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Economic Impact Analysis of Covid-19 Implication on India's GDP, Employment and Inequality

BiswajitNag

Willem van der Geest

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Contact
workingpapers@iift.edu

Economic Impact Analysis of Covid-19
Implication on India's GDP, Employment and Inequality

Biswajit Nag

Professor, Indian Institute of Foreign Trade, New Delhi

Willem van der Geest

Formerly Chief, Development Strategies and Policy/Senior Advisor for Macro-economic policy, Department of Economic and Social Affairs (DESA), of the United Nations, New York

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Abstract
India with large-scale informal workers face a major crisis due to Covid-19 pandemic. The current paper attemptsto understand the possible growth trajectory in few major sectors and its effect on employment, possible bearing on health management and fiscal scenario. It starts with a comparative analysis of South Asian economies in terms of incidence of the disease, stringency and its impact. This is juxtaposed with the predicted impact on GDP, consumption and investment as calculated by multilateral agencies. Using the base level data provided by Asian Development Bank and the World Bank, the current paper analyses the possible decline of India's GDP developing 'upper' and 'lower' case scenarios through various sector level assumptions. Further, employment impact is assessed using asymmetric nature of employment elasticity of output. For the year 2020-21, the model did quarterly prediction. Next, the article describes the channels in which job loss and health crisis can lead to income inequality and whether current state of health management and fiscal constraint address in short and medium term in light of the announced stimulus package. The results indicate a large-scale job losses in 2020 (16 to 34 million)and a slight recovery in 2021. This will have a severe socio-economic impact and may push the economy backward for several years.

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Economic Impact Analysis of Covid-19

Implication on India's GDP, Employment and Inequality

I. Introduction

COVID 19 pandemic has changed the global economic situation. Unlike recession such as the Great Depression of the 1930s or the financial meltdown of 2008, this health crisis is not a product of the failure of economic system. The Great Lockdown of 2020 is unique in the sense that it has come all of a sudden halting almost all economic activities, for a while. Economists and policy makers besieged to analyse the implications and predict the future. However, in absence of high frequency data, it has become a daunting task to map the possible impact of the lockdown. Developed countries are better placed in managing both the patients due to good health infrastructure and the economy due to robust stimulus package. We have noted that peak infections level has reached in Europe and USA in the May and new infection level is having a downward trend. On the contrary, emerging economies such as Brazil, Russia and India are experiencing a significant rise in daily infections and it looks like there is no immediate abatement. India also had a very stringent lockdown over two months and the similar story is there for other South Asian economies. However, economic pressures have also pushed the governments to open up slowly. Since June 1st 2020, India has initiated its strategy of unlocking the economy.

South Asian economies have picked up growth in post globalisation period. However, growth is not evenly distributed. As a result, internal migration towards high growth centres are very common. Due to sudden lockdown, both manufacturing and service sector has experienced a major shock bringing the economies almost at the brink of collapse. India has already been experiencing a slow growth since last couple of years and current shock has pushed it to a precarious corner. According to the recent reports, the World Bank has warned in its draft India Development Update (IDU) that the country is at "risk of losing its hard-won gains against poverty" and also said that several households are "likely to slip back into poverty due to income and job losses triggered by Covid-19".(Vishnoi, 2020).

Large number of migrant workers has started going back to their native places. This has not only increased the burden of individual state governments in terms of arranging livelihood of these people but also provide a challenge to future economic activities. Due to a major fear psychosis and travel difficulties (absence of frequent long distance trains) migrant workers especially from Eastern India are not ready to go back even when the country is preparing to reboot its economy. Large number of SMEs, construction and infrastructure sector in general, informal service economy, utility sector and agricultural activities are expected to have labour shortage.

Considering this ground reality, this paper has made an attempt to understand the possible growth trajectory in few major sectors and its effect on employment scenario using asymmetric employment elasticity of output, possible impact on health management and fiscal scenario. The base model is primarily influenced from the prediction of the World Bank and Asian Development Bank.

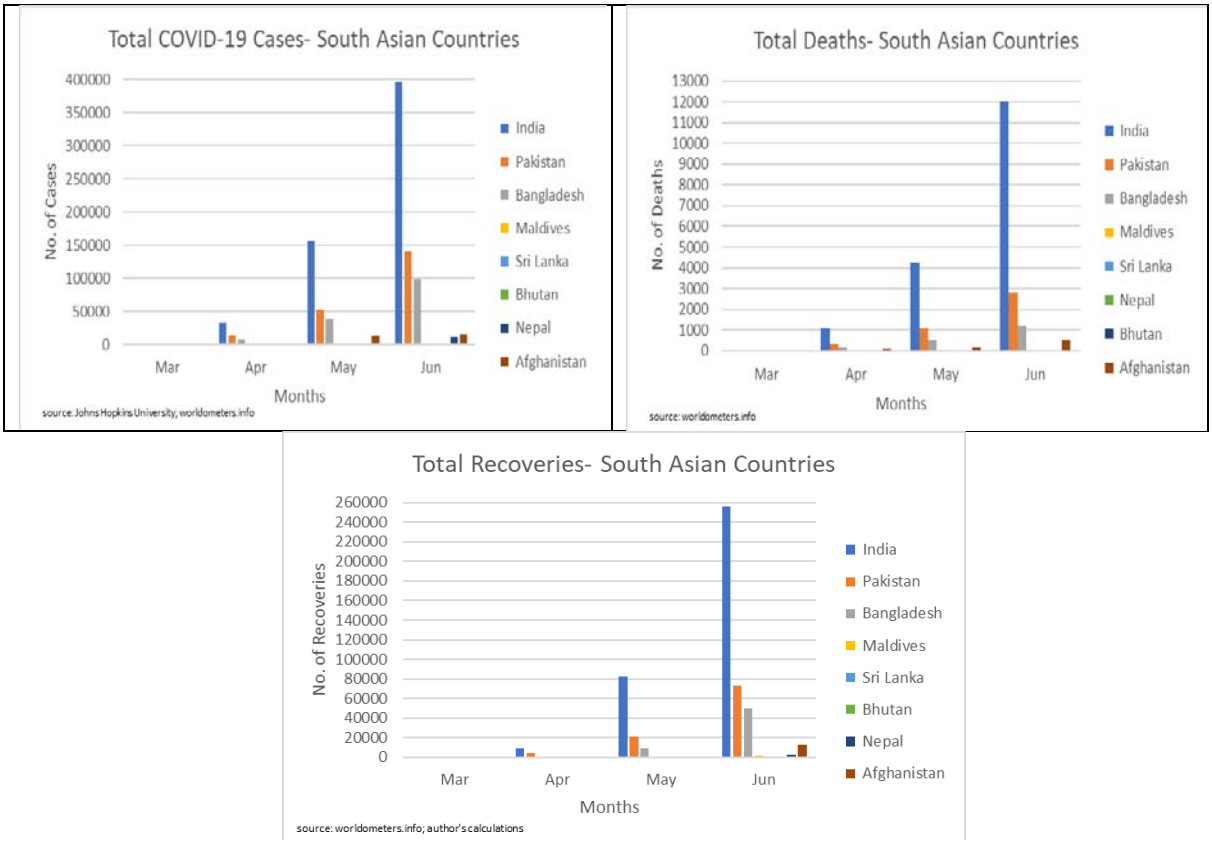
The article is divided into following sections. First, it will describe the nature of pandemic in South Asia and its progress. All South Asian countries are highly populated and home of world's largest number of poor. However, some countries are able to slow down the progression through a quick and timely stringent measure of lock down. In some cases, like in India lockdown seems to be ill timed. A comparison of the progress of pandemic in South Asia can provide a comparative picture of India vis-à-vis other South Asian countries in relative terms. The next section of the paper describes impact on GDP, consumption, investment in South Asia mostly calculated by multilateral agencies. The following two sections explain sector level scenarios in India and build up 'upper' and 'lower' case scenarios through various sector level assumptions. For the year 2020-21, the model did quarterly prediction. Further, using the GDP growth rate and asymmetric employment elasticity, the paper envisages the

degree of employment loss in various sectors. Next, the article describes the channels in which job loss and health crisis can lead to income inequality and whether current state of health management and fiscal constraint address in short and medium term in light of the announced stimulus package.

II. Covid Pandemic and Response in South Asia

Looking at the monthly breakup of total no. of cases that surged in South Asian Countries, India, Bangladesh and Pakistan witnessed a significant jump especially in May and June. The growth in India is alarming. The number of cases increased in India by approximately 1.6 times from May to June. Pakistan and Bangladesh have been able to contain the death quite early. It is interesting to note that in June, the Government of India announced the plan Unlock-1 allowing economic activates to resume.

Figure 1: Covid Pandemic in South Asia: A Snapshot



Source: worldmeters.info and authors' calculation

Along with surge in cases, India has also witnessed steep rise in the number of deaths in the month of June as compared to other south Asian countries. Other countries that have seen a surge in no. of deaths are: Pakistan, Bangladesh and Afghanistan. One analysis suggests that this increment in deaths can be due to the comorbidities present in a COVID-19 patient like hypertension, diabetes etc(Sanyaolu *et al.*, 2020). It is noteworthy that Bhutan did not record any death till end of June.

