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Exploration of India's COVID-19 Policies in Addressing the Ramifications of the Pandemic and their Implications on Public Health and The Economy

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ABSTRACT

The COVID-19 pandemic became a global emergency, seriously affecting healthcare systems and economic systems all over the world. This study aims to present a comprehensive review of the policies implemented by the Indian government and central bank to address their economic impact. India, being the largest populated country, encountered extreme challenges while limiting the spread of SARS-CoV-2. This catastrophe significantly hampered the state of the economy and therefore required monetary, fiscal, educational, and technological interventions to shape economic recovery. Articles, journals, online newspapers, published documents, websites, and figures have been used to gain knowledge about the policies that were administered during the COVID-19 time. Furthermore, frameworks and models such as the AD-AS framework and the Lucas Asset Pricing System have been used to ease the process of understanding.

Keywords: *COVID-19, India, Policy Framework*

1. INTRODUCTION

The coronavirus disease 2019 (COVID-19), caused by severe acute respiratory Coronavirus 2 (SARS-CoV-2) syndrome, emerged as one of the most significant pandemics in modern history, causing over 6.9 million deaths and leaving a persisting impact on the global economy and public health. ("Weekly epidemiological update on COVID-19 - 1 September 2023")
In the face of COVID-19, countries had to act swiftly by implementing a series of urgent measures to protect the public's health and sustain the country's economy. As a result, India replied by administering monetary, fiscal, educational, and technological policies andinterventions.
This research paper explores the policies implemented against COVID-19 in India by examining their impact on public health and the economy, specifically focusing on measures to combat the virus and the negative effects associated with the pandemic. It highlights how financial markets responded to this situation in the economy through the use of a Lucas Asset Pricing Model and also uses Aggregate Demand and Aggregate Supply (AD-AS) models to illustrate the effect of the interventions on the economic equilibrium. Through analysis of public health data, governmental guidelines, economic indicators, and policy outcomes, this study sought to understand India's policies and their outcomes.

2. BACKGROUND

COVID-19 first appeared on a small scale in November 2019 with the first large cluster appearing in Wuhan city, Hubei province of China in December 2019. (Wei) Although the exactsource of COVID-19 remains unknown, it is widely believed that it was first transferred to humans through the wet markets in Wuhan, which sell fresh produce and meat.

The first recorded case of COVID-19 outside of China was in Thailand on 13th January 2020. Following its initial detection, the virus quickly spread to all seven continents, transforming from a localized outbreak into a global health emergency, prompting governments and health organizations worldwide to take urgent actions.

On 30th January 2020, India reported its first case of Covid-19, in Thrissur, Kerala. This case was of a student who returned from Wuhan and tested positive for Covid-19. ("First confirmed case of Covid-19 infection in India: A case report") By the end of March, the number of confirmed COVID-19 cases surged to over 1000, with 32 recorded deaths.

An exponential rise in Covid-19 cases in India from early March to mid-April 2020, wasobserved. (See Figure 1)

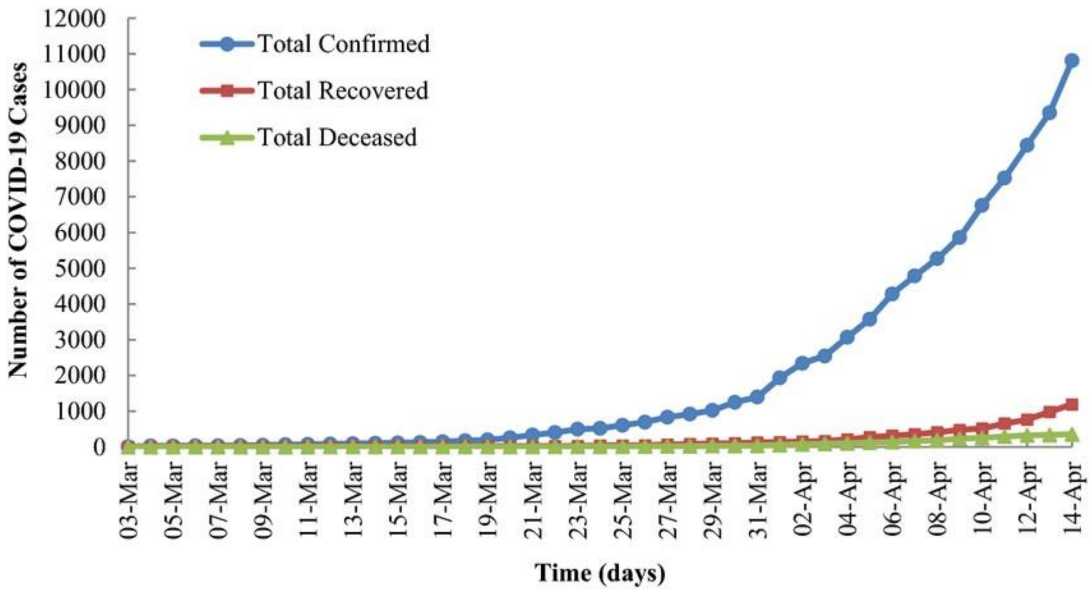

Figure 1: Number of Cases

This figure underscores the critical situation India experienced during the early stages, with the number of confirmed cases rapidly increasing and the healthcare system under significant pressure to manage the growing caseload.

The increasing number of cases led to the implementation of a 3-week nationwide lockdown on March 24 to control the spread of COVID-19. The bustling world came to a halt as all resources were diverted to meeting the never-experienced-before crisis. During this period, all non-essential services and industries were shut down, public transportation was halted and everyone was forced to stay at home. The unanimous acceptance of the public curfew across India nudged people toward the behavior desired by the government.

As the pandemic progressed, India experienced multiple waves of Covid-19 with varying levels of severity. The first wave began in March 2020 and lasted until nearly November 2020. The second wave began in March 2021 and lasted until the end of May 2021. Although the second wave was short-lived, it led to widespread devastation as there were acute shortages of hospital beds and medical supplies. The third wave, driven by the Omicron variant, emerged in late 2021, continuing up to 2022, but was less severe in terms of hospitalizations and deaths due to the widespread vaccination efforts. The pandemic was widely described as a Black Swan event due to its unpredictability, severity, and widespread insistence.

In response to the quickly spreading pandemic, the government administered a myriad of policies to mitigate the economic impact. This encompassed monetary and fiscal policies and educational and technological interventions. The Reserve Bank of India (RBI) introduced changes in aspects such as interest rates, repo rates, and reverse repo rates to ensure liquidity in the economy and thus financial stability. The government implemented fiscal policies such as tax reliefs, financial aid packages for vulnerable sections of society, and financial support such as subsidies for infant industries and small and medium-sized enterprises. During this period the healthcare system saw the implementation of several critical measures. One of the most notable problems that India faced as the number of cases rose was the lack of oxygen cylinders. This required the government to enhance healthcare infrastructure as well as have additional tankers airlifted from abroad. The domestic production of PPE kits, masks, gloves, and essential medical equipment skyrocketed. Furthermore, there was an increase in the number of public health campaigns being organized alongside the international collaboration to secure medical supplies through initiatives such as Covid-19 Vaccine Global Access (COVAX).

