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Impact of Covid-19 Pandemic on the Indian Economy:
A Critical Assessment

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R. Ramakumar and Tejal Kanitkar[1]

This paper provides an analysis of the economic impact of the Covid-19 pandemic in India. First, using secondary data published by various sources, the paper attempts to document the trajectory of the infections and the lockdown in India. Secondly, the paper explains the status of growth and development in the Indian economy over a decade prior to the pandemic. Thirdly, it describes the nature of impacts inflicted by the lockdown in the economy between March 2020 and August 2020. Fourthly, it attempts to quantify the extent of economic losses in India using an Input-Output framework. Finally, it critically assesses the economic response of the Indian government to the pandemic and lockdown.

I
THE PANDEMIC AND THE ECONOMY

The impact of the Covid-19 pandemic on the global economy has been profound. The global economy was slowing down prior to the pandemic, and levels of inequality were high (Gopinath, 2019). The number of unemployed persons in the world was rising over the years (ILO, 2019). Debt, particularly bad quality debt, was dangerously building up in every country (Wirz and Timiraos, 2020). It was, thus, on a fragile global economy that the pandemic first arrived in early weeks of 2020.

The pandemic necessitated the imposition of strict lockdowns in most countries. As a result, economic activities came to a halt. As factories and offices are temporarily closed, the production of goods and services declined. Supply chains were also severely disrupted. Thus, goods and services were not *supplied* in adequate quantities to meet the pre-existent demand. Concurrently, autonomous to the supply shock, a shrinkage took place on the demand side. As economic units were shut down, people lost jobs and wages. Due to the lockdown, consumers did not venture out to purchase or access goods and services. Thus, aggregate effective *demand* also fell.

In short, the economic crisis induced by the pandemic was marked by an autonomous, concurrent and global decline in demand *and* supply. Given the exogenous nature of the shock, the demand and supply shocks were independent in their origin. These shocks arose together in time. They also emerged in almost all the economies, leaving no region free to compensate for the shocks in other regions. Recent crises in the global economy were caused by either demand slowdowns *or* supply shocks *or* speculations in financial markets. The Covid-19 lockdown was unique in that both demand and supply fell. This was not a normal circumstance; rarely in history had such a convergence of demand and supply shocks occurred in all economies at the same time, and as a consequence of a non-economic, exogenous cause.

While the demand and supply shocks arose independently of each other, these shocks had also a feedback relationship with each other in a theoretically indefinite loop. Every decline in supply or production implied a decline in demand due to lost jobs or unpaid wages – an illustration of the *reverse multiplier effect*. Given the fall in profits, reinvestment of capital also declined leading to another round

of demand depression. But each fall in demand also led to a fall in supply. In fact, in reality, one unit of fall in demand led to a fall in production or supply by more than one unit. In the logistics literature, this is called the *supply bullwhip effect*, where a small change in demand is extensively and disproportionately amplified as the signal is transmitted down the supply chain.

The shocks to the real economy would surely spill over into the financial and external sectors. With reduced economic activity, debt repayments slow down. A prolonged lockdown could even lead to a banking and financial crisis. Sectors dependent on exports face a fall in export demand and prices. In sectors dependent on imports of intermediate goods or raw material, production is halted as inventories dry up. Remittances fall, reducing foreign exchange reserves. The pandemic, thus, extends from being a health crisis into becoming a global economic crisis as well.

Two further points may be made. First, given the relationship between the pandemic and the enforcement of lockdown, any revival of the economy is also dependent on the "flattening" of the epidemic curve (Baldwin and Mauro, 2020). Only when the epidemic curves begin to flatten is the lockdown eased, and only then can economic activities be restarted. In other words, an early control of the spread of infections is important for an early revival of the economy.

Secondly, till the lockdowns are fully lifted, governments cannot introduce classical Keynesian types of economic stimuli. The reason is that no demand revival measures are likely to be successful in the presence of supply declines and supply chain disruptions. Opinions differ on whether lockdowns should be blanket shutdowns, or calibrated to ensure protection of livelihoods. The scientific view is that while lockdowns may be necessary, two aspects of policy should be

prioritised: one, the lockdown period should be used to slowdown the spread of infections and expand testing and health infrastructure, which prepares the economy for a spread of infections afterwards. Two, a universal economic support package for the firms and people is essential during the lockdown including provision of financial support, ensuring food security and continued functioning of essential sectors and activities.

Our analysis of the pandemic, the lockdown, its economic impacts and the response of the Indian government broadly follows the logic of the description above. In what follows, we shall take up each one of these aspects and discuss them in greater detail.

II
THE TRAJECTORY OF THE PANDEMIC IN INDIA

The first case of Covid-19 infection in India was reported on 30 January 2020. At that juncture, there were almost no restrictions in India on domestic or international travel or tourism. There were only two notable restrictions: one, international travellers from China were screened at the airports and two, a ban was imposed on the exports of personal protective equipment (PPE).[2] Later, in early-February 2020, the National Disaster Management Authority (NDMA) released guidelines to all States on the nature of awareness campaigns to be undertaken through the media. These campaigns included the advocacy for face masks and hand sanitisers as well as the need to avoid travel and large gatherings.

Three major limitations of the Indian policy in these early days have to be underlined. First, even in early-February 2020, screening and surveillance of international travellers were applicable only for in-bound passengers

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[2] This directive was amended on the 8th of February 2020 to allow the exports of surgical and disposable masks as well as gloves.

from China, even though many other nations were also reporting Covid-19 cases.[3] In fact, it was only from 26 February 2020 that India started screening passengers from other hotspots like Italy, Iran and South Korea. Official data show that between 15 January and 18 March 2020, about 7.8 million international passengers arrived in India. However, only about 1.5 million of them (or 19 per cent) were subjected to screening or surveillance.

Secondly, adherence to the advisories on avoiding mass gatherings was poor. Two events attracted particular attention. On 24 February 2020, during the official visit of President Donald Trump, a massive road-show and a public meeting was organised in the city of Ahmedabad in the Indian State of Gujarat. About 100,000 people participated in this official event. In March and April 2020, Ahmedabad was a hotspot of Covid-19 infections. On 15 and 16 March 2020, an international conference was organised in Delhi by the Tablighi Jamaat, a religious organisation. About 250 delegates from outside India, including from hotspots in Malaysia and Indonesia, participated. This congregation was a major spreader of infections across the country. On both occasions, the government failed to strictly impose its own guidelines.

Thirdly, while the need to increase the manufacture of PPE was recognised the world over, the Government of India did not respond in time. The World Health Organisation (WHO) noted on 27 February 2020 that the global stock of PPEs, gowns and goggles was "insufficient". India's Ministry of Textiles estimated on 18 March 2020 that India required about 725,000 coveralls and about 6 million N-95 masks, both of which were in short supply. But according to the Preventive Wear Manufacturer Association of India (PWMAI), they received the government's

guidelines on the specifications of equipment only on 21 March 2020. By then, however, the lockdowns were in effect and the manufacturers were less able to respond effectively to the rising demand for PPE.

By March 2020, the pandemic was spreading fast. On 18 March 2020, the government formed a national task force with 21 health experts. However, no details of discussions within this task force or their recommendations are public till date. By 20 March 2020, many States announced shutdowns of various degrees. About 75 to 80 districts out of the 739 districts – identified as hotspot districts – were completely shut down, with only essential services allowed to function. On 22 March 2020, all train services, air services and inter-State bus services were suspended.

The national lockdown

By 23 March 2020, the impression provided by the government was that it intended to shut down only the hotspot districts to contain the spread of the virus. However, on 24 March 2020, the Prime Minister appeared on national television at 8 PM and announced that the whole country was being locked down for 21 days from midnight that day. After 21 days, the lockdown was extended till 3 May 2020, and then again first till 17th and then till 31st May 2020.

As we emphasised, a lockdown may be necessary to meet the immediate needs of addressing the pandemic. We do not agree with the argument that a lockdown was unnecessary, and that large-scale testing, quarantine and monitoring would have sufficed. On the contrary, a lockdown helps in slowing down the spread of infections. It provides time to the governments to expand health and quarantine facilities, intensify testing and contact tracing and be prepared for a surge afterwards. The governments

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[3] This was despite the advisory issued by the World Health Organisation (WHO), on 24 January 2020, noting that the virus may spread globally from regions outside China also.

should, also, ensure that all essential services are maintained, firms are allowed economic leeway to survive the lockdown period and people are provided relief and basic needs like food and, possibly, a cash transfer.

India's announcement of a national lockdown, however, appeared more like a shock-and-awe tactic rather than part of a well-thought out plan. Just as the tactic means in military parlance, India's lockdown was designed more to help the government achieve rapid dominance over its people, using the force of power and leaving them "stunned, confused, overwhelmed, and paralysed". It was imposed without adequate warning and was not backed up by any transparent and scientifically sound statement of intent.

Beginning from 25 March 2020, India was totally shut down. The government announced that a set of essential services would be allowed to operate, but reports from the ground indicated that most essential services were adversely hit (Narayanan and Saha, 2020). The guidelines regarding the lockdown were handed down from the centre to the States, and the States were given little flexibility in deciding the guidelines based on the contexts of implementation. Almost all economic enterprises were closed and the mobility of people was halted. Police force was extensively used to ensure strict implementation of the lockdown.

We ask two questions as we try to assess India's lockdown from a public health perspective. One, did the lockdown help the government to contain the pandemic? Two, did the government use the lockdown to improve health infrastructure?

The lockdown and the spread of infections

India is a densely populated country with inadequate housing, sanitation facilities and public transport. When the lockdown was announced on the 24th of March 2020, India had only 571 confirmed infections. During the lockdown, the testing rates had to be raised, the infected had to be identified and quarantined in time, contacts of the infected had to be traced and monitored and social distancing and the use of sanitisers had to be universalised. The curve had to be "flattened".