Although India has seen highest number of deaths, but the total number of recoveries is even higher. But the recovery rate is the highest in Sri Lanka with 83.5% followed by Maldives with 82.3%. This success can be attributed to recent increase in testing and improved health care strategies including promotion of home quarantine measures for patients with mild symptoms which, in an indirect way, contributed in containing the spread of virus.

The impact of COVID-19 in terms of the rapid rise in cases, deaths and recovery for the period March, April up to 31st July 2020 for South Asian countries is summarised below:

TABLE 1: COVID-19 in South Asia as of 31 July 2020

	Reported Cases Covid-19	Fatalities due to Covid-19	% of Cases	% of Fatalities	Fatalities / Cases %	Cases per million population	Fatalities per million population	UN DESA Population estimate 01 Aug 2020
Country:	*31-07-2020*	*31-07-2020*	*31-07-2020*	*31-07-2020*	*31-07-2020*	*31-07-2020*	*31-07-2020*	*01-08-2020*
Afghanistan	36675	1272	1.6%	2.71%	3.47%	940.3	32.6	3,90,02,229
Bangladesh	237661	3111	10.4%	6.63%	1.31%	1441.9	18.9	16,48,26,318
Bhutan	101	0	0.0%	0.0%	0.0%	130.8	0.0	7,72,318
India	1695988	36511	74.5%	77.80%	2.15%	1227.7	26.4	1,38,13,88,842
Maldives	3793	16	0.2%	0.03%	0.42%	7006.6	29.6	5,41,343
Nepal	19771	56	0.9%	0.12%	0.28%	677.5	1.9	2,91,80,816
Pakistan	278305	5951	12.2%	12.68%	2.14%	1257.9	26.9	22,12,52,925
Sri Lanka	2815	11	0.1%	0.02%	0.39%	131.4	0.5	2,14,20,709
South Asia	**2275109**	**46928**	**100.0%**	**100.00%**	**2.06%**	**1224.2**	**25.3**	**1,85,83,85,500**
World	**17397594**	**675043**			**3.88%**	**2230.0**	**86.5**	**7,80,17,15,432**
South Asia as % of World	**13.08%**	**6.95%**						**23.82%**

(Source: CSSE, John Hopkins University, UN DESA, authors' calculations).

Each of the eight SAARC Member States displays distinctly different patterns and intensity of the corona epidemic. India has the highest number of COVID-19 cases and deaths in absolute terms followed by Pakistan and Bangladesh. Normalizing for population size, the highest number of deaths is found in Afghanistan (32.6)) followed by Maldives (29.6) and Pakistan (26.9) and India (26.4) while the South Asian average was 25.3.It is important to note fatalities per million population in South Asia is far lower than the world average (86.5) despite having high population density. In terms of case fatality[1]also South Asia (2.06) has much better record vis-à-vis world (3.86). However, India has higher percentage (2.15%) compared to South Asian average.The ratio has started declining since early July and reached below 2.5% as reported by Health Ministry of Government of India on 19th July[2]. It declined steadily during the entire July. Among South Asian nations, Sri Lanka, Nepal and Maldives stand out as the pandemic incidence is significantly lower. The case-fatality ratio (CFR), shows the difference in prevalence of the pandemic amongst all eight South Asian countries. The CFR is the ratio between confirmed deaths and confirmed cases. This ratio indicates the risk of mortality in a particular country given the number of confirmed cases (Ritchie and Roser, 2020).

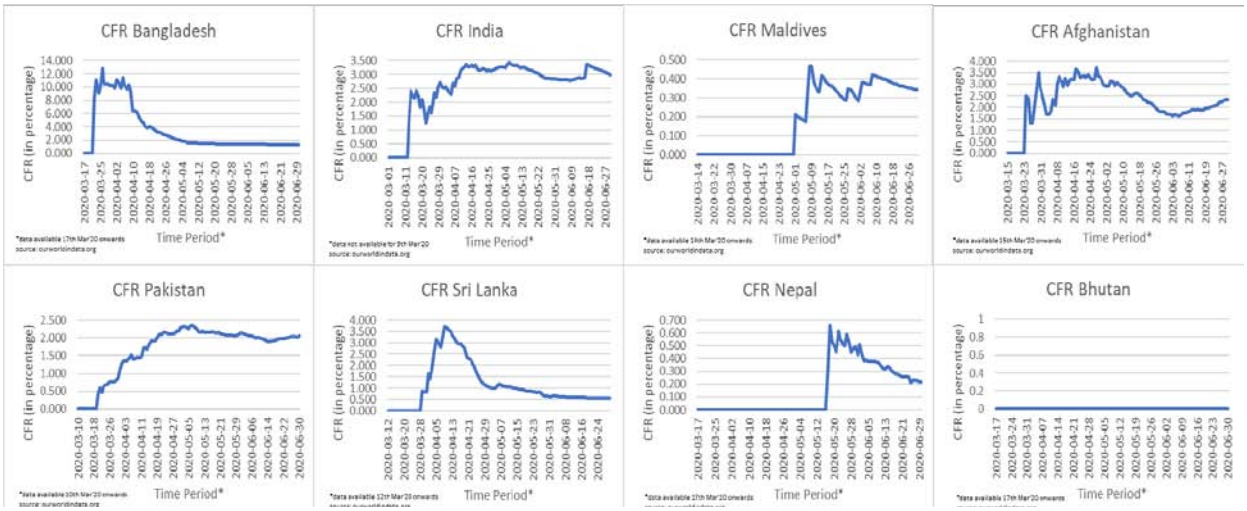
As shown in Figure 2, Bangladesh, Sri Lanka and Nepal have experienced an initial upward and a subsequent downward trend of CFR. India has witnessed a sharp upward trend in CFR during the month of March but since mid of April, it is hovering around the range of 3-3.5%. Similarly, in Pakistan, CFR showed an upward trend until mid-April and then moving ahead within a constant range of 2-2.5%. CFR in Afghanistan has shown a wave-like trend as after the initial increase and decrease, a subsequent

[1]The case-fatality ratio (CFR), has distinct limitations as it remains a variable until the outbreak terminates. Confirmed cases and deaths may not be accurate because of under-reporting of cases and/or deaths. The measure is time and location specific and may not be interpreted as a constant. For instance, in Afghanistan, the coronavirus may be spreading undetected: a random sample of residents in the capital city of Kabul in the first week of May found nearly a third were infected (Farmer, 2020). The declining value of its CFR during 27 April to 14May (from 3.7 to 2.5) may be considered to result of low testing, combined with under-reporting.

[2]https://www.thehindu.com/news/national/covid-19-indias-case-fatality-rate-progressively-falling-among-lowest-in-world/article32129700.ece

increasing trend is noticed. CFR in Maldives, although low in absolute terms, has shown a sharp rise and continues to stay at that level with minor fluctuations. CFR of Bhutan shows a zer death so far. This makes Bhutan stand out amongst other south Asian countries.

Figure 2: CFR in Select South Asian Countries



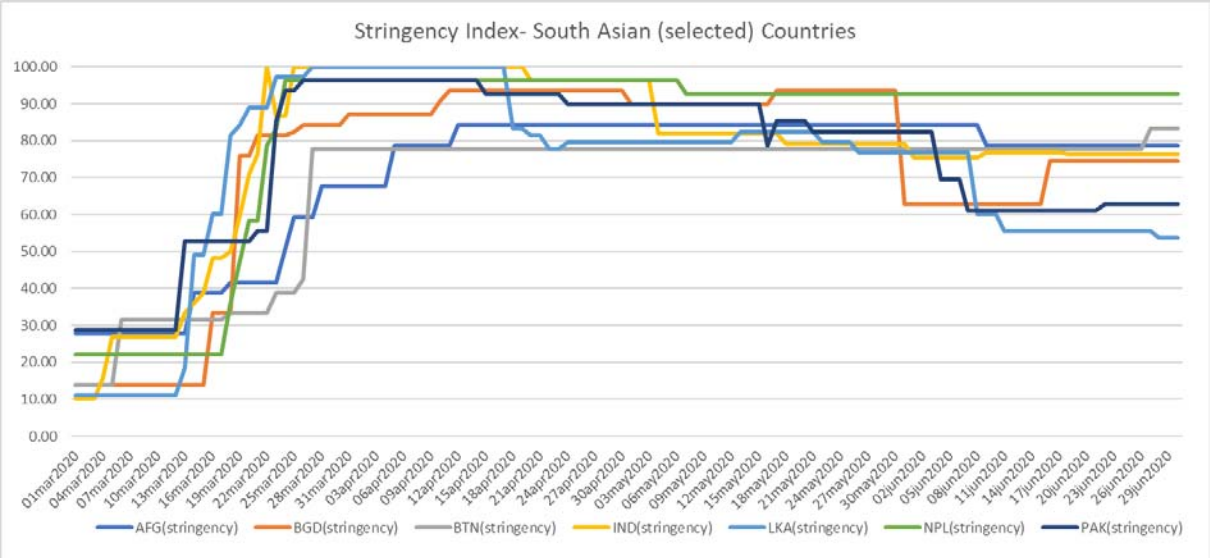
Source: Oneworldindata.org

One protocol has become very common throughout the world to fight corona virus. Countries took the policy of locking down millions of people inside their home to contain the spread of virus. The degree of lockdown is measured through stringency index[3]. Figure 3 below, explains the degree of stringency in major South Asian countries. It can be noted all countries took steps more or less at the similar time.

