	0.0%	-32.4%	-13.8%	-6.9%	-19.5%	-13.0%	106.4	87.6
Tobacco	-3.6%	-18.0%	-11.3%	-5.6%	-9.0%	-6.0%	95.4	87.2
Textiles	0.8%	-18.2%	3.8%	1.8%	-1.2%	-0.8%	115.7	114.2
Wearing apparel	8.1%	-51.6%	-27.8%	-13.9%	-27.6%	-18.4%	134.6	117.3
Leather etc.	1.4%	-38.0%	-10.6%	-5.3%	-11.9%	-7.9%	121.7	108.9
Wood etc.	1.6%	-35.9%	-12.1%	-6.0%	-5.6%	-3.8%	113.8	107.6
Paper	-2.0%	-36.4%	-14.9%	-7.5%	-13.0%	-8.7%	90.8	73.8
Printing and recorded media	-1.2%	-36.9%	-23.1%	-11.5%	-26.0%	-17.4%	90.7	69.9
Coke and petroleum	2.9%	-1.7%	-10.2%	-5.1%	-7.2%	-4.8%	126.7	117.8
Chemicals	1.9%	-14.3%	3.4%	1.7%	3.9%	2.6%	118.5	123.2
Pharma	-11.8%	-30.0%	5.0%	2.5%	4.7%	3.1%	215.2	225.5
Rubber	-0.6%	-33.7%	5.5%	2.8%	6.9%	4.6%	100.0	107.1
Non-metallic items	2.5%	-27.1%	3.6%	2.8%	0.8%	0.6%	121.3	122.3
Basic metals	5.1%	-21.4%	8.4%	4.2%	7.1%	4.8%	159.1	170.9
Fabricated	-0.4%	-43.0%	0.1%	0.1%	-2.9%	-1.6%	90.6	88.0
Computers etc.	6.3%	-57.1%	-14.0%	-7.0%	-5.6%	-3.7%	151.0	142.9
Electrical	-1.6%	-41.8%	18.5%	9.2%	5.0%	3.3%	105.2	110.6
Machinery etc.	2.0%	-47.2%	5.2%	2.6%	-0.4%	-0.3%	107.7	107.2
Motor	1.4%	-87.1%	-5.1%	-2.6%	-2.2%	-1.5%	100.2	97.9

Other transport:	5.3%	-12.5%	-12.5%	-6.2%	-9.2%	-6.2%	136.5	124.5
Furniture	9.7%	-28.1%	-21.6%	-10.8%	-22.0%	-14.7%	197.3	158.4
Other	-3.8%	-61.2%	8.7%	-4.4%	-4.0%	2.6%	81.2	84.5
Mfg	3.2%	-25.9%	0.8%	0.4%	0.2%	0.1%	129.5	129.8
IP General	3.4%	-20.7%	2.5%	1.3%	0.8%	0.5%	129.0	130.0

NB:

1 Trend growth rates 2012:Q4 to 2020:Q3 of the de-seasonalised series using ARIMA

2 Crisis quarter YOY (%) (2020:Q3 to 2020:Q6)

3 5th Quarter Recovery YOY2 (not annualized)

4 5th Quarter Recovery YOY2 (annualized)

5 Average of Year 2020:10 to 2021:09 Recovery YOY (1.5) (i.e. over average of (2019:10 to 2020:Q3 and 2019:Q4 to 2019:Q9)

6 Average of Year 2020:10 to 2021:09 Recovery YOY (1.5) (i.e. over average of (2019:10 to 2020:Q3 and 2019:Q4) adjusted for the period difference, (i.e. annualized)

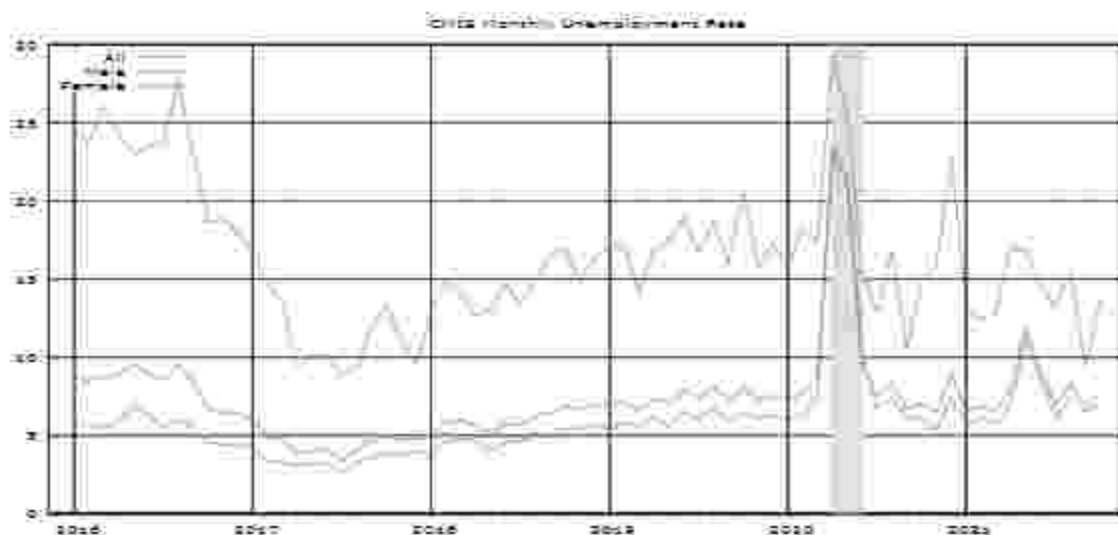
7 Pre-COVID average of 12 months (April 2019 to March 2020)

8 Average over the latest rolling year of recovery since the crisis (2020:10 to 2021:09)

## Employment

The COVID brought about a very sharp rise in the unemployment rates. Female unemployment climbed to almost 29% and male unemployment to 23% before falling off to levels a little higher than their levels prior to the COVID. See Figure 6. Both unemployment rates had been rising since the demonetization to reach levels that were high in the immediate pre-COVID period, and this is particularly true of female unemployment. After the COVID Crisis during the recovery female unemployment fell back to levels lower than just before the COVID. And male unemployment during the recovery reached a level that was a tad higher than before the crisis. However, the unemployment figures are deceptive because in times of severe recessionary stress people especially women drop off the labour force. This is because of the vast disguised unemployment (and disguised employment) that exists. When the probability of finding a job reduces significantly and is expected to remain low, rationality implies that people stop searching for a job and conserve their resources.

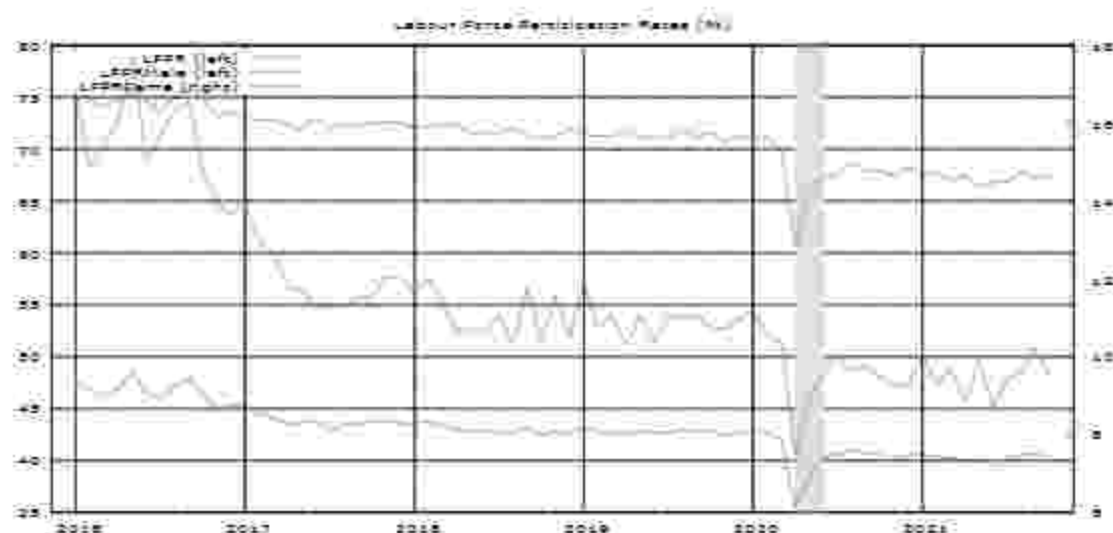
Figure 6



Consider the labour force participation rates (LFPR) brought out in Figure 7. Over the period of stress, from 2017 onwards, both male and female LFPR had fallen, particularly the latter. This could not have

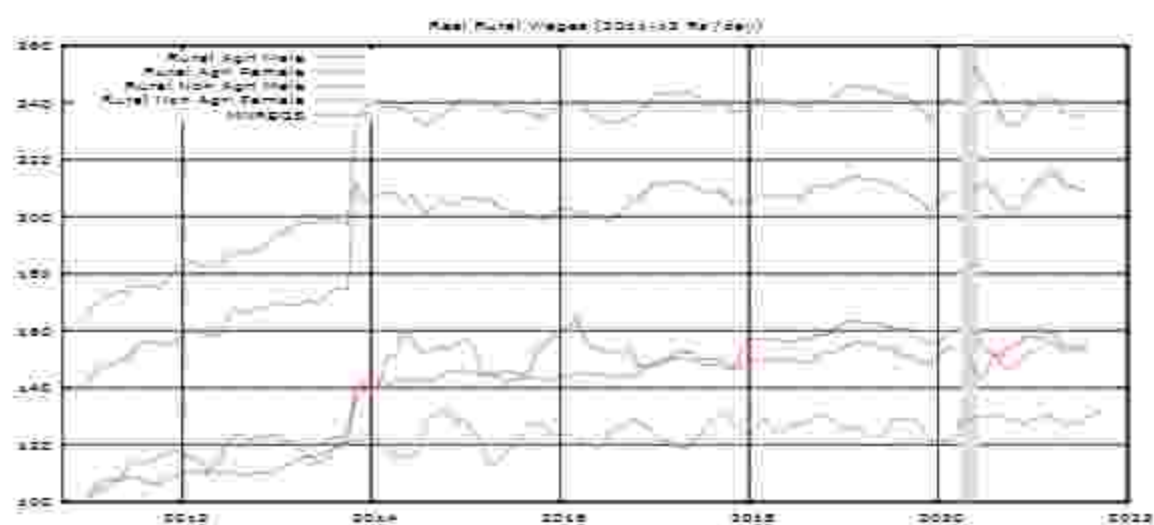
happened because of a “higher reservation wage”, especially from 2015 July when the last minimum wage revision took place (from Rs 137 per day to Rs 160). Earlier there had been a revision in July 2013 which was quite steep from Rs. 115 to 137.<sup>40</sup>

Figure 7



The minimum wages earlier in the 90s had little impact on overall wages, but since the introduction of the MNREGS they should have had a significant impact if the employment under the MNREGS was available on top, by placing a floor on the rural wages. Observe from Figure 8 that the real wages had remained nearly constant from early 2014 onwards. Earlier after the steep rise in the minimum wage announced in July 2013 and implemented a little later, the rural wage both agricultural and non-agricultural had risen, but there was no significant rise due to the increase in minimum wages announced in July 2015. The rural wages both male and female and the MNREGS rates also remained stagnant right from 2014 onwards which coincides with the Modi years.

Figure 8



<sup>40</sup> See ET(2015)

Hence the fall in the LFPR is real due to declining opportunities rather than due to any rise in the reservation wage. The male LFPR fell from 75 c. 2016 to 70% on the eve of the COVID crisis and the recovery has taken it back to only about 67% after it had fallen to a low 61% during the crisis.

The idea of a reservation wage in India with vast disguised unemployment (and disguised employment) is problematic and needs to be treated with caution. It would be very close to the "socially necessary subsistence" levels, and would secularly move up only with the cost of living going up, or what is socially acceptable slowly rises. In the short run though since vast numbers of the working age population are not on the look for jobs, the wages could rise with a tendency to fall back over the short run. Urban non-manual wages could have a reservation wage. Given the "schism" in the labour market, this is unlikely to be the case since the unorganized labour market in urban areas would only have wages that are a little above (to compensate for housing and commuting) the quit rate in rural India, à la Arthur Lewis. (Morris, S. et al 2001)

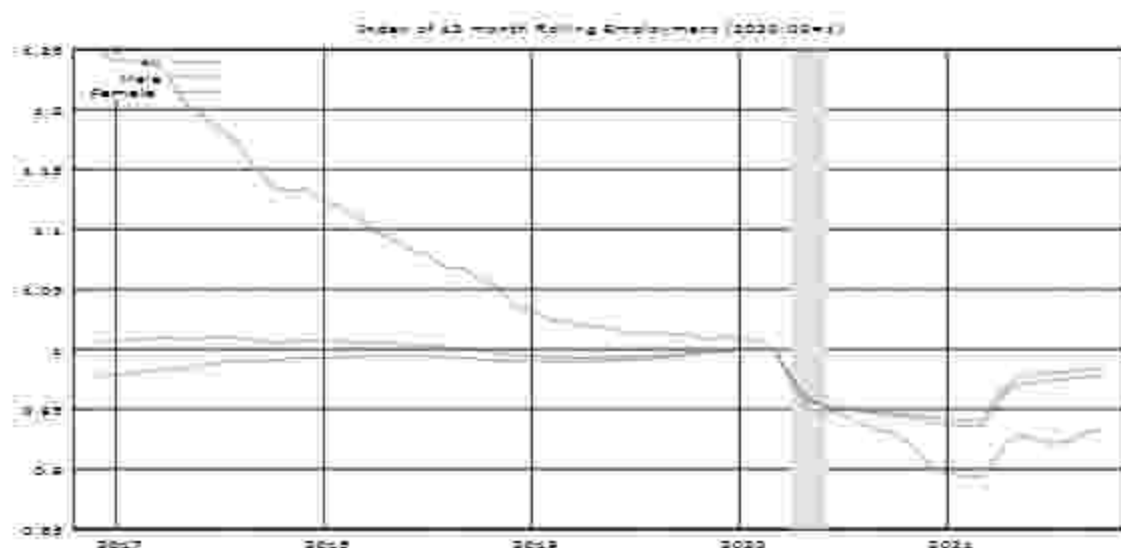
The female LFPR which is known to be abysmal from a level of about 15.5% in 2016 had fallen to a low 11% on the eve of the crisis, dropped to a low 6% before rising to 7.5% after more than a year of recovery).

There has been much discussion on the female work participation rate, which many believe falls with rural "prosperity" as women are drawn back to the home. While this is no doubt true, it is only suggestive of very few job opportunities in rural India which asymmetrically fall on women. At starting levels of income which are unsustainable for rural household in caloric sense, which was the case in the 70s and 80s (in BIMARU India), as wages rose to give caloric "sufficiency" and a little more, women back at home had greater useful value for the family as a whole by withdrawing from the work force, only with the natural desire to come back when wages were above a certain level. That India in large parts of the rural hinterland may not have reached these levels of wages, when women can come back, is quite evident because rural agricultural wages for women remained some 40% lower than that for men and at about Rs 250 per day in 2020:08, in current prices! MGNREGS wages were Rs 220.

Thus, to get a better picture of the employment situation, rather than consider the unemployment rate alone, it is necessary to look at the actual employment levels and the growth rates in the same. The recovery growth rates in employment YoY would be severely affected by the low base during the COVID months hence we work out the employment over a rolling year for each month.

Figure 9 gives the rolling employment (12 month moving average) indexed to 2020:03 (the last month before the COVID Crisis). Observe that over the pre-COVID period female employment had fallen steadily from 2017 with a stagnancy over 2019, while male employment was almost stagnant, having grown by a mere 2.5% or so over the entire period from 2017 to the eve of the COVID. During the COVID period the employment plummeted sharply and the recovery has still not taken it back to the pre-COVID levels, being short from that level by almost 2-2.5%. Thus, the recovery of employment has been significantly delayed, but is in keeping with the recovery as indicated by the Index of Industrial production.

Figure 9



When we consider the actual numbers of employment (average) over various periods, we find that the employment from Mod I to Mod II shows a fall in the overall employment largely due to the sharp fall in the female employment by as much as 5.2 million, and with a rise in male employment by 3.3 million. The COVID quarters saw sharp fall employment both male and female. If we compare the average of the year ending Nov 2021 which was the recovery period, with a period of a full year before the COVID then the loss in employment is of the order of 8.2 million, with the loss in male employment being as high as 5.4 million. Oct 2021 compared to October 2019 the loss is significantly lower so that there is hope that the employment recovery would take place in the coming months. See Table 9.