There are two positives in the Indian experience with lockdowns (see Figure 1). First, India's lockdown was partly successful in slowing down the spread of confirmed infections. The total number of confirmed infections per day rose from 119 on 23 March to only 1718 by 30 April, 7964 by 30 May and 18,522 by 30 June. In other words, India had the opportunity to expand its health preparedness over these three months. Of course, it is impossible to build a counterfactual to judge whether the virus would have spread faster in the absence of a lockdown or whether a partial lockdown of hotspots alone would have been a more effective and efficient use of the already thinly stretched resources. In a situation of crises, the formulation and implementation of public policies are a challenging exercise in trial and error and learning-by-doing. Still, in the absence of the lockdown, the absolute number of infections in India would have in all likelihood surpassed that of every other country in April 2020 itself.

Secondly, the death rates in India have also been lower than for other countries. On 24 March 2020, the number of daily deaths in India was just two, which rose to only 67 by 30 April, 265 by 30 May, 418 by 30 June, 775 by 30 July, 948 by 30 August. For a country of India's size, the number of deaths was a major comfort, allowing the government extraordinary political space to focus on scientifically sound policies.

At the same time, important qualifications are in order. Number of infections are dependent on the extent of testing; the less you test, less is our ability to detect infections. A major concern raised by public health scholars is that the extent of testing in India was lower than in other countries. The number of tests per million in India was

lower than 100 till 10 June 2020, or about two and a half months after the lockdown began. It was after mid-June that the number of confirmed infections in India began to rise decisively i.e., after the number of tests per million crossed 100. It was only after 13th and 26th July 2020 that the number of tests per million crossed the next milestones of 200 and 300 respectively. Once India crossed 250 tests per million, its test positivity rate crossed 10. The test positivity rate fell back to below 10 only in the first week of August 2020 and remained so afterwards. As on 30 August 2020, the number of tests per million in India (about 610 per million) was still lower than in many other countries. Clearly, India failed to test higher numbers between March and mid-June 2020.

Figure 1 Daily numbers of confirmed cases, number of deaths and number of tests, India, United States and Brazil, December 2019 to August 2020
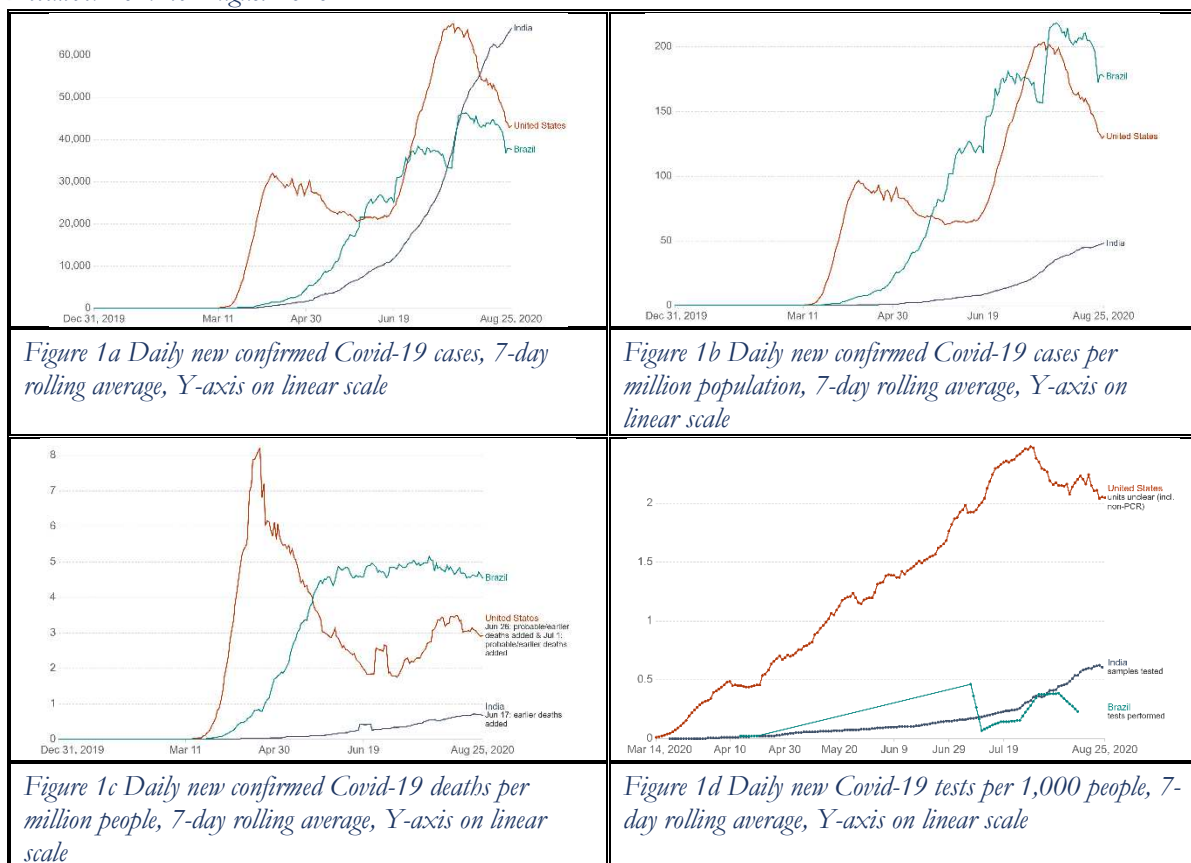
Figure 1a Daily new confirmed Covid-19 cases, 7-day rolling average, Y-axis on linear scale	*Figure 1b Daily new confirmed Covid-19 cases per million population, 7-day rolling average, Y-axis on linear scale*
Figure 1c Daily new confirmed Covid-19 deaths per million people, 7-day rolling average, Y-axis on linear scale	*Figure 1d Daily new Covid-19 tests per 1,000 people, 7-day rolling average, Y-axis on linear scale*

Source: Computed from *Our World in Data*, https://ourworldindata.org/coronavirus-data-explorer.

On 30 August 2020, India did not appear anywhere close to flattening the curve. On 30 August, India had 78,761 new confirmed cases per day. The total number of cases was rising, and was one of the highest in the world alongside United States and Brazil. Even when we normalise the number of new confirmed cases per million, the number of cases in India was rising rapidly, though the figure was lower than that of United States and Brazil. If we consider the number of new deaths per day, India again was right at the top with United States and Brazil on 30 August 2020. However, when we normalise the number of new deaths per million, the Indian figures, though rising, were lower than for most other countries. The only solace was that the number of tests were slowly rising and that the test positivity rate had fallen below 9.

Some regions of India, such as the state of Kerala, were able to effectively contain the virus through stringent testing and contact tracing (for details, see Thomas Isaac and Sadanandan, 2020; Swaminathan and

Johnson, 2020). States like Kerala were also able to keep the death rate lower than the national average due to the better quality of public healthcare systems, decentralised health governance and effective reverse quarantine measures. But major cities in the country, such as Mumbai, Delhi, Ahmedabad, and Chennai, were witnessing a rapid rise in cases despite the strict lockdown.

In summary, while India's lockdown may have slowed down the growth of infections and kept death rates low, the rising numbers delayed the opening up of the economy (see Sundararaman and Ranjan, 2020). As we shall discuss, the economic cost of the long lockdown was considerable.

Health preparedness during the lockdown

India was poorly equipped to deal with the pandemic in March 2020. India's major health indicators are inferior to not just the developed world, but also its compatriots in the club of emerging economies and South Asia (Dreze and Sen, 2013). Poor health indicators in India are the outcome of an underdeveloped public health system. While the ratio of health expenditure to GDP is more than 3 per cent in the developed world, the corresponding ratio in India in 2018-19 was only 1.3 per cent. As a result, India has a skeletal work force in the public health sector. It has only 0.85 physicians per 1000 people, 0.70 beds per 1000 people, 0.58 community health workers per 1000 people and 1.72 nurses and mid-wives per 1000 people.[4]

Given the poor level of health preparedness, India was forced to quickly increase the number of hospital beds, ventilators, doctors, nurses, care staff, spaces for quarantine, laboratories and health workers to undertake testing and contact tracing.[5] According to the government, it had put in place 3027 dedicated Covid-19 hospitals and 7013 care centres across the country by the end of May 2020. Further, there were 0.28 million isolation beds, 31,250 ICU beds and 1,09,888 oxygen-supported beds in these hospitals and centres. All these were indeed improvements over March 2020. However, as infections began to rise exponentially by May and June 2020, the weaknesses of India's health system were exposed. Reports emerged of hospitals unable to accommodate adequate number of patients, mortuaries with little space to hold dead bodies and doctors and nurses struggling without adequate number of PPE kits.

The key problem in India during the lockdown was the inability of the historically underinvested public health system to cope with the rising intensity of the pandemic. Accumulated under-preparedness spilled over into the inability to ramp up health infrastructure at short notice.

III
THE PANDEMIC AND THE INDIAN ECONOMY

As with the world economy, Indian economy too was faced with multiple constraints when the pandemic emerged. In this section, we shall outline the major features of the crisis in the Indian economy prior to the pandemic before discussing the economic situation after March 2020.

Indian economy before Covid-19

A key feature of India's economic growth performance after independence was the relatively low levels of economic growth rate. Beginning from the 1950s till the 1970s, India's economy grew at about 3 per cent per annum. Scholars across the world called it "the Hindu growth rate". The economy

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[4] See https://data.worldbank.org/.

[5] The private health sector was incapable of participating in the fight against Covid-19. Many private hospitals simply closed down during the lockdown.

finally moved up from the average annual growth rate of 3 per cent only by the 1980s; the economic growth rate in this decade averaged 5.6 per cent. Thus, the Indian economy had moved into a higher growth path in the 1980s itself as compared to the first three decades after independence (see Chandrasekhar and Ghosh, 2002).

From 1991, India began liberalising its economy in response to a balance of payments crisis. Over the first decade of economic reforms – between 1992-93 and 2002-03 – the rate of growth of the economy was 6.1 per cent, which was only marginally higher than the growth rate for the 1980s (RBI, 2003). In other words, the growth rates of GDP did not show a significant acceleration in the 1990s compared to the 1980s.