India, Sri Lanka, Nepal and Pakistan witnessed a sudden spike in stringency of lockdown between 13th March and 25th March and stayed at this level for a couple of weeks. Sri Lanka eased the restrictions imposed during the third week of April, unlike other countries which continued with the lockdown. Bangladesh also imposed restrictions at the same time, but not at the same level. It reached its highest level of stringency during second week of April and started easing the restrictions at the end of May. Interestingly, Bangladesh increased its lockdown intensity one again in mid of June. Bhutan imposed the least restrictive lockdown as compared to other south Asian countries. Low case load and zero deaths can be the possible reasons for that. Afghanistan imposed its highest level of restriction during second week of April. Before that, the increment in levels was not very steep in comparison to the other nations. It is important to note that majority of the countries have eased their lockdown now. One of the reasons can be the revival of crippled economy. As mentioned earlier, Sri Lanka has become the first country to ease the regulations. It was followed by India, Pakistan and Bangladesh. As of 30th June, 2020, Afghanistan has imposed lockdown with the least stringency. On the contrary, Nepal has maintained its restrictive policy with minor fluctuations.

[3]The stringency index is curated by Blavatnik School of Government, University of Oxford. The index measures the stringency of the steps taken by various governments in wake of spread of COVID-19 using various indicators. The value of the index on any given day is the average of nine sub-indices pertaining to the individual policy indicators. The Indicators taken into consideration are: School closing (C1), workplace closing (C2), cancelation of public events (C3), restrictions on gathering size (C4), public transport closure (C5), stay at home requirements (C6), restrictions on internal movements (C7), restrictions on international travel (C8) and public information campaign (H1). Eight out of these nine indicators have an additional flag indicating whether these steps are applied to target a particular geographical area or are general (nationwide) in nature. Only 'restrictions on international travel' is a generic indicator here. The lowest value of the index is zero and the highest is 100.(Petherick *et al.*, 2020)

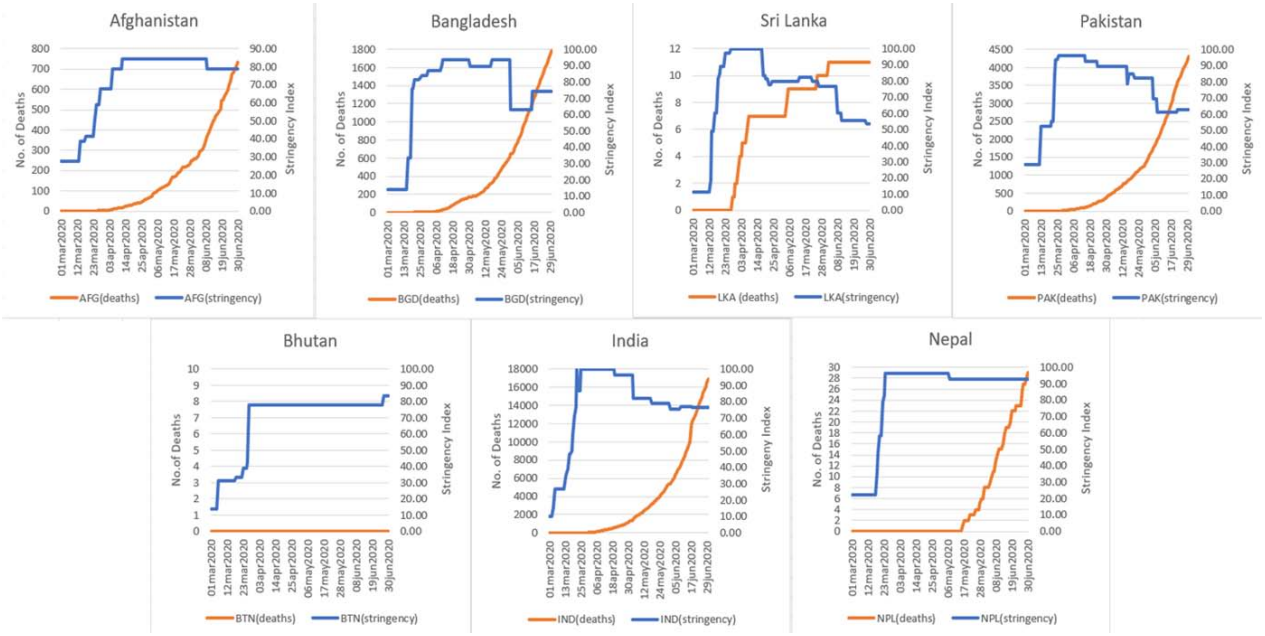
Figure 3: Stringency Index in Select South Asian Countries



Source: Drawn from the data available from Blavatnik School of Government, University of Oxford

Is there any correlation between stringency index and number of deaths? The stringency index is calculated from the policy announcements but challenge is to implement it. We have noted that in India, thousands of migrants from big cities started walking down to their hometowns/villages as factories, workplaces were closed, and there was no transportation available. People were regularly violating the lockdown rules risking the increase of virus infections. Figure 4 below, clearly depicts that the effectiveness of lockdown did not have much impact on the rate of deaths as majority of the countries are more or less following exponential curves except for Bhutan, Sri Lanka and Nepal. In these countries, death load is very low as compared to the other South Asian countries. Amongst these countries, Bhutan's restrictive policy seems to be the most successful one as it has recorded 0 deaths. It is interesting to note that despite of this, Bhutan's stringency level has not come down unlike other nations and neither it is as stringent as it was done by India, Nepal, Bangladesh, etc.. In Sri Lanka, minor increment in number of deaths can be seen as the stringency level comes down significantly. Although in rest of countries, i.e. Afghanistan, Bangladesh, Pakistan and India, the restrictions were imposed when death load was low, but the lack of implementation of these measures resulted in exponential increase in number of deaths proving it to be ineffective which has ultimately led to easing down the regulations.

Figure4: Stringency vis-à-vis Death in South Asia due to Coronavirus



Source: Drawn from the data available from different sources

At the time of the conclusion of this analysis there is no evidence to support the proposition that the number of daily cases and deaths reported has reached a peak across the South Asia region. It is highly probable that both cases and fatalities due to COVID-19 will continue to change for one or several months, perhaps throughout 2020 as South Asia has large population. High poverty, joblessness, uncertainty may force the people disobey the basic restrictions and as a result number of cases may rise sharply in coming months.

Nevertheless, in view of the enormous and unsustainable financial and economic pressures which households, companies and corporations experience during the lockdown, there has been a consistent pressure on the governments in most of these countries to reduce the stringency of the measures of COVID-19 containment. This is to provide opportunities for business to operate, perhaps on a reduced scale and within a framework of rigorous health and safety regulations toensure safety of the workforce, the consumers and the general public. Indian scenario is not very much different from the neighbouring countries despite its higher per capita income.

III. Impact on GDP and Consumption in South Asia

In an attempt to estimate the impact of COVID-19 pandemic on South Asian economies, the World Bank forecasted GDP growth rate for each South Asian country considering the current scenario and compared it with the growth rate that might have persisted if this pandemic did not exist (Table2. However, recently, World Bank has updated their forecast(Table3). It is important to note that the initial prediction put positive figure for India both in 2020 and 2021 fiscal year. However, with the impact of Covid India's GDP in 2020 was down to -1.1%. The revised number in Table 3 predicts that India's GDP will shrink further to -3.2%. The downward revision is an important indication that Covid impact is most serious in India compared to other South Asian countries. It is also important to note that for other countries, World Bank has made an upward revision for 2020 implying that other countries may revive their growth during the second half of the year.

Table2

World Bank's GDP Growth Expectations for South Asia 2020-2022.

Real GDP at market prices (percent)						COVID-19 Impact	
Country	**Fiscal year**	**2019 (e)**	**2020 (f)**	**2021 (f)**	**2022 (f)**	**2020 (f)**	**2021 (f)**
Afghanistan	Dec. to Dec.	2.9	-4.85	3.6	5.7	-7.85	0.1
Bangladesh	July to June	8.2	2.0 to 3.0	1.2 to 2.9	2.8 to 3.9	-4.7	-5.25
Bhutan	July to June	3.9	2.2 to 2.9	2.0 to 2.5	3.1 to3.5	-1.35	-1.65
India	April to March	6.1	4.8 to 5.0	1.5 to 2.8	4.0 to 5.0	-1.1	-4.75
Maldives	Jan. to Dec.	5.2	-10.75	6.8	5.25	-16.25	1.2
Nepal	mid-July to mid-July	7.1	2.15	2.15	3.15	-4.25	-4.35
Pakistan	July to June	3.3	-1.75	0.6	3.25	-4.15	-2.4
Sri Lanka	Jan. to Dec.	2.6	-1.75	0.7	2.25	-5.05	-3.0

Notes: (e)=estimate; (f)= forecast. The 2020 to 2022 values represent the forecast range. For Bangladesh, Bhutan, India, Nepal and Pakistan 2020 refers to FY19/20, 2021 is FY20/21 and 2022 is FY21/22 . COVID-19 impact is compared with the expected growth for 2020-2022 as of October 2019 forecasts. Source: World Bank, 2020, Table 2.2 and Author's calculations.