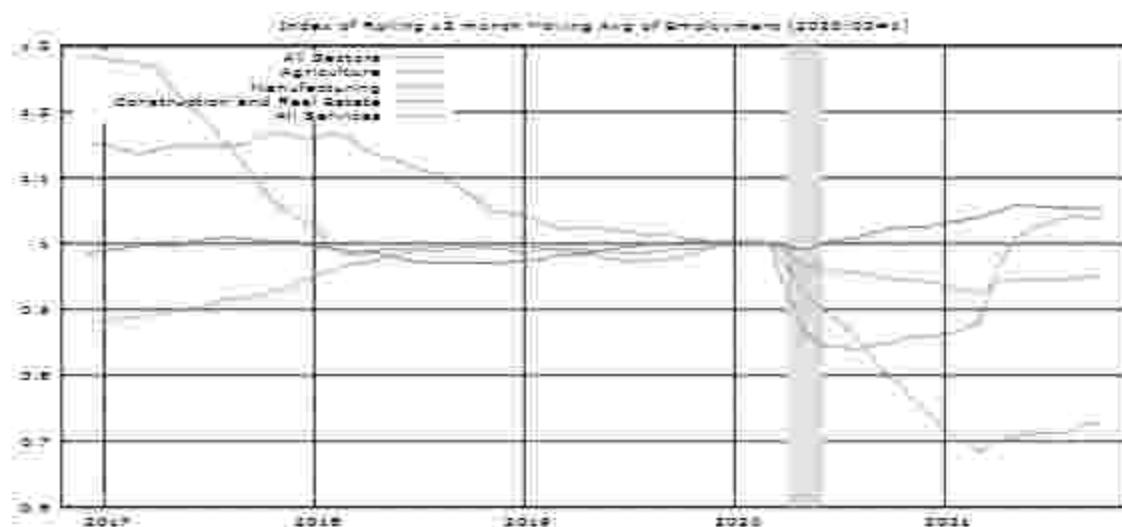
Table 9

Table 9: Employment (Millions) over Various Periods			All	Male	Female
Mod I	2016:01 to 2019:05		404.4	356.0	48.4
Mod II before COVID	2019:06 to 2020:03		403.9	360.7	43.2
COVID quarter	2020:04 to 2020:06		324.3	291.5	32.8
Recovery period	2020:07 to 2021:10		394.6	352.2	40.4
Recovery over latest year	2020:08 to 2021:10		394.9	354.6	40.3
Full non COVID year before COVID	2019:02 to 2020:03		403.1	360.0	43.2
Employment latest month i.e. Oct 2021	2021:10:00		400.8	359.8	41.0
Employment Oct 2019	2019:10:00		404.1	362.9	41.3
Lost employment i.e. average year ending early Nov 2021			8.2	5.4	2.8
Lost employment Oct 2021 compared to Oct 2019			3.3	3.1	0.3

The sectoral pattern of employment is more revealing. From Figure 10 we observe that the fall in manufacturing employment has continued even well after the 1<sup>st</sup> quarter of the COVID crisis and is still way short of the level before the crisis. Construction too had fallen sharply but has recovered.

Agriculture which did not show a fall during the crisis had actually greatly increased over the recovery period.

Figure 10



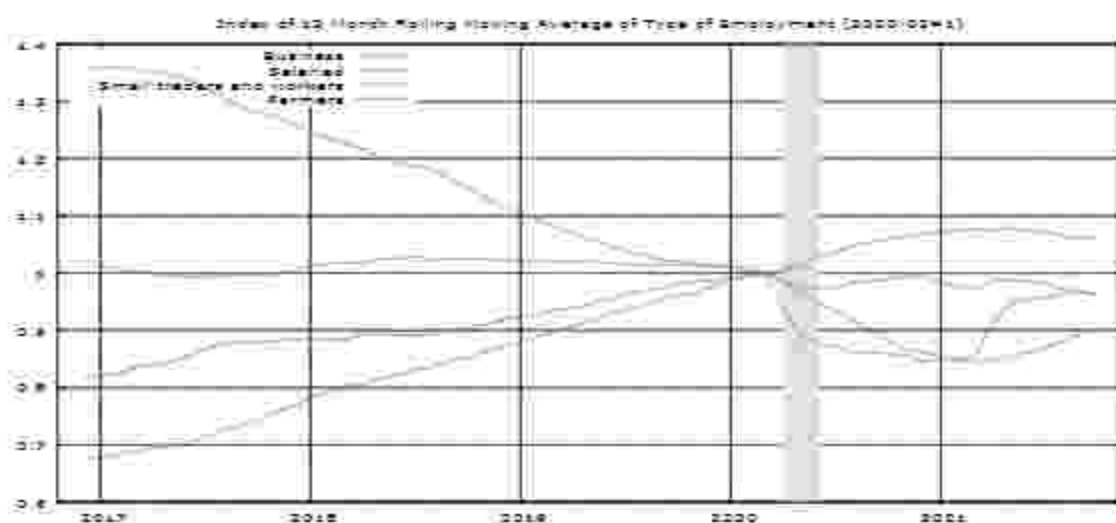
The non-recovery of employment in the manufacturing sector is most disconcerting. Thus, even though the index of manufacturing shows a recovery that is within striking value of the pre COVID level by October 2021, the employment had barely grown from the low levels to which it had fallen. In other words, there seems to be a structural transformation of the manufacturing sector in the offing —shifting to less labour intensive mode of production. This is in keeping with the widely held belief that the formalization of the industry may have been rapid during the COVID.

The introduction of GST may also have been a contributory factor. Although introduced in 2017, its effects on the (size and organizational) structure of industry would have taken time which may have accelerated owing to the crisis with its shutdowns and migrations. The lack of continuity over long period imposed by the shutdown would have allowed the larger more solvent units to eat into the market share of the smaller more labour intensive units, so that the employment had fallen much short of the output recovery. The fall in manufacturing employment by almost 30% and its non-recovery lends a “depression like character” to the manufacturing labour force. In 2019:09 and 2021:10 the manufacturing employment was 30.8 and 30.3 million vis-à-vis 40.8 and 40.5 million a full 10 million less! Clearly therefore the COVID has been a period of major structural change in the manufacturing sector which has adversely affected the labour intensity of manufacturing.

The services sector too shows a recovery that is still significantly short of the level of employment prior to the COVID, though here the gap is much less than in the case of manufacturing. We do not have data on further breakup of the services sector. Much of the services sector and the agricultural sector is a residual sector with vast disguised unemployment and employment, to which workers in hard times retreat to. Many of the farms and service “businesses” here really are ‘peasant enterprises’ which are value added (actually wage + rent + implicit profit) maximizing enterprises rather than capitalist profit maximizing. The formal services like storage, transport and communication would have shown a sharp fall in employment and poor recovery since these sectors are known to have high correlation with the manufacturing sector. The employment in the services sector in 2019:09 and 2021:10 was 156.6 and 157.0 million, while it was only 149.3 and 154.6 in the same months of 2021, showing that there was a gap of still around 2.4 million.

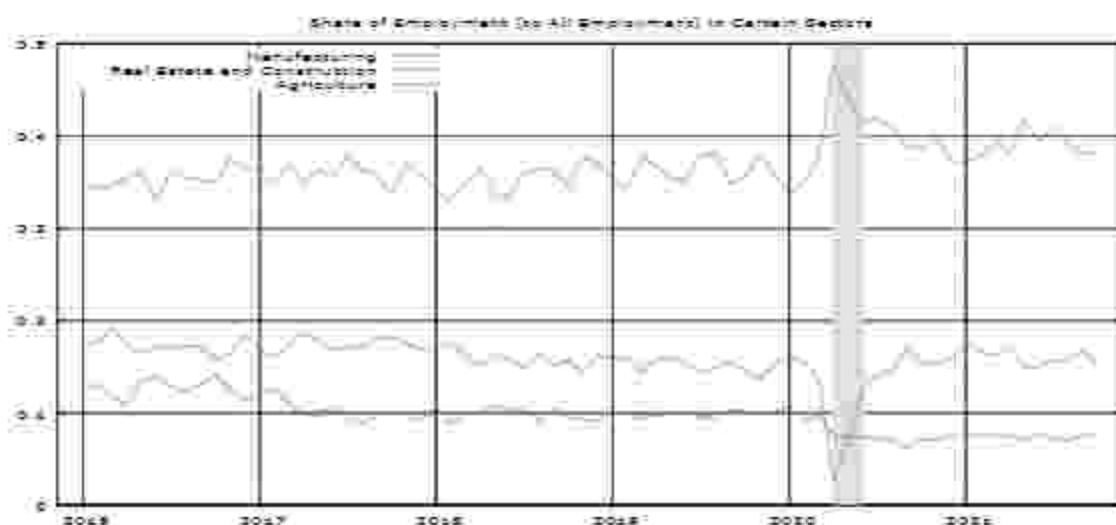
The "type of work" wise employment as brought out by the CMIE - shown in Figure 11 also shows that "salaried employees" shows the poorest recovery followed by the mixed class of "Small traders and workers". Those who reported as "farmers" shows a steep increase confirming the agricultural sector as the main sector for those who suffer from disguised unemployment.

Figure 11



This is a major structural retrogression of the economy since a reversal of falling share of employment in the non-agricultural sector and especially in manufacturing would imply that much of the dynamism for transformation has been arrested. See Figure 12 which shows that the share of manufacturing has declined from a low 10% to now after the COVID crisis to a shocking 7-7.5% without much variation, now over a period that is more than 18 months. Clearly, the structural and (strategic policy biases) against manufacturing has deepened over the Modi years and since the COVID Crisis. The rise in the employment share in the agricultural sector is entirely due to the residual receptacle character of agriculture, given the vast disguised unemployment and disguised employment in India, which has been most certainly enhanced. That the demand counter action has been weak is beyond doubt.

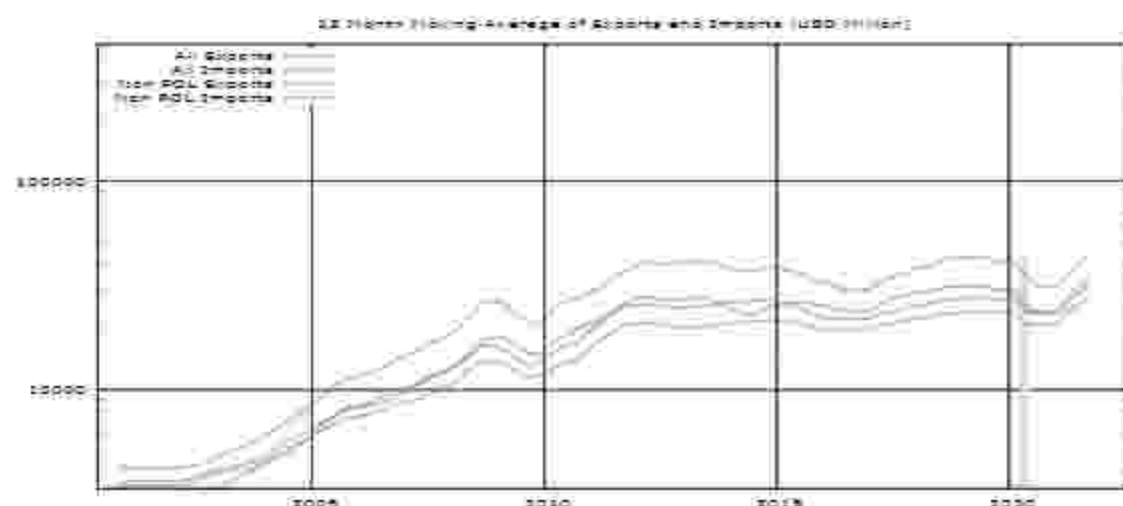
Figure 12



## Export and Imports

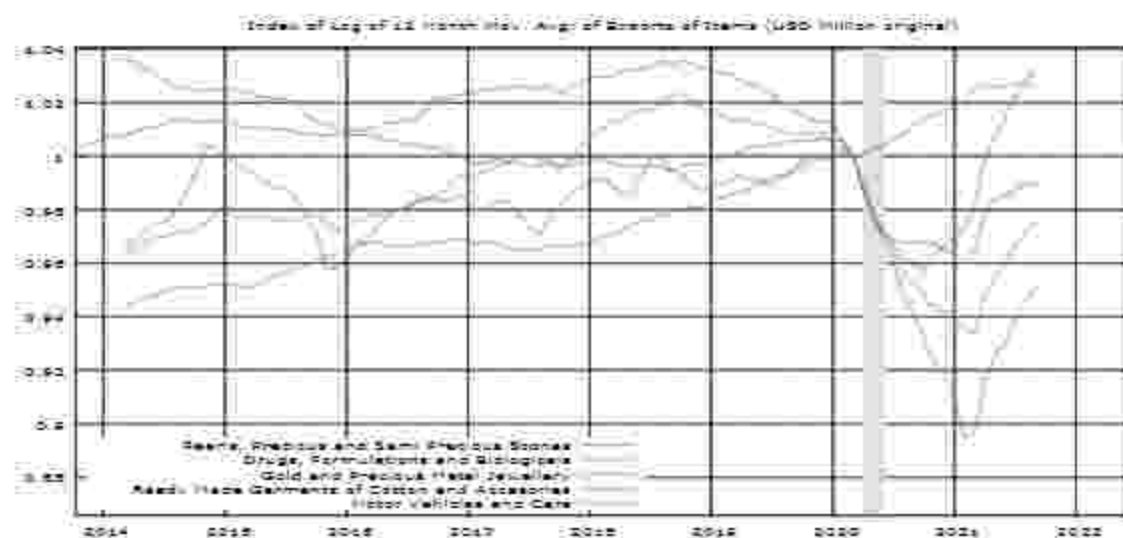
Export growth as we had brought out earlier had barely grown from 2012-13 onwards, with the period up to 2017 being one of decline with a modest recovery since then. This may be seen from the plots of the 12-month moving average of exports and imports as well. See Figure 13. The sharp decline in overall exports and imports over the COVID was followed by a recovery in which both exports and imports have recovered fully. Ignoring PQL products and considering only non-PQL products the recovery has been complete. However, there were sharp sectoral differences in export performance.

Figure 13



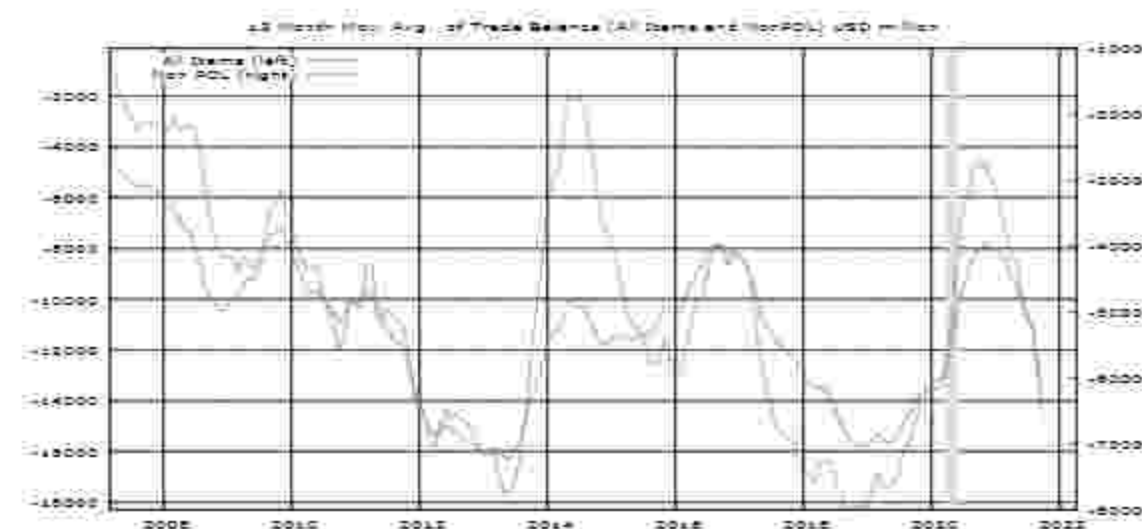
Export of drugs, pharmaceuticals and biologicals which had grown significantly over the immediate pre COVID period continued to do so without a break even during the COVID months. See Figure 14. Motor vehicle exports which had grown slowly before, declined sharply and has yet to recover. The "chip shortage" has apparently played havoc with exports and with recovery here. Jewelry, precious stones related have recovered, but not gold related jewelry exports. Readymade garments too have yet to recover though here the gap is much lower than in the case of motor vehicles and cars.

Figure 14



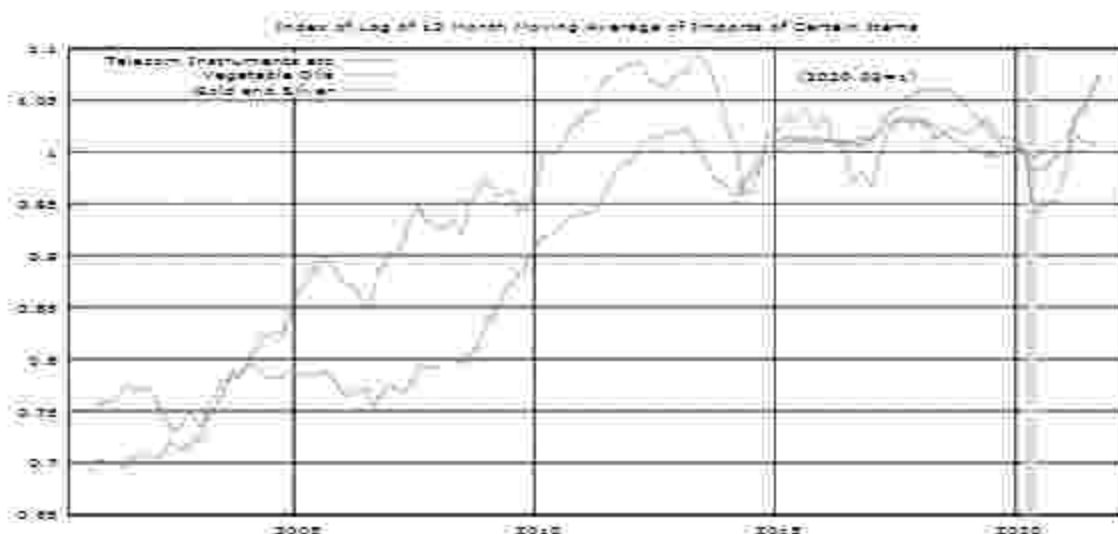
The domestic demand drivers on the trade balance (the trade balance on Non-POL items) is evident. The balance had declined over the period of the fiscal stimulus, only to rise over Modi I which was a period of negative demand shock as we have already seen and fell over late 2018 and 2019 given the rise in spending due to the elections. Here we observe that over the crisis the trade balance (algebraic value) rose sharply in response to demand in India being curtailed much more than elsewhere (since the stimulus in India has also been proportionately much lower in India than in the major economies), but as demand picked up and the recovery began this has reduced. See Figure 15.