The impact of the pandemic on public health and the country's economy was profound, with significant mortality as over 900,000 deaths were recorded (WHO, 2024). The growth of numerous economies slowed down as production channels were shut down and millions of jobs were lost. The strain on the healthcare system highlighted gaps and the need for increased investments in healthcare infrastructure and workforce.

3. PERFORMANCE OF INDIAN ECONOMY BEFORE COVID-19

India's economy has been steadily growing over the past decade, marked by significant economic reforms through initiatives like Make in India and robust expansion in various sectors. India has recorded a consistent increase in the GDP growth rate since the 1980s up to 2019. The rapid growth in the past few years has made India one of the fastest-growing economies in the world. This economic growth was driven by increased demand for goods and services, supported by the middle class, and increasing urbanization.

India has launched numerous initiatives, implemented structural reforms, attracted significant FDI, ensured fiscal and monetary stability, and allocated resources towards infrastructural development to become a key player globally. To understand the depth of these efforts, numerousaspects that endorsed steady economic growth in India are examined.

Several initiatives were taken by India to bolster its economic growth. The Make in India initiative was launched globally in the year 2014 as part of India’s renewed focus on Manufacturing. This initiative aimed to create incentives for domestic and international firms to produce in India. It planned to make India an integral part of the global supply chain and increase the manufacturing sector's contribution to GDP.

Launched in 2015, the Skill India mission is a government scheme that was launched in 2015 to empower the youth of the country with adequate skills that will aid their recruitment process in relevant sectors and increase their efficiency and productivity. It also planned to improve the overall space and scope for underperforming and underdeveloped sectors.

The smart cities mission, also initiated in 2015, had the goal of promoting 100 cities with sustainable and improved urban infrastructure and services. The core changes in the infrastructural elements in the cities included factors such as adequate water supply, assuredelectricity supply, affordable housing, especially for the poor, sustainable environment, etc. (“Smart Cities”)

Lastly, Startup India is an initiative that was launched in 2016 to foster innovation, encourage development, drive sustainable economic growth, and generate employment opportunities. It included provisions of benefits such as tax exemptions, simplified regulations, and easier access to funding.

India has also transformed its business climate and expedited economic growth by enacting several structural reforms. One significant reform is the Goods and Service Tax which is an indirect tax imposed on the supply of goods and services. This reform has had positive impacts on the growth of India’s economy by simplifying the tax structure, increasing tax compliance and revenue, enhancing ease of doing business and economic formalization.

Another important reform is the Insolvency and Bankruptcy Code (IBC). The IBC is a law to protect the interest of creditors including stakeholders in a company. It seeks to consolidate the existing framework by creating a single law for insolvency and bankruptcy.

Finally, many labor markets reformed by the government were undertaken, including skill development initiatives and the Pradhan Mantri Rojgar Protsahan Yojana which have worked towards reducing inefficiencies and therefore increasing the productivity of the workforce. These reforms also work towards the implementation of better working conditions for the labor and promoting job creation.

Alongside structural reforms and initiatives, the government has launched infrastructural development programs like the Bharatmala Pariyojana the Housing for All scheme. These programs have helped allocate significant resources towards the development of infrastructurewhich has been crucial for sustaining long-term economic growth.

The country’s economic initiatives and policies, like the ones mentioned above, have helped foster a conducive and innovative environment for business. However, the COVID-19 pandemic was an unprecedented global shock that brought a severe disruption in the working of a myriad of economies, leading to widespread job losses, economic contraction, and an increased mortality rate.

As a response to the global pandemic, India, along with other countries, implemented lockdowns to prevent the spreading of the virus. A complete lockdown of 21 days was announced on March 25, 2020, as a method of social distancing to contain the pandemic. During this lockdown period, all commercial and private establishments were closed, excluding banks.

Furthermore, the government was still operating like before, and medical institutions like hospitals continued to remain functional but all transport services were suspended excluding the transport of essential goods.

To mitigate the economic concerns that arose during this period, the government and the central bank administered monetary and fiscal policy frameworks. The following section delves into the monetary and fiscal policy framework and the specific actions taken by the Reserve Bank of India (RBI) and the government during this period.

4. MONETARY POLICY FRAMEWORK

Monetary policy is a demand-side policy which is a set of actions taken by the central bank to control a nation's overall supply of money and economic growth. Monetary policy includes controlling the interest rate and the money supply. Before the pandemic, the Reserve Bank of India had a policy repo rate of 5.15% in December 2019. This rate was part of the RBI’s efforts to manage inflation and support economic growth prior to the onset of the pandemic. As COVID-19 started spreading in India, there were fluctuations in the interest rates as the RBI started implementing various monetary policies in order to combat the economic impact of the pandemic.

The Indian Rupee depreciated to one of its lowest points in 2020 to INR 76.81 per USD. In response, the Monetary Policy Committee of RBI attempted to provide countercyclical support to growth by reducing the policy rate by 1.15% (or by 115 basis points). This significant reduction aimed to lower borrowing costs and stimulate economic activity during the challenging period. Furthermore, the repo rates and reverse repo rates were reduced by 115 and 155 basis points to 4.0% and 3.35% respectively.

The ultimate motive of the central bank was to increase liquidity in the economy. This was done by introducing liquidity measures such as long-term repo operations (LTRO), a cash reserve ratio, a cut of 100 basis points, and an increase in the marginal standing facility to 3 percent of the Statutory Liquidity Ratio and open market operations resulting in cumulative liquidity injections of 5.9 percent of GDP through September. Furthermore, cuts in repo rates and reverse repo rates were made to increase liquidity in the financial system and support the economy.

In the month of May, the RBI cut the repo rate by 75 basis points, reducing it to 4.4 percent. This reduction in the repo rate reduced the cost of borrowing for banks, ensuring that more funds were available for allocation towards businesses and consumers and therefore increasing liquidity.

This cheaper credit was particularly helpful to small and medium-sized enterprises (SMEs) and helped stabilize the financial markets by reducing volatility and restoring confidence among investors and consumers. Moreover, the RBI also reduced its reverse repo rate by 25 basis points in order to encourage banks to redistribute these surplus funds into investments and loans in the productive sector of the economy. This reduced reverse repo rate reduced the attractiveness of storing excess funds with the central bank, therefore increasing liquidity.