Table3: World Bank's Revised GDP Growth Estimate for South Asia (June 2020)

	2017	**2018**	**2019e**	**2020f**	**2021f**
Calendar year basis					
Afghanistan	2.7	1.8	2.9	-5.5	1.0
Maldives	6.8	6.9	5.2	-13.0	8.5
Sri Lanka	3.6	3.3	2.3	-3.2	0.0
Fiscal year basis	**16/17**	**17/18**	**18/19e**	**19/20f**	**20/21f**
Bangladesh	7.3	7.9	8.2	1.6	1.0
Bhutan	6.3	3.8	3.9	1.5	1.8
India	8.3	7.0	6.1	4.2	-3.2
Nepal	8.2	6.7	7.0	1.8	2.1
Pakistan (factor cost)	5.2	5.5	1.9	-2.6	-0.2

Source: World Bank, e: Estimate, f: Forecast

Using these numbers as reference, authors have attempted to calculate possible range of India's GDP growth for next two years and possible employment impact through non-linear or asymmetric employment elasticity of output. The details are discussed in next few sections. For 2019-20,authros calculation gives a range of output growth between 4.3%-3.7% whereas recently published official growth rate is 4.2%.

Table 4 below, explains that contraction of economic activities are predicted have significant impact on consumption, investment and trade. Scenario will improve in 2021 but it may take long time to reach pre-covid level. What is important here that public consumption will contrast substantially in 2020, which may reduce the overall demand. Private consumption will plummet to -2.6% in 2020 and it will go up to 3.3% in 2021 which will be far lower than pre-covid level. The same trend is visible for public consumption also. The fixed investment growth will also be negative and this includes government's

spending in infrastructure project. Hence, slowing down of government's consumption and investment may arrest the possible demand rise during the Covid time and that may delay the recovery. This prediction is significant and governments require sufficient stimulus to increase the demand.

Table4: Consumption, Investment and Trade Growth rate (%)in South Asia

	2017	2018	2019e	2020f	2021f
EMDE South Asia, GDP*	6.5	6.5	4.7	-2.7	2.8
PPP GDP	6.5	6.5	4.7	-2.8	2.8
Private consumption	6.4	7.2	4.5	-2.6	3.3
Public consumption	12.1	8.7	10.8	8.4	6.3
Fixed investment	5.8	11.2	-0.1	-8.2	1.2
Exports, GNFS #	4.8	10.2	0.3	-12.5	4.1
Imports, GNFS #	14.1	13.2	-5.8	-13.6	2.6
Net exports, contribution to growth	-2.6	-1.6	1.8	1.1	0.1

* EMDE: Emerging Market Developing Economies, the current calculation excludes Afghanistan, Maldives and Bhutan # GNFS: Goods and Non-factor services; e: Estimate, f: Forecast
Source: World Bank,

IV. Implication on Sector level GDP in India

To estimate the GDP and employment levels of FY19, FY20, FY21 and FY22, the base year of FY18 is taken into consideration. GDP share of five major sectors as representative of the economy namely (i) Agriculture, mining and quarrying, (ii) business, trade, personal and public services, (iii) hotel and restaurants and other personal services, (iv) light/heavy manufacturing, utilities and construction and, (v) transport services have been taken into consideration for the overall prediction with assumptions on possible impact of covid-19 on each sector.

As per the data extracted from Asian Development Bank, in 2018, the sectoral GDP of business, trade, personal and public services is the highest with a share of 52.60 %, followed by manufacturing and agriculture, mining and query (15.61%).

Table 5: India Data for Base-Year 2018

Sector	**Sectoral GDP (in $) in 2018-19**	**Sector% of value added**
Agriculture, Mining and Quarrying	450245.41	15.61%
Business, Trade, Personal, and Public Services	1517389.24	52.60%
Hotel and restaurants and Other Personal Services	120048.57	4.16%
Light/Heavy Manufacturing, Utilities, and Construction	624544.61	21.65%
Transport services	165566.85	5.74%
All	2884574.90	100.00%

Source: ADB

Since the emergence of COVID-19 pandemic, the economic scenario has been changed completely. India is likely to witness the worst recession in 40 years[4]. Although the government has eased restrictions and allowed businesses to restart operations as the country has entered in the phase-1 of unlock, India's more than two-month-long lockdown and flight of migrant workers from urban and industrial centres have crippled economic activity. The pandemic has different impacts on different sectors of the economy. As the service sector such has been driving the Indian economy, supressed consumerism is having a significant impact. Informal service is also severely hit due to absence of informal workers at this moment. Let us discuss some of the sector specific issues more in details.

Agriculture

Due to the stringent lockdown in the months of March-May, the supply chain of agricultural sector broke down as despite the good produce of rabi crops this year, which constitutes for nearly 50% of the total food-grain production(Ghosal, 2020), the harvesting procedure is in a difficult phase as most of it is done by migrant workers (especially in North India) who are migrating back to their native places. In addition to this, restricted transportation has made sales of produce difficult. Since around 70%of the rural households are engaged in agriculture[5], with only 17.9% of GVA share as of 2017(Suneja, 2019), the lockdown and migration will add pressure to the agricultural wages and employment. The problem of "disguised unemployment" which is quite rampant in this particular sector, may go unnoticed due to this situation which will probably lead to underestimation of employment loss. Due to this, not only migrant labourers have lost the jobs, but also farmers received severe income shock.

Transportation

According to McKinsey and Company, the sector provides employment to 5% of the total workforce along with GDP share of 8%.(Gupta and Madgavkar, 2020)The lockdown has heavily affected the Indian freight sector, which is based on the traditional approach of trucking, loading, unloading, and material handling. The trucking industry employs 30 million people, and more than 150 million people depend on it for their sustenance. The outbreak has escalated the issues particular to the Indian logistics sector, such as high fragmentation and low technology development.

The lockdown has resulted in a shortage of drivers and loading-unloading personnel, which in turn has generated delays in delivery and disruption in the supply chain with potential impact on other sectors. Due to its structural weaknesses and other combining effects, such as the reverse migration of millions of daily wage workers, the freight sector might not be so fast in recovering due to labour shortage.[6]

The freight trains are running at about 60% of their capacity. They have been affected by a 26% reduction in coal-based power generation in India since the lockdown began. It is estimated that Indian Railways will lose around Rs.125-Rs.650 billion from passenger trains and Rs. 60 billion from freight services.(Chauhan, 2020)

Hospitality Sector

There will be large scale cascading effects for the hospitality and tourism industries. Hotels and restaurant chains across the country were closed till the announcement of unlocking 1.0. Food delivery and take away from restaurants are allowed. However, they are unlikely to witness a pick-up in demand even as the

[4]India economy growth: Economy may contract by over 40% in Q1: SBI Research - The Economic Times, 2020
[5] India at a glance | FAO in India | Food and Agriculture Organization of the United Nations
[6]COVID-19: Focus on cities and transport responses – India – EcoMobility, 2020

lockdown is further relaxed. Their businesses will suffer for several months, sparking worries of large-scale layoffs. This causes 50 million jobs at risk, globally. According to estimates from CMIE's Consumer Pyramids Household Survey, travel and tourism accounts for 5% of total employment in India (nearly 20 million jobs). Hotels and restaurants account for another 4 million jobs. Employment in this industry has already been declining since late 2017. These sectors are going to be disproportionately affected during the on-going crisis.(Mahendra Dev and Sengupta, 2020)The ripple effect of the coronavirus pandemic will lead to the industry losses up to Rs. 6200 million. The hotel chain and standalone hotel segment may sustain losses of over Rs. 1300-1550 million, whereas the alternate accommodation segment is probable to make losses of over Rs 4200-4700million. Layoffs of contracted staff are probably going, a research suggested. It has been estimated that the tourism industry in India contributes to about 10 per cent of the GDP (approximately US$275 billion). Adding to these woes is the fact that between 15 and 25 per cent of the employees of the various branded hotel chains in India are either contracted or casual staff. These people have become the weak link to the whole chain and it is evident that it may break them first.(Kumar, 2020)

Manufacturing

The Indian Manufacturing sector, as of 2014, contributes 16-17% to GDP and gives employment to around 12% of the country's workforce. Various studies have estimated that every job created in manufacturing has a multiplier effect and thus creating 2–3 jobs in the tertiary sector[7]. India's factory output has shrunk by a record 16.7% in March as economic activity came to a standstill because of the nationwide lockdown from March to May, which prompted the government to announce a fiscal stimulus plan to revive industrial activity. The success of fiscal stimulus package is yet to be realised. In March, manufacturing output plummeted to 20.6% while electricity generation shrank 6.8% and mining output grew at 0%, government data showed. In FY2019-20, factory output contracted 0.7% against 3.8% growth in the previous year. The country's eight infrastructure sectors contracted by a record 6.5% in March after touching an 11-month high in February, data released by the industry department in April. India's manufacturing and services Purchasing Managers' Index has also dipped to record lows in April, stoking fears that the economy is heading towards recession as the crushing lockdown shut businesses and kept consumers indoors.(Mishra, 2020)