The next stage of growth in the economy began by around 2002-03 (see Figure 2). Due to a number of fortuitous international and national circumstances, the economic growth rate rose to an average of 8 to 10 per cent per quarter between 2003-04 and 2011-12, except in the midst of the global financial crisis of 2007-08 and 2008-09 (see also Nagaraj, 2013). This phase of growth was backed by a corresponding rise in an array of macroeconomic indicators. The investment rate grew from 27.2 per cent in 2003 to 40.2 per cent in 2011 (Figure 3). The savings rate grew from 26.8 per cent in 2003 to 36.9 per cent in 2011. The share of the value of exports in the GDP grew from 10.2 per cent in 2003 to 16.6 per cent in 2011 (Figure 4). On an average, the annual percentage growth in merchandise exports was 25 to 30 per cent between 2005-06 and 2011-12. Domestic credit supply was growing at about 11.1 per cent per month in April 2004, but gradually

rose to 27.1 per cent in July 2009 and 20.3 per cent in March 2011 (Figure 5).

These improvements in the macroeconomy were reflected in the levels of living of people, even if marginal. Reports of the National Sample Survey Office (NSSO) of the government show that there was a decline in unemployment from 2.3 per cent in 2004-05 to 2 per cent in 2009-10 and 2.2 per cent in 2011-12 (Figure 6). The levels of poverty also fell from 37.2 per cent in 2004-05 to 21.9 per cent in 2011-12 (Figure 7).

The trends were reversed in the years after 2011-12. One problem that arises while analysing economic growth in India after 2011-12 is the change in the base year of national accounts statistics from 2004-05 to 2011-12.[6] In the past, changes in base years did not present any methodological difficulty, as temporal comparability was ensured. However, the change of base year to 2011-12 was accompanied by fundamental changes too, which hampered comparability. For instance, the database on the organised private sector used in the estimation of GDP was changed from the Annual Survey of Industries (ASI) to the list of companies registered with the Ministry of Corporate Affairs, called MCA-21. Due to these changes, we have not followed a uniform base year for our plot in Figure 2. Instead, we have separately presented the Gross Value Added (GVA) series prior to 2011-12 with base year 2004-05 and after 2011-12 with base year 2011-12.

After 2011-12, GVA showed a rising trend till the first quarter of 2016-17 (Figure 2). From the second quarter of 2016-17, the GVA began to fall. It fell from 9.3 per cent in Q1 of 2016-17 to 3.5 per cent in Q3 of

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[6] As per the earlier methodology (with base year 2004-05), the Central Statistics Office (CSO) used to release estimates for GDP at factor cost. GDP at factor cost included all payments for the factors of production (rent, wages, interest, profits, dividends and other costs). A major change in the method of estimation under the new base year of 2011-12 was the introduction of the concept of Gross Value Added (GVA) at basic prices. GVA at basic prices was taken

as the indicator of economic activity from the supply side. It was arrived at by adding the net indirect production taxes (i.e., indirect taxes – subsidies on production) to the earlier concept of GDP at factor cost. From the supply side indicator of GVA at basic prices, GDP at market prices, the indicator of economic activity from the demand side, was arrived at by adding to it the net indirect product taxes (i.e., indirect taxes – subsidies on products).

Figure 2 Year-on-year growth rates of Gross Value Added (GVA) at basic price, India, quarterly series, 2004-05 and 2011-12 base years, in per cent *Source*: CEIC Database	*Figure 3 Investment rate and savings rate, India, annual, 2003 to 2019, in per cent to GDP* *Source*: CEIC Database	*Figure 4 Share of exports values in GDP and growth of merchandise exports, India, 2005-06 to 2019-20, in per cent* *Source*: CMIE Database
Figure 5 Monthly growth rates in domestic credit supply, India, 2004 to 2020, in per cent *Source*: CEIC Database	*Figure 6 Unemployment rates, India, 2004-05 to 2018-19, principal plus subsidiary status, in per cent* *Source*: NSSO reports, Government of India.	*Figure 7 Head count ratios of income poverty, India, 1993-94 to 2017-18, in per cent* *Source*: Parliament of India, Unstarred question 1418.
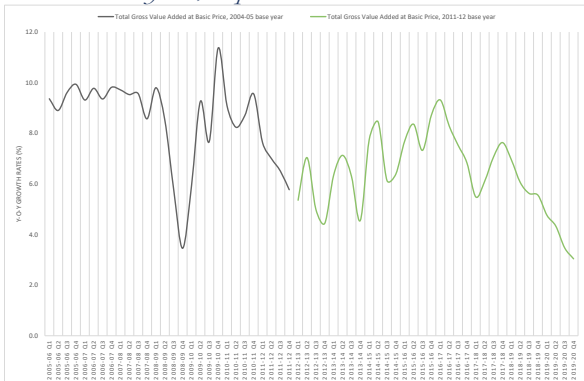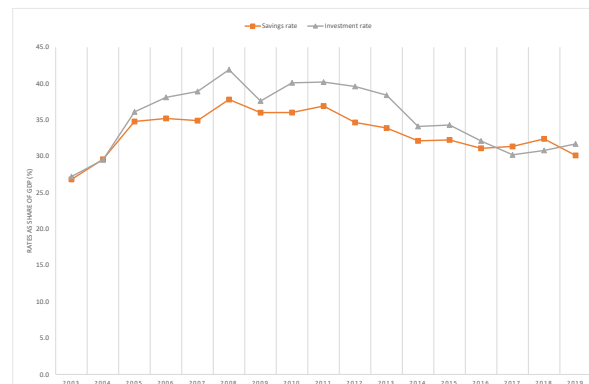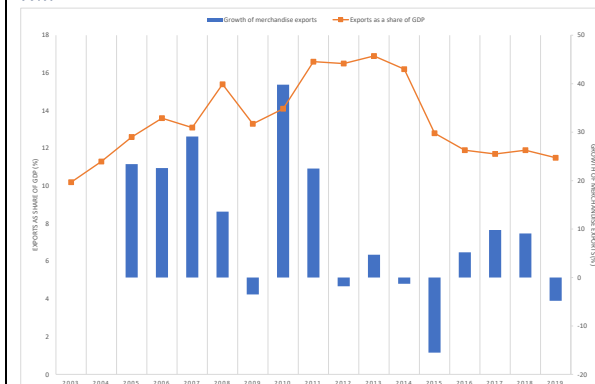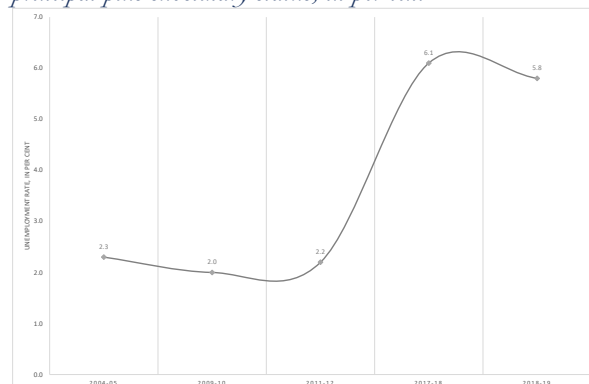
2019-20 and 3 per cent in Q4 of 2019-20. One of the triggers for this decline was the ill-conceived demonetisation of Rs 500 and Rs 1000 notes in November 2016, which sucked out about 86 per cent of the cash in the economy in just a few hours (Ramakumar, 2017).

While the new GVA series shows a rise till 2016-17 and a fall afterwards, economists have questioned the veracity of the rise of GVA growth rate between 2011-12 and 2016-17. A number of macroeconomic indicators universally associated with a rise in economic growth had begun to decline from 2011-12 itself. The investment rate fell from 40.2 per cent in 2011 to 32.1 in 2016-17 and 31.7 per cent in 2019-20 (Figure 3). The savings rate fell from 36.9 per cent in 2011 to 31.1 per cent in 2016-17 and 30.1 per cent in 2019-20.

The share of exports in the GDP fell from 16.6 per cent in 2011 to 11.9 per cent in 2016 and 11.5 per cent in 2019 (Figure 4). The rate of growth of exports, which averaged 25 to 30 per cent between 2005-06 and 2011-12 fell to between 5 and 9 per cent per year after 2011-12. The monthly growth rate of domestic bank credit fell from 27.1 per cent in the July 2009 to 6.3 per cent in March 2015 and 7.3 per cent in March 2020 (Figure 5).

The slowdown of GVA growth after 2011-12 had a direct impact on the lives of people. First, there was a sharp rise in the unemployment rate from 2.2 per cent in 2011-12 to 6.1 per cent in 2017-18 and 5.8 per cent in 2018-19 (Figure 6). The unemployment rates recorded for 2017-18 and 2018-19 were the highest rates recorded over the previous four decades.

Secondly, there was a rise in the levels of income poverty from 21.9 per cent in 2011-12 to 22.8 per cent in 2017-18 (Figure 7). In fact, this was the first rise in the absolute poverty levels in India after the early-1970s. The rise in rural poverty was steeper than for rural and urban areas put together; rural poverty rates rose from 25.7 per cent in 2011-12 to 29.6 per cent in 2017-18.

In summary, the Indian economy was gradually slowing down after 2011-12, and particularly so after 2016-17. While the GVA growth rates show a decline only after 2016-17, the range of economic indicators usually associated with economic growth had begun to decline from 2011-12 itself. In particular, the fall of investment rates and domestic credit growth are likely to have considerably eroded India's manufactural and infrastructural capacities over the last decade.
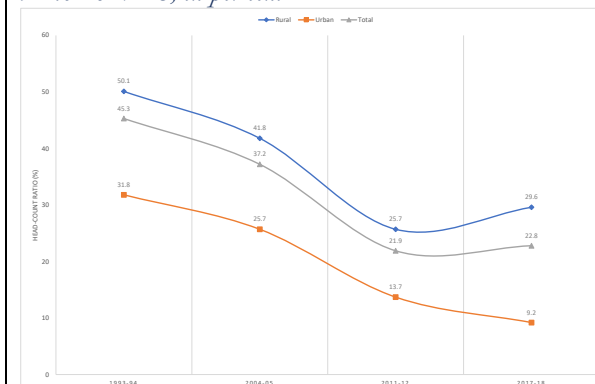
There was also clear evidence that these changes were accompanied by a sharp contraction of demand. On the one hand, the growth of real rural wages stagnated after 2016-17; it even recorded negative growth rates in many quarters. On the other hand, the manufacturing capacity utilisation fell from about 79 per cent in 2010-11 to about 72 per cent by 2016-17 and about 70 per cent in 2019-20 (RBI, 2020).