The cash reserve ratio was also lowered to provide additional liquidity. With effect from March 28, 2020, the cash reserve ratio (CRR) was reduced by 100 basis points from 4% to 3%, with the aim to augment Rs 1,37,000 crore in the banking system. This lowering of the CRR funds ensures that banks have more funds available to meet the credit needs of the economy and also works towards reducing the interest rates so that borrowing for consumers and businesses becomes cheaper.

Marginal standing facility (MSF) is the rate at which commercial banks obtain liquidity overnight during emergencies by selling securities held with them under the Statutory liquidity ratio (SLR) if interbank liquidity completely dries up. In order to provide comfort to the banking systems, the SLR was raised from 2% to 3% of Net Demand and Time Liabilities, allowing banks to access the additional liquidity accounting for Rs 1,37,000 crore.

5. FISCAL POLICY FRAMEWORK

Fiscal policy is a demand-side measure that encompasses both the demand and supply-side aspects. It refers to the changes in government spending and taxation in an economy to promotestrong and sustainable growth and reduce poverty.

Demand-side fiscal policies aim to stimulate economic growth by taxation and government spending. During the pandemic, India implemented numerous demand-side fiscal policies to uphold the needs of the disadvantaged groups, sustain the consumption of vulnerable groups, and ensure financial and therefore economic stability. These measures include direct cash transfers, food security programs modifications to employee benefits, and many more. Fiscal policies also positively affect the supply side of the economy by aiming to increase the economy's productive potential. This is done by encouraging investment, enhancing infrastructure, and supporting industries. The Indian government introduced such fiscal policies through production incentive schemes, special liquidity schemes, and support for the agricultural sector.

In India, the government launched several measures aimed at providing relief to vulnerable groups and businesses, supporting the healthcare system and India's economic growth. The International Monetary Fund (IMF) website states how India's fiscal strategies can be divided into two clear categories: 'Above the line measures' and 'Below the line measures.' Above-the-line measures are strategies that include direct government spending that are included in the budget and have an immediate impact on the fiscal deficit. The lines measures, on the other hand, refer to the support provided which does not have a direct impact on the budget deficit of the country.

Starting off by delving into the above-the-line measures, the government spent a substantial amount during this time, launching a number of packages and relief packages to meet urgent needs and promote economic recovery. The government spent about 2.2 percent of India's GDPin just the year 2020.

During the beginning of the pandemic, the government increased its expenditure on social protection and healthcare. The Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) program was announced in March 2020 with the aim of providing assistance to the most vulnerable sections of society. The program is operated by the Department of Food and Public Distribution under the Ministry of Consumer Affairs, Food and Public Distribution. The program had three main components to which it catered. These included food security, direct cash transfers, and LPG cylinders.

With the agriculture and allied sectors registering a decline of 7.2% in their growth in 2020-2021, numerous measures were implemented to the smooth functioning of the agricultural sector despite the nationwide lockdown. The first aspect of the program entailed providing poor people with 5kg of wheat or rice and 1kg of preferred pulses for every month until November 2021. This scheme was carried out using electronic point of sale devices (ePoS) and the distribution mechanism of Fair Price Shops (FPS). The existing structure of FPS was used to distribute food grains via the Public Distribution System. Nearly 99.8% of FPS were automated with ePoS to ensure that the subsidized food grains would reach the intended beneficiaries. This ensured that during the pandemic no one would go hungry. The second aspect of the program aimed to provide direct cash transfers to women who had a Jan Dhan account. 20 crore women Jan Dhan account holders were provided with 500Rs per month for the next three months. "During April and May, as many as 20.05 crore women Jan Dhan account holders received Rs 500 each in their accounts as the first installment. The total disbursement under the head was Rs 20,344 crore as of June 3." The last aspect of the program aimed to provide free LPG cylinders to the poor to help alleviate the stress of the pandemic. In order to refill the LPGs, which were delivered bythe OMCs, an advance of Rs 9670.41 crores was credited to the PMUY beneficiaries.

With India reporting a continuous decline in its COVID-19 cases in October, the government decided to boost public investment and support specific sectors. Small and medium-sized enterprises (SMEs) play a pivotal role in income generation, poverty reduction, and creating domestic demand in an economy. With the outbreak of the pandemic, SMEs were at an even greater risk of failure as there was a shrinkage in demand and disruptions in global supply chains. To combat this and accelerate economic recovery, the government initiated a myriad of programs. The Aatmanirbhar Bharat package, launched on October 1, 2020, by the government provided a 27 lakh crore fiscal package to businesses in order to mitigate the adverse effects of the pandemic.

To provide relief to businesses, Rs 3 lakh crore collateral-free automatic loans were given to businesses, including SMEs. Businesses were also eligible to receive an additional working capital finance of 20% of their outstanding credit in the form of a term loan at a concessional interest rate. Concessional interest rates are interest rates arrived at by suitably adjusting the rate of interest at the increased rate.

Furthermore, significant amendments were made to the Insolvency and Bankruptcy Code (IBC), 2016, during the COVID-19 period. Some of its key measures included an increase in the threshold for default, temporary suspension of the Corporate Insolvency Resolution Process (CIRP), and special resolution for SMEs. The threshold for default was increased from Rs 1 lakh to Rs 1

crore to provide SMEs with greater financial stability and protection during the pandemic. 'Under sections 7,9 and 10' the CIRP was temporarily suspended to ensure that firms continued with their operations without any pressure of insolvency. The special resolution for SMEs included modifying the existing insolvency procedures to better suit small firms by reducing compliance burdens and enabling faster recovery.

An additional measure as a part of the Atmanirbhar Bharat package includes the Employee Provident Fund (EPF) which was

adjusted to increase the employees take home pay. The EPF was reduced from 12% to 10%. This decreases the financial burden upon the employees thus providing them with immediate financial relief and helping them manage their cash flow better during the economic slowdown caused by the pandemic.
The Pradhan Mantri Mudra Yojana (PMMY) scheme was launched in 2015 with the goal of supporting all kinds of income-generating activities in manufacturing, processing, trading, and service sectors, promoting employment. This scheme aims to provide collateral-free loans amounting to Rs 10 lakhs to SMEs and individuals so that they can set up or expand their operations. With an objective of promoting entrepreneurship, networking, and overall development of micro sectors, the loans were divided into three categories: 'Shishu', 'Kishore', and 'Tarun.' These categories denote the borrower's financial demands and their stage of growth and development. Figure 2 showcases the number of loans sanctioned and the amount sanctioned increased during 2019 and 2020.

Year	No of Loans Sanctioned (in cr.)	Amount Sanctioned (Rs. Lakh crore)
2015-16	3.49	1.37
2016-17	3.97	1.80
2017-18	4.81	2.54
2018-19	5.98	3.22
2019-20	6.22	3.37
2020-21	5.07	3.22
2021-22 (as on 25.03.2022)*	4.86	3.07
Total	**34.42**	**18.60**

Figure 2: Number of loans sanctioned and the amount sanctioned increased during 2019 and 2020.

