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Impact of Covid-19 on Indian Economy

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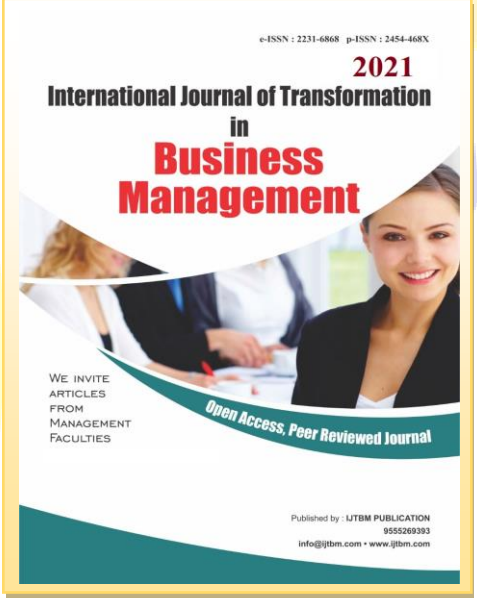

India which is considered a developing country is one of the fastest-growing major economies of the world. The Indian economy was one of the fastest-growing economy after global financial crisis. Integration of Indian economy with world economy is one of the probable reasons for fast growth rate of Indian economy. Looking at the state of Indian economy for last 10 years (FY 2010 – FY 2002), after global financial crisis of 2008, India showed remarkable recovery with services sector coming out to be a major driver of growth along with other sectors. Now, let us look at the trend in Indian economy since 2010 in detail and how it had evolved into one of the fastest growing economies of the world

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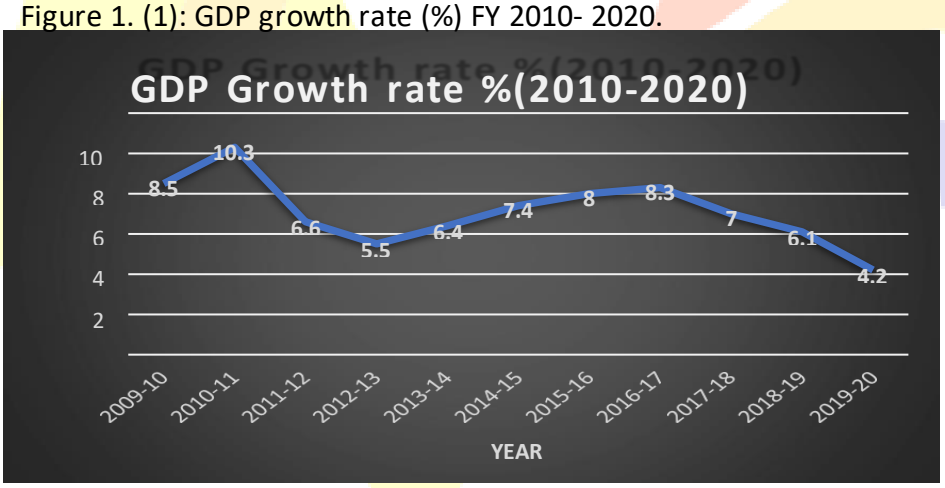
Table 1. (1): GDP growth rate (%) FY 2010- 2020.

EAR	GDP Growth rate (%)	Base year
2009-2010	8.5%	2004-2005
2010-2011	10.3%	2004-2005
2011-2012	6.6%	2004-2005
2012-2013	5.5%	2011-2012
2013-2014	6.4%	2011-2012
2014-2015	7.4%	2011-2012
2015-2016	8%	2011-2012
2016-2017	8.3%	2011-2012
2017-2018	7%	2011-2012
2018-2019	6.1%	2011-2012
2019-2020	4.2%	2011-2012

(Source: Ministry of statistics and program implementation)

Figure 1. (1): GDP growth rate (%) FY 2010- 2020.



(Plotted by the researcher)

2009-10

Owing to global financial crisis of 2008, FY 2010 commenced on a difficult note. Attention of policymakers shifted from crisis management to recovery and certain expansionary monetary and fiscal measures were adopted. Due to delayed monsoon there was supply side shortage of food items which led to double digit food inflation signaling the beginning of policy exit.

2010-11

2011 was final year for recovery from global financial crisis and economic slowdown. Robust economic growth can be seen with GDP growing at a rate of 10.3%. However, inflation remained high throughout the year due to high commodity prices, high aggregate demand and cost push factors. Increased cost of inputs was passed on to the consumers amidst high consumption demand.