Small and Medium Sector

The micro, small and medium enterprises (MSME) as a whole form a major chunk of manufacturing in India and play an important role in providing large-scale employment and in the country's exports. The sector also includes mushrooming start-ups in service sector. Recent annual reports on MSMEs indicate that the sector constitutes around 30% of India's GDP, and based on the estimates, employs around 50% of industrial workers. Over 97% of MSMEs can be classified as micro firms (with an investment in plant and machinery less than Rs 2.5 million), and 94% are unregistered with the government. Many of the micro enterprises are small, household-run businesses. Although all businesses have been affected by the pandemic, the MSME sector would be badly hit by reduced cash flows caused by the nationwide lockdown. Their supply chain would be disrupted, and they would be affected by the exodus of migrant workers, restrictions in the availability of raw materials, by the disruption to exports and imports and also by the widespread travel bans, closure of malls, hotels, theatres and educational institutions etc. This, in turn, would massively impede the MSME businesses. As a consequence, hundreds of thousands of people who work for these small businesses may end up with job and salary losses.(Mahendra Dev and Sengupta, 2020)

[7] Sectors, CII

Service Sector

As per the services Purchasing Manager's Index (PMI) of IHS Markit India, the value was 57.50 in Feb 2020, which dropped sharply 5.40 in April and then moved to 12. 60 in May and 33.70 in June reflecting a slow recovery[8]. The index value points out to the third-sharpest deterioration in services activity in India since the series began 14 years ago. Several sectors such as tourism and hospitality, distribution & retail, entertainment, aviation and transportation, received big blow due to sudden stoppage of all economic activities. Large-scale services in India are also done through informal channel, which have also collapsed. Only IT sector has shown some resilience as most of the employees have worked from home. Some services such as telemedicine, financial services, education are trying use new technologies such AI. However, in general, new orders fell at a sharp pace, which firms attributed to reduced consumption habits and lower requirements at key clients and export sales collapsed due to travel restrictions. IHS Markit highlights that on the price front, input cost inflation eased leading to fall in output charge. Services companies became more pessimistic, amid of prolonged economic weakness domestically and overseas. The future demand of services will remain low as consumer confidence collapsed. The current situation index and the future expectations index were both below 100, indicating that consumers were pessimistic.[9]Demand will be suppressed due to economic dislocation; sharp decline in GDP growth; broken supply chains; low consumer confidence; and concerns about lingering outbreaks of coronavirus.[10]

V. Scenario Building for GDP and Employment effect in India

The above observation can be used to develop scenarios for India's growth in 2020 and 2021. In absence of relevant data, we'll use simple static structure with rigid assumptions to estimate the possible sector level GDP and further employment effect using the ADB supplied information on effect of 1% GDP reduction on employment loss. Overall, in India, 1% GDP loss reduces around 6.8 million jobs as per ADB data on reduction of employment over reduction of GDP using 2018 data.

We have considered ADB's method[11] and use possible output loss (in percentage) due to covid and its effect on possible number of months. Further, the output shock is matched with possible quarter wise shock in 2020-21as discussed in NCAER's Quarterly Review of Economy (Q1, 2020)[12]. This indicates a deep shock in first quarter in 2020-21 (April-June) and a slow recovery in subsequent quarters.
Considering the possible effect on Indian economy, the paper presents upper and lower bound to understand India's GDP and employment growth considering optimistic and pessimistic scenarios. The two scenarios are based on degree of economic shock.

GDP Prediction

[8]https://tradingeconomics.com/india/services-pmi#:~:text=The%20IHS%20Markit%20India%20Services%20PMI%20(Purchasing%20Managers'%20Index),%2C%20employment%2C%20inventories%20and%20prices
[9] https://www.cnbc.com/2020/06/22/economic-impact-of-indias-coronavirus-lockdown-in-four-charts.html
[10] https://www.indiatoday.in/business/story/coronavirus-5-indian-sectors-that-need-urgent-help-as-virus-ravages-economy-1670099-2020-04-23
[11]See Appendix for a brief method used by ADB
[12] Webinar, Thursday, June 25, 2020, 6:30 pm IST

For 2019-20, the effect is very limited as the lockdown started only in March end. As India's fiscal year ends in March, we assume the effect is only for 3 weeks. Though, immediately there is a huge negative impact but overall yearly impact is minimal. The projected GDP growth through this method is between 3.7%-4.3%, which is close to, recently released official growth rate (4.2%).

The expected loss in agriculture is 0-3%, only in March. For hotel, restaurants and personal service, the output shock is in between 25-40%. For rest of the sectors, output loss is in between 15% to 25% during March. As this decline happened in March 2020 only, the yearly impact is much less as described in Table 6.

Table6: Possible Shock in March 2020 to estimate 2019-20 GDP (Upper and Lower Case Scenario), GDP value in US$ Million

Sectors	% Decline of GDP (Effect on March 2020), Upper Case Scenario	% Decline of GDP (Effect on March 2020), Lower Case Scenario	Predicted GDP in 2019-20 (with Covid Effect), Upper Case Scenario	Predicted GDP in 2019-20 (with Covid Effect), Lower Case Scenario
Agriculture, Mining and Quarrying	-0.115	-0.173	474460.82	474186.78
Business, Trade, Personal, and Public Services	-0.865	-1.442	1582103.34	1572896.14
Hotel and restaurants and Other Personal Services	-1.442	-2.308	126599.30	125487.70
Light/Heavy Manufacturing, Utilities, and Construction	-0.865	-1.731	642048.07	636443.39
Transport services	-0.865	-1.154	176444.11	175930.70
Total			3001655.64	2984944.70
Yearly Growth rate in 2019-20			**4.3%**	**3.7%**

Source: Authors' calculation

In 2020-21, Indian economy is expected to face a severe shock. Recent discussion in NCAER predicted that quarterly shocks will slowly get reduced. As per the prediction, there will be -25.7% growth in first quarter of 2020-21 and followed by -16.7%, -8.1% and 0.5% growth in subsequent quarters. The current paper has looked into quarterly distribution of GDP in last few years and calibrated different level of shocks distributed over four quarters in 2020-21. In case of upper scenario immediate shock is higher (50%) and then it slowed down with an effect of 25%, 15% and 10% in next three quarters. On the contrary, in lower case, effect of shock is deep rooted and it will have a prolonged effect. The shock is assumed to have a distribution of 45%, 30%, 20% and 5% over the four quarters of 2020-21. Highest shock has been given to hotel, restaurants and personal services, followed by business, trade and manufacturing. We assume that effect on hotel, restaurants, trade and manufacturing will be much severe in lower case scenario compared to upper case. The result shows that India's GDP will contract by 19-10% in first quarter and subsequently by 12.5-8.4% in second quadrant, 8-3% in third quadrant and around 2% in last quadrant. This results into an overall GDP contraction by 4.7% to 10.2% in 2020-21 depending on upper and lower case scenario. Table 7 provides a snapshot.

Table7: Different Scenarios for 2020-21 GDP Prediction

			Distribution of GDP decline effect over four quarters			
Sectors	% decline in Sector GDP (Upper Case Scenario)	% decline in Sector GDP (Lower Case Scenario)	Effect on Quarter 1, (%); *Upper-Lower case scenario*	Effect on Quarter 2, (%); *Upper-Lower case scenario*	Effect on Quarter 3, (%) *Upper-Lower case scenario*	Effect on Quarter 4, (%), *Upper-Lower case scenario*
Agriculture, Mining and Quarrying	-2	-5	50-45	25-30	15-20	10-5
Business, Trade, Personal, and Public Services	-5	-12	50-45	25-30	15-20	10-5
Hotel and restaurants and Other Personal Services	-10	-15	50-45	25-30	15-20	10-5
Light/Heavy Manufacturing, Utilities, and Construction	-5	-10	50-45	25-30	15-20	10-5
Transport services	-5	-6	50-45	25-30	15-20	10-5
% decline in GDP due to shock (Upper Case Scenario)			**-9.8**	**-4.8**	**-2.8**	**-1.8**
% decline in GDP due to shock (Lower Case Scenario)			**-19.0**	**-12.5**	**-8.2**	**-2.0**

Source: Authors' calculation

In 2021-22, in lower case scenario, negative impact will continue at least for half of the year before Indian economy moves to a positive growth quadrant. However, overall predicted growth rate still remains at the negative level (-0.4%). On the other hand, in case of upper case scenario, positive green shoots are visible from the beginning and lead to growth in all sectors resulting into a close to 3.9% growth rate annually.