Figure 15



Gold and silver imports declined over the COVID, but has recovered since then. Telecom instruments (mostly mobile phones and related items) which had declined from 2018 onwards recovered to the pre COVID levels but not to the peak levels that had been reached c.2018. Vegetable oil imports which had shown a slowdown from 2014 end, did not show any dip during the crisis but has shown a rise over the recovery period having exceeded the pre COVID levels. Since the consumption remained stagnant the increased import is most likely due to lower production or in keeping with stock adjustment / changes in import duties. See Figure 16.

Figure 18



## Section VI: The Financial Sector

### Monetary Developments

We had already seen for much of the period since 2011-12 to around middle of 2018 the monetary side was restrictive. The fight against the perceived high inflation which had started just two years into the fiscal stimulus, had made the monetary side highly restrictive. Interest rates rose to record high levels and a brief retreat from these high levels of 8.5 % or so. The 9 month t-bill yields got pushed to over 10% due to the inaction of the RBI over the taper tantrum and only slowly came down to about 6% by 2017, after which it again rose to reach over 7% by early 2019. (Morris, Sebastián 2020).

But more pertinently, during much of this period the low end bond yields were not being collared by the repo and reverse repo indicating that the windows were not open fully, so that rather than the repo, these yields should be considered as the policy rates, given the implicit liquidity rationing in often keeping the repo window shut. It was only with the coming of the new Governor Dr. Shaktikanta Das that this business of the repo not being open began to get addressed. Also, rates fell, as the deepness of the recession was manifest since 2018.

From Figure 17, we observe that the M3 growth measure was kept very close to 10% despite the demonetization, and from late 2019 when accommodated foreign inflows resumed (NFA growth), the M1 and H measures were kept under check at about 12%. However, the 10-year bond yields rose again from 2017 reflecting the sensed uncertainty in the financial markets. From 2017 onwards, the divergence between the 10 and the 1yr bond yields has only increased and even into the COVID Crisis. See Figure 18.

Of all the principal instruments used, bringing the CRR down from 4 to 3 % during the crisis (which also increased the narrow money multiplier M1/H as may be seen from Figure 19, while increasing the growth of M1 to between 15 and 17% per annum (Figure 17). However, the broad money multiplier could not be raised given both the low demand situation and the weak transmission mechanism through the banks. The Cash / Deposit ratio fell as the deposits grew along with M1. Once the CRR was raised back the narrow money multiplier went back to the pre COVID levels.

Figure 17

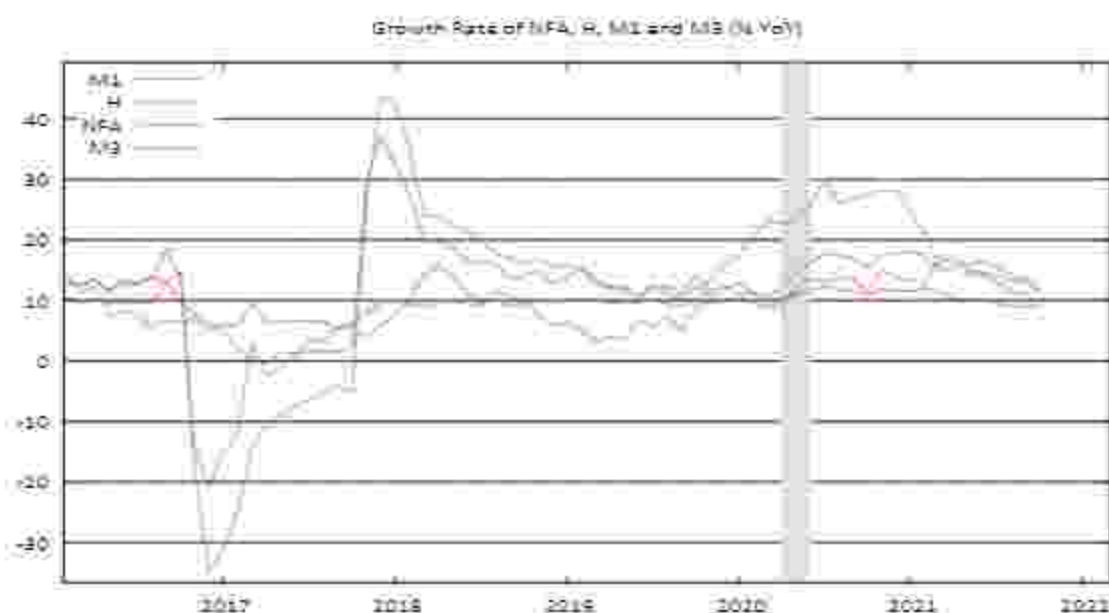
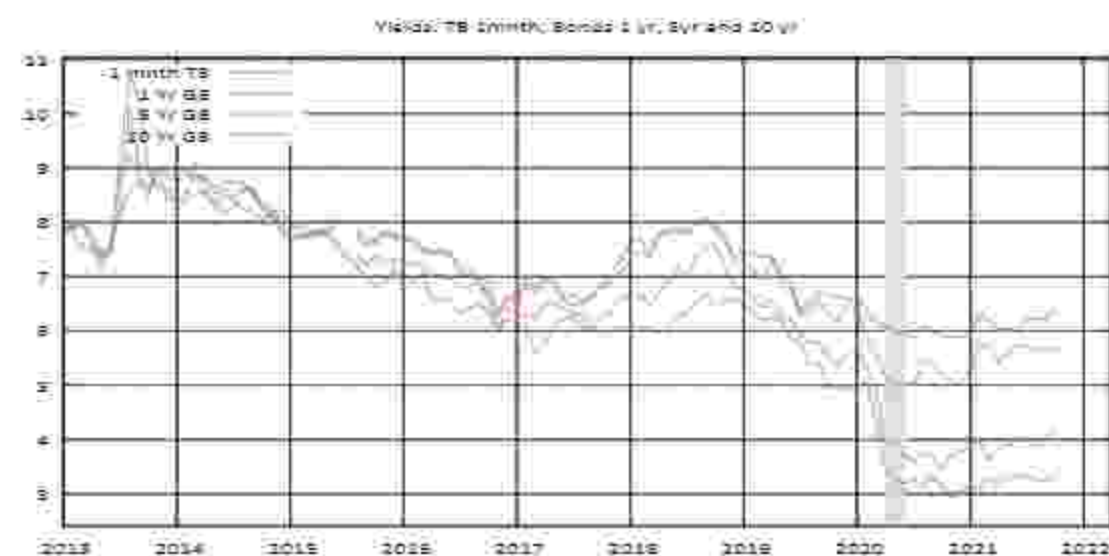


Figure 18

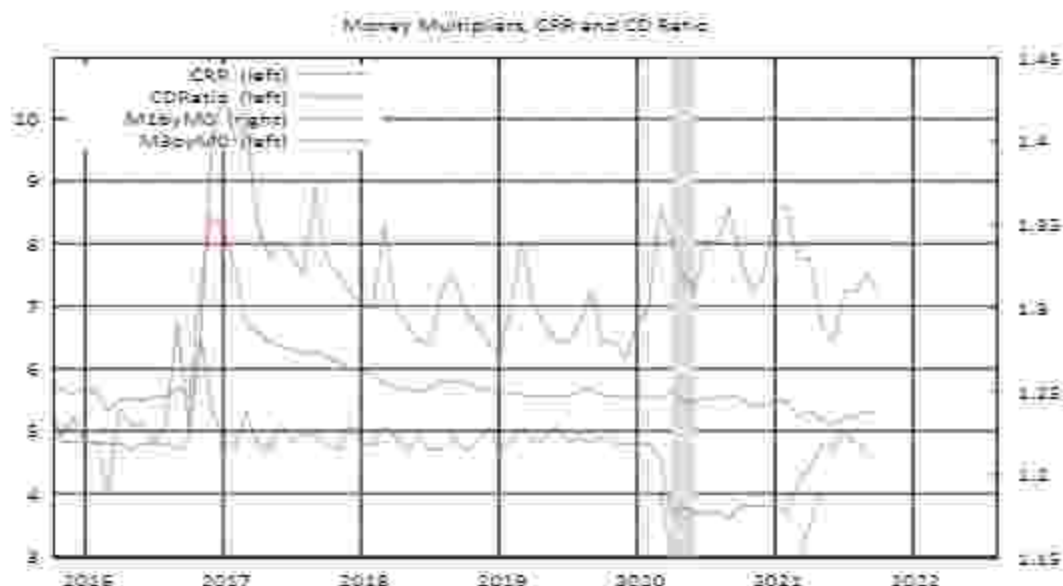


The 1-month TB fell from around 5% pre COVID to about 3.25% during the COVID recovery period (to date) i.e. by around 1.75%. Similarly, the 1-yr GB yield fell from 5.5 to 3.5 i.e. by about 1.5%. See Figure 18. However, the RBI could barely move the 10-year bond yield which continued to be around 6% from the pre COVID level of about 6.5%. The 5-year yield fell from around 6.4% pre COVID to about 5% before it moved up to about 5.6%, i.e. resulting in a fall of barely 0.8% as on date. Thus, despite all the measures that the RBI has done, the longer duration rates have not fallen. This is not surprising at all. As argued before, given inflation targeting as the stated policy and mandate of the RBI, with the actual CPI, rather than the core as the target, the market would anticipate that the short-term rates

are not going to be steady since they would move with commodity (food and fuel), so that the market would discount low short-term rates even when sustained, as a path to longer term rate. This would be especially true when rates are low<sup>41</sup>. At 1 month yields closer to 5.5 to 6% there is belief that the rates are "normal". The conservatism of the central bank too after it had punished the economy over long years with TB rates being above the repo rate have also been responsible for such expectations.

The RBI's reduction in the CRR dramatically increased the money multiplier though with much volatility over the recovery period. Thus, not all the increase in M0 was taking the form of excess reserves; the liquidity in the system was being enhanced, and the CRR reduction was working. The broad multiplier though remained steady with a small fall thereby indicating that the broader multiplier could not be enhanced significantly by the fall in the CRR. See Figure 19.

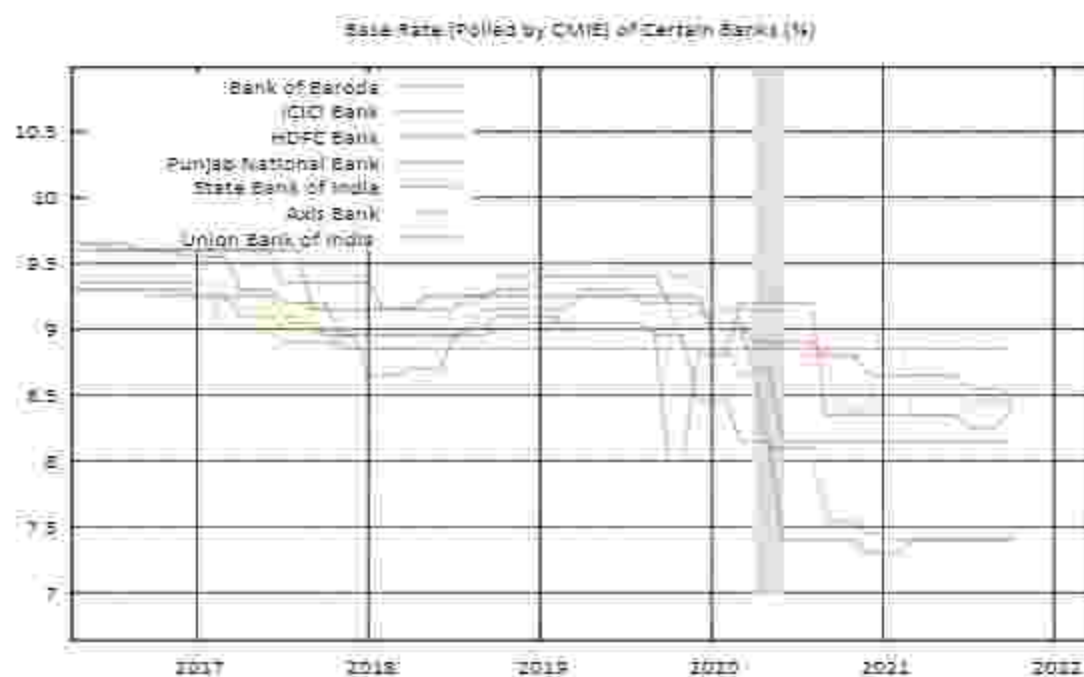
Figure 19



The lending rates of banks show a mixed picture in response to the COVID crisis and the initiatives of the central bank to lower the repo rate and make the same the policy rate. Thus, the base rate of ICICI Bank and did not change at all, that of Punjab National Bank, Axis Bank and Union Bank fell by about a 1% still remaining high at around 9+%. Only for HDFC Bank and SBI was the base rate reduced by about 2+% from the pre COVID levels c. end 2019. SBI and HDFC had lowered its base rate substantial even before. Thus, broadly the base rates have fallen in sync with the reduction of the repo rates and the fall in the 1 yr yields and perhaps more than was the case with the 5yr yields. See Figure 20.

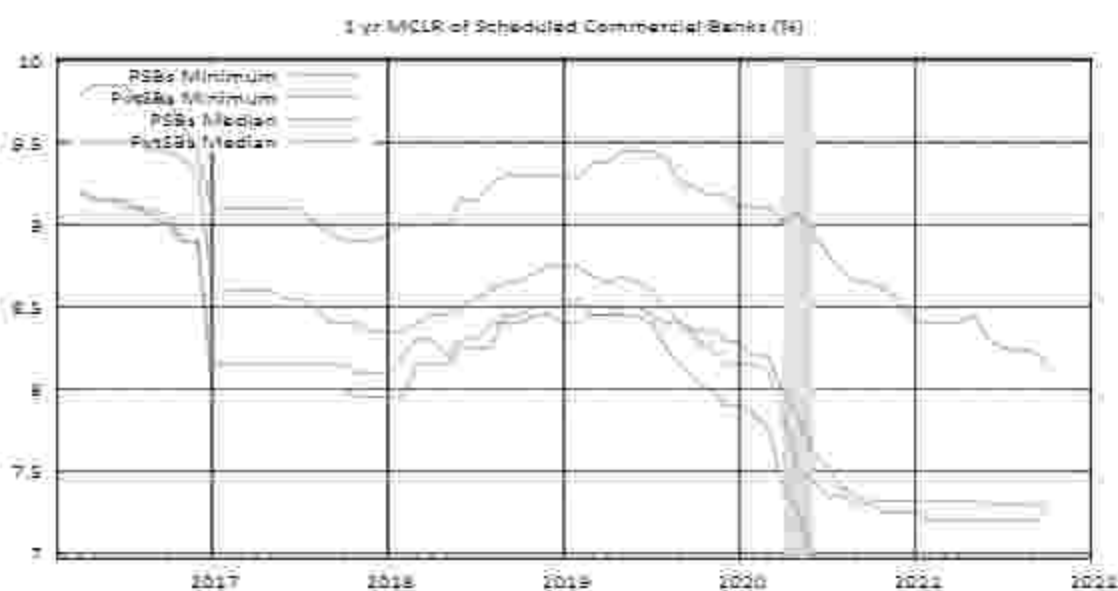
<sup>41</sup> In the US the only factor is the expectation of the market on the continuance of the low rates, so that measures like forward guidance over the GFC and the few years that followed the GFC, could bring down the longer rates

Figure 20



The MCLR of the scheduled banks show that these were falling even before the COVID crisis due to the repo rates becoming true policy rates from middle of 2019 onwards, when the RBI had also lowered the repo rates. However, in response to the COVID the fall has been under 2%, with the MCLR for private banks despite the fall in the repo rate being quite high – above 8% which was the case for the median MCLR rates. See Figure 21.