Though the presence of a demand slowdown was unmistakable, the Union government consistently refused to adopt a counter-cyclical fiscal policy. As Figure 8 shows, the ratio of Union government's expenditure to the GDP fell between 2011-12 and 2018-19. The government remained wedded to the ideological orthodoxy of fiscal consolidation in this period. Fiscal deficit had turned into a holy cow in this orthodoxy; any rise in fiscal deficit, it was argued, would scare away private foreign investors (Patnaik, 2019).

The fall of public expenditure was also an indicator of the increasing withdrawal of the state from economic activities under the neoliberal policy regime. Many economists, and even business associations, argued that the slowdown in the economy was structural, an outcome of poor aggregate demand and necessitated a pump-priming of the economy (see Chandrasekhar, 2019). But these arguments were ignored.

Thus, when the pandemic struck, Indian economy was already in a vulnerable position.

Lockdown and the economy: Nature of impacts

The national lockdown, which began on 25 March 2020, crippled economic activities across the country. The economic crisis precipitated by the lockdown was marked on the demand and supply sides. These shocks also reverberated across all the three sectors of the economy. On the supply side, the lockdown led to the shutdown of factories, firms and offices everywhere. In the primary and secondary sectors, there were reductions in supply (due to stoppage of production) as well as disruptions in the supply chain, which restricted movement of goods.

Figure 8 Expenditure of the Union government as a share of GDP, India, 2004 to 2020, in per cent
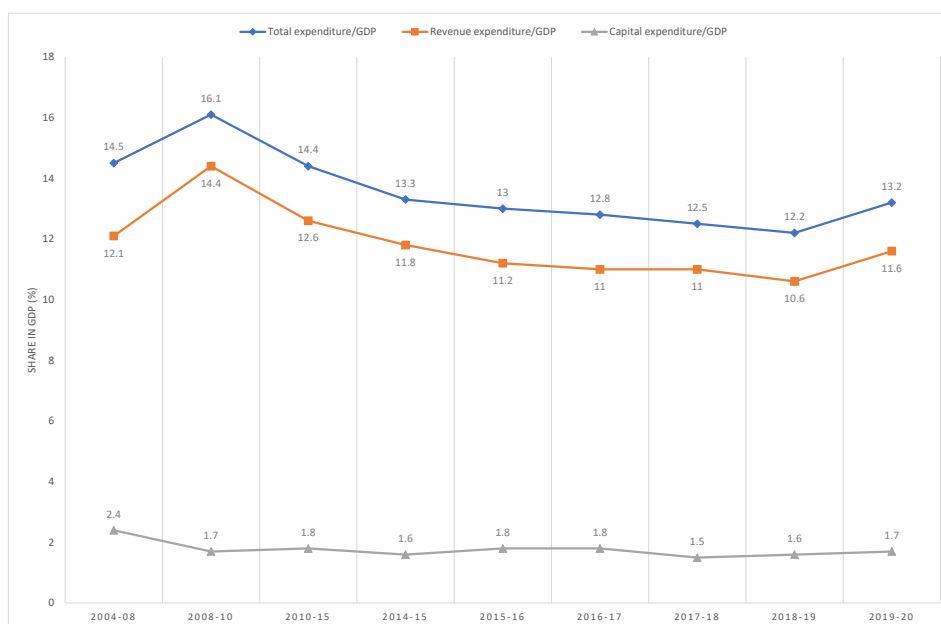
Source: RBI (2020)

Agriculture

The lockdown began when the harvest of India's second agricultural crop season (*rabi*) had begun. The harvest of crops in March, April and May 2020 was adversely affected due to two reasons: one, the disruptions in the agricultural supply chains; and two, the lack of adequate number of agricultural labourers, many of whom were migrant workers (for detailed analysis, see Ramakumar, 2020).

On the one hand, international trade was shut down. Thousands of containers were piled up in ports. Movement of goods through ports was adversely affected because of a shortage of workers to load and unload, a shortage of containers and the failure of importers to pay the import detention charges to the global container shipping lines.

On the other hand, domestic procurement systems were not operational in many regions. Even when the procurement centres were open, farmers struggled to bring their produce to the market yards due to poor availability of transport facilities and restrictions on movement of goods. Even where farmers were able to transport their produce to the market, they needed an invitation or appointment slip from the Market Board, which slowed down the entire procurement process. Further, procurement centres in many States refused to accept more than a specified quantity of produce per day. In the case of perishables, many farmers did not harvest their produce to avoid the costs

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of harvesting. Others were reported to be dumping their harvest of vegetables and fruits.

In many States, wholesale markets either closed down or were operational only for two or three days a week. Many large private traders were also not operational during the lockdown because of disruptions in truck services. According to one report, in early-April 2020, about 500,000 trucks were stuck in different highways of India as they could not cross state borders or were stopped by the police for technical reasons related to permissions. As a result, trucks were in shortage. When trucks were available, truck drivers were not available as many had returned home before the lockdown.

The broken supply chains drastically reduced market arrivals of agricultural goods in India. In this paper, we use data for 15 commodities from the database of the Centre for Monitoring Indian Economy (CMIE), which puts together data from 3289 markets across the country. These commodities are paddy, wheat, barley, gram, pigeon pea, lentil, potato, tomato, onion, cabbage, cauliflower, peas, lady's finger, banana and mango. These crops represent all types of crop groups, such as cereals, pulses, fruits and vegetables, and crops that are specifically important for the *rabi* season. Table 1 provides data on the total market arrivals of these 15 commodities between two dates: March 15 and June 30 for two years, 2019 and 2020.

Table 1 Total arrivals in the agricultural markets between March 15 and June 30, selected crops, India, 2019 and 2020 in tonne and per cent

Crop	Total arrivals between March 15 and June 30, 2019 (in tonnes)	Total arrivals between March 15 and June 30, 2020 (in tonnes)	Difference between arrivals in 2020 and 2019 (in tonnes)	Arrivals in 2020 as per cent of arrivals in 2019 (%)
Paddy	29,05,418	27,17,162	-1,88,257	93.5
Wheat	2,01,85,942	1,24,33,927	-77,52,014	61.6
Barley	4,46,930	2,38,934	-2,07,997	53.5
Gram	20,96,710	8,12,194	-12,84,516	38.7
Pigeon pea	3,48,473	1,63,093	-1,85,380	46.8
Lentil	2,48,903	2,15,300	-33,603	86.5
Potato	32,51,382	17,00,994	-15,50,388	52.3
Tomato	7,38,216	6,58,532	-79,684	89.2
Onion	43,64,300	16,77,379	-26,86,921	38.4
Cabbage	1,76,559	1,15,976	-60,584	65.7
Cauliflower	1,88,100	1,10,392	-77,708	58.7
Peas	1,18,896	50,633	-68,263	42.6
Lady's finger	1,55,505	1,13,759	-41,746	73.2
Banana	5,46,608	4,82,107	-64,501	88.2
Mango	7,61,645	3,28,616	-4,33,029	43.1

Source: Computed from the CMIE commodities database.

For the period examined, market arrivals of all crops, except maize, were lower in 2020 than in 2019 both in the aggregate and for most days during the lockdown. It was only in paddy, lentil, tomato and banana that market arrivals in 2020 constituted more than

75 per cent of market arrivals in 2019. In the case of wheat, barley, potato, cauliflower, cabbage and lady's finger, market arrivals in 2020 were between 50 and 75 per cent of market arrivals in 2019. For the remaining crops, such as gram, pigeon pea, onion, peas and mango, market arrivals in 2020 were less than half of the market arrivals in 2019. In wheat, the most important *rabi* crop, only 61.6 per cent of the arrivals in 2019 were recorded in 2020. The lowest ratio was recorded for onion, where only 38.4 per cent of the market arrivals in 2019 were recorded in 2020.

Animal husbandry

India is largely self-sufficient in milk, and is not dependent on imports. During the lockdown, many regular consumers of milk like sweet shops, restaurants and hotels were shut. The demand for milk is estimated to have fallen by 20-25 per cent during the lockdown (GoI, 2020). As a result, milk sales declined, and the differential between milk procurement and sale widened by about 30 per cent at the national level. Many milk dairies were forced to announce milk holidays. Data on milk procurement by milk unions and federations in India show that liquid milk procurement fell from 534.2 lakh litres per day (llpd) in the first two weeks of March 2020 to 503.9 llpd by the last two weeks of May 2020. The sale of milk also declined from 386.9 llpd in the first half of March 2020 to 347.5 llpd by the last two weeks of May 2020.

India is the second largest exporter of beef in the world, after Brazil. It is the top supplier of beef to Malaysia and Indonesia, as well as the West Asian region. It exports about 100,000 tonnes of buffalo meat every month, but exports in March 2020 were estimated to have fallen to 40,000 tonnes. Sales fell domestically too. On the supply side, sufficient animals could not be transported from the source areas to large abattoirs. Many abattoirs closed down.

Poultry producers in India were adversely affected at multiple levels: small growers in homesteads, layer nursery owners and broiler farms. Broiler birds, whose life span is about 30 to 40 days on an average, began to pile up in the farms and growers were forced to keep feeding them with purchased poultry feed. The supply of poultry feed itself was disrupted by the lockdown. As broiler birds grew in size as well as in numbers, and as the markets for their sale shrank, growers incurred major financial losses. As a result, birds were culled on a large scale. According to the Poultry Federation of India, most poultry businesses in India were running at 30 to 35 per cent of their stocks in early-April 2020. According to the All India Poultry Breeders Association, the total loss for the poultry industry was likely to be Rs 250,000 million.