Table8: GDP forecast for India in next Three Years

Real GDP (Million US$)				
Upper Case	**2018-19**	**2019-20 (With Covid)**	**2020-21**	**2021-22**
Agriculture, Mining and Quarrying	450245.41	474460.82	464971.60	474271.04
Business, Trade, Personal, and Public Services	1517389.24	1582103.34	1502998.17	1578148.08
Hotel and restaurants and Other Personal Services	120048.57	126599.30	113939.37	119636.34
Light/Heavy Manufacturing, Utilities, and Construction	624544.61	642048.07	609945.67	631293.77
Transport services	165566.85	176444.11	167621.91	168040.96
All	**2877794.68**	**3001655.64**	**2859476.72**	**2971390.18**
Lower Case				
Agriculture, Mining and Quarrying	450245.41	474186.78	450477.44	449351.24
Business, Trade, Personal, and Public Services	1517389.24	1572896.14	1384148.60	1377227.86
Hotel and restaurants and Other Personal Services	120048.57	125487.70	106664.54	105331.24

Light/Heavy Manufacturing, Utilities, and Construction	624544.61	636443.39	572799.05	571367.05
Transport services	165566.85	175930.70	165374.85	164961.42
All	**2877794.68**	**2984944.70**	**2679464.49**	**2668238.81**
GDP & Sector level Growth Rate (%)				
Upper Case				
Agriculture, Mining and Quarrying		5.38	-2.00	2.00
Business, Trade, Personal, and Public Services		4.26	-5.00	5.00
Hotel and restaurants and Other Personal Services		5.46	-10.00	5.00
Light/Heavy Manufacturing, Utilities, and Construction		2.80	-5.00	3.50
Transport services		6.57	-5.00	0.25
All		**4.30**	**-4.74**	**3.91**
Lower Case				
Agriculture, Mining and Quarrying		5.32	-5.00	-0.25
Business, Trade, Personal, and Public Services		3.66	-12.00	-0.50
Hotel and restaurants and Other Personal Services		4.53	-15.00	-1.25
Light/Heavy Manufacturing, Utilities, and Construction		1.91	-10.00	-0.25
Transport services		6.26	-6.00	-0.25
All		**3.72**	**-10.23**	**-0.42**

Source: Authors' calculation

Employment Impact

To calculate the employment effect, we have attempted to use employment elasticity of output. The literature highlights asymmetric nature of employment elasticity. When GDP growth rate is positive, employment generally grows less than the GDP growth making elasticity figure less than one. However, during the time of recession, especially when GDP experiences a negative growth employment rate dips faster. The non-linear relationship between GDP and employment is already an established issue in the literature. Explaining US employment growth after the great recession, Chinn et al (2014)highlightsthat the decline in employment exceeded the level predicted bystandard econometric models of employment elasticity.US GDPcontracted by 4.2% during 2008-09 while employment declined by 6.2% – yielding an"elasticity" of employment to GDP losses of around 1.45. The strong disconnect between GDP and employment reflects the flexibility of US labour market. In contrast, during the same time, elasticity value was much lower in euro area as institutional support – in particular widespreadreliance on short-time working schemes and other job-saving measures arrested the decline in employment.[13]This has also explained by Balakrishnann (2010). According to him, during recessions, financial crises, large house price busts, and other sectoral shocks raise unemployment beyond the levels predicted by Okun's law. On the other hand, at the time of recoveries, the impact of financial crises and house price busts continues to constrain employment creation.The recovery in employment during the post crisis period depends on degree of macroeconomic uncertainty and its affects consumer confidence.

We use this non-linear concept of elasticity for calculating effect of declining GDP on employment. As discussed in the previous section, we assume a bigger shock on employment in

[13]https://www.ecb.europa.eu/pub/pdf/other/eb201606_article01.en.pdf

the initial quarters and a slow recovery thereafter. Indiahosts huge number of vulnerable people working in the informal sector and hence the initial shock will create large-scale job losses. This is following the argument made by CMIE in projecting quarter 1 unemployment level in 2020 fiscal year.

We don't have readymade employment elasticity available for the current scenario. We use RBI working paper written by Mishra and Suresh (2014) which has made an attempt to estimate the employment elasticity during the post liberalisation period using various methods. The study noted a steady decline of India's employment elasticity especially in manufacturing. In agriculture the figure has reached even negative number implying, continuous exodus of people from agricultural activities. We have averaged out the numbers estimated through different methods and summed up to the main five sectors as described in the table below. The elasticity number supplied in the study is based on long term time series data (19901-91 to 2011-12). However, other studies have mentioned that India's employment elasticity has fallen drastically since 2012 but we don't have sector wise number for that. The current study uses these numbers to calculate the effect on employment when GDP growth is positive. ADB, recently made an attempt to estimate separately the percentage decline of GDP and employment between 2018 and 2019. Using the arc elasticity formula with 2018 data we have estimated sector wise numbers especially when GDP declines from ADB figures.

Table 9: Sector wise Employment Elasticity in India

Sectors	Avg from RBI numbers (used when GDP growth is positive)	Implicit Elasticity from ADB (Used when GDP growth is negative)
Agriculture, Mining and Quarrying	0.19	1.053
Business, Trade, Personal, and Public Services	0.35	1.052
Hotel and restaurants and Other Personal Services	0.3	1.002
Light/Heavy Manufacturing, Utilities, and Construction	0.48	1.073
Transport services	0.2	0.993
All	0.25	1.195

Source: Table 1 and 6 of Mishra and Suresh (2014) and ADB calculation

Using GDP and employment figure of 2018, we have predicted the employment growth in 2019 using the following formula. This estimation assumes that there is no impact of Covid. Further, estimated employment loss in March 2020 is calculated considering the GDP decline during the period.

$$\epsilon_t = \frac{E_t - E_{t-1}}{Y_t - Y_{t-1}} X \frac{Y_{t-1}}{E_{t-1}}$$

Let us assume GDP growth rate is 'r' and hence, $Y_t = Y_{t-1}(1 + r)$. Combining these two, we get

$$\epsilon_t = \frac{E_t - E_{t-1}}{E_{t-1}} X \frac{1}{r_t}$$

Hence, employment growth rate (α) is $\alpha = \epsilon_t r_t$. We use this formula to calculate the employment growth. $E_t = (1 + \epsilon_t r_t) E_{t-1}$

Considering this effect, the overall employment loss is around 2.3-4.0 million in March2020(upper and lower case scenario). The effect is more prominent in April. The March figure of Job loss estimated by

CMIE is around 8 million. CMIE calculation includes large number of informal workers and self-employed people such as street vendors. Hence, our number is more conservative.

For the year 2020-21, we develop two scenarios upper and lower. At the lower case, we assume the negative effect of covid-19 will last for the entire year reducing India's GDP growth to -4.7%. If the negative effect persists for only six months and Indian economy's resilience will be visible from August onwards but the yearly growth will be still at the negative quadrant (-2.4%). In 2020-21, agriculture will get seriously affected, as migrant workers won't be returning soon and the sowing seasons in India coincides with the monsoon, which starts from July. We have assumed a 2% drop in agriculture output. For Hotel Restaurants, output will be dropped by 10% and in other service sectors by 5%. Government will give huge focus on the manufacturing sector which may experience a negligible positive growth in this year. The employment loss will be between 34 million to 16 million lower and upper cases respectively. The total employment loss in 2020 is quite severe as it ranges between 4 to 9% of total employment in the beginning of the year. In contrast to our calculation, CMIE predicts that unemployment rate will go down but will never reach to pre-covid level soon. We consider the secondary effect of the pandemic (rising incidence of disease in the second quarter, shallow demand due low consumer confidence, low investment and possible inflationary pressure due to high borrowing by the governments in the coming months).

Situation will improve in 2021-22. In lower case situation we assume negative impact will continue for 6 months and in upper case, small positive growth is achieved at the end of the year. In lower case scenario, we assume trading, public services, hotel and restaurant still experience small negative growth for six months at least, manufacturing will have 1% growth and agriculture will grow by 1%. In upper scenario, all sectors will grow positively for the full year. Service sector will grow by 5%, industry by 3.5% and agriculture by 2%. Overall, in upper case, Indian economy will grow almost by 3.9% but in lower case, it might still experience a negative growth rate (-0.2%). In lower case, India will still experience fall in jobs by 1.3 million but in upper case, India will be able to add 3.9 million jobs. Hence, the recovery in 2021-22 will not be able to compensate fully the job losses. In total, we have estimated a net loss of 15 to 40 million jobs in India during 2019-20 to 2021-22 which is between 3.6% to 9.8% of 2019 employment level. The average wage loss is between 1 to 1.84% in 2020. Table 10 below provides the detailed information on employment losses.

Table 10: Employment Scenario in India

Employment (in Million)	Exp Emp in 2019 (no Covid)	Exp Emp in 2019-20 (with Covid)	Exp Emp in 2020-21	Exp Emp in 2021-22
Upper Case				
Agriculture, Mining and Quarrying	190.634	190.403	186.404	187.113
Business, Trade, Personal, and Public Services	84.829	84.058	79.645	81.039
Hotel and restaurants and Other Personal Services	19.526	19.243	17.315	17.575
Light/Heavy Manufacturing, Utilities, and Construction	94.897	94.016	88.971	90.466
Transport services	16.621	16.479	15.661	15.668
All	**406.507**	**404.199**	**387.996**	**391.860**
Lower Case				
Agriculture, Mining and Quarrying		190.286	180.263	179.788
Business, Trade, Personal, and Public Services		83.542	72.997	72.613
Hotel and restaurants and Other Personal Services		19.074	16.207	16.004
Light/Heavy Manufacturing, Utilities, and Construction		93.134	83.139	82.916
Transport services		16.431	15.452	15.414

All		**402.468**	**368.058**	**366.735**
Emp gain/loss as % of Sector Employment				
Upper Case				
Agriculture, Mining and Quarrying		-0.12	-2.15	0.38
Business, Trade, Personal, and Public Services		-0.92	-5.54	1.72
Hotel and restaurants and Other Personal Services		-1.47	-11.14	1.48
Light/Heavy Manufacturing, Utilities, and Construction		-0.94	-5.67	1.65
Transport services		-0.87	-5.22	0.05
All		**-0.57**	**-4.18**	**0.99**
Lower Case				
Agriculture, Mining and Quarrying		-0.18	-5.56	-0.26
Business, Trade, Personal, and Public Services		-1.54	-14.45	-0.53
Hotel and restaurants and Other Personal Services		-2.37	-17.69	-1.27
Light/Heavy Manufacturing, Utilities, and Construction		-1.89	-12.02	-0.27
Transport services		-1.16	-6.33	-0.25
All		**-1.00**	**-9.35**	**-0.36**

Source: Authors' calculation

VI Income Inequality and further Marginalisation

UNDP estimates that since 1990, for the first time the global human development (a combined measure of the world's education, health and living standards) will decline in 2020. The decline is expected across the majority of countries - rich and poor - in every region. The World Bank has cautioned that the pandemic could push between 40 and 60 million into extreme poverty this year. The employment losses, decline in per capita income, rise in health expenditure, contraction of public services etc. will make the life difficult for already marginalised people. ILO estimates that half of working people could lose their jobs within the next few months and the World Food Programme says 265 million people will face crisis levels of hunger unless direct action is taken. As per ILO's estimation, almost 400 million people in India alone are at vulnerable level with a high risk to slide down to poverty level[14]. As the schools are closed, a large number of young kids are out of school and deprived of free food in many countries (Mid-Day Meal programme in India). UNDP estimates that effective out-of-school rates could regress to levels not seen since the 1980s.