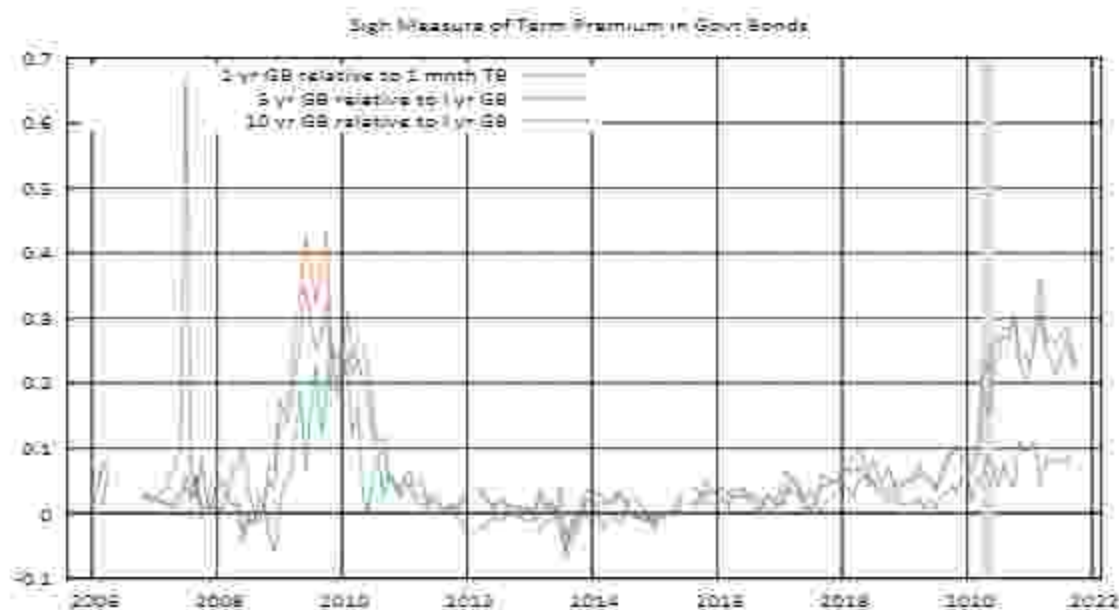
Figure 21



### Yields and Credit Flows

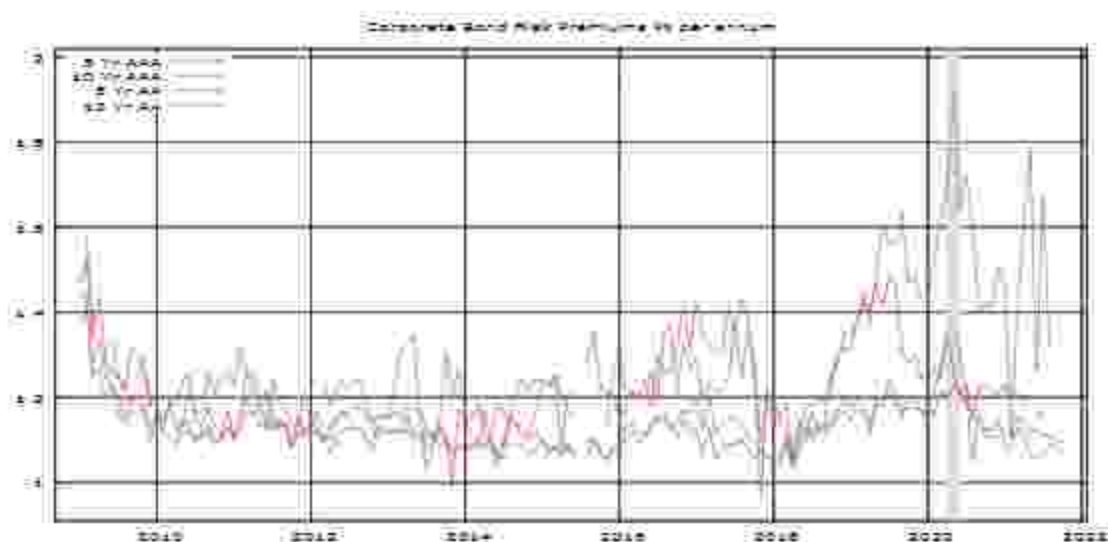
Despite the lowering of rates, the transmission to long duration bond yields remaining problematic so that the yields on corporate bonds and the lending by banks for capital formation would be problematic. The measure of  $\psi = ((\frac{R_{t+1}}{R_t}) - 1) / \ln(n)$  which is a measure of uncertainty over time that financial markets sense shows that even before the COVID Crisis from 2017 onwards, it had risen and due to the crisis, it rose sharply quite like during the GFC, but has yet to fall in India. In other words, the RBI has despite all effort of increasing liquidity has not been able to convince the financial markets that rates over the longer period would not go up, so that the longer bond yields remain high and the yield curve continues to be steep. This is not surprising given the nature of inflation targeting practiced by the RBI, as mentioned earlier. See Figure 22.

Figure 22



Before we consider the credit flows to industry, the corporate bond yields are revealing. Relative to gilt the yields for AA rated bonds had been high from 2016 onwards by over a 1.2%. This is because the fiasco with the NBFCs and the large delay in the recapitalization of banks. The infusion of capital into PSBs began only in Oct 2017 and by December 2018 some Rs. 1.28 lakh crore had been infused. (PIB, 2018). This helped the purchase of bonds of AA rated companies which brought down the premiums. However, the problem of IL&FS whose Inane ways of working in the infrastructure space were known, had to declare itself unable to honor its vast debts, put the financial sector into a deep panic (ET, 2018), and the premiums for AA bonds rose sharply to their highest in a very long period with the five-year premium rising to as much as 1.8%, while the 10 yr. too rose to over 1.4%. Just before the COVID Crisis these began to fall since the RBI had loosened its stance from 2019 onwards. See Figure 23.

Figure 23

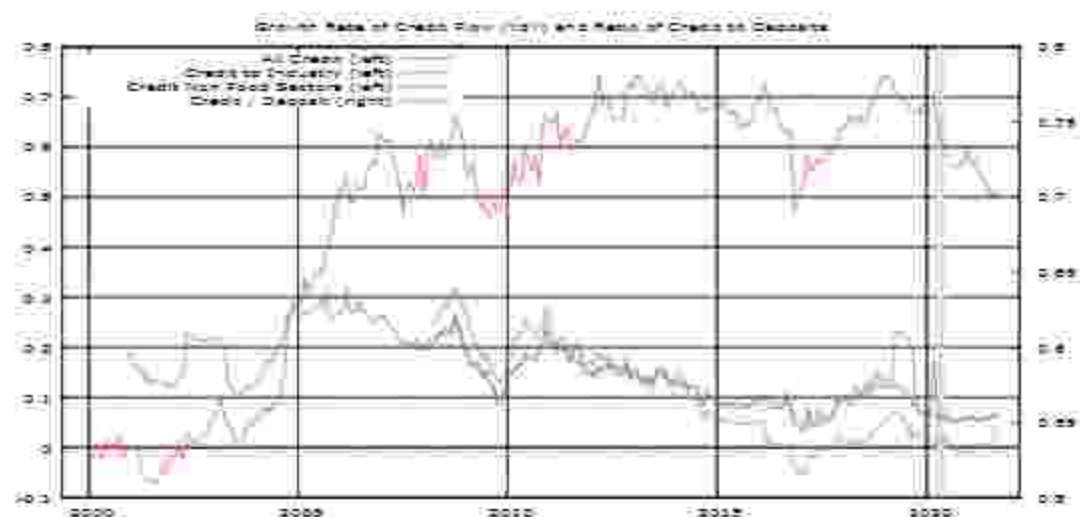


The initiatives of the central bank resulted in lowering the premiums for the longer duration bonds but not for the 5 yr. bonds, which had reached their highest during the Crisis, and continued to be at levels exceeding 1.5% even over the recovery period. For AAA bonds the premiums despite a rise from 2018 to the crisis moderated thereafter. This is because the yield curve itself had steepened with yields on longer term government bonds itself having diverged sharply.

When we consider these developments along with the marginal fall in the lending rates, it is obvious that the leading AAA firms faced no issues in raising capital either before or after the crisis though the rates they face are far too high in relation to the rates for short term funds. However, for other firms lower in the rating, it would have been another story. Even for firms one level below the AAA, i.e. for AA firms the risk premiums continue to be high especially for market borrowings.

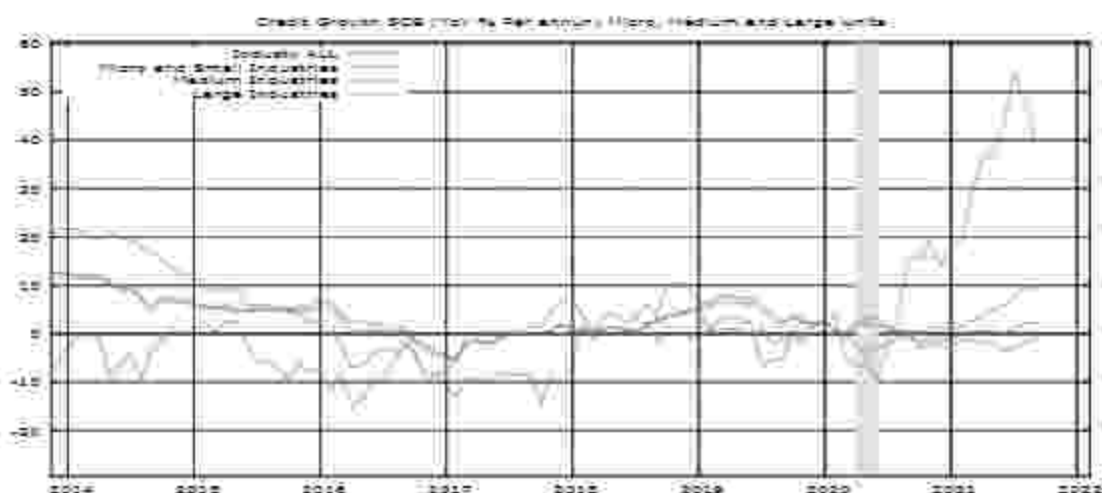
The actual credit flow from banks to industry despite the significant fall in the MCLR and the base rates have been muted. Total Nonfood credit has grown at less 7% in the recovery period, and credit to industry has been barely positive. See Figure 24. Ever since 2011-12 when the major tightening happened credit growth had declined, and the bump up in 2018 did not hold, so that in the immediate pre-COVID year, the credit growth to industry sharply fell from about 5% to nearly zero. So, despite all the efforts of the RBI the credit flow to the industrial sector has not been anywhere near what it should have been for an economy that many believe is just on the beginning of a long delayed investment cycle.

Figure 24



When the credit flow from SCBs is considered in terms of RBI's classification: to micro and small units, to medium sized units, and to large units, we see that the credit to large units has not grown at all, and to micro and small units at well below 10%. For Medium Industries there is apparently a very large increase over the COVID recovery period. But if we remember that the "Medium" industries for the RBI is a residual category, with less than 10% of the credit, then the change is most likely to be due to classification, though it is certain that there is revival from a very low base as well. Overall credit flow to industry as a whole was hovering around 0% growth in the recovery period. For Medium Industries right from 2014 credit growth was negative or zero, and from 2015 it has been muted to industry and its size wise segments. See Figure 25.

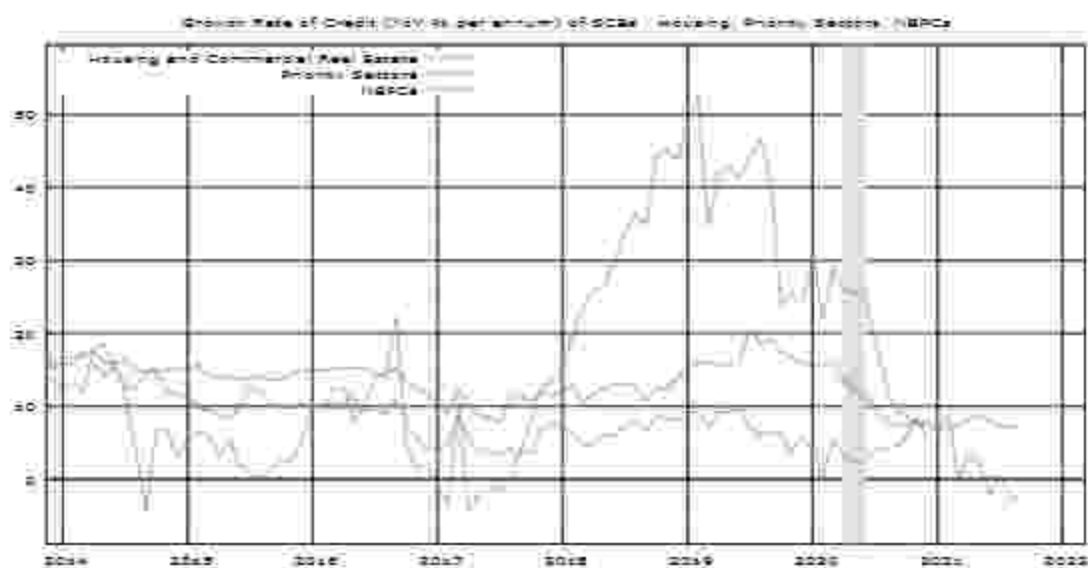
Figure 25



The growth rate of credit to priority sector (till Nov.2020) was well under 10% which was a continuation of the trend before the COVID crisis almost from 2016. Thus, for the priority sector there has been little growth in credit for a long time. For commercial real estate and housing after a recovery in the immediate pre COVID period when the government shored up the capital base in two tranches, there was recovery, which fell off to under 10% after the first three months of the COVID crisis. The

credit to NBFCs shot up from a very low level in mid-2017 all through 2018, 2019 and 2020, as the government shored up the capital base of the PSBs, and from 2018 onwards as the interest rates fell. But from mid-2020 onwards the credit growth to NBFCs declined to under 10% and over the last quarter has been practically nil. See Figure 26.

Figure 26

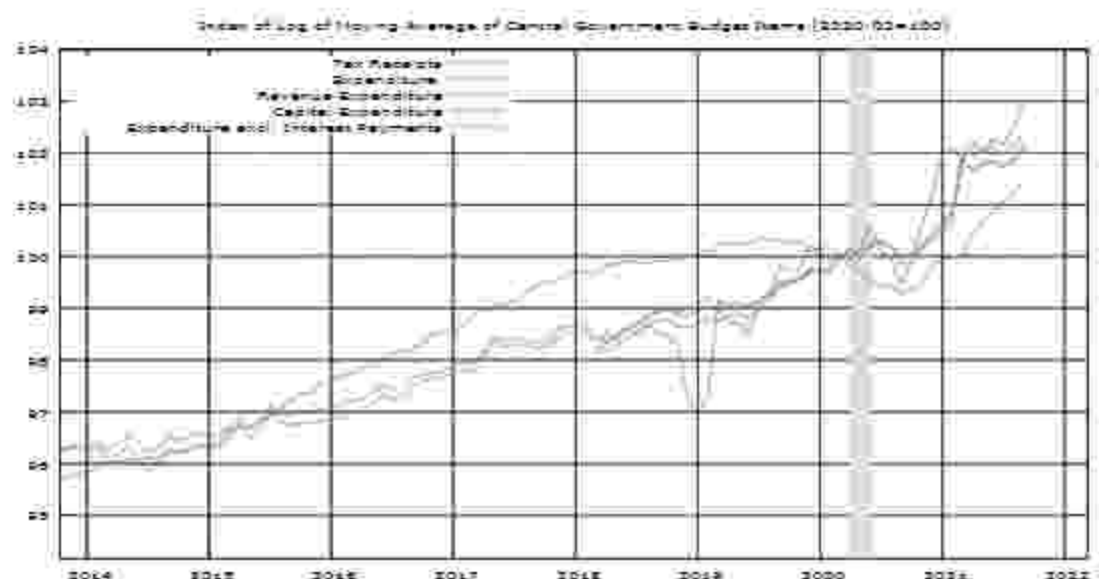


Thus, the picture of credit growth to industry is consistent or below the picture of recovery (still behind 2019 values) that we saw by considering the index of industrial production and the CMIE series on employment. Credit to deposit ratio had been stagnant since 2011-12 (See Figure 24), so that the credit growth would only have kept pace with the deposit growth, i.e. with M3 growth which as we saw was much muted all the way from 2017 (See Figure 17 again). During the COVID crisis the credit/deposit ratio fell sharply and has continued to do so since then (See Figure 23). Monetary measures have gone a distance to reduce the low-end interest rates, but less so to reduce the longer duration interest rates. And very little to raise the credit to productive industry. It is a moot point if the latter is possible through monetary measures without a very dynamic demand situation that brings back the investment cycle.

#### Government Expenditure

Using monthly data on expenditure and tax collections is problematic because of the volatility here which has systematic seasonal pattern so that even a YoY measure would not reveal the underlying trend. Yet the month to month variations are too high for the trend to reveal. We have used a rolling 12 month moving average of expenditure and tax revenue to consider the trends in over the COVID and the recovery periods. This confirms that government expenditure has been dynamic and has gone over the levels in the pre-COVID year. The fiscal stimulus of nearly 1.81% of GDP which we had estimated in Morris, Sebastian (2020) was no doubt responsible. However, the actual expenditures may have begun well after the COVID quarter in the last quarter of 2020 and the bulk of it happening in the first quarter of 2021. See Figure 27. Revenue expenditure excluding interest payments and capital expenditure are what drive demand, and these rose from the middle of 2021. But since then revenue expenditures may have slowed down marginally.

Figure 27



On a quarterly basis (aggregation of monthly figures) we see from Table 10 that revenue expenditure has gone beyond its highest level reached in the same quarter in a pre COVID period. Capital expenditure has been very steady and significantly more than before in the COVID period. Tax collections too when similarly considered have risen from well over their pre COVID levels. The peak in overall expenditure was reached in the 1<sup>st</sup> quarter of 2021 after which it has climbed down to levels that are a little higher than before. Thus, the fiscal stimulus has weakened since Q1 of 2021. The gross fiscal and revenue deficits, are already on a trajectory of coming down from the high levels reached over stimulus period. This may be premature since the economy has to recover the lost ground and the demand needs to be strong enough to start the investment cycle. Investment had been sputtering all the way from 2012-13.