Industry

The most important indicator of industrial sector growth is the index of industrial production (IIP). Monthly IIP data for 2019 and 2020, at the base year 2011-12, are presented in Figure 9. The IIP, which stood at 134.2 in February 2020 fell by 53.6 in April 2020. While it rose in May, June and July 2020, it continued to be considerably below the levels in February 2020 or July 2019. If we consider IIP for manufacturing alone, the decline was steeper.

A survey of 317 firms by the Federation of Indian Chambers of Commerce and Industry between 15th and 19th March 2020 had shown the initial signs of stress. Even at this early stage, about 53 per cent of the businesses surveyed had responded that the impact on them was likely to be "very high" or "high" (FICCI, 2020). About 73 per cent of the businesses said there was likely to be a "big" reduction in orders; 35 per cent reported a rise in inventories; and 81 per cent reported a "significant" impact on cash flows. About 52 per cent indicated that the delay in sourcing products was more than four weeks.

Figure 9 Index of Industrial Production (IIP), India, monthly, 2019 and 2020, base year 2011-12=100
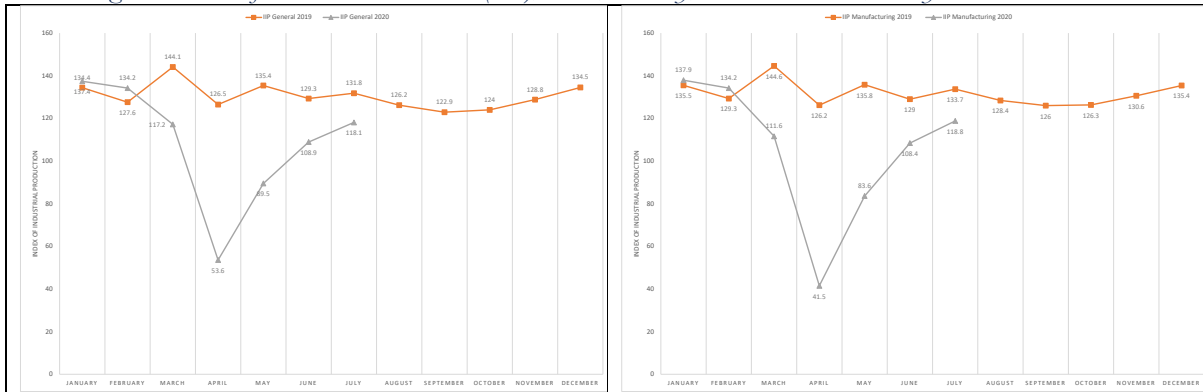
Source: Ministry of Statistics and Programme Implementation, Government of India.

We also use three indirect indicators of industrial activity: the total collection of goods and services tax (GST), the total movement of goods through the Indian Railway's freight services and total exports. First, there was fall by one-third in the total GST collections in India between February and April 2020 (Figure 10). The collections rose in May and June 2020, but the reason was delayed filings of GST returns (which was allowed by the government). The cumulative shortfall of GST collections between March and August 2020 was Rs 1.64 lakh crore compared to March-August 2019. This shortfall was about 27 per cent of the GST collection between March and August 2019.

Figure 10 Total collection of Goods and Services Tax (GST), India, monthly, nominal figures, 2019 and 2020, in Rs million
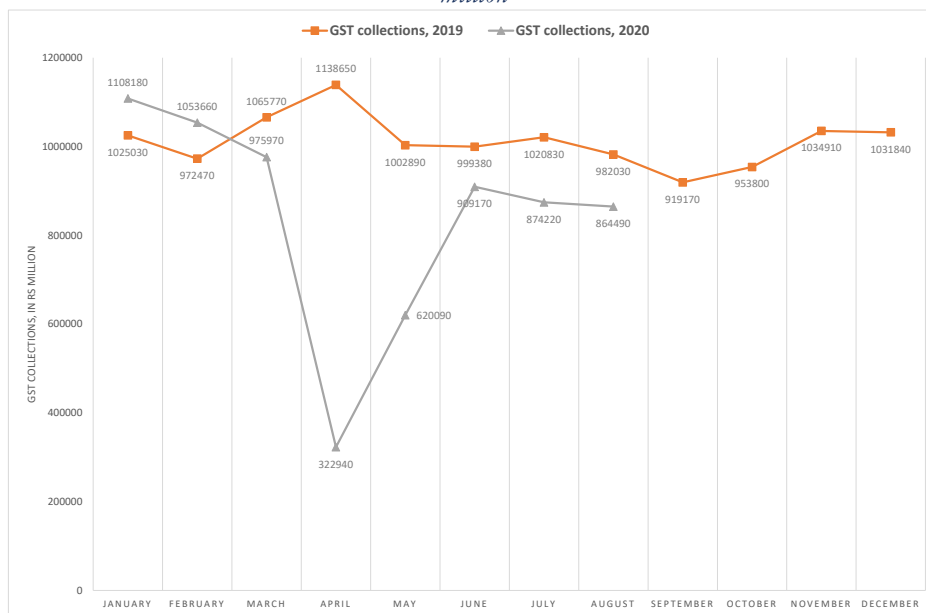
Source: CMIE

Secondly, the total quantity of revenue-earning freight moved by the Indian Railways was lower between March and August 2020 compared to March and August 2019 as well as in February 2020 (Figure 11). The fall was most severe in April 2020. The freight traffic in August 2020 appears higher than in August 2019, but freight traffic between July 2020 and August 2020 fell in absolute terms from 95,180 tonnes to 94,360 tonnes. If we consider the period between March to August 2020, the cumulative freight movement was lower by 83,520 tonnes (or by

about 14 per cent) than between March and August 2019.

Thirdly, India's exports also fell after February 2020 (Figure 12). The value of exports fell from $27,729 million in February 2020 to $10,271 million by April 2020 before

improving gradually to $23,644 million by July 2020. If we consider the period between March and July 2020, the value of exports was lower by $43,663 million (or about 32 per cent) compared to March-July 2019.

Figure 11 Revenue earning freight traffic of major commodities through Indian Railways, monthly, 2019 and 2020, in '000 tonnes
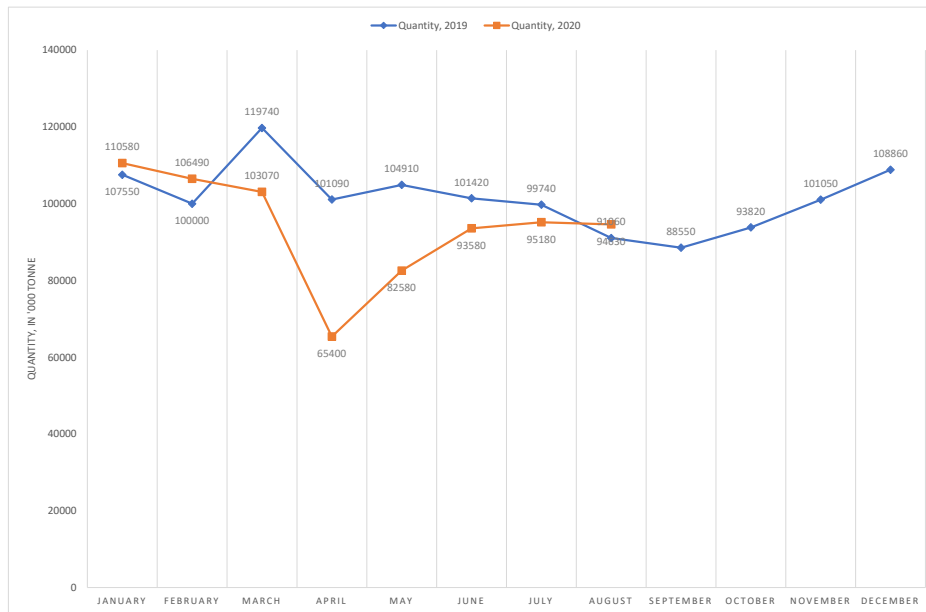
Source: CMIE

Figure 12 Monthly value of total exports, India, 2019 and 2020, in US$ million
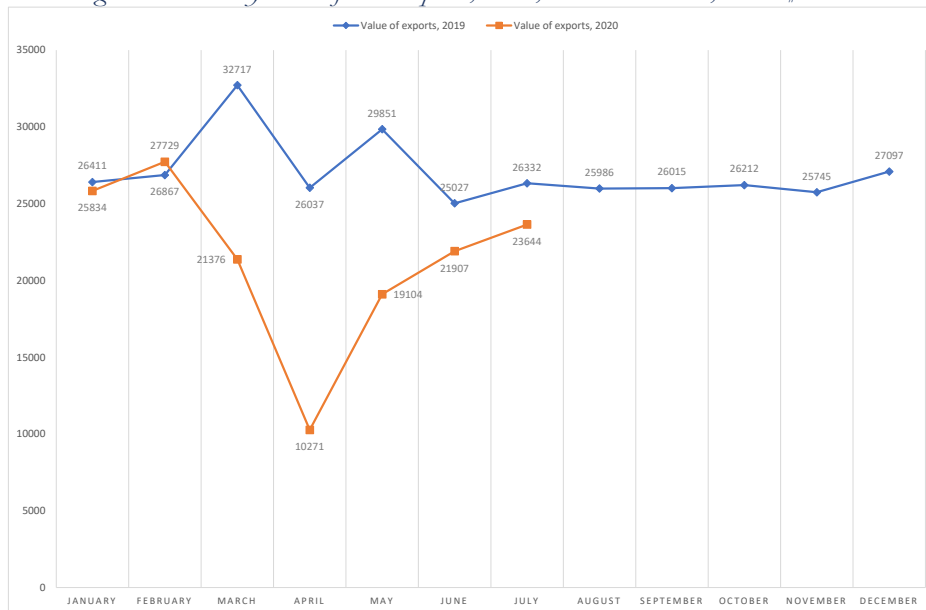
Source: CMIE

If we consider India's total non-farm work force, about 40 per cent of them are engaged

in micro, small and medium enterprises (MSMEs). It is estimated that about 60

million MSMEs employ about 110 million workers (GAME, 2020). They contribute 33 per cent of the total manufacturing output and 25 per cent of the GDP from services. It was in the MSME sector that the impact of the lockdown was most severe. The total losses in this sector are estimated to be about Rs 0.8 to 1.2 trillion in profits.