Income inequality has been rising in India since it experienced accelerated growth from mid-2000. The current shock has given a major blow to the employment level, which will deteriorate the situation further as most employment in India are at the informal level. A significant inequality exists among regular wage earning or salaried, non-agriculture sector employees. As per the Periodic Labour Force Survey (PLFS) 2017–18, almost 71 percent of regular wage/salaried employees had no written job contracts; 54 percent were ineligible for paid leave and almost 50 percent were ineligible for social security benefits (Dutt & Prasad, 2020). Also due to lockdown and social distancing norms in urban areas construction workers, taxi drivers, housekeeping and maintenance staff, factory workers etc. are not able to perform their duties as they require physical presence at work sites. , Most people will not earn a salary for the days they are unable to work. Daily wage earners and those in the informal sector will be affected disproportionately. Hence, this segment is extremely vulnerable to shutting down of workplace. For them, the lockdown essentially means loss of livelihood. India as a country has experienced high growth rates in few states and they also witnessed large-scale migration of workers from other states. The current shutdown means many of them will not be able to repatriate money to their family members who live in different places. The slowdown of remittances may have already created havoc to those people. Moreover, this pandemic

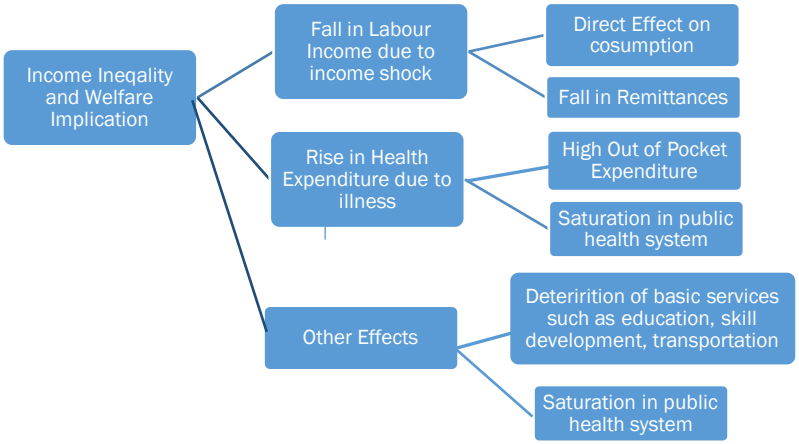
[14]https://feature.undp.org/coronavirus-vs-inequality/

has happened at a time of global slowdown and a public health crisis of this magnitude is likely to have an additional negative impact on the economy. 2020 will witness a sharp contraction in GDP as described above and more people will lose their jobs thereby enhancing the income inequality[15].Fall in GDP means decline of many basic public services including subsidised education, skill development, health facility and even transportation. Hence, in real sense, the drop in income along with sluggish economic condition gives a double blow to Indian poor.

In 2012, top 20% of India's population accounted for 47 per cent of consumption share while bottom 20% of population accounted for only 6 per cent. The gap of 41 percentage points in consumption shares of top two deciles and bottom two deciles is glaring. It is expected that Covid-19 could enlarge this gap due sudden shutdown of the economy and rise in health expenditure. As per NSSO 2012 data around 30% population in India spends around 10-12% of their income in food. Contrary to this, the top 5% spends 13-15% on food (Deodhar, 2020). It is expected that as poorer households are severely affected, the share of food in consumption basket would increase markedly leading to a drop in consumption of durables, entertainment, and personal care products.

Dasgupta and Murali (2020) developed different scenarios to understand the impact of Covid-19 on income inequality and noted that the increase inequality could be between 3-21%, which is against of rise of inequality of approximate 10% over six years since early 1990s. This is quite significant as India's intensity of covid infection has increased during June and July, which will continue to disrupt the economic activities for some time. The authors argue that along with income inequality there could also a probability of increased inequality in health outcomes between the high and low-skilled workers. As inequality rises health disparities widenes. High skilled workers afford to stay at home and work from home which is a luxury for low skilled workers. As they step out to earn their livelihood, the probability of contracting the virus rises. Once again, the differing nature of their occupations leads to an increase in inequality between the two groups.Moreover, preventive care and health education have steadily tilted toward the educated and the well-off leading to more inequality. Following diagram provides a snapshot how income inequality is influenced by number of factors.

Figure 5: Sources of Income Inequality and its Implication



VII Health Management and Fiscal Issues

[15] ibid.

India's Public Health System has been developed over the years as a three-tier system, namely primary, secondary and tertiary level of health care. This three-tier public health infrastructure, comprising community health centres, primary health centres and sub-centres across rural and semi-urban areas and multi-speciality hospitals and medical colleges located at urban areas. Over the years, India's health care system has developed a contrasting scenario. Despite having an overarching public healthcare system, fund allocation to this has been miniscule. In 2016-17, only 1.02 % of GDP has been spent on healthcare, which has been increased to 1.28% in 2017-18. Government has targeted to increase expenditure on public health services to 2.5 per cent of the country's GDP by 2025. The cost of treatment has been on the rise in India, which has led to inequity in access to healthcare services. According to the data, in 2014, India stood highest amongst other Asian countries with percentage share of 62 percent of out-of-pocket expenditure of the total health expenditure (Behera&Dash, 2019).Health being a state subject has received skewed importance in different states. There exists significant rural-urban and intra-state disparities. Urban to rural doctor density ratio is around 3.8:1. Inter-state difference in hospital bed availability is also acute. For example, states like Bihar are well below the national average of 0.55 beds in the public sector per 1000 population while others like West Bengal (2.25 beds/1000) and Sikkim (2.34 beds/1000).As per the World Bank data the average number of hospital beds considering both public and private sector hospitals are only 0.7 per 1000 people in 2011[16]. Considering the available data the Center For Disease Dynamics, Economics & Policy (CDDEP) along with Princeton University estimated that most of the hospital beds are located in five states only (Uttar Pradesh (14.8%), Karnataka (13.8%), Maharashtra (12.2%), Tamil Nadu (8.1%), West Bengal (5.9%), Telangana (5.2%) and Kerala (5.2%)) implying acute inter-state disparities.[17]

Another glaring contrast is visible due to coexistence of high tech medical facilities to the urban rich and ramshackle primary health centres in rural India. Kasthuri (2018)[18] highlights the major challenges faced by Indian health care system are lack of awareness of health issues among the people, access to healthcare system, absence of human resources in healthcare, affordability of the cost of healthcare and lack of accountability on the part of hospitals and policy makers. Out migration of health care workers from India to other countries have also contributed to the shortage. Lack of adequate education and training opportunities and on the contrary, better lifestyle and earning opportunities in abroad, lure nurses/doctors to migrate overseas. State facilitation of this international migration or labour export suggests comprehensive national policy agenda to enhance retention through workplace improvement are unlikely (Thompson Maddy& Walton-Roberts, Margaret, 2019).

The expenditure by both central and state governments comprises of salaries, gross budgetary support to various institutions and hospitals and transfers to states under centrally sponsored schemes such as Ayushman Bharat, etc. Of the total public expenditure, the Centre's share is 25%. Over the last five years, the total public expenditure on health has risen at 15% CAGR, much of this due to pay hikes[19]. Lack of beds, physician and other medical workers are already a big problem in India and the pandemic has further aggravated the situation. The current background provides a huge opportunity for the government to devise a long term plan with a specially designed stimulus package targeting the bottlenecks in public health management system. Subsidized loans, earmarked land, single-window approvals, tax holidays, etc. can be used for setting up hospitals; more flexibility can also be brought in medical education. Finally, public sectors firms can be encouraged to for mass production of medicines and medical devices. All of these require an additional budgetary allocation.

[16] https://data.worldbank.org/indicator/SH.MED.BEDS.ZS?locations=IN

[17]https://cddep.org/publications/covid-19-in-india-state-wise-estimates-of-current-hospital-beds-icu-beds-and-ventilators/

[18] Kasthuri Arvind (2018): Challenges to Healthcare in India - The Five A's; Indian Journal Community Medicine; Jul-Sep; 43(3): 141–143.