Table 10

	Tax Receipts	All Expenditure	Interest Payments	Revenue Expenditure	Capital Expenditure	Revenue Deficit	Gross Fiscal Deficit	Expenditure excl. Interest
2019:Q2	4.00	7.22	1.42	6.59	0.63	3.74	4.32	5.80
2019:Q3	5.19	7.67	1.29	6.42	1.25	1.11	2.19	6.38
2019:Q4	4.84	6.21	1.54	5.53	0.68	2.23	2.80	4.67
2020:Q1	6.27	5.77	1.88	4.95	0.81	-0.40	0.02	3.89
2020:Q2	2.70	8.16	1.60	7.28	0.88	5.78	6.62	6.55
2020:Q3	4.51	6.63	1.45	5.86	0.78	1.85	2.52	5.18
2020:Q4	6.17	8.01	1.67	6.58	1.43	1.20	2.44	6.34
2021:Q1	6.87	12.31	2.10	11.15	1.16	5.72	6.63	10.21
2021:Q2	5.32	8.22	1.84	7.10	1.11	1.70	2.74	6.37
2021:Q3	6.52	8.04	1.79	6.87	1.18	1.45	2.53	6.25

### Inflation

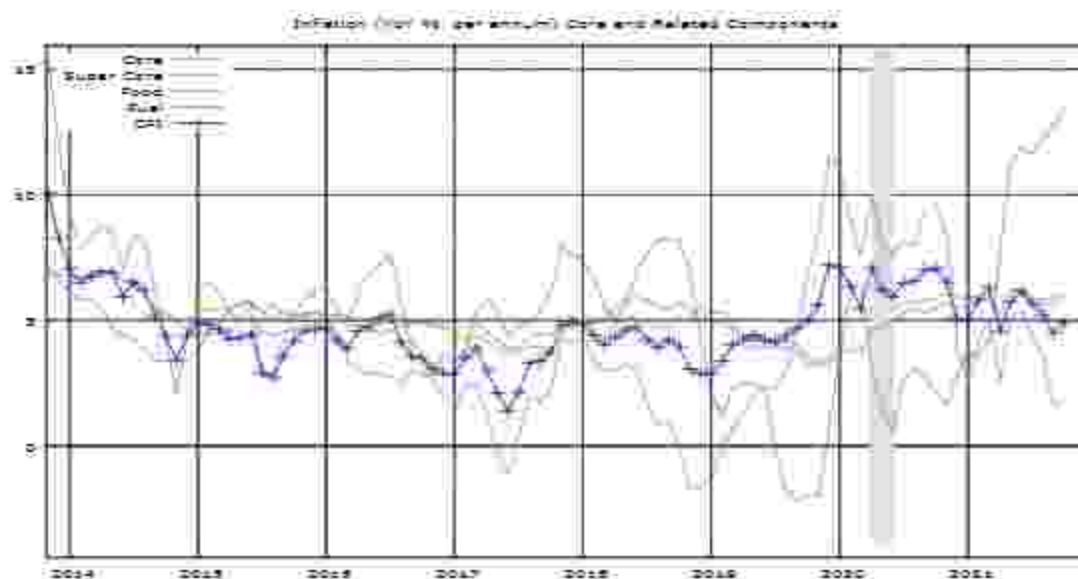
The COVID crisis is both a massive supply side shock and a demand side shock. Therefore, inflation outcomes are difficult to predict. Both shocks being negative, the only way the economy can adjust is

by a large reduction in output. Thus, over a quarter when the lockdowns happened the output was at 30% below its normal level, or worse.

There would be an inflation in items like vegetables, and items of mass consumption that arise owing to the fracture in the supply chain. As these are restored the supply chains in items that involve more roundabout ways of production could get affected forcing a specific inflation in these items. The inflation in these items if sustained over periods of more than 6 quarters, could build inflationary expectations that could give a push to the overall core inflation. However, since the situation is also one a negative demand shock, addressing such push up cannot be without the cost of a slowdown in the revival. Certain ubiquitous items like oil and gas, and other materials prices, and now "semi-conductor" chips pose problems which are not easy to address.

Inflation as measured by the CPI had been below 5% from mid-2014 onwards dipping as low as 2% in mid-2017, largely because food inflation had remained low, and with the CPI having as much as 45% (now 37%) weight for food, the dependence is not difficult to understand. It rose in 2020 with food inflation reaching levels close to 6.5% before stabilizing at this level through the COVID crisis and the recovery period. From 2021 it fell back to a range between 4.8 and 6.2 % or so. See Figure 28. However the core which is the measure of addressable inflation, was far more steady operating within a range from about 4 to 6% rising and falling with the pass through effects of food and fuel prices, with no trend to take it away from this level, till 2019.

Figure 28

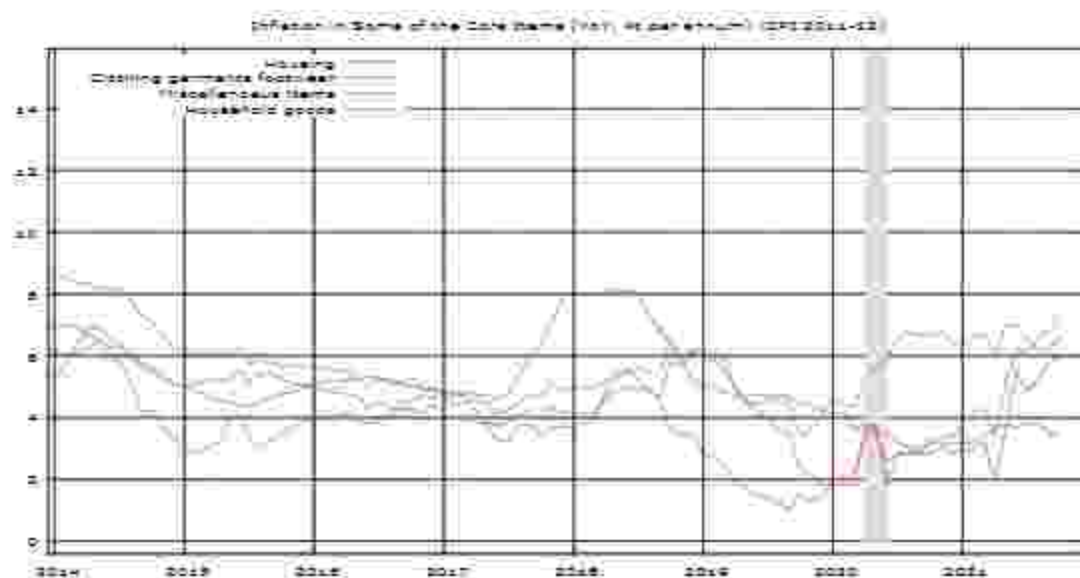


The core and the "super-core" (which excludes housing as well), from 2019 fell to a low 3.75% (approximately) owing to a bout of low food inflation followed by very low fuel inflation, again with a pass thru with fuel inflation being more quickly passed through while food inflation involved a year or so. Thus, our earlier explanation (Morris, Sebastian 2020), of the determinants of inflation remain intact. The core and the super-core are expected to be close in this period, since housing inflation is one of the steadiest items with significantly much lower volatility. It is only in India given the absurd way in which housing prices (rentals) are determined that the housing CPI shoot up as happened in 2010-11, which we have dealt with in Morris, Sebastian (2020); in this period since 2019, there was no "Pay Commission" etc., so the core and the "super-core" go together. The core has fallen as the

food inflation came down from late 2020. It would most certainly have fallen to lower than 5% had the fuel inflation been not pushed to record high levels of over 10%. Fuel prices are entirely external to monetary management, being largely administrative (government and oil companies deciding the taxes), and global with no feedback from India's demand curtailment to global oil prices. Being pass through both ways as the experience now over 2 decades would tell us, there is no rationale to respond to this rise in the core in the COVID recovery period through any kind of tightening from the current levels.

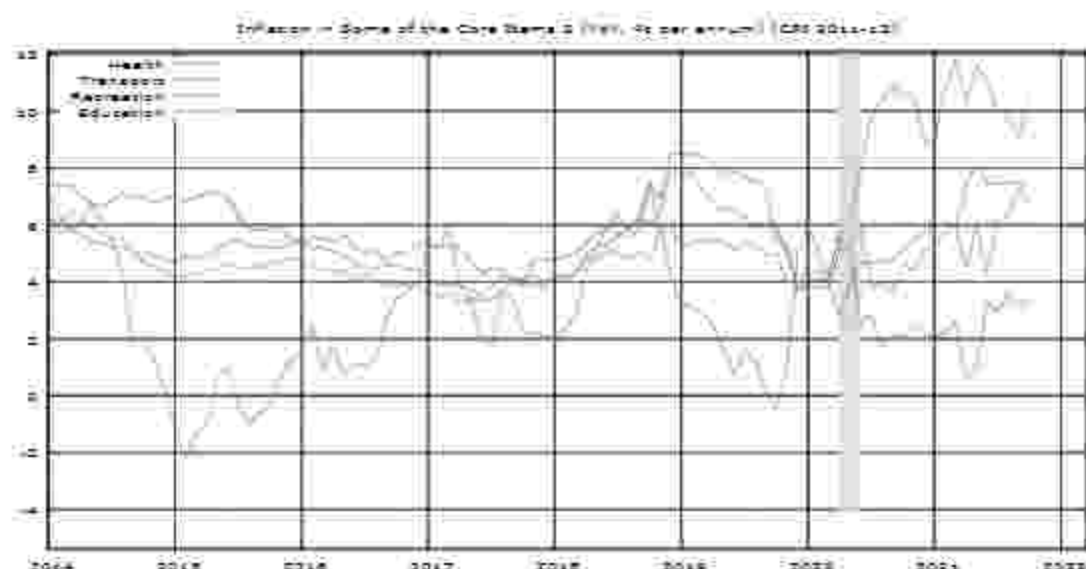
Further examination of the item/sector wise inflation reveals the supply side dominance in the pattern of inflation over the COVID period. From Figure 29 we see that clothing, garments and foot wear the inflation in which had been a low 3% or so since mid-2019, moved up from the second quarter of 2021 to about 5.5 to 6%. This is likely to be temporary. Miscellaneous goods which includes much of the rest of the items of the CPI (Household goods and services, Health, Transport and Communication, Education, and Personal Care and Effects), rose to drive the core due to the pull of the high food and fuel prices as said before. But within that household goods being more produced in character have been last to respond quite like clothing, garments and footwear. Housing has remained muted and below 4% since there was no shock over the period.

Figure 29



Education too has shown a similar pattern as is only to be expected remaining a levels between 2 and 4%. See Figure 30. Health and recreation remained confined to their old levels of between 4 and 6% with both rising above 6% during 2021, health first and then recreation for just two months. The rise in recreation is related to the rush for the services once the travel restrictions were off and the opening taking place and due to the bunching of pent up demand. Health services is of course related to the very large spurt in demand and to a temporary lag in the supply response, since the supply response can be expected to be high, there being few barriers to entry. It may also be due to the large outlays in publicly supported health insurance, in a situation where there is little supply.

Figure 30



Transport though shows a very large spurt in inflation over the COVID periods and well into the recovery period. This is due to the straight pass through effect of fuel prices on truck, bus, and taxi service prices which had risen over the same period, and also due to the increased demand on road transport as the rail and air services remained shut or operational at low levels till almost the 3<sup>rd</sup> quarter of 2021.

Thus, there is a simple supply side explanation for the inflation, and there being little or no expectations that these would be maintained, even core inflation targeting would not require any tightening measures over the situation in November of 2021. That there are no expectations of a secular rise in the inflation may also be confirmed from the behavior of real wages. As we have seen before from Figure 8 earlier rural real wage rates (agricultural, non-agricultural and for both males and females) have remained flat from 2014 onwards with only small movements. Ditto with the MNREGS wages which puts a floor and a reference for rural wages. Wages in the competitive rural markets and in agriculture – the residual sector – are entirely dependent upon the CPI, and have seen movements only in keeping with the cost of living and no more, thus again showing that on rural wages there is only a pass thru effect and no sustained rise based on expectations.

We don't have equivalent monthly data for urban wage rates. But the rural being typically the lower of the two is better indicative of any basic wage pressure other than that due to basic goods inflation pass thru. Using the quarterly corporate sector estimates of the CMIE, the share of wages for all companies in the Non-financial sector, and in the Manufacturing segment of the former, both show steady levels if not a small fall. See Figure 31. The sharp rise over the COVID months is only to be expected since many industries remained closed while still paying for their employees on annual or "permanent" contracts, while they did not have production or had much reduced production. Wage rate data from the Annual Survey of Industries (ASI) is available only on annual basis and with much delay.

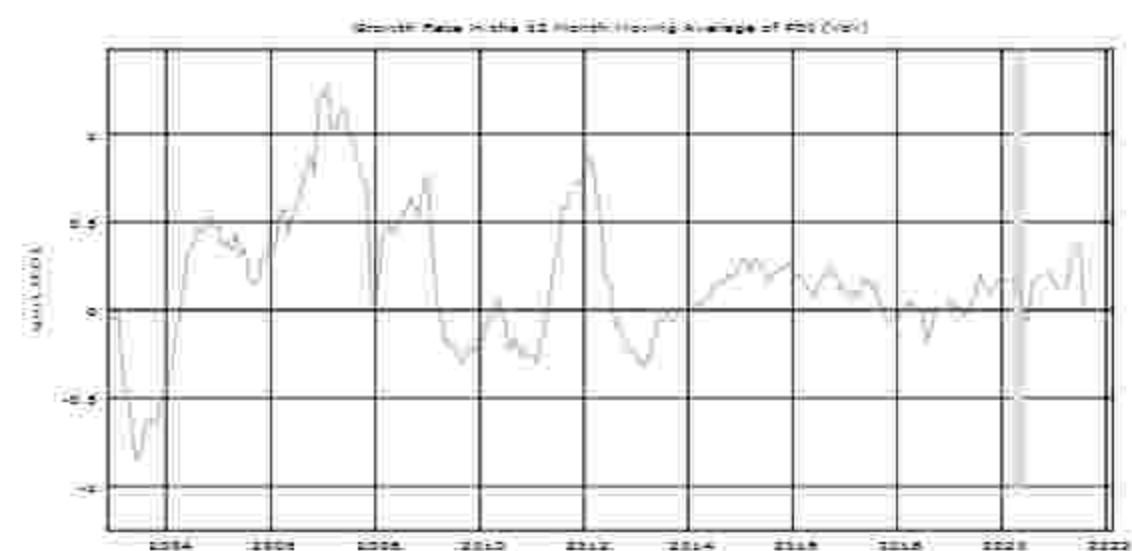
Figure 31



#### FDI, FII and the "Fisher-Open"

FDI inflow growth had slowed down over the period from 2013. Although it had picked up the growth rates never really reached the levels achieved during the "Tiger" period, nor what was achieved during the period of the fiscal stimulus. During the COVID it has dipped, but revived to reach growth rates of around 15-20% per annum. Since FDI flows are volatile we have taken the YoY growth rate of the 12 month moving average to indicate the trends. See Figure 32.