During the pandemic period, the PMMY scheme expanded credit access, focused on vulnerable sectors and SMEs, introduced an interest subvention scheme, and provided a loan moratorium. The government encouraged enhanced loan disbursement by motivating financial institutions to accelerate the MUDRA loan application and disbursement process. A significant measure was the loan moratorium which allowed borrowers to delay their loan repayments without any effect on their credit scores. The objective of this measure was to ease any cash constraints that were caused due to the economic disruptions by the pandemic. To further facilitate the process of accessing loans, application processes were simplified as physical documentation and visits to the banks were minimized in order to adhere to the pandemic protocols of social distancing. The temporary simplifications made to the eligibility norms allowed even more small enterprises to avail of loans and thus maintain or expand their operations. Lastly, the PMMY scheme included financial awareness and inclusion campaigns which were held to impart knowledge to prospective entrepreneurs about financial management and the advantages and drawbacks associated with MUDRA loans.
In addition to providing direct assistance and rescue packages for agriculture and small businesses, the Government of India also decided to implement fiscal measures that would improve the supply of critical medical equipment and bolster healthcare. Some of the key fiscal measures included waiving customs duties on medical supplies that were pertinent to COVID-19 and other taxes on vaccines, oxygen, and oxygen-related equipment. Custom duties on medical supplies such as '(a) Remdesivir injection, Remdesivir API, Amphotericin B and specified inputs for their manufacturing (b) oxygen and oxygen related equipment (c) Covid-19 Vaccines (d) specified inflammatory diagnostic kits, etc.' ("GOVERNMENT OF INDIA MINISTRY OF FINANCE DEPARTMENT OF REVENUE")have been exempted in order to ensure their availability and affordability by reducing the cost of burden on healthcare facilities. GST has also been reduced on imports of specific Covid-19 related drugs and vaccines to further reduce costs and therefore increase its availability to the population of India.
The sudden rise of Covid-19 cases, especially due to the second wave led to a shortage of oxygen supply, trained workforce, drugs, and hospital beds. In order to conquer this, the government introduced fiscal incentives such as PLI schemes and subsidies for medical-grade oxygen production for manufacturers of medical supplies in order to buttress the production of essential medical supplies during the COVID-19 pandemic. Starting from a time wherein India used to import ventilators and PPE kits, it became a major party that is responsible for supplying COVID-19-related medical supplies in 2021. With an objective to boost the domestic manufacturing sector and attract large foreign investments in the medical sector, a PLI scheme for 'Promotion of Domestic Manufacturing of Medical Devices with a total financial outlay of Rs. 3,420 Crore ($ 455.2 Mn)' was launched for the period 2020-2021 to 2027-2028.
Furthermore, as part of the Aatmanirbhar project, a PLI scheme for bulk drugs and medical services was also announced, with a financial outlay of Rs 6,940 Crore. This allowed them to lead vaccine production for their neighboring countries as well. In order to battle the acute shortage of oxygen tanks in April and May 2021, the government issued an order (under the Emergency Credit Line Guarantee Scheme (ECLGS) 4.0) which provided for subsidies and tax reimbursements to private firms. This policy covers a variety of equipment ranging from cryogenic tankers and pressure swing adsorption plants (PSA) to air separation unit (AUS) technology.
The Indian government introduced measures to provide a grand total of Rs 30,000 crore additional emergency working capital

funding for farmers through the National Bank of Agriculture and Rural Development (NABARD). The additional funding was primarily targeted at small and medium farmers who had problems accessing credit. This measure helped provide support to the rural sector enhancing credit flow by significantly increasing the liquidity of rural cooperatives and regional banks, ensuring economic stability as farmers' incomes stabilized, and improving productivity as farmers may invest in better technology, potentially improving agricultural productivity and income in the long term. While this measure has some elements of demand-side fiscal policy, it aligns with supply-side fiscal policy due to factors such as an increase in the productive capacity of farmers and supporting economic stability.

Similarly, in order to support the agricultural sector The Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) scheme was continued. The government provided farmers with cash amounting to Rs 2000 in the first week of April 2020, benefitting an estimated 8.7 crore farmers.

The Aatmanribhar Bharat program included collateral-free automatic loans for businesses, additional emergency working capital funding for farmers, a special liquidity scheme for NBFCs/HFCs/MFIs, enhancement of doing business through IBC-related measures, and tax andregulatory measures.

To address the liquidity challenges faced by financial intermediaries such as non-banking financial companies (NBFCs), Housing Finance Companies (HFCs), and Microfinance Institutions (MFIs), the package included a Rs 30,000 crore special liquidity scheme. This provided support for credit flow and gave a boost to the housing and small business sectors as the HFCs are responsible for providing home loans which is essential for the growth of the housingand real estate industry.

Numerous Production Linked Incentive (PLI) schemes were introduced during the pandemic as part of India’s fiscal policy to draw in investments, strengthen domestic manufacturing, and enhance the resiliency of supply chains. Most of the PLI schemes were delayed and finally mobilized in 2021-2022 and cost about 0.8 % of India’s GDP. PLI schemes were introduced for numerous sectors such as pharmaceuticals, medical devices, automobiles, food processing, and textile products. The incentives given were based on the sales, performance, and local value addition over the next 5 years.

These fiscal policies encompass a wide array of initiatives and schemes such as rescue packages, provision of collateral-free loans, and other measures to promote small and medium-sized enterprises, making amendments to the Insolvency and Bankruptcy code, enhance healthcare infrastructure, waive custom duties on medical goods and services and tax reliefs to ensure that the economy remains stabilized and is able to withstand the impact of the pandemic on the public's health. The various initiatives such as the PMMY, PMGKY, ECLGS schemes, and the PLI schemes played pivotal roles in easing COVID-induced economic stresses, saving jobs, and promoting sectoral resilience.

6. OTHER POLICIES AND INTERVENTIONS BY THE INDIAN GOVERNMENT AGAINST COVID-19

In addition to the demand and supply side policies introduced, the Indian government implemented a series of innovative policies and interventions relating to education and technology. Numerous geospatial, information, communication, and surveillance technologies have been employed to control the virus’s spread. These measures aimed to use technological advancements to enhance healthcare, ensure continuity of education, and improve healthcare delivery.