[19] https://www.livemint.com/news/india/india-s-economy-needs-big-dose-of-health-spending-11586365603651.html

The creation of fiscal space, which is the capacity of government to provide additional budgetary resources for the desired purpose without any prejudice to the sustainability of its financial position can be facilitated by three methods namely: mobilisation of tax revenue, grants and transfers and borrowings. The research shows that tax revenue as a share of GDP is just 11.2% (world bank report, 2017) and there is a need to bring reforms in the tax policy to increase this number. The dependency on borrowings and transfers is not appropriate for long run. Also, there is a huge disparity amongst the states when it comes to proportion of government expenditure as in most of the under-developed and low-income states like Bihar, Jharkhand, Madhya Pradesh etc., the expenditure is more towards the developmental parameters like the infrastructure not towards health.

The unprecedented health and economic crisis created by the COVID-19 pandemic has brought the idea of extra ordinary borrowing by the government to ease the fiscal space. Several governments around the world, both rich and poor have started stretching their fiscal resources to manage this unprecedented humanitarian crisis. This has raised a doubt whether sudden increase in the government debt would bring up any inflationary pressure.

The modern monetary theorists (MMT) accept that future inflation is the binding constraint on the extent of current government spending. However, they push for creation of money through fiscal policy instruments, which is necessary at the time of crisis. As the interest rates are low, the cost of long-term borrowing is also negligible and that reduces the possibility of 'crowding out' effect. However, this theory disagrees that most of the inflation is due to excess demand and any such pressure can be managed through additional taxes to reduce the purchasing power. The jury is still out on the idea of unconditional borrowing and creation of money through this.

Government of India is walking on a tight rope and so far has taken a cautious step. It has allowed individual state to increase their borrowing from 3% of Gross State Domestic Products (GSDP) to 5% but with conditions attached. An increase of 0.5 percentage points is unconditional and will be applicable immediately. A further increase of 1 percentage point will be released in four tranches of 0.25 percentage points each, linked to state performance in four areas of reform, whichinclude one nation one ration card scheme; ease of doing business; reforms of power sector distribution companies; reforms of urban local bodies. The final 0.5 percentage points in increased borrowing limit will be unlocked if targets are met in three of the four outlined areas[20]. This is important to note that immediate fund for health management is not highlighted in these conditions. States are required to be pro-active in developing temporary hospitals, arrange PPEs, medicines, subsidise private hospitals etc. Indirectly, the relaxed borrowing can help states to absorb the sudden drop in revenue receipts and to avoid a cutback in capital expenditure. At the central level, government has allocated around Rs 150 billion (0.1%) of GDP for health infrastructure[21]. It is now clear that government is inclined towards a long term reform rather than immediate management of issues such as health, employment generation, etc. These are left with the states and hence, response to corona virus issues will be different from one state to other.

VIII Conclusion

In the midst of an imminent GDP decline, reduction in employment, rising inequality along with abject condition of migrant workers, government of India has made its effort to extent its support to various stakeholders with a focus on long-term reform to increase India's resilience. The support package consists of credit support to businesses (1.9 percent of GDP), poor households, especially migrants and farmers (1.6 percent of GDP), distressed electricity distribution companies (0.4 percent of GDP), and targeted support for the agricultural sector (0.7 percent of GDP), as well as some miscellaneous support measures (about 0.3 percent of GDP). The question is whether a robust programme to increase demand, consumer

[20] https://www.bloombergquint.com/economy-finance/covid-19-economic-package-government-allows-increased-state-borrowings-with-conditions-attached

[21] https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

sentiment and provide enough money in the hand of poor backs up the support. Health management is mostly left in the hand of states. The article has made an attempt to analyse the possible decline of GDP and its employment impact considering the sector level impact. The results indicate a large-scale job losses throughout in 2020 and partly in 2021. This will have a severe socio-economic impact and may push the economy backward for several years. How far and how fast the announced package is able to improve the job scenario is yet to get a clear picture. Whether, borrowing by companies will take off and how far they will invest to improve consumer sentiment is also an important parameter for India to come back to resilient and vibrant growth path.

Appendix

Predicting short-term sectoral, national and regional GDP growth.

The Asian Development Bank (ADB) creates its prediction for national and regional GDP growth through aggregation of sector-specific performance estimates. Country-economists continuously monitor sectoral performance data, including production levels, final and intermediate consumption, public and private investment as well as product price levels at wholesale and retail levels. Based on latest data, the country-economists formulate a two-year prediction of accelaration or decelaration of output growth for each sector. These sectoral performance assessments are revised in two stages. First, through a process of reconciliation with national data on (i) output and input data from other sectors; and (ii) export and import data by product and destination/origin. Second, the national level data are examined for consistency through the multi-regional input-output database (MRIOD) developed by the ADB. The same multiregional IO database is also used by the The World Bank Group.

The ADB database has been built starting from a multi-regional input-output data base developed by Timmer et al. at the University of Groningen.[22]The ADB multi-regional input-output table offers a consistent database for all South Asian countries except Afghanistan. For our analysis we start from a base-year in 2018. (ADB, 2020a).

The input-output tables for India (and other Asian countries) have been developed at a disaggregate level of 35 sectors, distinguishing production (supply) and a final demand (utilization). The production vector describes total supply at purchase prices. The finaldemand distinguishing vectors for private and public consumption, investment demand and changes in inventories.[23] The 35 sectors of the India IO-table have been aggregated to the following broad 5 sectors.

The India IO table provides a comprehensive and consistent system for depicting and analyzing production and trading activities, yet some data limitations may be observed from the underlying supply and utilisation tables. First, for several service sectors intermediate demand data are scanty and incomplete. For example, for the education sector only two intermediate inputs are

[22]See Timmer et al. (2012) as well as www.mriod.org. This database covers 40 countries including India. It presents a disaggregated supply and utilization table for 2014 describing 64 products and services.

[23] For a summary description of sources and methods see Mariasingham, Joseph, (2012) *ADB Multi-Region Input-Output Database: Sources and Methods,* Asian Development Bank.

identified, whereas for the health and social work sector there are only three intermediate inputs. For the public administration and defence sectors, intermediate demand is not identified at all and its final demand is valued at zero, not like an economic activity with intermediate inputs. Second, the distinction between 'basic' prices and 'purchase' prices intends to reflect that the latter will include (i) total trade and transport margins; and (ii) taxes less subsidies on products. However, the underlying supply and utilization table (Nov 2016) enumerates margins, taxes and subsidies at zero throughout. Every activity is valued at purchase prices.

Sector Description	Sectors included
1: Agriculture, Mining and Quarrying	Agriculture, Hunting, Forestry and Fishing; Mining and Quarrying
2: Business, Trade, Personal and Public Services	Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel; Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles; Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods; Post and Telecommunications; Financial Intermediation; Real Estate Activities; Renting of M&Eq and Other Business Activities; Public Admin and Defence; Compulsory Social Security.
3: Hotel and restaurants and Other Personal Services	Hotels and Restaurants; Education; Health and Social Work; Other Community, Social and Personal Services; Private Households with Employed Persons.
4: Light and Heavy Manufacturing, Utilities, and Construction	Food, Beverages and Tobacco; Textiles and Textile Products; Leather, Leather and Footwear; Wood and Products of Wood and Cork; Pulp, Paper, Printing and Publishing; Coke, Refined Petroleum and Nuclear Fuel; Chemicals and Chemical Products; Rubber and Plastics; Other Non-Metallic Mineral; Basic Metals and Fabricated Metal; Machinery, Nec; Electrical and Optical Equipment; Transport Equipment; Manufacturing, Nec; Recycling; Electricity, Gas and Water Supply; Construction;
5: Transport Services	Inland Transport; Water Transport; Air Transport; Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies

Unsurprisingly, the GDP estimates made of the economic impact for India ahead of the lock down did not adequately portray the severity of COVID-19. ADB brief No. 128 published on 6 March 2020 indicated a 'hypothatical worse-case impact' of -1.1 per cent of GDP for India; similarly impact were vastly under-anticipated for the other South Asian countries.[24] The Asian Development Outlook 2020, published during the first phase of lock down on 3 April 2020, recognized that COVID-19 would jeopardize global growth and India's recovery. It forecasted a further slowdown of GDP growth at 4.0% in FY 2020, 'assuming that the pandemic would dissipate in the second half of 2020'. The ADO identified the strenthening of the nonbanking financial companies (NBFCs) as a major policy challenge, acknowledging that their asset quality 'has deteriorated as they expanded'. (ADO, 2020, p230 and p235). The ADO Supplement, published in June 2020, revised the forecast of India's GDP growth for the current fiscal year, ending 31 March 2021 to – 4.0%.

While taking into account ADB forecasts, the present authors tend to stay on the side of caution, recognizing that down-side risks prevail in the unique and unprecedented case of the Corona crisis. Our downward revisions of estimates for GDP growth in India reflect the severity of output losses in manufacturing and services sector already observed during FY 2020 and and

[24]Bangladesh GDP impact was estimated at -1.1%, Nepal at -1.11%, Sri Lanka and Pakistan at -1.57%, Bhutan at -0.77% and Maldives at -4.96% (See ADB Briefs No. 128, Figure 10).

anticipated for FY 2021. Our estimates of the social impact are driven by the asymmetry of employment demand, where a substantial cohort of persons facing job and income losses, will only be partly re-engaged or not at all and, in many cases, at reduced wages and salaries, even if the growth trajectory returns to the levels realized during the pre-pandemic period 2017-2019.

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