2011-12

From 10.3%, GDP fall down to 6.6%. Factors responsible for slowdown were high inflation, rising fiscal deficit and rising current account balance. Steep decline in industrial sector and service sector such as construction, hotels, trade and communication were major drivers which drove economic growth down.

2012-13

Indian economy slowed down further in 2012-13 to 5.5%. All the sectors, namely, agricultural, industrial and services sector suffered with industrial sector suffering the most. Economic activity in all the three sectors declined with services sector being highest contributor, contributing 90% to GDP.

2013-14

There was marginal improvement in GDP growth in FY 14 to 6.4% from previous year's 5.5%. Sectors contributing significantly to growth were agriculture and service sector with service sector leading the growth. Industrial sector faced major downfall. Economy started stabilizing with decreasing twin deficits and with inflation being on a declining trend in later part of the year.

2014-15

GDP picked up in FY 15 marking growth at 7.4%. India was among the fastest growing economies in the world. Sectors responsible for growth were industrial and services sector.

2015-16

GDP growth rate picked up in FY 16 and touched 8% mark. Private consumption was the main driver of growth accounting for about half of the GDP growth owing to higher real incomes because of low inflation. Industrial and services sector were the major contributors to GDP.

2016-17

GDP growth rate in FY 17 was 8.3%. Most important event in 2016-17 was demonetization announced in Q3 (November 2016). Deposits saw an increase due to demonetization but still money supply was moderate. This spike in deposits created excess liquidity in banking system which was controlled through reverse repo rate under Liquidity adjustment facility, increased CRR, issuing cash management bills.

2017-18

GDP growth rate slowed down to 7% on account of after effects of demonetisation and implementation of GST. Implementation of GST was a milestone achieved towards adopting an effective indirect taxation regime. After various fluctuations, year ended with low inflation rate.

2018-19

Impressive growth in FY18 was followed by slow growth in FY 19 bringing down GDP rate to 6.1%. Economy was basically going through a slowdown as growth suffered various downturns in the path. It might not be wrong to say that global economy was going through a slowdown in economic activity and reduced global demand.

Certain factors responsible for weakening of global activity were increasing trade tensions, oil price volatility, Brexit uncertainty, Chinese economy slowdown and normalisation of US monetary policy.

2019-20

This year had been very critical for Indian economy as well as global economy due to persistent economic slowdown. While economies were trying to come out of slowdown, all countries globally including India got a major hit from COVID-19 (In Q4 of 2019-20). GDP growth rate of Indian economy for FY 20 decelerated to 11-year low of 4.2% due to halt of economic activities during nation-wide lockdown amid coronavirus spread. This was not enough that now this slowdown has become more intense due to COVID-19 which led to nationwide lockdown bringing almost all economic activities to a halt. We will be discussing economy in detail in later part.

REVIEW OF LITERATURE

Several studies have delved into India's economic growth and the factors influencing it:

1. **Rudra Prakash Pradhan (2010)**: Pradhan investigates the long-term relationship between financial deepening, FDI, and economic growth. He finds that a well-developed financial market is crucial for attracting FDI and facilitating economic growth, citing the efficient allocation of funds and technological diffusion as key drivers.

2. **Rajiv Kumar Bhatt (2011)**: Bhatt explores the impact of the global financial crisis on India's economy. He identifies three channels through which India was affected: the financial sector, exports, and exchange rates. Despite the challenges, India's growth rebounded impressively in 2009-10, with various measures taken by the RBI to stabilize the economy and boost liquidity.

3. **Mahanta Devajit (2012)**: Devajit analyzes the impact of FDI on India's economy, highlighting its role in technology upgradation, managerial practices, and employment generation. He underscores the importance of FDI in boosting economic growth through various projects and initiatives across sectors.

4. **Soumya Guha Deb and Jaydeep Mukherjee (2008)**: This study examines the relationship between stock market development and economic growth in India. Their findings suggest that stock market development precedes economic growth, supporting the "supply-leading" hypothesis.

5. **P. Srinivasan (2013)**: Srinivasan explores the relationship between public expenditure and economic growth in India, considering Wagner's law and the Keynesian approach. He finds a long-term relationship between public expenditure and GDP growth, supporting Wagner's law and indicating that public expenditure is growing faster than GDP.