India’s technical centers played a crucial role in fighting Covid-19. These steps were taken by organizations under the Ministry: MSME-DI’s. Various states of India were responsible for the production and then distribution of essential medical supplies such as sanitizers, masks, gowns, ventilators, face shields, and hospital furniture. For instance, the Central Footwear Training Institute in Chennai and Agra, the Indo-German Tool Room in Aurangabad, and the Process and Development Centre in Meerut were involved in the production of masks to ensure a consistent supply of protective equipment. Similarly, technology sectors responsible for the hardware for Corona testing kits were also set up. ESTC hostels in Ramnagar were converted into shelter homes which were responsible for providing accommodation to 80 migrant laborers. Furthermore, isolation centers were also set up in Bhiwadi and TC to control the spread of the virus. These technology centers made a combined contribution of Rs 22 lakh to the PM CARES fund. The PM CARES fund is a public charitable trust that has been established to support any form of relief or assistance in case of a public health emergency like COVID-19 and render financial assistance. It is exempt from Comptroller and Auditor General and Right to Information oversight and consists of voluntary contributions from individuals and communities. This means that it does not get any budgetary support from the government. Community kitchens were started to provide food packets to migrants and even those in quarantine. Kudumbashree, in convergence with the local self-governments, started a community kitchen responsible for preparing food and then delivering it to those who were quarantined and to the needy. Women's self-help groups, in partnership with the government, were a boon in mitigating the effects of COVID-19. These groups have even contributed to the production of protective equipment including masks. These organizations have been successful in creating 10,000 community kitchens across the nation. These kitchens were particularly helpful to those who lost their jobs due to the pandemic.

As a result of the pandemic, the educational institutional framework took a great toll. Covid-19 and its proposed solutions, like lockdown, caused severe issues such as the breakdown in regular lectures and exams. To tackle this issue and make certain that each student has access to ongoing education, the PM e-VIDYA initiative is part of the Atma Nirbhar Bharat Abhiyan. This initiative was established on 17th May 2020 and included online educational platforms like DIKSHA, communication mediums like radios and podcasts organized by the CBSE board, and special e-content for the visually and hearing impaired was developed by the Digitally Accessible Information System. DIKSHA provided India with a digital infrastructure for offering high-quality e-content for class instruction in states and UTs. This platform offers access to a vast array of digital resources, including interactive lessons, videos, quizzes, and textbooks, all of which are in line with the national curriculum. This is intended to assist educators, learners, and parents.

Moreover, one channel on the Swayam Prabha Channel was dedicated to each grade from grades 1-12. This helped ensure that students across different grades had access to tailored education. Radio, community radio, and CBSE podcasts (series known as Shiksha Vani) were extensively used to provide valuable information regarding the pandemic and offered educational content.

During the initial period of the COVID-19 scare in India, the National Law University, Delhi, came out with free online courses. Lastly, the E-Pathshala which was launched in November 2015 was of great use as it provided a platform wherein students could access education resources.

The Unlock 5.0 guideline stated that Ph.D and postgraduate students in the science stream had access to the laboratory for any experiment work. Aside from the education sector, the government permitted cinemas to be open from 15th October onwards; however, they must operate at 50% of their capacity. Similarly, swimming pools for the training of sportsmen and entertainment parks were opened following the issue of an SOP by the Ministry of Youth Affairs and Sports and the Ministry of Health and Family Welfare respectively.

One of the major technological initiatives by the Indian government was the development of the Aarogya Setu app. This app uses a Bluetooth connection to keep in check the details of all the people you may have come in contact with. It will then alert you if anyone whom you may have come in contact with is positive for Covid-19. It also helps identify any hotspots around your location and provides you with suitable actions to take if you have tested positive. The app helped trace 8,436,524 suspected contacts in 322 days. By May 12, 2020, it had alerted 1.4 lakh users in the countries about a possible risk of infection due to the proximity of infected individuals. With over 100 million downloads, the app played a pivotal role in tracing potential COVID-19 patients and providing them with helpful tips to prevent its spread.

Another technological initiative is CoWIN, an online platform that was a key factor in India's success while battling Covid-19. It was launched on January 16, 2021, and was designed to manage and make the process of vaccinating the population more efficient and well-organized. This platform is an open-source multilingual system that manages the registration, scheduling, and tracking of vaccinations across the nation. India has administered more than 350 million doses of the vaccine using this platform for scheduling and logistics. Numerous countries such as Canada and Mexico even expressed their interest in adopting this platform. A digital vaccination certificate can be viewed and corrected which can then be used by individuals as proof of vaccination while traveling. CoWIN was essential for controlling the spread of the virus and therefore allowing for the gradual reopening of the economy. The high immunization rates, as suggested by the number of administered doses, made it possible for firms and enterprises to start their operations while also lessening the strain on the healthcare sector. Besides this, as part of the technological interventions, drones were introduced to monitor lockdown compliance and robots were introduced in the healthcare sector to minimize human contact.

In conclusion, the Indian government's policies went beyond the demand and supply side measures and included technological interventions such as drones, robots, apps and platforms, and education programs like DIKSHA, free law online programs, and E-pathshala.

7. AD-AS FRAMEWORK

The following section explores the effect of COVID-19 in India and the way the market forces of demand and supply reacted using Aggregate Demand (AD) and Aggregate Supply (AS) diagrams. In this analysis, the influence of the pandemic on India's economy and the consequences of the government and central banks' intervention will be visually shown through AD-AS diagrams.

The first diagram illustrates the pre-pandemic output and price levels at the intersection of AS1 and AD1 curves, under the ceteris paribus. This marks the initial equilibrium of India's economy.