A survey of MSMEs by FICCI in April 2020 showed that about 73 per cent of the MSMEs reported a drop in orders (GAME, 2020). In addition, about 50 per cent of the MSMEs reported a rise in inventory levels by more than 15 per cent. Another survey by the All India Manufacturers' Organisation in May 2020 covered 46,525 companies (AIMO, 2020). It showed that about 35 per cent of the MSMEs reported their future as "beyond recovery"; they had "no chance of recovery" and had begun "shutting down their operations". Another 39 per cent reported their recovery to be at least six months away. Yet another survey in July 2020 by the Global Alliance for Mass Entrepreneurship (GAME) and Krea University, covering 1500 micro-enterprises, showed that 57 per cent of the micro-enterprises had no cash reserves, and 65 per cent of them had to access finances from personal savings to continue operations. About 40 per cent of the enterprises had already borrowed capital to survive; among them, only 14 per cent used a formal source of borrowing (GAME, 2020).

In sum, the impact of the pandemic on the industrial sector, especially the small and microenterprises, was severe. Unlike in agriculture, a third of the industrial firms affected by the lockdown are likely to shut down permanently. For most industrialists, real recovery may not begin at least till November-December 2020.

Impact on employment

The economic shutdown after March 2020 led to a major rise in unemployment. Monthly data on employment and unemployment are collected and published by the CMIE. Their surveys show striking results (see Table 2).

First, seekers of employment exited the labour force in large numbers in March and April 2020. The size of the labour force shrank by 1.4 per cent in March 2020 and 15 per cent in April 2020. There was some recovery from May 2020, but the total size of the labour force in July and August 2020 were still lower than in February 2020 by about 16 million and 12 million persons respectively.

Secondly, the total number of employed persons shrank at a faster rate than the labour force. There was a fall of employed persons by 2.5 per cent in March 2020 and 29 per cent in April 2020. Despite recovery after May 2020, the number of employed persons were less by 13.5 million in August 2020 compared to February 2020.

Thirdly, there appears to be a "discouraged worker effect" in the labour force after the pandemic. The number of persons actively looking for employment rose from 34.2 million in February 2020 to 93.1 million in May 2020, but fell to 35.7 million by August 2020. However, the number of unemployed persons not looking for employment rose eight times between February 2020 and April 2020. It fell back to 13 million by August 2020, which was higher by about 2.6 million persons than in February 2020.

Fourthly, unemployment rose. The monthly unemployment rate, which was about 7.8 per cent in February 2020, rose to 23.5 per cent in April and May 2020 before falling to 8.4 per cent by August 2020. However, this was no reason for solace, as large numbers had already exited the labour force. The impact of unemployment was most severe on the historically disadvantaged and oppressed sections of India's society: Scheduled Caste (SC) and Scheduled Tribe (ST) persons. The unemployment rate among SC persons was lower than for all persons in February 2020. But between March 2020 and August 2020, it was higher than the unemployment rate for the general population.

Table 2 Selected indicators of labour force and employment, India, February to August 2020, in million and %

Variable	Feb 2020	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020
Labour force (million)	440.1	433.8	369.0	396.5	420.0	424.3	428.3
Labour participation rate (%)	42.6	41.9	35.6	38.2	40.3	40.7	40.9
Employed persons (million)	406.0	395.8	282.2	303.4	373.8	392.7	392.5
Unemployed persons actively looking for employment (million)	34.2	37.9	86.8	93.1	46.2	31.5	35.7
Unemployed persons not actively looking for employment (million)	10.4	16.3	88.6	50.0	31.8	15.5	13.0
Unemployment rate (%)	7.8	8.8	23.5	23.5	10.9	7.4	8.4
Unemployment rate for Scheduled Caste groups (%)	7.2	9.4	31.9	33.8	15.2	8.6	8.5
Unemployment rate for Scheduled Tribe groups (%)	6.4	4.3	18.7	23.3	8.2	3.0	4.5

Source: CMIE

Fifthly, the impact on employment was not limited to the informal sector, but also the formal sector. The total number of salaried jobs in India, as per the CMIE surveys, was 86.1 million in 2019-20 (Vyas, 2020a). In April 2020, this number fell to 68.4 million; by August 2020, it had further fallen to 64.9 million. In other words, there was a 24 per cent decline in salaried jobs during the lockdown.

Finally, age group-wise data show that young job seekers were the most acutely hit. The largest losses in employment were in the age group 15-39 years (Vyas, 2020b). Persons in the age group of 20-24 years constituted only 9 per cent of the total employment but accounted for 35 per cent of the total employment losses. Persons in the age group of 25-29 years were only 11 per cent of the total employment but accounted for 46 per cent of all the job losses.

Lockdown and migrant workers

A visible demonstration of the harshness of the lockdown was in the plight of migrant workers. Census data for 2011 show that there are more than 142 million "migrant workers" in India. Of them, about 30 million migrant workers were located in other districts of their own State, while about 19 million migrant workers were located in a different State. The announcement of the lockdown with a notice period of just four hours set off a panic reaction. Millions of migrant workers disregarded the lockdown and began travel to the safety of their homes. As bus and train services were suspended, these workers moved alone or in groups either by foot or in bicycles (Srivastava, 2020). The summer had begun, and more than 100 persons died on the roads due to starvation and exhaustion.

As the tragedy of the return journeys of migrant workers unravelled, the Union government directed the State governments to house the migrant workers in temporary shelters and provide them food. Later, on 19 April 2020, the government allowed intra-State travel of migrant workers, but continued the ban on inter-State travel. In early-April 2020, a number of concerned citizens approached the Supreme Court to

intervene. Unfortunately, the court did not pass any order till June 2020. In the meanwhile, on 1 May 2020, special inter-State trains were announced for migrant workers to return home – called *shramik* trains. According to the government, between 1st May and 3rd June 2020, 4228 *shramik* trains ran, transporting 5.7 million workers. This was just a trickle compared to the total number of migrant workers, though it came as a relief to many. Further, these trains were poorly equipped to deal with the large number of passengers, and reports indicate that more than 80 persons died in these trains for want of food and water.

IV
QUANTIFICATION OF THE ECONOMIC IMPACT

In this section, we attempt an exercise to quantify the direct and indirect losses to the Indian economy on account of the pandemic.

Input-Output analysis: A methodological departure

Many multilateral agencies have used either prevailing economic models or sector-wise estimates to arrive at the *direct* economic losses due to the lockdown in India. We provide a list of such estimates for the Indian economy in Table 3 (an exception is ADB, 2020). But the Covid-19 lockdown has not just *directly* disrupted production across sectors, but also *indirectly* affected other sectors either because of an impact on inter-sectoral demand for inputs or due to slowdown in final demand due to reduced incomes and employment. In this paper, we depart from such traditional methods, and present estimates of economic losses based on an Input-Output (I-O) analysis. The I-O analysis includes *direct* and *indirect* impacts due to multiplier effects in each sector resulting from changes in the other sectors.

The I-O analysis is an analytical framework developed by Wassily Leontief in the late-1930s using a system of linear equations. Each equation describes the distribution of the output of a commodity, in value terms, throughout the economy. A closed I-O model is one where the demand and supply in the system are balanced through a series of national accounts (Miller and Blair, 2009).

In the recent years, Computable General Equilibrium (CGE) models of the neoclassical variety have been popular as a method of simulating economic activity and forecasting outcomes. These models use neoclassical assumptions of perfectly rational agents transacting within markets that allow a large degree of substitution between inputs viz., capital and labour. These models typically consist of a large set of non-linear production functions. These functions are sensitive to parametric assumptions and provide an overall result without transparently examining the relationship between sectors that result in the estimated outcomes.

In contrast, I-O models are a set of transparent linear computations that allow for a more detailed sector-wise examination of the impacts of external shocks. In our view, they are better suited to analyse the impact of Covid-19 on economic activity.

The common criticisms directed at I-O models are three: (a) the technical coefficients that determine inter-sectoral dependence remain constant over time; (b) the analysis assumes constant returns to scale; and (c) the elasticity of substitution for all inputs is zero. It is argued that the above three characteristics of I-O models are deviations from the actual behaviour of the economy.

While these criticisms are valid to an extent, they apply mainly to analyses that attempt forecasting of future economic behaviour. The analysis presented in this paper does not attempt to forecast economic activity into the future. The only time dependent analysis that

we attempt is the estimation of an I-O table for 2019-2020 and 2020-21 based on the coefficients for the year 2016-2017. The period of forecast here is relatively short.

While all the coefficients may not hold, it is reasonable to assume that the variation may be relatively small.

Table 3 Forecasts for real GDP growth by different agencies, India, 2020-21, in per cent

Agency/Institution	Latest		Previous	
	Forecast	Month	Forecast	Month
CMIE	-5.5	July	-6.0	May
RBI forecasters survey (Median)	-5.8	Aug	-1.5	June
FICCI Survey	-4.5	June	5.5	January
Government of India	Decline	-	2.0-3.0	May
World Bank	-3.2	June	1.5-2.8	April
International Monetary Fund	-4.5	June	1.9	April
Asian Development Bank	-4.0	June	4.0	April
Organisation for Economic Co-operation and Development	-3.7	June	5.1	March
S&P Global Ratings	-5.0	May	1.8	April
Fitch Ratings	-5.0	May	0.8	April
Moody's	-4.0	June	0.0	May
ICRA	-9.5	July	-5.0	May
CRISIL	-5.0	May	1.8	April
Care Rating	-6.4	July	-1.5	May
India Ratings	-5.3	June	1.9-2.1	April
State Bank of India	-6.8	May	1.1	April
Bank of America Securities	-4.0	July	-3.0	June
DBS Group	-4.8	July	-	-
Citi Group	-6.0	July	3.5	-
Goldman Sachs	-5.0	May	-0.5	May
Nomura	-6.1	July	-5.2	May

Source: Swamy (2020).