6. **P. K. Mishra, K. B. Das, B. B. Pradhan (2010)**: This study investigates the relationship between credit market development and economic growth in India, emphasizing the dominance of bank credit. They observe a unidirectional positive relationship from economic growth to credit market development.

HYPOTHESIS AND RESEARCH METHODOLOGY

Objective

This report will study the impact of aggregate demand on overall economic growth, i.e., GDP of India from FY 2010-FY 2020. Components of aggregate demand include Government Final Consumption Expenditure (GFCE), Private Final Consumption Expenditure (PFCE), Gross Fixed Capital Formation (GFCF), Net Exports.

This report will also project the GDP growth of India for FY 2021.

Methodology and Data Collection

To measure the impact of aggregate demand on overall economic growth of India from FY 2010 to 2020, four components of aggregate demand (Government Final Consumption Expenditure (GFCE), Private Final Consumption Expenditure (PFCE), Gross Fixed Capital Formation (GFCF), Net Exports) have been chosen as independent variables and GDP is taken as dependent variable. The table below mentions the variables and the secondary data sources which are referred for the same.

Table 3.1: Data for hypothesis testing.

S. No.	Variable	Secondary Source
1.	Government Final Consumption Expenditure (GFCE)	Quarterly estimates of GDP at constant prices, (2004-05) series and (2011-12) series, Ministry of Statistics and Programme Implementation, Government of India. (http://mospi.nic.in/data)
2.	vate Final Consumption Expenditure (PFCE)	Quarterly estimates of GDP at constant prices, (2004-05) series and (2011-12) series, Ministry of Statistics and Programme Implementation, Government of India. (http://mospi.nic.in/data)

3.	Gross Fixed Capital Formation (GFCF)	Quarterly estimates of GDP at constant prices, (2004-05) series and (2011-12) series, Ministry of Statistics and Programme Implementation, Government of India. (http://mospi.nic.in/data)
4.	Net Exports	Quarterly estimates of GDP at constant prices, (2004-05) series and (2011-12) series, Ministry of Statistics and Programme Implementation, Government of India. (http://mospi.nic.in/data)
5.	GDP	Quarterly estimates of GDP at constant prices, (2004-05) series and (2011-12) series, Ministry of Statistics and Programme Implementation, Government of India. (http://mospi.nic.in/data)

(Note: - Data for year (2010-11) is from 2004-05 series. Data for year 2011-12 up to year 2019-20 is from 2011-12 series. Primary Source: There is no primary data collection in the project.

Secondary Source: The study conducted is analytical in nature and makes use of secondary sources of data. Data has been collected from the website of reputed government ministry (Ministry of Statistics and Programme Implementation).

Software used: Microsoft-Excel is used for the statistical analysis (regression analysis and correlation analysis) of the data.

Hypothesis

To fulfil the objectives of this study, the following hypotheses have been set:

H0: There is no significant relationship between the aggregate demand and the Gross Domestic Product.

H1: There is a significant relationship between the aggregate demand and the Gross Domestic Product.

Analytical Tools to Be Used

In order to analyse the collected data, following tools have been used using **Microsoft Excel.**

1. CORRELATION: Correlation analysis is a method of statistical evaluation used to study the strength of a relationship between two, numerically measured, continuous variables.

Correlation can have a value:

- 1 is a perfect positive correlation
- 0 is no correlation (the values don't seem linked at all)
- -1 is a perfect negative correlation

2. REGRESSION ANALYSIS: The Regression Analysis is used to estimate the relationship among independent and dependent variables. The results of the analysis are presented in tabular form containing various parameters showing how much the dependent variable is related to the independent variables under study. The parameters used here are as follows:

I. R square: This shows how much of the changes in the dependent variable could be explained by the changes in the independent variables. In other words, it explains the unknown variations in the dependent variable with the help of known changes in the independent variables.

II. P-value: The p-value is used to determine the significance of the independent variables in determining

the dependent variable. Statistically, a p-value of less than 0.05 shows that the independent variable is significant in determining the dependent variable.

III. Statistical model: A linear equation showing the relationship between independent variables and dependent variable could be formed with the help of coefficients found in the regression coefficients table (tabular depiction of the Regression analysis).

Importance of the Study:

It is apparent from the discussion in chapter 1 that aggregate demand plays an important role in an economic growth (GDP growth rate). We have studied the trends in Indian GDP growth which are very much affected by trends in aggregate demand. Therefore, this empirical analysis will study the relationship between the aggregate demand and economic growth of Indian economy and will project GDP growth rate for Indian economy for FY 2021.