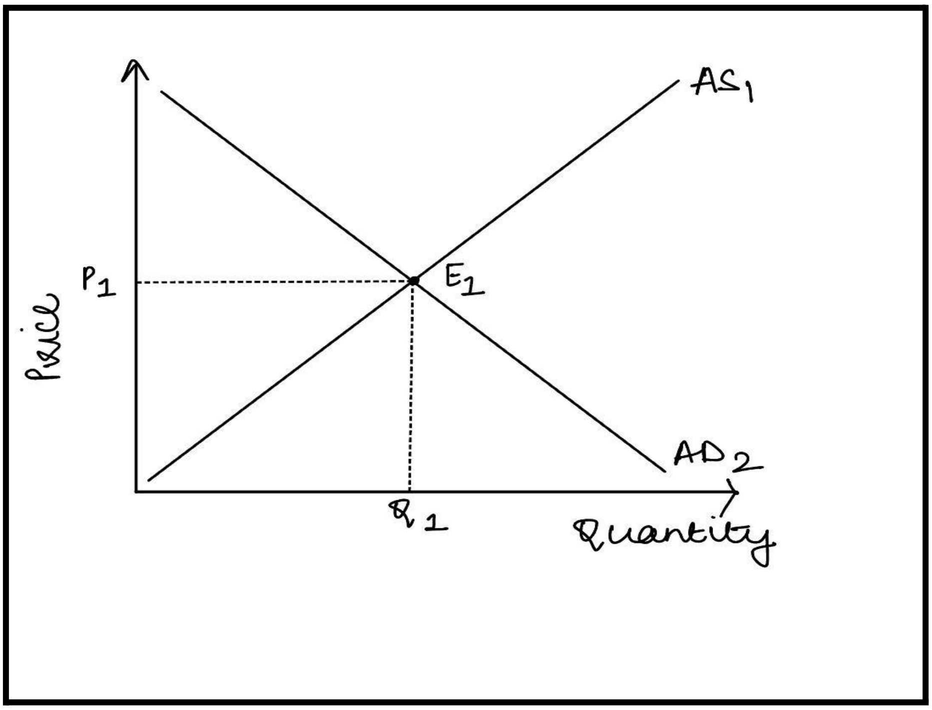

Diagram 1: Equilibrium in India pre-Covid-19

During the initial few months, the pandemic caused a precipitous drop in consumer and investor confidence, which led to unemployment due to lockdown, income reductions, and future uncertainty. These factors led to a leftward shift in the AD curve from AD1 to AD2. The lockdowns caused the supply chains to come to a halt as factories, warehouses, and offices started closing. Due to these circumstances, the AS curve shifted leftwards from AS1 to AS2. As a result, the Indian economy reached equilibrium point E2 where it is assumed that the prices and quantity of goods and services decreased. (See Diagram 2 for the impact of the pandemic on the Indian economy)

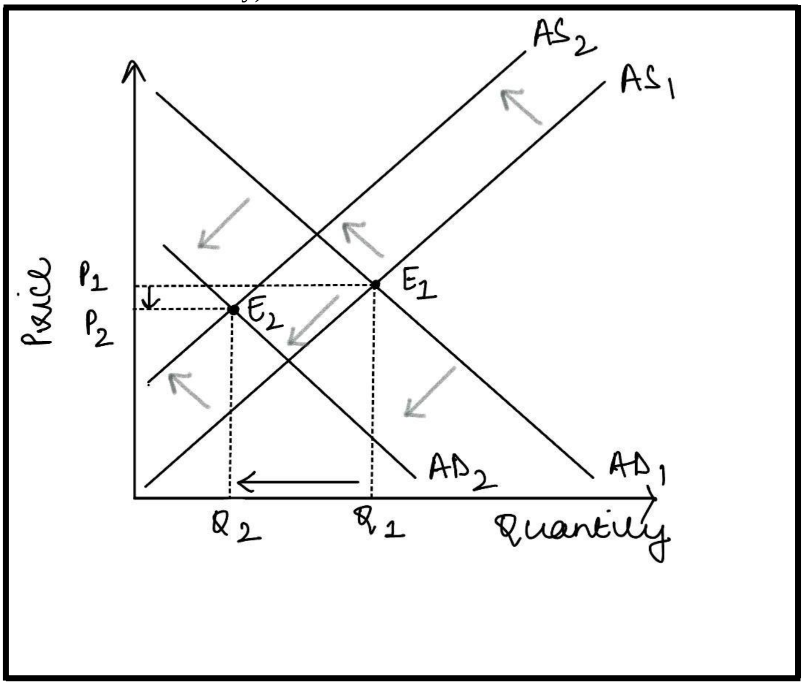

Diagram 2: Impact of Covid-19

In order to ensure that the effects of the pandemic were reversed, numerous policies were administered. This includes the above-explained measures such as monetary policy, fiscal policy, educational measures, and technological interventions. The AD and AS curves began to shift backwards towards their original equilibrium which is illustrated in Diagram 1. However, it is assumed that the AD and AS shifted beyond their pre-pandemic levels as a result of the significant number of policy actions, especially on the demand side. This increased demand led to demand-pull inflation as the prices of goods and services increased to P3. (See Diagram 3 to understand the effects of these measures taken to combat the pandemic).

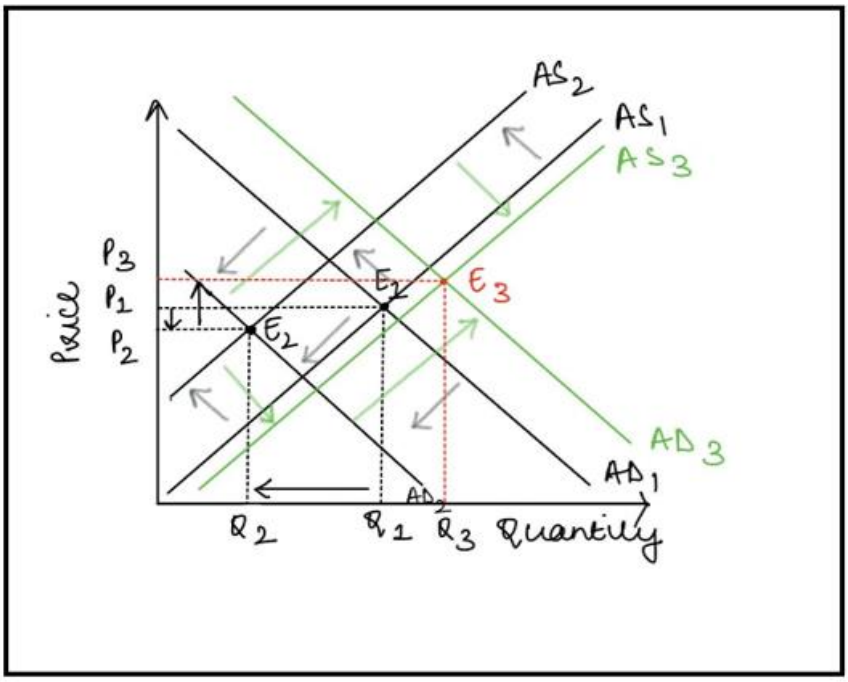

Diagram 3: Effect of interventions and policies implemented to combat Covid-19

8. FINANCIAL MARKET SITUATION IN INDIA DURING AND AFTER COVID-19

After analyzing the impact of the pandemic through AD-AS diagrams, the focus has now shifted towards the financial market situation in India. The financial market tumbled as the lockdown was announced on March 25, 2020. The global financial report, published by the IMF highlights that the prices of risk assets collapsed and the market volatilities quickly rose. Till October 2020 uncertainty levels remained high and vulnerabilities kept on rising, making the economy more susceptible to headwinds that may hinder the recovery of the economy.

In March 2020, the market capitalization of listed businesses on the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) decreased by 23% apiece. The stock indices such as Nifty 50 and the BSE Sensex saw their first fall down in decades. From the start of the year 2020, a total market cap of 27.31% was lost and was thus a reflection of the sentiment of the pandemic upon investors and companies, foreign or domestic.

The stock returns during the different lockdown periods varied. For instance, the returns during Lockdown 1 were positive, however, the returns during Lockdown 2 and Lockdown 3 were negative. Moreover, the stock returns varied for different industries. Sectors such as tourism, hotel management, automotive, services and cement, and the construction industries reported lower yields. On the other hand, the pharmaceutical sector, IT sector, and the food and beverage sector due to online platforms like Zomato and Swiggy flourished.