There is a reason why we rely on an I-O table for 2016-17. An I-O table for 2019-2020 is not available. The last official I-O table published by the Government of India is for 2007-08. Since the Indian economy has undergone significant structural changes since then, the coefficients estimated using the I-O table for 2007-08 cannot be applied to estimate the economic impacts of Covid-19. At the same time, an I-O table for India for 2016-17 has been published by the Asian Development Bank (ADB). The ADB's is a 34 sector I-O table closed with accounts for

private consumption, government consumption, exports, imports, capital accumulation and savings, value added and indirect taxes. Using this table, we estimate the loss in economic output across different sectors of the economy for 2019-20 and 2020-21.

The method used in this paper has previously been used in studies that estimated economic losses due to natural disasters. While the scale of natural disasters is typically regionally confined, the nature of their impact in terms

of the simultaneous declines in both demand and supply is similar to the impact of the Covid-19 lockdown. Yasuhide Okuyama has a series of papers on the use of this method for assessing losses due to natural disasters (see Okuyama and Santos, 2014; Okuyama, 2007; Okuyama *et al.*, 2004). I-O models have also more recently been used to assess the impacts of Covid-19 in specific sectors. For example, Baldwin and Tomiura (2020) applied the I-O method to assess the impact of Covid-19 on international trade. The ADB has evaluated the economic impact of Covid-19 on developing Asian economies (ADB, 2020). The method used in this paper broadly follows Okuyama and Santos (2014).

Our method

We begin with the I-O Table for India for 2016-17. From this table, the matrix of technical coefficients [A] was calculated using Equation (1). The Leontief matrix [L] was then calculated using Equation (2).

$$A = Z \times \hat{x}^{-1} \qquad (1)$$

$$L = [I - A]^{-1} \qquad (2)$$

where Z is the matrix of intermediate consumption by each sector, which represents the distribution of an industry's output across different sectors of the economy; x is the vector of total outputs from each sector; and $\hat{x}$ is a square matrix with diagonal elements representing the total output in each sector.

A pro-rata growth rate for the final demand in each sector was then applied to derive the actual final demand for 2019-20, and the expected final demand for 2020-21. This gave us the final demand vectors [$f_{2019-20}$] and [$f_{2020-21}$]. The growth rate in final demand was assumed and adjusted such that the expected GVA for the two years, without COVID-19, matched the projections made by the Ministry of Statistics and Programme Implementation, Government of India. The I-O coefficients represented by the matrix [A], and the wages-to-profit ratio, were assumed to be constant over this period. Applying the standard Leontief equation, i.e., $x = L \times f$, to the two demand vectors [f] for 2019-20 and 2020-21, we obtained $x_{2019-20}$ and $x_{2020-21}$. We could therefore calculate $Z_{2019-20}$, $Z_{2020-21}$, $GVA_{2019-20}$, $GVA_{2020-21}$, and then create I-O tables for 2019-20 and 2020-21 assuming that these were normal years without COVID-19.

The next step was to estimate the impact of Covid-19 on economic activity and the total potential losses. At the outset, we must state a few limitations of the exercise. First, it was difficult to estimate the exact value of loss as the economic situation is evolving and changing rapidly. Secondly, because the output varies across the year and the quarter in which economic activity is halted will affect the total loss estimations, a sub-annual analysis was difficult to do; quarterly I-O tables and output estimates are not available.

Thirdly, the unprecedented scale and impact of Covid-19 is likely to result in changes in structural inter-dependencies in the economy represented in the I-O table. In such a dynamic context, it was difficult to arrive at very precise estimates. Fourthly, the I-O table fails to capture all the information about the informal sector, which plays a significant role in the Indian economy. Due to all these reasons, the estimates of economic loss that we present here should be considered conservative estimates. The scenarios we construct address this uncertainty by providing a wide range of possibilities.

We constructed four scenarios based on a range of potential lockdown days for each sector in the economy. The loss per day was calculated as the ratio of total potential economic output in a normal year for each sector and the number of days in the year. The product of the lockdown days and potential output per day gave us the total output loss in each sector i represented by the vector [Δx_i]. The standard linear I-O analysis using the Leontief matrix required a change in the final demand [Δf]. Therefore, the

change in output was converted to a change in final demand by dividing the total output vector [Δx_{2020}] by the diagonal of the square matrix [L], as shown in Equation (3). This methodology is discussed in detail in Miller and Blair (2009). The direct impact of a loss of output on final demand was captured by the diagonal elements of the matrix [L].

$$[\Delta f] = [L_{diag}]^{-1} \times [\Delta x] \qquad (3)$$

The resultant vector [Δf] is the corresponding loss in final demand. The total potential output loss as well as the reduction in final demand was then estimated for 2019-20 and 2020-21. The new final demand vectors [f_{CV}] were estimated by subtracting [Δf] from [f].[7] New row vectors [X_{CV}], square matrices [Z_{CV}], and column vectors [GVA_{CV}] were calculated and new I-O$_{CV}$ tables were constructed for both years to reflect the system of economic transactions after Covid-19.

Our estimates

We construct four scenarios by varying the potential down-time for each sector across the economy. Table 4 shows the average down-time across all sectors of the economy, and the resulting loss in GVA for each scenario in 2019-20 and 2020-21. While the first Covid-19 case in India was registered on 30 January 2020, the pandemic truly arrived on Indian shores only by March 2020. Therefore, the workdays lost in 2019-20 are likely to be relatively less. Our sector-wise assumptions about lockdown periods are broadly based on Government of India's official notifications on the classification of which goods and services were "essential", and the respective rules applicable to these sectors at different points in the five months between 24 March 2020 and 30 August 2020.

Table 4 Projected losses in Gross Value Added (GVA) and Gross Domestic Product (GDP) due to Covid-19 lockdown, India

Scenario	2019-20			2020-21		
	Average lockdown period* (days)	Direct + Indirect loss compared to the expected loss in the year: I-O analysis (%)	Growth Rate in real GDP with respect to GDP in the previous year (%)	Average lockdown period* (days)	Direct + Indirect loss compared to the expected loss in the year: I-O analysis (%)	Growth Rate in real GDP with respect to GDP in the previous year (%)
Scenario-1	5	2.3	6.2	31	11.9	-6.0
Scenario-2	7	2.9	5.6	40	16.1	-10.5
Scenario-3	9	3.4	5.0	53	20.4	-15.1
Scenario-4	9	3.4	5.0	70	26.3	-21.4

Source: Computed by authors.
Note: *: These are averages across all sectors. Economic activity in some sectors has either been completely halted or severely curtailed for a long period of time. Other sectors, in contrast, have officially not been shut down but have nevertheless experienced curtailment. Our scenarios are built on the basis of an approximation of the number of days lost in each sector due to the lockdown.

The results show that India's economic losses in 2019-20 itself range from 2 to 3 per cent of the expected GVA if indirect impacts are also considered. In 2020-21, the losses are considerably higher. The total direct and indirect losses due to the pandemic in 2020-

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[7] The term "CV" is used to denote the estimates of all relevant vectors and matrices post COVID-19, i.e.

after taking into account the losses due to the lockdown period.

21 range from 12 to 26 per cent of the expected GVA without the pandemic. This results in an actual negative growth rate in the GDP that ranges from -6 per cent to -21 per cent.

On 31 August 2020, the CSO published its first estimate of the growth of GVA and GDP for Q1 of 2020-21.[8] It estimated that the growth rate of GVA was -22.8 per cent and of GDP was -23.9 per cent. While the nation-wide lockdown was lifted on 31 May 2020, many industries and services continued to either remain shut or function in a curtailed capacity in July and August 2020. As a result, the growth estimates for Q2 are also likely to be negative. It is likely, therefore, that the losses would be much higher than those estimated by other agencies as shown in Table 3. In our view, the annual growth rate for 2020-21 is likely to be somewhere between Scenario 3 and 4 (Table 4).

We note two potential ameliorating factors here: one, a moderate growth upswing in Q4, if not in Q3, of 2020-21; and two, a possible fresh fiscal stimulus package from the government, which might help in reviving demand (see next section).

We have not included two aspects in our scenarios. One, the revival of wage compensations may be delayed even if the lockdown is lifted. Two, schools, colleges and other educational institutions were functioning in offline modes, and revenue from events like sports or cultural activities continued to be low at the time of our writing. Despite the exclusion of these factors, our results show the pervasiveness of the lockdown's economic impact. Further, even in those sectors classified as "essential" and allowed to function during the lockdown, there may be major indirect economic losses. For example, electricity, gas and water supply were to be essential sectors and fully operational through the lockdown. Yet, a loss of 5 per cent to 12 per cent was

observed in this sector in the four scenarios. Agriculture also suffered losses of 8 per cent to 11 per cent despite the fact that the lockdown period was shorter than in other sectors.

V
THE GOVERNMENT'S ECONOMIC RESPONSE

Given the economic losses, firm closures and losses in employment, it would be wrong to assume that the economic activities would return to normal when the lockdown is lifted. Surveys on the economy show that business and consumer sentiments were not improving even in July 2020, and a revival of the economy may be delayed. Two sets of survey results from the Reserve Bank of India's (RBI) bi-monthly Consumer Confidence Surveys (CCS) would bear this assessment out. First, the Current Situation Index in the economy was lower for the three months beginning in July 2020 compared to for the three months beginning in March 2020 and May 2020 (Figure 13). Secondly, the Future Expectations Index in the economy for the three months beginning in July 2020 was higher than for May 2020, but still lower than for March 2020 (Figure 13).

As lockdowns are lifted, supply chain disruptions would ease even if supply may normalise only with a lag. Here, the extent to which production would be restored depends also on the extent of firm survival and the success of credit and liquidity injection measures. On the other hand, losses in employment are a huge drain of aggregate demand in the economy. Employment levels may not reach February 2020 levels anytime soon in 2020-21. Even if levels of employment are restored, they are still likely to be of less-skilled and less-paid forms. In such a circumstance, stimulus measures by

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[8] See the official press release available at http://mospi.nic.in/sites/default/files/press_release/PRESS_NOTE-Q1_2020-21.pdf.

governments would have to play a central role in reviving demand.