COVID- 19 AND ITS IMPACT

Background of Covid-19

COVID-19 is an infectious disease caused by corona virus, outbreak of which began in Wuhan, China, 2019. It is a communicable disease and transmits thorough close contact with an infected person. When an infected person coughs, exhales or sneezes, droplets produced may contain the virus and transmit it to others. People can catch this disease if they touch any object or surface (as virus can survive on the surface from few hours to few days) which has already been infected and then touching their eyes, mouth or nose which makes it highly communicable.

All economies today are open economies and involve free movement of people and goods from one country to another. Being a communicable disease, COVID-19, that originated in China has spread worldwide and reached almost all countries. As the number of people being infected and dying of it kept on increasing and, WHO declared the crisis as a pandemic. Pandemic refers to a global spread of an infectious disease at the same time.

Governments all over the world have taken concrete steps to limit the spread of virus such as stressing on social distancing, border closures, imposing travel restriction within and outside the country, nationwide lockdowns, halting almost all types of economic activity. Although these measures have put businesses to a halt, disrupted supply chains, led to unemployment and adversely affected economies all over the world but to save the lives of billions of people, these steps were the need of the hour. No medicines or vaccines to treat the virus are presently available. Only way to prevent being infected is to maintain distance from others and follow social distancing.

Global Outlook

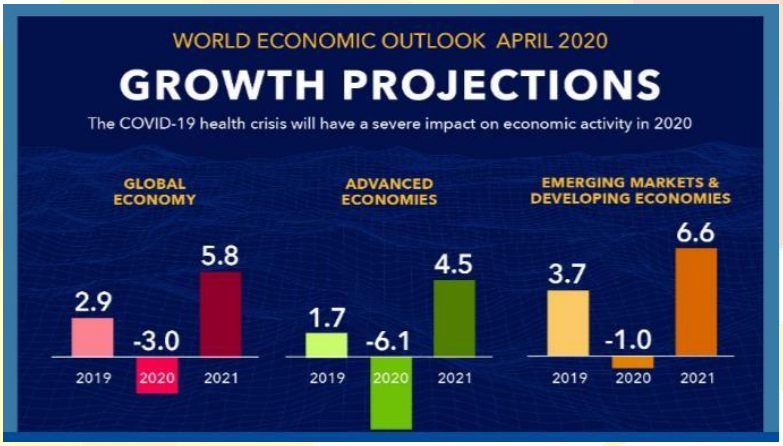
The COVID-19 pandemic has plunged the global economy into turmoil, disrupting production, supply chains, trade, and tourism. The IMF projects a historic contraction of (-)3% in global GDP for 2020, surpassing the 2008–09 financial crisis. Advanced economies are expected to grow at 4.5%, while emerging markets may see growth of 6.6% in 2021, assuming the pandemic recedes by the second half of 2020. However, the overall loss to global

GDP over 2020 and 2021 could amount to $9 trillion. The RBI reports contractions in GDP for both advanced economies and emerging markets, with significant economic downturns observed in key countries like the US, Euro area, Japan, UK, and China.

World trade contracted by 3.0% in Q1 2020-2021, and further declines of 13-32% are projected for 2020 by the WTO. Global services trade, including air travel and container shipping, also declined notably in Q1 2020. Commodity prices have softened due to reduced demand amid lockdowns, although supply chain disruptions have led to inflation in food prices. Financial markets initially experienced sharp declines similar to 2008–09 but have since stabilized, albeit with lingering concerns about global financial stability.

India's exports plummeted by 60.28% to $10.36 billion in April 2020, marking the highest ever monthly decline, attributed to canceled orders and reduced demand across sectors like gems, jewelry, leather, petroleum, engineering, and chemicals. This decline underscores India's vulnerability to the global economic slowdown exacerbated by COVID-19 and lockdown measures.

Figure 4.2. (1): World Economic Outlook.



Disruption of Supply Chain

Efficient supply chain management is an integral part for smooth running of any business. For manufacturing concern, smooth supply of raw material is essential for timely production and to further maintain timely supply of output to wholesalers and retailers. All the backward linkages and forward linkages of a business are linked. It is a balanced process and disruption at any one of the stages is going to adversely affect the business.