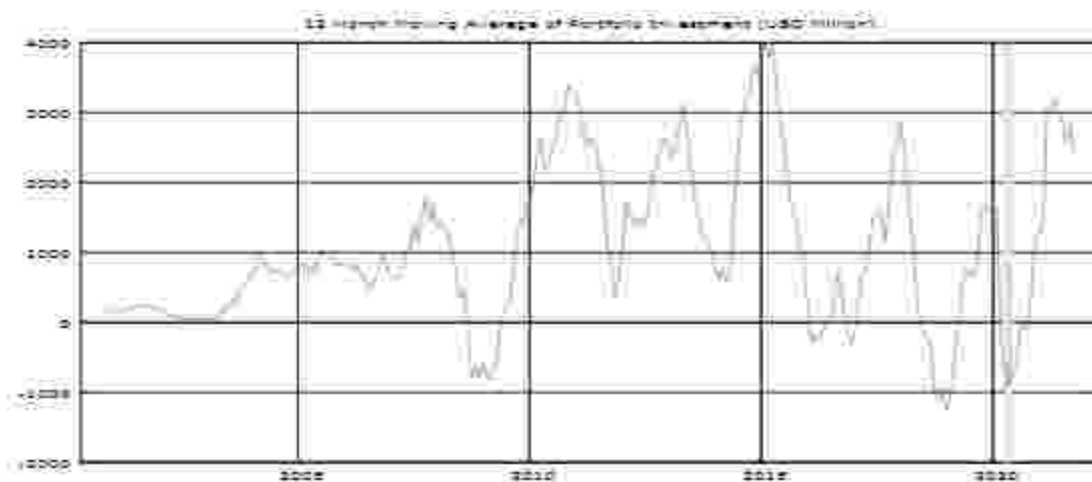
Figure 32



FII flows are even more volatile. In Figure 33 we have the 12-month moving average of the portfolio investment flows in US\$-millions. After the GFC as the massive liquidity expansion took place we see a heightened level of flows, though with much volatility from 2010 all the way to the present. In the

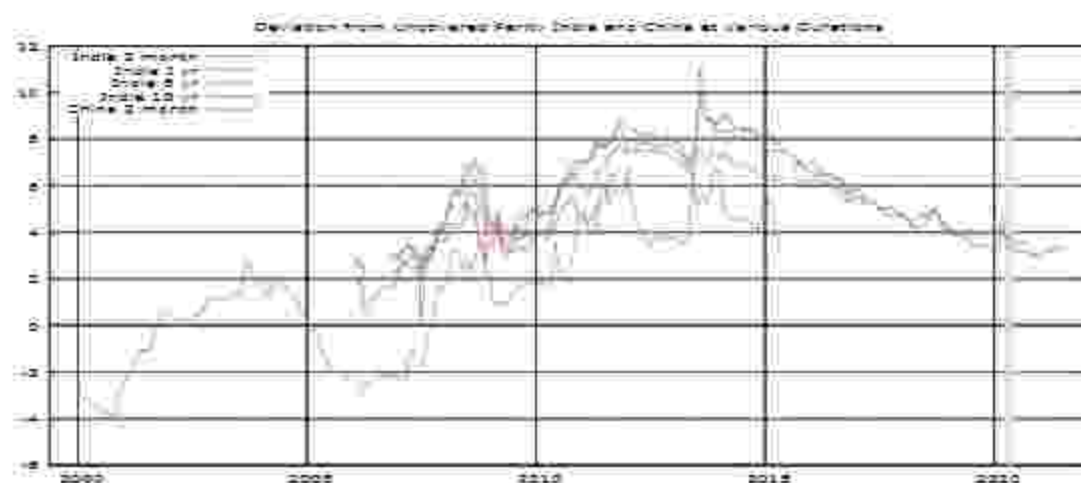
pre COVID period the flows remained overall positive but sometimes were even negative. We had earlier considered the gross purchases and sales to show that flows had slowed down in the immediate pre COVID period. The tight liquidity condition in India over much of the period from 2011-12 almost until mid-2018, is an added factor in the high flows overall over the period. In the recovery period, large FII flows have been instrumental in the rise of the capital market till almost end October. Long period interest rates in India compared to the other dynamic east Asian economies have been high which would have helped to attract far more FDI and FII flows into India relative to the potential than in these other countries, or relative to the potential in the "Tiger" period, in the short to medium term. This would have allowed FII to finesse the market through high volatility to realize gains from the Indian market.

Figure 33



Observe from Figure 34 that the deviation from uncovered parity (the so called "fisher open") in India has been large, and had risen from the GFC to the taper tantrum quite steeply to reach a 10% level. This meant that with reference to the US the interest rates were so high for the forward premium (expectation of the currency depreciation) was systematically overestimating the actual (ex-post or realized depreciation) by as much as 10%! Right through the period this has been in excess of 4%. During the COVID as it came down (it had been falling from 2013 when the beginnings of monetary easing from the very tight levels began, and fell to below 4% from 2019, with the new RBI governor. The liquidity expansion over the COVID recovery helped to lower it to about 2.5 to 3%. The longer duration values would have followed these trends closely. Observe also that for China the "fisher open" has been general under 2% for much of the period when it was pursuing export led growth policies. Since the GFC, it has gone up but it was still lower than for India by around 200 basis points. Thus Indian policy makers relative to China have been very conservative on their monetary policy stances, keeping the interest rate well above the rate required to bring about uncovered parity with a small 2-3% country risk which may be granted to non-reserve emerging market economies.

Figure 34



The 10-year government bond yields are important in setting the reference rate for risk free earnings in investment decisions. Observe that among the emerging Asian countries and China, covered in Figure 35<sup>42</sup> India has had the highest rates. From around 10-11% it fell to around 7% and then rose again to cross 9% in mid-2018, and has fallen since then to reach a little above 6% on the eve of the Crisis. Over the crisis it fell briefly to under 6% to remain a little above that level over much of the recovery period to date. It is highly unlikely that it would go down from here on, if we go by the market expectations. In contrast, in the cases of China, Malaysia, and Thailand it has been under 4.25% through the period. For China it has been generally lower than 3% from 2018 onwards. In none of these countries do we observe a very significant fall from the pre COVID levels, except in the case of China, from its low (lowest among the set of countries) pre COVID levels. What is interesting is that Vietnam the newest entrant into the ranks of the ELG economies, has witnessed a steady fall in the rate from high levels in 2012 to reach very low levels of 3.6% or so. Clearly Vietnam has been strategizing its ELG by now ensuring that interest rates stay low to spur investments. Thus, the problem of higher interest rates in India is a result of the orientation of its macroeconomic policy towards the normal "stabilization" and inflation targeting. In ELG countries it is "strategic" where growth using global markets and spurring investment is the core objective of macroeconomic policy with core-inflation bounds as constraint.

<sup>42</sup> Ignore the right-side scale. All series use the left side scale.

Figure 23



The higher FDI flows, that has been happening since 2013, based increasingly on brown-field investments and on takeover of Indian businesses, despite low growth, is not difficult to fathom, as also the high FDI flows with high volatility. IT and software businesses and startups have seen a continued flow of FDI despite the pandemic.

## Section VII: Conclusions and the Immediate Situation

The COVID19 Crisis was universal, imposed negative shocks on both demand and supply. All over the world governments came out with large support measures to prop up expenditure and livelihoods, and shore up the net worth of enterprises, which were badly hit – travel, entertainment, hospitality, tourism etc. The possible ill-effects of the crisis could be intuitively clear to even the most diehard ‘stay-off’ economists and politicians. The experience of the GFC, and the successful response to the same that the US under Bernanke pioneered, was in the memory of policy makers.

The Government’s “20 lakh crore stimulus” package when unraveled revealed a more modest Rs. 1.721 lakh crore including a direct expenditure increase of Rs. 0.331 lakh crore, and transfers (to both consumers and small producers) of Rs. 1.390 lakh crore. The rest were liquidity, credit enhancement, guarantees, and provisions, and included the raising of the borrowing limits of state governments by 2% of GDP. The expenditure and transfers estimates when fed into an expenditure based model gave a counteraction of about 2.65% to growth. Growth with no fiscal counteraction but with no “collapse” of productive entities would have fallen to between -8.9 to -12.3. The year ended with an early estimate of GDP growth of -7.5% which first Advance Estimates of the National Statistical Office revised to -7.4% (-7.53% if log rates are used). The “territorial” approach to the lockdowns and the universality of the same, the “unanticipated” displacement of migrant labor, exposed the limitations in the “knee-jerk” response of the administration. The lockdowns amplified the economic downturn taking giving rise to an impact of -11% or close to the median we had estimated in early May 2020. The brunt of the crisis was borne by the workers on daily contract especially in the manufacturing sector. Employment which had more or less stagnated from 2017<sup>22</sup> dived.

<sup>22</sup> It is only from 2016 that detailed monthly data on unemployment, employment and the labor force and on rural wages is available from the CMIE.

The RBI's measures helped to expand liquidity, shore up many businesses and kept the financial system functioning. Indeed, the liquidity expansion and the support to the NBFCs and the small firms through the Targeted Long-Term Repo Operations (TLTRO) helped to overcome the precarious situation in the financial sector, which existed even prior to the Crisis. The ability of liquidity expansion to overcome the negative effects of uncertainty on financial portfolios, and on the financial sector more generally, worked. And many medium sized enterprises were shored up. The banks too by November 2021 were in far better shape than even before the Crisis.

The contrast between the fiscal and the monetary responses was very stark. This time the RBI responded in kind, while the government continued to delay and moderate its spending. Earlier in the counter action of the GFC, the government responded, while the RBI sulked.

The COVID saw unemployment rise to record highs of almost 30% during the lockdown quarters and then fall to the levels before the COVID Crisis. These levels were high. But the unemployment figures hide the deeper distress in the economy. The dim prospects of employment made many people fall off the labor force. Much of this is involuntary, even if it does not appear as such. If there was a reservation wage it had hardly gone up in since 2014, and may have actually fallen. The employment figures bring out the grim picture. As late as November 2021 the employment in the manufacturing sector was 30% below the pre-COVID level when measured by a rolling 12-month average employment. The rise in employment in the agricultural sector paints the same picture; since in a situation of hopelessness people go back to the residual sector that houses all the disguised employment. Between 3 to 8 million people have yet to regain whatever employment they had. Most certainly, inequality would have risen sharply. It is also likely that people under the poverty line has swelled, reversing some of the hard-won gains made over in the past, especially over the periods of high growth. Few industries have reached their pre COVID levels of output, and only a couple – pharma, rubber and basic metals had reached close to their trend values. Overall the IIP was a mere 1% above the pre COVID level. Yet the stock market peaked to reach dizzying heights. This, as many believe, is not because of a run-away overvaluation. It can almost entirely be explained by the fall in the discount rates, the fall in the share of interest in overall cost, the reduction in the corporate tax rates which had happened a wee bit before the Crisis, and the share of labor in costs falling, as the structure shifted in favor of larger players with less labor intensive modes of production, through the recovery itself was weak.

The GVA for the year 2021-22, at basic prices is a mere 1.9% above the level in 2019-20. GDP 1.3%. This is hardly a recovery for an economy that can easily clip at rates in excess of 7%. The dip in growth should have been followed by a bounce that should have covered quite a bit of the lost ground. The pattern of growth, when considered from the demand side is interesting. Valuables (essentially gold and ornaments) purchase has shown a very high growth rising to a value of 178.7 indexed to 2019-20. Keeping aside net exports and stock accumulation, and working with the rest, gives an index value to GVA of 101.4 and further removing Government Final Consumption Expenditure 100.2. In other words, the recovery has just taken domestic demand back to the 2019-20 level over nearly a year and two quarters of recovery. See Table 11.

Private Final Consumption Expenditure still remains at 97.1, i.e., nearly 3% points below the 2019-20 which itself was a low point. The sharp increase in valuables, at a time when the economy is down is suggestive of rising inequality. Exports and imports have been a silver lining with exports rising to 111.1 and 111.8 respectively. Thus, the external market demand, as also demand from government, have been vital for production in India.

The year ended with the index for manufacturing at a modest GVA of 104.4. Not surprising that the data shows Trade, Hotels, and Transportation etc. to have taken a big hit being at 91.5 for the year 2021-22.

When we look at the implicit deflator, it rose to 111.8 giving an inflation of 5.59% average across the two years and a high 7.83% in the year 2021-22. In some sectors it has been even higher: Construction etc. 17.28%, Manufacturing 6.68% and Mining and minerals a whopping 35.27%. Clearly the China effect, and disruptions (both mining and logistic) have raised mining and mineral prices. And the inflation in Manufacturing and Construction are beyond doubt.

#### A New "Logistic" Inflation in the Offing?

It is beginning to become clear that the inflation is a global phenomenon. Is it entirely because of the Chinese disruptions? While the Chinese disruptions have certainly been important, no country has escaped this inflation, which for want of a better word we would like to call "logistic" inflation. The few quarters of near complete interruption of especially international movements of cargo (by ships and aircraft) may have been the root cause. The sheer complexity of the movement both national and international in the modern economy is difficult to visualize. Goods and subassemblies normally move across multiple countries, stay in warehouses, are processed in multiple factories and go to retailers and wholesalers. The optimality of the network had emerged gradually as the system expanded and grew, with the feedback of spatial price differences reflecting congestion and logistic costs, feeding back to decision makers in organizations to create logistic investments along particular routes, and handling stations. Small shocks slow moving changes could be addressed by incremental optimality often arising out of analysis.

When the system was pushed to a near complete halt, there is no way it can quickly go back to the optimal. Even if a port say Shanghai has a program to optimally manage the berthing of ships and the handling of containers, it cannot really use the same since there is no constancy to the patterns of cargo it needs to handle, given that we are in a period of re-emergence of the logistic networks. All ports would face the same problem and there is no dynamic optimization software that includes all the major ports! Hence willy-nilly only the "market" can solve the problem and it would take time. The markets' way of working is to create price signals that then become the cues to re-develop portions of the network, deploy resources here, remove the resources from there and so on. The optimality of global production and logistics was not an optimum of a gigantic enterprise. It was constituted by the optimum internal to particular corporations, with the networks across nations being base of the logistic network - a market mechanism - that had evolved, and hence cannot be rebooted. It would have to re-emerge.

Unfortunately for the world the Chinese disruptions caused by the structural realignment of their economy directed from the top would interfere with the re-emergence, delaying the process and also raising prices acutely. Demand elasticities need not be symmetric. The value a person attaches for instance to an air conditioner when he has not yet experienced the same is much lower than the value that he would attach if suddenly he is deprived of it. His willingness to pay to get back access, can be very large, and this can lead to high prices during the re-emergence of optimality in logistic networks.

Countries like India with lower varieties in their wage goods consumption, and with much of the food output being sourced internally would not face a high inflation in bringing back the optimality of the network within India. Here because agricultural commodity movements never stopped, it is unlikely that India would face an undue burden on account of rising basic food prices.

For the advanced countries with food (even basic) being sourced over continental distances, and with lower willingness to switch between staples, or food types, the inflation may be higher and could also spiral into wage inflation. The dilemma really is that the price rises are necessary to speed up the movement back to the optimal configuration of networks after which prices are likely to fall as well. Yet economists believe that the resulting inflation from these price adjustments could spiral into a raising expectation regarding inflation. Convergence processes are quick, but then governments have to be seen to be doing something, even when what they do – closing borders, and interrupting movements, and imposing – would have little effect, because in the glare of a media that dominates opinion, human lives matter! Global coordination to open up should be a top priority otherwise a slower process of reaching the optimal would lead to build up of expectations and hence to what the economist fear.

Of course, the logistic nightmare may be amplified by the China factors. This may give Indian firms advantage, in such items as steel, basic metal manufacturers, chemicals, pharmaceuticals, automobiles and many other products. On the balance there are already signs that the manufacturing sector is using exports to clamber back, even as consumption demand is muted in India. But would the investment cycle revive? For almost 9 years private investments have been lying low, so it is likely that with the push of PLI, the China Factors, and the 'logistic-inflation' would all work to revive the same. If there is a big push to demand, particularly consumption then the prospects improve a great deal. Indian firms have plans to have large capacities and that too has been raising the growth expectations and hence the market valuation over the last couple of months.

Much would depend upon whether this pre-eminently a supply side inflation- would invite tightening in the US and Europe? Tightening would have little workability, given that the high prices (not continuing inflation) are necessary to signal the optimization of networks. They would only slowdown economies without much effect on the inflation that is bound to fall as the networks re-emerge. Allowing a quick rise in prices may make the movement towards the optimum quicker. And since the length of the period over which an increase in inflation is important in the buildup of expectations, it may actually help not to intervene on the demand side.

This 'logistics' inflation while on the supply side is different from the oil price increase based inflation that the world saw in the late seventies and the early eighties. Being a price rise that is happening because of the misalignment and closure of portions of the network, the end point is known to be optimal, and hence the price rise would be temporary. In the oil case there was a permanent terms of trade push up in their favor by the OPEC, and the pass-thru and secondary expectations rise had to be endured for long. The expectations part of the inflation could therefore be addressed by demand curtailment.

Administrative and coordination efforts of governments that go beyond their own countries – all agreeing to open up, clear shipping lines, the big 100 container ports in the world coordinating their handling - would be the best way forward. But then if the current inflation as the usual "vanilla inflation" a more protracted period of high inflation may be in the offing.