Governments in the developed world have stepped in with unprecedented levels of intervention in the economy. These interventions took multiple forms. Compensations to farmers for economic losses, furlough packages to pay firms up to 80 per cent of wage bills, direct cash payments to workers, injections of liquidity, provision of credit at zero interest rate or without collateral, free supply of food or food stamps and recapitalisation of banks are examples.

Figure 13 Index of current economic situation and future economic expectations, India, 2019 and 2020, base year 2011-12
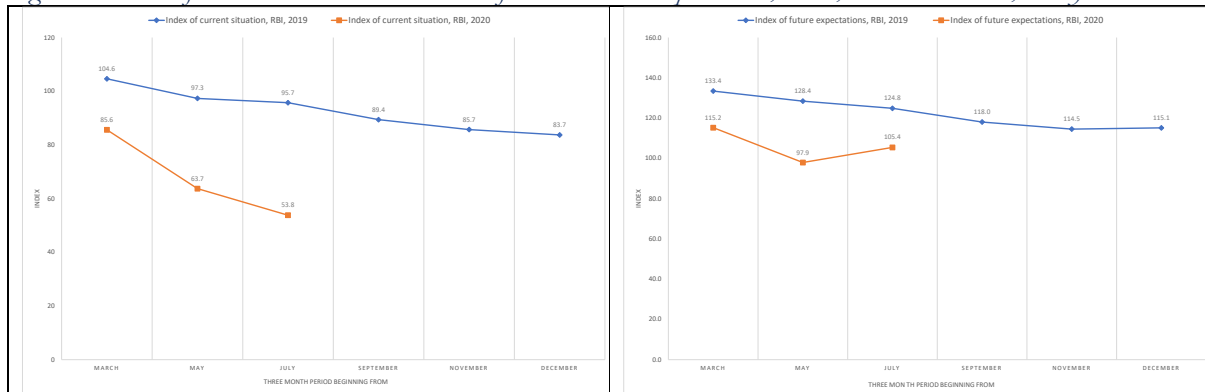
Source: Reserve Bank of India, Mumbai.

The International Monetary Fund (IMF) classifies interventions into two types: one, direct spending and revenue measures called "above-the-line measures"; two, loans, equity injections and guarantees called "below-the-line measures". IMF's estimate in April 2020 was that $7.8 trillion was the size of planned interventions of governments across the world. Of this, about 3.3 trillion (42 per cent) was accounted for by direct spending and revenue measures. The remaining $4.5 trillion (57 per cent) was accounted for by loans, equity injections and guarantees (IMF, 2020).

It is in this context that we study India's economic response to the pandemic. India, till 30 August 2020, has announced a total of Rs 20.97 trillion as the Covid-19 economic stimulus package. This amounts to about 10 per cent of India's GDP, which makes the package appear impressive. However, there are important qualifiers.

First, the appeal of India's stimulus package is largely deceptive. Many announcements made were already included as part of the budget for 2020-21 presented in February

2020. Of the Rs 20.97 trillion announced, only Rs 3.1 trillion constituted direct fiscal spending or exemptions. In other words, only 15.4 per cent of the package would be "above-the-line" measures (see Table 5). The rest constituted loans, credit guarantees and liquidity enhancement measures from the banking system. If we consider only above-the-line measures, the size of the India's package would shrink to just 1.5 per cent of the GDP. If we are more liberal, and exclude only the liquidity injection measures by the RBI, the total size of the package would be 5.3 per cent of the GDP. Thus, India's stimulus package was smaller than those announced by other major economies of the world.

Secondly, the size of India's package was small relative to the stringency of its lockdown. The Oxford COVID-19 Government Response Tracker (OxCGRT) estimates a country-wise Stringency Index for lockdown based on 17 indicators, such as school closures and travel restrictions. The index ranges between 0 and 100 (100 for most stringent). More stringent the lockdown, larger is the stimulus package

expected. India had one of the most stringent lockdowns in the world. Yet, the size of India's stimulus package was smaller than for countries with less stringent lockdowns (Figure 14). In Japan, the package constituted 21.1 per cent of the GDP; even in Sweden, with one of the most relaxed lockdowns, the package constituted 12 per cent of the GDP.

Thirdly, even within the above-the-line measures, only a small share was aimed at raising aggregate demand or increasing capital investment in the economy. In fact, India's package has been termed by many as a supply-side package.

Table 5 India's Covid-19 economic stimulus package, in per cent

Type of intervention	Details	Outlay as share of GDP (%)	Share in total outlay (%)
Above-the-line measures: direct spending and foregone/deferred revenue	Provision of in-kind (food; cooking gas) and in-cash transfers to lower income households; insurance coverage for workers in the healthcare sector; wage support and employment provision to low-wage workers.	1.4	14.6
Above-the-line measures: Improve health infrastructure	Increase number of hospital beds, ventilators, intensive care facilities and quarantine centres	0.1	0.8
Below-the-line measures	To support businesses and shore up credit provision to several sectors of the economy and sections of the population	8.5	84.6
All measures		*10.0*	*100.0*
Measures with direct bearing on the government budget/deficits		*1.5*	*15.4*

Source: Computed by authors from government documents and official press briefings.

Figure 14 Relationship between size of Covid stimulus packages and the strictness of lockdowns, selected countries, 2020
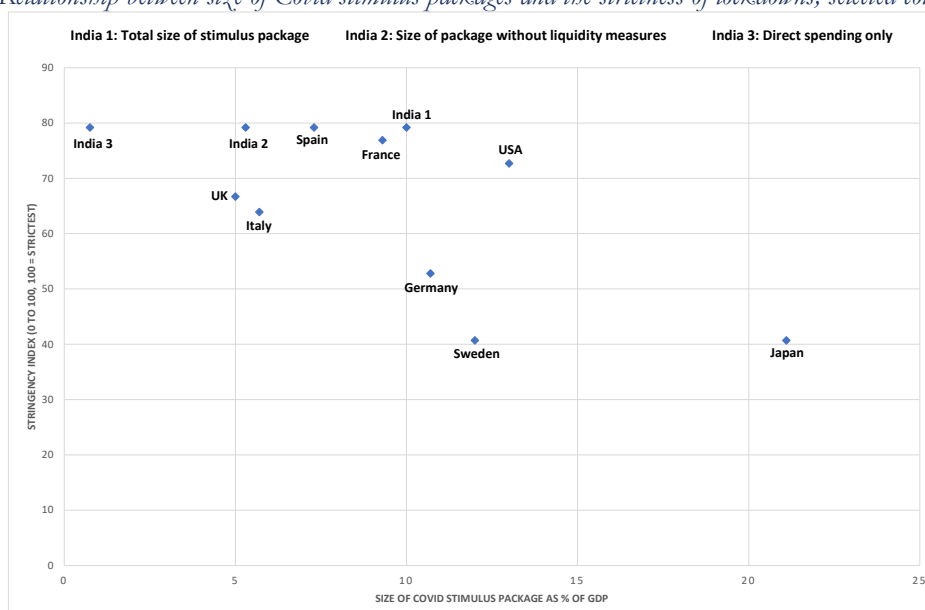
Source: Compiled from official sources and OxCGRT.
Note: India-1 = total size of package; India-2 = package after deducting liquidity injections; India-3 = package with only direct spending measures.

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Fourthly, the overriding reliance in the package on fresh loans through the banking system, as well as moratorium on loan repayments, has raised fears about the long-term health of the banking system. India's banks, even prior to the pandemic, were burdened with high levels of non-performing assets (NPA). There was no indication that forcing banks to provide fresh loans, with little attention to creditworthiness, would be associated with any measure to recapitalise banks. In the absence of recapitalisation, the long-term outlook of the banking system may be adverse.

Finally, given the high levels of reliance of the package on bank credit, the success of the package would depend on whether the banking system would be able to deliver the promise of fresh credit provision. The growth of India's domestic bank credit was slowing down from 2011-12. Given this falling growth of credit provision, it is doubtful if the banking system can fulfil the new challenge.

VI
CONCLUSIONS

This paper dealt with the impact of the Covid-19 pandemic on the Indian economy. The health crisis has been accompanied by an unprecedented economic crisis, where demand and supply have fallen autonomously and concurrently, even as they depress each other in feedback loops. The intensity of this crisis was exacerbated by the fact that both the global and the Indian economy were on a slowdown even prior to the pandemic. The Indian economy was marked by a slowdown of economic growth, a decline in investment, savings, bank credit and exports relative to the size of the economy and record increases in unemployment and income-poverty. As a result, India's capacity to deal with a new crisis stood seriously diminished when the pandemic hit in March 2020.

The post-pandemic economic crisis affected all economic sectors. In agriculture, farmers were faced with broken supply chains, lack of market outlets, poor demand and falling output prices. Our analysis of market arrivals of 16 agricultural commodities between March and May 2020 brought home this reality in the countryside. In industry, micro and small enterprises were the most acutely affected. Surveys showed that about 35 per cent of all MSMEs were likely to shut down permanently. Very few firms expected a revival to begin before November-December 2020. The crisis also led to a major loss of employment; even in August 2020, the number of employed persons was less by 13.5 million than in February 2020.

Using a I-O framework, this paper attempted an original assessment of the extent of direct and indirect losses to the Indian economy. Based on four scenarios of losses, we estimated that India's GDP growth rate in 2020-21 may range from -6 per cent to -21.4 per cent. In terms of GVA, these losses imply a loss of 12 to 26 per cent under different scenarios. These estimates did not take factor in potential ameliorating factors, such as a fiscal stimulus package from the government.

But the government's economic response till August 2020 was seriously deficient on demand-side interventions. The extent of short-run and long-run employment losses demanded that the package focussed on raising demand through employment generation. Yet, allocations for employment generation were raised only marginally. The government was hesitant to expand spending because it feared a rise in fiscal deficit. Such fiscal conservatism is not new under India's neoliberal regimes. However, India has remained steadfast in its adherence to fiscal conservatism even as advanced capitalist economies have shed the dogma of austerity. This is illustrative of a certain ideological orthodoxy that marks India's present right-wing dispensation. Given this conjuncture, the chances of an early revival in the Indian economy appears dismal.

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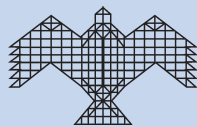
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