The operating circumstances of enterprises within a given sector are closely related to how the stock market functions and therefore affect the economy's environment. During the initial emergence of the pandemic, the Indian stock market faced a sharp decline but the implementations of monetary and fiscal demand side and fiscal supply side policies helped return the stock market back to the pre-covid period. The initial impact of the pandemic led to a decline for companies such as India Hotels (owners of the Taj Group), wherein they saw more than a 50% decline in the early months. Similarly, major automotive companies such as Maruti Suzuki and Tata Motors reported a 40% loss of their market value. Conversely, though, the pharmaceuticals and the IT sector showcase positive performance with a reported boom in their demand. The IT sectors such as Infosys and TCS saw an uprise in their stock prices. This sector was able to recover very quickly and even reached new highs in its stock prices by the end of 2020.

Now focusing on the market recovery and the second half of 2020 and the first half of 2021. The sectoral performances particularly the Information and Technology, Pharmaceuticals and the Consumer Goods, and FMCG sector helped investors regain confidence and therefore assisted in the gradual reopening of the economy. Companies like Nestle India identified consumer trends and thus tried to adjust their production process to the increased demand for packaged foods and hygiene products. As the economy started to rebound, the financial markets also started reaching new heights.

In order to understand how the asset prices were affected during this time period, the Lucas Asset pricing model can be used. During the pandemic, the expectations regarding future prices became uncertain. This was due to a lack of consumer and business confidence. According to the model, when economic conditions are uncertain, investors demand a higher risk premium, meaning that they want to be compensated at a greater level as they are now taking additional risks during a time period of uncertainty. As a result, the prices of assets drop as potential investors will only buy at a point at which the prospective return is proportional to the risk that they are accepting. This behavior was observed in India during the first year of the pandemic as the disruptions of economic activities and world trade had led to a huge dip in confidence. In March, the BSE Sensex was down by around 13.5% and the NSE Nifty was down by around 12.98%. ("Markets Close in Red: Sensex, Nifty End at Four-Year Low") This drop in asset prices is a direct reflection of the increased risk premium demanded by the investors. With the introduction of various policies to combat the pandemic, investor confidence began to stabilize. As a result, the asset values began to rise again in late 2020 as perceived risk started to drop.

9. IMPACT OF COVID-19 ON THE HEALTH OF THE PUBLIC ECONOMY AND THE ENVIRONMENT

COVID-19 is an invisible threat which spread gradually and become a worldwide threat. In terms of the number of people who died due to Covid-19, India ranks number 3 worldwide. India's total toll of deaths by the end of 2021 stood at 481,000. Many people who recovered were still faced with a condition termed 'Long Covid.' The symptoms for these included fatigue, weakness, headaches, tremors, or dizziness upon standing. This sometimes lasts weeks and maybe even months after the infection has occurred and was treated. As discussed before in the paper, India faced a shortage of oxygen and essential drugs that were required to treat COVID-19. This was one of the main reasons why the mortality rate in India has increased significantly.

The pandemic also gravely affected the mental health of many citizens. This required a definite psychological intervention. As a result, institutions like the National Institute of Mental Health and Neurosciences and the All India Institute of Medical Sciences established roles during the pandemic to manage the mental health concerns of individuals through online platforms.

The pandemic also had a varying impact on the environment. Due to the lockdown, the streets were clear, factories were closed and air travel was restricted. This led to a reduction in pollution, particularly air pollution caused due to the emission of toxic and greenhouse gasses by cars and airplanes. There was an overall decrease in the consumption of electricity which meant that the usage of nuclear/thermal power stations had also decreased. However, the pandemic did have a disadvantageous impact on the environment. The excessive usage of plastic equipment, including PPE kits and masks which were described as 'one use and then throw' led to an increased accumulation of waste. There was even deterioration of water which acted as a source of transmission of the virus. This occurred due to the excessive usage of detergents to clean supplies such as groceries during the start of the pandemic. Several organic and metallic compounds spread across rivers and seas, leading to the loss of marine life.

In conclusion, India's ecology, environment, public health, and economy were all impacted intricately by the COVID-19 pandemic. The virus's widespread spread resulted in a shortage of medical supplies and therefore a staggering number of deaths. People with diseases beforehand, such as cardiovascular diseases, when combined with the infection would sometimes lead to severe pneumonia. The increase in medical waste negated some of the positive impacts of the pandemic on the environment. This dual impact on the environment showcases the complexity of the pandemic.

10. GENERAL DISCUSSION

The findings of this paper illustrate the way that India handled the pandemic and provide a holistic overview of the impact of COVID-19 policies on public health, the economy, and financial markets. The analysis shows that numerous fiscal policies that required a large budget were implemented to cushion the pandemic-induced drawbacks. These include relief packages, subsidies, and loan moratoriums. Furthermore, the liquidity-induced initiatives by the RBI played a huge role in downplaying the effects of the pandemic. The educational and technological interventions were crucial in maintaining continuity of education and medical equipment and resources. Upon further research, it is evident that India's approaches align with the policies that the rest of the world administers. Some of the limitations of this research paper include how the analysis is focused on the short-term effect of the policies rather than their long-term effect, some papers that have been used for literature review may not include completely accurate figures, and how the study does not take into consideration the regional disparities in India and that affects the effectiveness of the policies.

11. CONCLUSION

The entire world has gone through one of the biggest pandemics of our lifetime, reaching a total number of 10 million confirmed cases. This has led to several economies coming to a standstill for a brief period of time. Particularly, it has caused large disruptions in the Indian economy straining the health industry and burdening the financial markets. In summary, we examine the origins of COVID-19 and explore the policies implemented in India to address the pandemic and the ramifications that it had on the public health, environment, and economy of India.

REFERENCES

[1]. Reserve Bank of India, "Report on the State of the Economy," 27 Dec. 2019. [Online]. Available: https://rbidocs.rbi.org.in/rdocs/Wss/PDFs/5T_271220195DC77D074E4A461EB218F20937A4D85A.PDF. [Accessed: Aug. 23, 2024].

[2]. Ministry of External Affairs, "Make in India Initiative," 2015. [Online]. Available: https://www.mea.gov.in/Images/attach/Make_in_India_Initiative.pdf. [Accessed: Aug. 23, 2024].

[3]. Lok Sabha, "Questions for Answer," Annex 176, 2020. [Online]. Available: https://sansad.in/getFile/loksabhaquestions/annex/176/AU104.pdf?source=pqals. [Accessed: Aug. 23, 2024].

[4]. Press Information Bureau, "Press Release," 25 Feb. 2021. [Online]. Available: https://pib.gov.in/PressReleasePage.aspx?PRID=1700790. [Accessed: Aug. 23, 2024].