Table 11

	2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
	At 2011-12 Prices			Per Capita at 2011-12 Prices		
GVA at basic prices	100.0	99.8	101.9	100.0	92.9	99.8
Net Indirect taxes	100.0	81.6	94.9	100.0	80.8	92.9

GDP	100.0	92.7	101.3	100.0	91.8	99.2
NDP	100.0	92.6	101.2	100.0	91.6	99.1
Private Final Consumption Expenditure	100.0	90.9	97.1	100.0	89.9	95.1
Government Final Consumption Expenditure	100.0	102.9	110.7	100.0	101.9	108.5
Gross Capital Formation	100.0	89.3	102.6	100.0	88.3	100.5
Change in Stocks	100.0	97.4	105.8	100.0	96.4	102.7
Valuables	100.0	103.0	178.7	100.0	100.9	175.1
Exports	100.0	95.3	111.1	100.0	94.3	108.6
Imports	100.0	86.4	111.6	100.0	85.6	109.5
Discrepancies	100.0	-4.3	153.8			
GDP	100.0	92.7	101.3	100.0	91.8	99.2
Population	100.0	101.0	101.1			
	At 2011-12 Prices (GVA at basic Prices)		Implicit Deflator using the 2011-12 Series			
Agriculture and allied act.	100.0	103.6	107.7	100.0	102.8	109.0
Mining	100.0	91.5	104.6	100.0	89.7	127.7
Manufacturing	100.0	92.8	104.4	100.0	102.7	114.3
Electricity, Gas and Water	100.0	101.9	110.5	100.0	98.3	99.6
Construction	100.0	91.4	101.2	100.0	102.5	111.6
Trade, Hotels, Transport Communications etc.	100.0	81.8	91.5	100.0	109.3	111.6
Finance and Real Estate	100.0	98.5	102.5	100.0	102.4	109.6
Public administration, Defense and other services	100.0	95.4	105.6	100.0	106.8	109.9
GVA at basic prices	100.0	99.8	101.9	100.0	103.4	111.8

Source: Compiled from Statements 1, 2, 3 and 4 of NSO (2012, 7th January). "Press Note on First Advance Estimates of National Income 2021-22" National Statistical Office, New Delhi

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Annex Table 1

Annex Table 1: A listing of Measures Announced by the Government and the RBI between March 26th and May 17th (Amounts Unless Otherwise Stated are in Rs. Million)									
S.No	Tranche	Authority	Details of Measure [Remarks, if any]	Liquidity Implied	Credit Potential	Fiscal Cost	Subsidies	Direct Expenditure	Guarantee/ Provision % to GDP 2019-20
		/Date		(A)	(B)	(C)=(D)+(E)+(F)	(D)	(E)	(G)
1	c. March 26	Govt. 2020	(0th)			31000	31000		0.0152%
			PM Garib Kalyan Yojana - Transfer of e-gratis payment of Rs. 500/pm for three months for 204 million women account holders under PM Jan Dhan Yojana						
2	c. March 26	Govt. 2020	(0th)			13000	13000		0.0064%
			Distribution of free gas cylinders to 80m poor families over next three months						
3	c. March 26	Govt. 2020	(0th)			5000	5000		0.0025%
			Govt. to bear PF contribution (14%) of both employee and the organization for 3 months of employees earning less than Rs. 15,000 pm in small businesses with less than 100 employees						
4	c. March 26	Govt. 2020	(0th)			3000	3000		0.0015%
			Senior citizens and disabled people to receive Rs. 500 twice and around 30 m eligible people						
5	c. March 26	Govt. 2020	(0th)			5600	5600		0.0027%
			The wage rates under MNREGS increased from Rs. 182 per day (current) to Rs. 202 from 1st April 2020 to benefit an estimated 136.2 m families						
6	c. March 26	Govt. 2020	(0th)			4605	4605		0.0023%
			Insurance scheme for health workers, doctors/nurses etc for those fighting COVID19, to cover about 2.2m health workers, with compensation to go up to Rs. 5 lakh [Scheme to cover all health workers engaged in COVID related activities for death over 90 days. Rs. 50 lakh is the claim. Includes all. Essentially the number of deaths among COVID warriors would determine the expenditure. See <a href="https://www.mcafee.gov.in/pdf/PMHealthcareSchemePoster.pdf">https://www.mcafee.gov.in/pdf/PMHealthcareSchemePoster.pdf</a> Newspaper reports indicate that around 921 people were paid the claim of Rs. 50 lakh each ( <a href="https://www.business-standard.com/article/economy-policy/921-healthcare-workers-paid-rs-50-lakh-insurance-claim-under-pragati-scheme-121072001681_1.html">https://www.business-standard.com/article/economy-policy/921-healthcare-workers-paid-rs-50-lakh-insurance-claim-under-pragati-scheme-121072001681_1.html</a> )]						
7	c. March 26	Govt. 2020	(0th)			16000	16000		0.0078%
			Under PM Kisan Yojana government to disburse the first instalment of Rs. 2000 per kisan of the total cash transfer of Rs. 6000 per year for 87 m farmers. [Essentially front loading the transfer that was already budgeted for]						
8	c. March 26	Govt. 2020	(0th)			45000	45000		0.0211%
			Additional 5 kg of rice/wheat per poor person and 1 kg of pulses per family to cover for 800 m poor families						

			[Issues from overflowing buffer stocks]. The cost per three basket per family (we assume that a total of 800m baskets would be given) covering 800/3 families, at Rs. 562 per basket]						
9	c. March 26 Govt. 2020	(0th)	Women in SHGs to get up to Rs. 2 lakh (earlier limit was Rs. 1 lakh) collateral free loan, to cover 68.5m households. [Depends upon how many of the women take loans. Assuming that out of roughly Rs. 80,000 crore of outstanding loans to women the increase is 10% and some 10% of these double their size the additional expected credit flow is Rs. 8000 million. See NABARD (c.2020) "Status of Microfinance in India" Table A.1 p.43. <a href="https://www.nabard.org/content/nabard/works/4413/25349v=21e+bank+lll+lls+crup+atme+ll">https://www.nabard.org/content/nabard/works/4413/25349v=21e+bank+lll+lls+crup+atme+ll</a> ]	8000					0.0039%
10	c. March 26 Govt. 2020	(0th)	Funds accumulated under the District Mineral Fund to be used for COVID related activities of state governments -testing etc. [Would mean less spending later]		25000	25000			0.0123%
11	c. March 26 Govt. 2020	(0th)	Funds accumulated under the Building Construction Workers Fund to support workers [Would mean less spending later]		31000	31000			0.0152%
12	c. March 26 Govt. 2020	(0th)	Deadline for filing tax returns for 2018-19 FY extended by three months [Convenience and allows for the disruption to not attract penalties]						
13	c. March 26 Govt. 2020	(0th)	Interest rate reduced from 12 to 9% on delayed tax payment made for 2018-19 FY [Since the income taxes collected amounted to Rs. 11.5 lakh crore, and assuming that 1% of tax payments is delayed a 3% interest reduction over 3 months (i.e. up to June 2020) would amount to Rs. 862.5 million]		862	862			0.0004%
14	c. March 26 Govt. 2020	(0th)	Similarly, interest rate reduced from 12 to 9% on delayed TDS deposits made. [This is likely to be negligible]						
15	c. March 26 Govt. 2020	(0th)	Extension in the deadline for Aadhaar to Pan linking, till June 30 [Convenience and allows for the disruption to not attract penalties]						
16	c. March 26 Govt. 2020	(0th)	Similarly extension of dates for filing claims, extension related to tax extended to June 30. [Convenience and allows for the disruption to not attract penalties]						
17	c. March 26 Govt. 2020	(0th)	GST related filings extended to June 30 - returns for March, April, May; date for opting out of the compensation scheme for small tax payers [Convenience and allows for the disruption to not attract penalties]						
18	c. March 26 Govt. 2020	(0th)	Late fees waived for small firms (50m turnover or less), and those above late fees payment delayed. [Convenience and allows for the disruption to not attract penalties]						

19	c. March 26 Govt. 2020 (Oth)	Customs and Central Excise Department extended dates for dispute settlement, extension of 24x7 customs clearance to international trade [Convenience and allows for the disruption to not attract penalties]						
20	c. March 26 Govt. 2020 (Oth)	No interest for those delaying payments of indirect taxes in period March to April, up to June 30. [These months were also very low production months thanks to the lockdown, so the impact of those producing and delaying would be small. Since the collections were Rs. 19.6, 44.6 and 74.5 in 000 crore during the months of April, May and June, an assuming a delay of 10 days in the payments for all months except those in June, and assuming a delay of 5 days for payments in June on account of the concession, and penal interest that would otherwise apply of 14% this would amount to approx. Rs. 3945 m.]	3945	3945			0.0019%	
21	c. March 26 Govt. 2020 (Oth)	Ministry of Corporate affairs extended dates of various filings to Sept 2020 i.e. by 60 days and several regulatory relaxations relating to independent directors, mandatory holding of meetings, deadline for business commencement for new companies, minimum residency requirements, deadline for maintaining reserves for payments of deposits with companies, time relaxation in the use of the new Caro 2020 audit format, waiver of additional fees for late filing of documents over the extended period. Deadline for investing 15% of the debentures maturing during the year in specified instruments extended to June 30. [Convenience and allows for the disruption to not attract penalties]						
22	c. March 26 Govt. 2020 (Oth)	Banking: Charges for ATM cash withdrawal waived for three months; minimum account balance fee waived for three months, bank charges for digital transactions related to credit reduced. [Convenience. Some very small benefit at the cost of banks]						
23	c. March 26 Govt. 2020 (Oth)	Banking code related: Threshold for bankruptcy proceedings raised from Rs. 10 lakhs to Rs. 100 lakhs. [Would restrain banks from pursuing bankruptcy over the COVID period for tiny typically household enterprises]						
24	c. March 26 Govt. 2020 (Oth)	Imports related: Import permits for shrimp and fish seed which may have expired extended by another 3 months. Delay of 1 month in trade allowed [Convenience. Given the disruption these and similar measures should have been automatic without going all the way to the Finance Ministry]						
25	c. March 24-27 RBI	Repo reduced by 75 basis points to 4.4% [Makes the marginal cost of liquidity for banks lower if the repos are available on tap]						

26	c	March RBI 24-27	MSF rate reduced to 4.65% [The "MSF" rate for accessing liquidity for banks using their SLR securities is not important. It creates an unnecessary third rate over the repo and the reverse repo. The amount of their SLR securities that they can use is tiny so it has no influence in determining the yields on government bonds and bills (the rate in the market).]						
27	c	March RBI 24-27	Reverse repo reduced by 90 basis point to 4%. This is just 0.75% higher than the lowest achieved after the GFC. [With the repo window now open wide, this would mean off take by the banks, and a slightly lower incentive to park money back in the RBI through the reverse repo.]						
28	c	March RBI 24-27	Targeted Long-term Repo Operations (TLTRO) for up to three years cumulating up to Rs. 1 trillion, at a floating rate linked to the repo. [Allows banks to buy investment grade corporate bonds, CPs and non-convertible debentures in both the primary and the secondary markets. It actually amounts to the RBI acting outside the lower end govt bond yield and also bring the yield on corporate bonds AAA closer to gilt for duration up to three years. A very significant measure which should have been initiated during the NBFC crisis. Would greatly help in the transmission of lower policy rates to the productive sector.]	1000000					0.4906%
29	c	March RBI 24-27	CRR reduced from 4% to 3% of net demand and time liabilities, for a year equal to a potential liquidity increase (M1 increase) of nearly Rs. 1.4 trillion. [Major measure to enhance liquidity. However, could in itself not work in situation of lending uncertainty since excess CRR is possible, till the risks as perceived by banks decline.]	1400000					0.6868%
30	c	March RBI 24-27	Minimum required CRR reduced from 90% to 80% for three months in an attempt to reduce the matching of reserves to deposits/loans. [Could spur lending if and when the uncertainties come down and the demand for credit improves.]	140000					0.0687%
31	c	March RBI 24-27	MSF borrowing limit raised from 2% of SLR to 3% which has a potential liquidity impact of Rs. 1.4 trillion approximately. [Would help those banks constrained by little holdings of securities above SLR to access funds from the RBI. Few are so constrained.]	1400000					0.6868%
32	c	March RBI 24-27	3-month moratorium on term loans with payments outstanding on March 1, 2020, without asset classification downgrade. [Convenience. And also prevents cascading defaults. Necessary measure.]						
33	c	March RBI 24-27	3 months deferment on interest payment on working capital loans / Cash credit / overdraft, without an asset reclassification on that account.						

34	c. March RBI	[Convenience. And also prevents cascading defaults. Necessary measure] 6 months deferment of implementation of Net Stable Funding Rate (NSFR) under the Basle norms.						
35	c. March RBI	[Convenience. And also prevents cascading defaults. Necessary measure] Similar deferment of the last tranche of Capital Conservation Buffer, by six months.						
36	c. March RBI	[Convenience. And also prevents cascading defaults. Necessary measure] Banks with units in International Financial centers permitted to participate in the offshore rupee derivative market (RIF market). [Improves the depth of the forex market and has the potential to lower volatility by bringing longer duration funds into the currency markets].						
37	c. May 13	Govt. (1st)	Credit line of Rs. 3.0 trillion from Banks and NBFCs to MSMEs for standard borrowers with credit limit up to Rs. 25 crore and a turnover of Rs. 100 crore. Tenor of loans up to 4 yrs. with a 12 month moratorium on repayment of principal. MSMEs could avail of this credit line up to end October. It is expected to benefit 4.5 million units. [When the demand materializes, this would help to quickly move credit to the MSMEs. Right away it helps banks to rollover their credit].	300000				0.1472%
38	c. May 13	Govt. (1st)	Stressed MSMEs: Government would support the banks by providing partial credit guarantee through Credit Guarantee Trust Fund for Micro and Small Enterprise, the support by the government being Rs. 4000 crore. This is expected to benefit 2 lakh units. [Reduces the risks for banks, and supports solvent but liquidity constrained entities].	200000		40000		0.1177%
39	c. May 13	Govt. (1st)	Setting up of a fund of funds with an initial equity injection of Rs. 10000 crore, which is expected to provide credit of Rs. 50000 crore to MSMEs. [Credit enhancement to MSMEs].	500000		100000		0.2943%
40	c. May 13	Govt. (1st)	Not allowing global tenders in government procurement up to Rs. 200 crore. (Khan, M.H. (2017) estimates government procurement to be the order of Rs. 3 lakh crore annually. Assuming that some 10% of the same would be below Rs. 200 crore. Khan, M. H. Public Procurement Issues with Government of India (March 1, 2017). Available at SSRN: <a href="https://ssrn.com/abstract=2925865">https://ssrn.com/abstract=2925865</a> or <a href="http://dx.doi.org/10.2139/ssrn.2925865">http://dx.doi.org/10.2139/ssrn.2925865</a> ]					0.0000%
41	c. May 13	Govt. (1st)	Release of government dues to MSMEs in 45 days. [Better financial management by government. Indeed this should have been the norm in all government procurement].					0.0000%
42	c. May 13	Govt. (1st)	Setting up an e-market place for MSMEs for better marketing.					0.0000%

43	c. May 13	Govt. (1st)	Government guarantees for liquidity support to alling NBFCs and Housing Finance Companies, and Micro Finance Institutions for both AAA rated entities and below that rating. Up to Rs. 75000 crore would be so guaranteed	750000			750000	0.7358%
44	c. May 13	Govt. (1st)	Credit support for DISCOMs through PFC and REC against receivables, and against state government guarantee of Rs. 90000 crore	900000			900000	0.8830%
45	c. May 13	Govt. (1st)	Credit support by way of reduction in the rates of TDS and TCS. Reduced to 25% for the existing rate for the remaining financial year. Estimated at Rs. 50000 of credit	500000				0.2453%
46	c. May 13	Govt. (1st)	Extension of up to 6 months for contractors working on Central govt projects with firm schedules					0.0000%
47	c. May 13	Govt. (1st)	Immediate release of pending refunds to charitable organizations and non-corporate businesses [Governments in India are known to delay payments due to very inefficient process. The quick release would effectively mean a credit enhancement.]					
48	c. May 13	Govt. (1st)	Extension of due dates for direct tax filing by a month to three months: [Convenience]					
49	c. May 13	Govt. (1st)	Free food grain distribution extended to migrant workers. 200 (7) million packets, 5 kg of rice and 1 kg of dal per family for 2 months, at cost of Rs. 3500 crore	35000			35000	0.0172%
50	c. May 13	Govt. (1st)	Under PM Kisan Yojana government to disburse the first instalment of Rs. 2000 per kisan of the total cash transfer of Rs. 6000 per year for 87 m farmers. [Already budgeted for, so not additional measure]					
51	c. May 13	Govt. (1st)	2% interest subvention on Mudra Shiksha loans (loans going up to a maximum of Rs. 50000), for a period of 12 months [The loan outstanding is Rs. 160000 this amounts to a support of Rs. 3200 crore]	32000		32000		0.0157%
52	c. May 13	Govt. (1st)	Under Compensatory Afforestation Management and Planning Authority (CAMPA) funds worth Rs. 6000 crore would be released for immediate use by the State Government, to carry out maintenance and capex related works in forest areas. [This amount and more was anyway due to the state governments. The central government had after much delay released Rs. 47000 crore to the states. In August 2019, <a href="https://www.financexpress.com/lifestyle/science/modi-govt-opens-up-6000-crore-fund-for-afforestation/1690297/">https://www.financexpress.com/lifestyle/science/modi-govt-opens-up-6000-crore-fund-for-afforestation/1690297/</a> ] This announcement was a reiteration of the same, since despite the decision to release actual release had been slow]	60000		60000		0.0294%