Impact of coronavirus on supply chain and logistics is spreading across the world. China is the world's largest manufacturing hub and largest exporter of goods. Initially when there was coronavirus outbreak in China, there was month long closure of production units and shipping ports in China which disrupted the supply chain in all the countries as raw material and finished goods cannot be exported to other countries including India. This led to shortage of raw material for manufacturing units and finished goods for wholesalers and retailers globally. Supply of vehicles, smartphones, pharmaceuticals, jets any many more products was severely affected.

Any disruption in supply and demand affects the prices of goods. If supply is not enough to meet the demand, prices will shoot up. On the other hand, if demand falls drastically, there will be unsold inventories piled up which will drive the prices down.

Now, let us look at China as an importer of goods. Countries for whom China is a customer are also facing lot of problems as imports were restricted in China and also the demand had fallen as consumers in China were reducing the consumption of unnecessary goods and manufacturers have shut down or slowed the production.

Impact on Indian Economy

We have already discussed in the introduction part- the state of Indian economy for last 10 years and how it evolved as one of the fastest growing economies. We have also discussed about slowdown in Indian economy in 2018-19 and 2019-20 and various factors responsible for the same.

India was trying to recover from the slowdown but coronavirus that was spreading all over the world, did not spare India and made its first appearance in India on 30 January 2020. As the cases of corona virus patients started increasing in the country, government implemented a 21day nationwide lockdown on 24 March 2020 (lockdown 1.0). All educational institutions, businesses, commercial establishments, places of worship etc. were shut down except for few essential services.

Almost all the economic activities came to a halt. When situation was still not under control, lockdown was extended till 3 May 2020 (Lockdown 2.0). After this, all cities were divided into red, orange and green zones depending upon the number of cases of corona positive. Lockdown was further extended till 17 May (Lockdown 3.0) but cities lying under orange zone and green zone were given certain relaxations. Lockdown 4.0 was implemented from 17 May to 31 May but with certain relaxations. Partial opening up of the economy has started in lockdown 4.0. Economic activities such as industrial activities, air travel, e-commerce deliveries of essential and non-

essential items, opening up of retail shops have started with precautionary measures. Idea behind opening up the economy was- *"Jaan Bhi Jahaan Bhi"*

GDP growth rate of India for the fiscal year 2020 is 4.2% against an earlier estimate of 5% and GDP growth rate for Q4 of FY 2020 is 3.1%. According to Dun & Bradstreet GDP growth rate of India for the fiscal year 2021is estimated to be 6%.

Lockdown and Impact on Economic Activities

There is no doubt that this lockdown of almost 2 months had adversely affected the economic growth of the country resulting in dismal growth, if not recession. High frequency indicators indicate drastic fall in demand beginning in March 2020 across both urban and rural sectors. Electricity and petroleum products consumption that indicate day to day demand have shown steep declines. The loss in terms of demand and production has affected fiscal revenues. Investment demand has come to a standstill. This is evident by decline in production of capital goods by 36% in March and shrinkage of 27% in imports of capital goods in March and 57.5% in April, fall in 'finished steel consumption' by 91% in April and a fall of 25% in cement production in March.

The biggest component of aggregate demand affected from COVID-19 is private consumption, that accounts for about 60% of domestic demand. In March 2020, production of durable goods recorded a fall of 33% and 16% fall in non-durables.

We will analyse the impact of lockdown due to COVID-19 on different sectors of Indian economy.

Impact on Agriculture Sector

The COVID-19 pandemic has severely impacted India's agrarian economy, disrupting agricultural activities due to labor shortages and halted transportation. With over 30% of crops unharvested, the shortage of migrant laborers during the peak of rabi crop harvesting led to increased daily wages and crop wastage. The return of laborers to some areas resulted in declining wages, exacerbating the challenges faced by farmers.

Transportation disruptions prevented harvested crops from reaching markets, leading to supply chain disruptions and wastage. Cold storage and warehouses also suffered due to labor shortages. Despite these challenges, India's agricultural sector has remained relatively resilient, with a 3.7% increase in food grain production. Favorable factors such as forecasted good monsoons and increased kharif sowing further support agricultural growth.

However, supply chain disruptions have impacted both producers and consumers differently. Producers of fruits and vegetables face stress selling at low prices, while consumers experience limited availability and higher prices. Post-lockdown, there is a risk of price crashes due to excess supply, potentially driving farmers into further losses. Additionally, panic buying and food hoarding have contributed to a spike in food prices, with food inflation rising to 8.6% in April 2020 due to supply chain disruptions, particularly affecting vegetables, pulses, edible oils, milk, and cereals.