[5]. T. Aggarwal, "Transforming manufacturing dynamics: A look into India's PLI scheme," Observer Research Foundation, 22 Apr. 2024. [Online]. Available: https://www.orfonline.org/expert-speak/transforming-manufacturing-dynamics-a-look-into-indias-pli-scheme. [Accessed: Aug. 23, 2024].

[6]. S. Apostolia et al., "India and South Africa proposal for WTO waiver from IP protections for COVID-19-related medical technologies," MSF Access Campaign, 27 May 2021. [Online]. Available: https://msfaccess.org/india-and-south-africa-proposal-wto-waiver-ip-protections-covid-19-related-medical-technologies. [Accessed: Aug. 23, 2024].

[7]. R. Azamfirei, "The 2019 Novel Coronavirus: A Crown Jewel of Pandemics?" [Online]. Available: https://www.sciencedirect.com/science/article/pii/S2590061720300740.

[8]. S. Bhattacharya, "Impact of COVID-19 Pandemic on Indian Financial Market," Research Gate, 2022. [Online]. Available: https://www.researchgate.net/publication/362123744_IMPACT_OF_COVID-19_PANDEMIC_ON_INDIAN_FINANCIAL_MARKET. [Accessed: July 2024].

[9]. M. Chaudhary, "Effect of COVID-19 on Economy in India: Some Reflections for Policy and Programme," IIHMR. [Online]. Available: https://journals.sagepub.com/doi/full/10.1177/0972063420935541.

[10]. Kudumbashree, "Community Kitchen - COVID 19," [Online]. Available: https://kudumbashree.org/pages/826. [Accessed: Aug. 23, 2024].

[11]. Mint, "Covid-19 contact tracing app Aarogya Setu has alerted 1.4 lakh users: Official," 12 May 2020. [Online]. Available: https://www.livemint.com/news/india/covid-19-contact-tracing-app-aarogya-setu-has-alerted-1-4-lakh-users-official-11589226902816.html. [Accessed: 2024].

[12]. LIVELAW NEWS NETWORK, "COVID-19: NLUD Introduces Free Online 'E-PG Pathshala Courses' For Law Students To Avail Study-At-Home Facility," 17 March 2020. [Online]. Available: https://www.livelaw.in/news-updates/covid-19-nlud-introduces-free-online-e-pg-pathshala-courses-for-law-students-to-avail-study-at-home-facility-153938.

[13]. Exemplars in Global Health, "CoWIN in India: The Digital Backbone for the COVID-19 Vaccination Program," [Online]. Available: https://www.exemplars.health/emerging-topics/epidemic-preparedness-and-response/digital-health-tools/cowin-in-india. [Accessed: Aug. 23, 2024].

[14]. S. Mahendra Dev and R. Sengupta, "Covid-19: Impact on the Indian Economy," [Online]. Available: http://www.igidr.ac.in/pdf/publication/WP-2020-013.pdf.

[15]. Dey, "Delhi notifies policy to incentivise medical oxygen production, transportation," Hindustan Times, 21 Aug. 2021. [Online]. Available: https://www.hindustantimes.com/cities/delhi-news/delhi-notifies-policy-to-incentivise-medical-oxygen-production-transportation-101629469685876.html. [Accessed: 2024].

[16]. The Economic Times, "Final instalment of Rs 500 to women Jan Dhan account holders from Friday: FinMin," 4 June 2020. [Online]. Available: https://economictimes.indiatimes.com/news/economy/policy/final-instalment-of-rs-500-to-women-jan-dhan-account-holders-from-friday-finmin/articleshow/76198794.cms?from=mdr. [Accessed: Aug. 23, 2024].

[17]. PM CARES Fund, "Frequently Asked Questions (FAQs)," [Online]. Available: https://pmcares.gov.in/en/web/page/faq. [Accessed: Aug. 23, 2024].
[18]. Goel, "Effects of the COVID-19 pandemic in India: An analysis of policy and technological interventions," [Online]. Available: https://www.sciencedirect.com/science/article/pii/S2211883720301465.
[19]. Gupta and M. Goplani, "Impact of COVID-19 on Educational Institution in India," Purakala Journal, SSRN. [Online]. Available: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3679284.
[20]. BORGEN Magazine, "How Community Kitchens in India are Helping Mitigate the Spread of COVID-19," 13 Sep. 2020. [Online]. Available: https://www.borgenmagazine.com/community-kitchens-in-india-covid-19/. [Accessed: Aug. 23, 2024].
[21]. Macrotrends, "India GDP 1960-2024," [Online]. Available: https://www.macrotrends.net/global-metrics/countries/IND/india/gdp-gross-domestic-product. [Accessed: Aug. 23, 2024].
[22]. Economic Diplomacy Division, "India makes CoWIN platform available to countries across the globe," [Online]. Available: https://indbiz.gov.in/india-makes-cowin-platform-available-to-countries-across-the-globe/. [Accessed: Aug. 23, 2024].
[23]. Redalyc, "Indian Stock Market During COVID-19 Pandemic: Vulnerable or Resilient? - Sector Analysis," [Online]. Available: https://www.redalyc.org/journal/6923/692372861007/html/. [Accessed: Aug. 23, 2024].
[24]. BAIF, "Innovations during the pandemic will have a positive impact on agriculture," 2023. [Online]. Available: https://baif.org.in/Innovations-during-the-pandemic. [Accessed: June 2024].
[25]. India Infoline, "The Insolvency And Bankruptcy Code In India," [Online]. Available: https://www.indiainfoline.com/knowledge-center/financial-planning/economics-for-everyone-the-insolvency-and-bankruptcy-code-in-india-and-the-national-company-law-tribunal. [Accessed: Aug. 23, 2024].
[26]. M. Kapoor, "Impact of COVID-19 on healthcare system in India: A systematic review," National Library of Science. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10345816/.
[27]. Kaur, "How Aarogya Setu app works and how it helps fight Covid," Mint, 12 July 2020. [Online]. Available: https://www.livemint.com/ai/artificial-intelligence/how-aarogya-setu-app-works-and-how-it-helps-fight-covid-11594512597402.html. [Accessed: Aug. 23, 2024].
[28]. S. Khan and C. Vyawahare, "The Aarogya Setu mobile application as a bodyguard against COVID-19," National Library of Medicine, 2022. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9648279/. [Accessed: 2024].
[29]. P. K. Krishna, "COVID-19 Impact on Public Health, Environment, Human Psychology, Global Socioeconomy, and Education," National Library of Medicine, NIH. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8767375/.
[30]. Ministry of Petroleum and Natural Gas, "MARKETING - PMGKY," [Online]. Available: https://mopng.gov.in/en/marketing/pmgky. [Accessed: Aug. 23, 2024].