53	c. May 13	Govt. (1st)	Credit support of 30 million small and marginal farmers. NABARD to extend additional working capital support of Rs. 30000 crore to Rural Cooperative Bank in addition to the usual credit support, for the next 2 months	300000				0.1472%
54	c. May 13	Govt. (1st)	Concessional credit of Rs. 200000 crore to farmers through Kisan Credit Cards	2000000				0.9911%
55	c. May 13	Govt. (1st)	To launch a programme under the Pradhan Mantri Awas Yojna to provide rental accommodation to migrant workers in PPP mode and to incentivise manufacturing industries to build quarters for workers [Policy / Reform]					
56	c. May 13	Govt. (1st)	Extension of Credit Linked Subsidy Scheme (CLSS) by a year, which would benefit roughly 0.25 million middle income households. Government estimates that will give an investment boost in construction by front loading of Rs. 70000 crore. [Much less may happen, since middle classes under pressure may not go for house purchase at this juncture even with the subsidy. At an interest subsidy of roughly 3.5% (average of the two MIG categories on loans of around 11 lakhs this would amount to Rs. 962 crore, assuming all 0.25 million households avail of the same during the year. If we adjust that half of this would flow, then the cost to government is about Rs. 450 crore. (Data from <a href="https://pmay-urban.gov.in/credit-linked-subsidy-scheme/">https://pmay-urban.gov.in/credit-linked-subsidy-scheme/</a> )]	4500	4500			0.0022%
57	c. May 15	Govt. (2nd)	Agriculture Infrastructure Development Fund for storage, cold chains and related logistics would be set up. No details on time frame. (Amount is Rs. 100000 crore). [Only the concessional part of the fund (perhaps some interest subsidy would be an 'expenditure') It only improves the availability but since infrastructural investments in these areas are hardly constrained by lack of funds, there is really no effect here]					
58	c. May 15	Govt. (2nd)	Launch a scheme to support to MSMEs and micro enterprises in their marketing efforts especially in promoting local brands and in meeting FSSAI standards etc. Would benefit some 200,000 such units, and the expected expenditure is Rs. 10000 crore. [Firstly that so many units operate without meeting national standards is a matter of concern. While the time frame is not known it is presumed to be within the year. It is not known if the same is to be explicitly provided for in the budget]	10000	10000			0.0049%
59	c. May 15	Govt. (2nd)	Pradhan Mantri Matsya Sampada Yojana (PMMSY) with an outlay of Rs. 20000 crore for supporting fishing related activities, of which Rs. 11000 crore would be for various support activities for marine and inland water fishing.	200000	200000			0.0981%

			and Rs. 9000 crore for infrastructure development. The value chain would therefore be enhanced. [This was already part of the budget of 2019-20 and is being reiterated. So ostensibly the spending is proposed to take place now]						
60	c. May 15	Govt. (2nd)	Setting up of an animal husbandry infrastructure development fund of Rs. 15000 crore with the object of supporting private investment in dairy processing and cattle feed related infrastructure, to inter alia expand exports. [No time for this expenditure /support measure, nor clarity on the credit component for the same. Assuming all this is expenditure support, and much of it would happen in the next 12 months]	150000	150000			0.0736%	
61	c. May 15	Govt. (2nd)	New scheme for infrastructural development supporting beekeeping with an outlay of Rs. 5000 crore. [No time for this expenditure /support measure, nor clarity on the credit component for the same. Assuming all this is expenditure support, and much of it would happen in the next 12 months]	50000	50000			0.0245%	
62	c. May 15	Govt. (2nd)	Plans to cover 1 mn hectares over the next two years with medicinal plants and herbs, with an outlay of Rs. 4000 crore	40000	40000			0.0196%	
63	c. May 15	Govt. (2nd)	Support for logistics related to agricultural perishables amounting to Rs. 500 crore. Operation Green Scheme had been announced in the budget of 2019-19 covering potatoes, tomatoes and onions. Now though this outlay it was being extended to all fruits and vegetables. Scheme involves a subsidy of 50% on storage and 50% on transportation and was to be launched as a pilot over the next 6 months. Objective was to reduce harvest losses, and enhance the ex-farm realization.	5000	5000			0.0025%	
64	c. May 15	Govt. (2nd)	Amendment of Essential Commodities Act to allow for many more market players, and no constraint on the upside of prices. Law to modify/amend the APMC Act by which the "monopoly" of the APMCs would go. Creation of a legal framework for risk mitigation and price and quality assurance for farmers. [Mostly administrative "reform" measures the impact of which would lie in the details and on the capacity of the government to see the large number of announcements and measures holistically, and remove contradictions]						
65	c. May 15	Govt. (3rd)	Coal mining: Introduction of commercial mining of coal on a revenue sharing basis with liberalized entry norms, and no end-use restrictions. 30 blocks to be offered immediately, and production before the scheduled dates would receive rebates from the revenue share. Extension of the revenue share to gasification /liquefaction of coal to "reduce" the environmental impact.						



			Vincent (2021). Assuming the business during the COVID year to be about half this level, and inelastic demand, the cost to government would be Rs. 773.5 crore]						
75	c. May 16	Govt. (3rd)	Privatization of power DISCOMs in Union Territories. Tariff policy to protect consumers against DISCOM inefficiencies. [Policy / Reform]						
76	c. May 16	Govt. (3rd)	Measures to increase private investments in social infrastructure. VGF up to 30% to be enabled in these sectors. Space exploration and atomic energy also included. [Policy / Reform]						
77	c. May 17	Govt. (4th)	Increased allocation to MNRREGS by Rs. 40000 crore which would make the total allocation this year to Rs. 120000 crore. [Major way of supporting rural population with work]		400000		400000		0.1962%
78	c. May 17	Govt. (4th)	Enhancing the borrowing limit of states to 5% of GDP for FY21 from 3% earlier. This would give an enhanced borrowing potential of approximately Rs. 300000 crore. [The increase is not automatic but is linked to reforms in power sector, management and financing of ULBs, and the ubiquitous "Ease of Doing Business". The actual borrowing increase is likely to be significantly lower than what is implied by the enhancement, not only because of the linkage with reforms, but also the reluctance of states to borrow heavily is known. Many of the large states ran fiscal deficits much lower than 3% of their GSDP, and had underspent in the immediate pre-COVID period]	30000000					1.4717%
79	c. May 17	Govt. (4th)	Bankruptcy rules. Increase in the threshold (minimum) to initiate insolvency proceedings from Rs. 10 lakhs to Rs. 10 crore, over the period of the crisis. No fresh initiation of proceedings over the next months. And COVID-related loans not to be considered in default debt over the period. [This would give some breathing space for defaulting/ illiquid MSMEs and tiny units]						
80	c. May 17	Govt. (4th)	CSR Reporting. Decriminalizing violations under the Companies Act, for technical and procedural defaults related to CSR and board reporting, and delays in statutory procedures such as AGMs. [Relaxation in reporting]						
81	c. May 17	Govt. (4th)	Listing of companies. NCDs could be listed by private limited companies without being considered as de facto public. NCD listing abroad, more benefits under the NCLAT, reduction in default penalties for small and "one-person" companies. [Relaxation in reporting]						

82	c. May 17	Govt. (4th)	Opening all sectors, including strategic sectors, to private enterprise, through a Public Sector Enterprise Policy. Many PSUs to be notified for privatization. [Relaxation in reporting]										
83	c. May 17	Govt. (4th)	Health Care and Education: Will increase spending, especially in communication at the grass roots level. [No estimate has been given, and this may merely be a commitment to spend up expenditures already budgeted for]										
		(II)	TOTAL (COLUMN) (Rs. crore)	15909286	3940000	8458000	1721286	331286	1390000	1790000	7.8045%	0	
			.. Above in Rs. lakh crore	159.09286									
			.. Above as % to GDP	0.7804523									
		(II)	TOTAL (COLUMN) (Rs. Million) [excluding the borrowing limit enhancement for the states]		3940000	5458000	1721286	331286	1390000	1790000	6.3328%	0	
			Above in Rs. Lakh crore		3.940	5.458	1.721	0.331	1.390	1.790			
			Above (Total of rows) (A)+(B)+(C)+(F) (Rs Lakh crore)	12.909									
			Of the above that which can be considered as fiscal stimulus (C) (Rs. Million)	1721286									
			... in Rs. lakh crore	1.721									
			... as % of GDP of 2019-20	0.84%									
			MEMO GDP 2019-20		203847000								
			... (in Rs. lakh crore)		203.847								

# Subsidies to people /transfers to people /Transfers to state and lower levels of government /tax reduction.

Annex Table 2

Annex Table 2: Trajectory of Indices of Industrial Production (2011-12 Before and After the COVID: Decline and Recovery) (Absolute Index or % CAGR unless otherwise stated)												
	Food Beverages	Tobacco	Textiles	Wearing apparel	Leather etc.	Wood etc.	Paper	Printing and recorded media	Coke and petroleum	Chemicals	Pharma	Rubber
<b>Index Pre Crisis</b>												
Average 12 months before 31st March 2020 (2019-04 to 2020-03)	133.7	106.4	95.4	115.7	154.6	122.7	113.8	90.8	90.7	126.7	118.5	215.2
Average 4 quarter before 31st March 2020 (2020-01 to 2020-03)	135.7	99.8	95.3	113.1	147.5	121.0	102.4	83.3	87.5	119.2	115.9	207.8
<b>Index Crisis</b>												
Average over 1st Quarter of Crisis (2020-04 to 2020-06)	98.5	48.7	44.1	38.1	59.4	51.3	39.4	51.6	48.6	96.0	80.7	188.3
<b>Index Recovery</b>												
Average over 1st Quarter of Recovery (2020-07 to 2020-09)	109.7	80.1	91.5	98.6	115.9	115.3	95.1	70.1	67.4	104.4	122.2	233.7
Average of 2nd Quarter of Recovery (2020-10 to 2020-12)	116.2	90.2	79.5	117.5	117.1	114.5	102.1	85.1	68.4	117.9	126.0	219.9
Average of 3rd Quarter of Recovery (2021-01 to 2021-03)	141.3	100.3	99.0	116.1	137.3	125.3	115.6	83.1	71.1	124.6	126.2	217.6
Average of 4th Quarter of Recovery (2021-04 to 2021-06)	116.6	76.1	71.1	110.4	92.4	87.5	91.1	81.0	63.1	114.1	114.5	215.4
Average of 5th Quarter of Recovery (2021-07 to 2021-09)	114.3	87.6	85.1	118.0	118.6	110.5	108.0	81.1	69.1	112.9	125.5	233.8
Average over the latest rolling year of recovery since the crisis (2020-10 to 2021-09)	126.2	87.6	87.1	114.0	117.3	108.9	107.6	79.6	69.9	117.8	123.1	225.5
Average over corresponding months before the crisis (2019-10 to 2020-03 and 2019-04 to 2019-09)	123.7	106.4	95.4	115.7	154.6	122.7	113.8	90.8	90.7	126.7	118.5	215.2
<b>Change in Index</b>												
Crisis YOY (%)	-16.2%	-32.4%	-18.0%	-18.3%	-51.6%	-28.0%	-33.3%	-36.4%	-55.3%	-1.7%	-24.3%	-30.0%
Crisis over last quarter before crisis	-16.8%	-95.7%	-74.1%	-110.6%	-102.3%	-91.1%	-107.1%	-92.1%	-70.5%	-15.2%	-27.7%	-10.5%
1st Quarter Recovery YOY	1.3%	22.8%	-4.0%	-19.1%	-30.1%	-6.1%	-14.8%	-29.6%	-25.6%	-18.0%	0.8%	0.2%
2nd Quarter Recovery YOY	-10.6%	-7.6%	-11.0%	-1.8%	-24.1%	-8.2%	-12.6%	-8.4%	-27.1%	-9.0%	6.8%	9.0%
3rd Quarter Recovery YOY	4.1%	0.5%	3.6%	2.7%	-6.9%	-1.9%	-12.1%	-0.3%	-20.7%	-3.6%	8.5%	4.8%

1st Quarter Recovery YOY(%)	0.4%	-51.8%	-25.3%	-4.2%	-58.2%	-36.7%	-23.4%	-14.0%	-41.3%	-7.9%	-8.0%	3.0%	-3.1%
5th Quarter Recovery YOY(%)	0.8%	-13.8%	-11.3%	3.6%	-27.8%	-10.6%	-12.1%	-14.9%	-23.1%	-10.2%	3.4%	5.0%	5.5%
4th Quarter Recovery YOY(%)	0.1%	-26.0%	-12.6%	-2.1%	-29.1%	-16.3%	-11.7%	-7.0%	-20.7%	-3.9%	-1.1%	1.5%	-1.6%
5th Quarter Recovery YOY(%)	0.4%	-6.9%	-5.5%	1.8%	-13.9%	-5.3%	-5.5%	-7.5%	-11.5%	-5.1%	1.7%	1.5%	1.8%
Average of Year 2020:10 to 2021:03 Recovery YOY(1.5) i.e. over average of (2019:10 to 2020:03 and 2019:04 to 2019:09)	2.0%	-10.5%	-9.0%	-1.2%	-27.6%	-11.9%	-5.6%	-13.0%	-26.0%	-7.2%	3.9%	4.7%	6.9%
Trend growth rates 2012:04 to 2020:03 of the deseasonalised series using ARIMA %	2.15%	0.04%	-3.58%	0.80%	-6.10%	1.37%	1.63%	-1.09%	-1.22%	2.90%	1.23%	11.79%	-0.62%
Average of Year 2020:10 to 2021:03 Recovery YOY(1.5) i.e. over average of (2019:10 to 2020:03 and 2019:04) adjusted for the period difference, i.e. annualised	1.33%	-11.98%	-5.96%	-0.33%	-18.35%	-7.95%	-3.75%	-8.66%	-17.36%	-4.83%	2.61%	3.13%	4.57%
# Over the two years; 5 Over the two years /2 (i.e. CAGR)													

Annex Table 2 (Continued)-Trajectory of Indices of Industrial Production (2011-12 Before and After the COVID Decline and Recovery (Absolute Index or % CAGR unless otherwise stated)

	Non-metallic	Basic metals	Fabricated items	Computers etc	Electrical	Machine ry nec	Motor	Other transport	Furniture	Other	Mfg	IIP-General
Index Pre Crisis												
Average 12 months before 31st March 2020 (2019:04 to 2020:03)	121.8	158.1	90.6	151.0	105.2	107.7	100.2	136.6	197.3	81.2	129.6	129.0
Average 1 quarter before 31st March 2020 (2020:01 to 2020:03)	125.4	160.4	87.4	132.2	95.7	106.3	90.9	122.5	191.0	77.6	127.9	129.6
Index Crisis												
Average over 1st Quarter of Crisis (2020:04 to 2020:06)	72.8	91.7	38.4	64.0	33.0	44.6	25.0	31.6	68.9	30.3	77.9	84.0
Index Recovery												
Average over 1st Quarter of Recovery (2020:07 to 2020:09)	101.8	158.8	86.0	152.8	101.2	95.7	86.0	134.6	168.6	57.9	121.2	119.7
Average of 2nd Quarter of Recovery (2020:10 to 2020:12)	126.8	170.0	89.9	138.1	118.4	109.1	101.4	129.3	161.7	84.5	130.9	131.4

Average of 3rd Quarter of Recovery (2021:01 to 2021:03)	130.6	176.0	96.0	176.1	108.7	117.4	109.4	138.7	165.7	88.2	136.5	137.4
Average of 4th Quarter of Recovery (2021:04 to 2021:06)	119.1	163.9	74.1	113.3	76.8	89.0	83.1	88.1	134.8	79.3	119.1	121.3
Average of 5th Quarter of Recovery (2021:07 to 2021:09)	121.8	171.1	89.7	146.9	130.5	110.2	95.2	128.8	167.5	95.3	130.4	130.2
Average over the latest rolling year of recovery since the crisis (2020:10 to 2021:09)	122.3	170.9	88.0	142.8	110.6	107.2	97.9	124.5	158.4	84.5	129.8	130.0
Average over corresponding months before the crisis (2019:10 to 2020:03 and 2019:04 to 2019:09)	121.8	159.1	90.6	151.0	105.2	107.7	100.2	136.6	197.3	81.2	129.6	129.0
Change in Index												
Crisis YOY (%)	-27.1%	-21.4%	-43.0%	-57.1%	-41.8%	-47.2%	-67.1%	-12.5%	-28.1%	-61.2%	-	-20.7%
											25.9%	
Chals over last quarter before crisis	-53.9%	-53.3%	-61.5%	-100.3%	-112.5%	-92.5%	-151.1%	-150.6%	-103.3%	-105.0%	-	-43.9%
											51.5%	
1st Quarter Recovery YOY	-12.3%	0.9%	-4.1%	-10.0%	-7.0%	-8.9%	-15.2%	-7.9%	-20.8%	-41.2%	-6.5%	-5.9%
2nd Quarter Recovery YOY	5.8%	4.5%	0.7%	7.1%	3.0%	1.7%	5.4%	-4.1%	-19.6%	14.2%	0.1%	1.8%
3rd Quarter Recovery YOY	4.1%	9.3%	9.4%	29.7%	12.7%	9.9%	18.6%	12.4%	-14.2%	12.9%	6.5%	5.8%
4th Quarter Recovery YOY(%)	-4.6%	4.8%	-25.8%	-43.1%	-27.9%	-23.5%	-31.2%	-48.6%	-36.2%	-8.9%	-9.0%	-7.2%
5th Quarter Recovery YOY(%)	5.6%	8.4%	0.1%	-14.0%	19.5%	5.2%	-5.1%	-12.5%	-21.6%	9.7%	0.8%	2.5%
4th Quarter Recovery YOY(\$)	-2.3%	2.4%	-12.9%	-21.5%	-14.0%	-11.8%	-15.6%	-24.3%	-18.1%	-4.5%	-4.5%	-2.6%
5th Quarter Recovery YOY(\$)	2.8%	4.2%	0.1%	-7.0%	9.2%	2.6%	-2.6%	-6.2%	-10.8%	4.4%	0.4%	1.3%
Average of Year 2020:10 to 2021:09 Recovery YOY(1.5) (i.e. over average of (2019:10 to 2020:03) and 2019:04 to 2019:09)	0.8%	7.1%	-2.9%	-5.6%	5.0%	-0.4%	-2.2%	-9.2%	-22.0%	4.0%	0.2%	0.8%
Trend growth rates 2012:04 to 2020:03 of the de-seasonalized series using AR/MA %	2.5%	5.1%	-0.4%	6.3%	-1.6%	2.0%	1.4%	5.3%	9.7%	-3.8%	9.2%	3.4%
Average of Year 2020:10 to 2021:09 Recovery YOY(1.5) (i.e. over average of (2019:10 to 2020:03) and 2019:04) adjusted for the period difference, i.e. annualized	0.6%	4.8%	-1.9%	-3.7%	3.3%	-0.3%	-1.5%	-6.2%	-14.7%	2.6%	0.1%	0.5%
* Over the two years; † Over the two years /2 (i.e. CAGR)												