Impact on Industrial Sector

Industrial sector contributes around 23% to GDP which has significantly declined with intensification of COVID-19. Industrial sector has been very hardly hit with COVID-19 and witnessed contraction amid lockdown. Industrial production contracted by around 17% in March 2020 and manufacturing activity fell by 21%. Core industries output, constituting about 40% of overall industrial production, recorded a fall of 6.5%. Manufacturing PMI with 27.4 hit its highest fall in April.

When coronavirus started spreading in China, there were supply chain disruptions from foreign suppliers of auto components, electronics, smartphones, chemicals, pharmaceuticals due to border closure. As Indian manufacturers are heavily dependent upon imports for raw materials, manufacturing sector suffered. (India imports 45% of electronics, around one third of machinery, about two fifth of organic chemicals, around 70% pharmaceuticals, 90% smartphones and more than 25% of auto parts from China). Not only imports, exports also declined for the same reason. With regards to exports, China is India's third largest export partner and accounts for about 5% of India's exports.

Gradually as coronavirus started spreading in India, due to lockdown, domestic demand for consumer durable goods and automobiles declined significantly as demand was majorly concentrated towards essential commodities. Migrant labourers have flocked to their hometowns which created shortage of workforce required to carry out production. Therefore, due to reduced demand, shortage of labour, lack of transportation facilities and government orders of lockdown, most of the manufacturing units (except few) have to shut down their plants bringing a complete halt to production activities. Owing to backward linkages, suppliers of components and ancillary units had to close their operations as there was no demand from producers.

Manufacturing, mining and quarrying and electricity are major components of industrial sector. As per RBI monetary policy report, GVA growth at basic prices, in the industrial sector declined to 1.3% in second half of 2019-20 from 1.7% in the first half, and 2.8% a year ago.

Figure 4.5.2.(1): Weighted Contribution to Industrial GVA Growth.

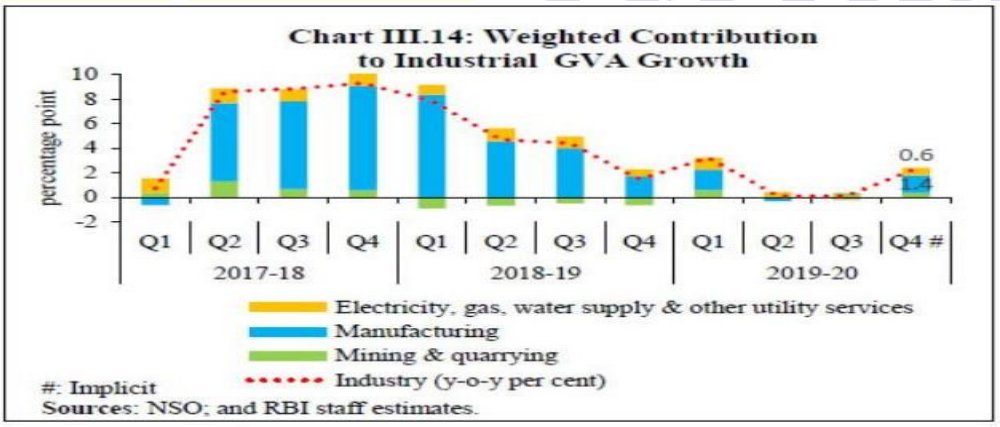


Table 4.5.2. (1): Growth Rate (%) in 2019-20 in Industrial sector and Estimated growth rate for Q1(2020-21).

Growth rate %	2019- 20	2019- 20	2019- 20	2019- 20	Q1- 2020-21
Industry	3.2	0.1	0.1	2.3	
***Of which*-Mining and quarrying**	4.7	0.2	3.2	2.6	-14.7
Manufacturing	2.2	-0.4	-0.2	1.8	-6.3
Electricity, gas and water supply	8.8	3.9	-0.7	6.5	-13.9

Source: RBI Monetary Policy Report, April 2020 (https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=19439#32)
(https://www.statista.com/statistics/1107798/india-estimated-economic-impact-of-coronavirus-by- sector/)

We can conclude from the table above that growth of different components of industrial components picked up in Q4 of FY 2020 but it is estimated to be negative in Q1 of 2020-21 as effects of lockdown are going to materialize in coming quarter.

Figure 4.5.2.(2): Use- Based Contribution to IIP Growth.

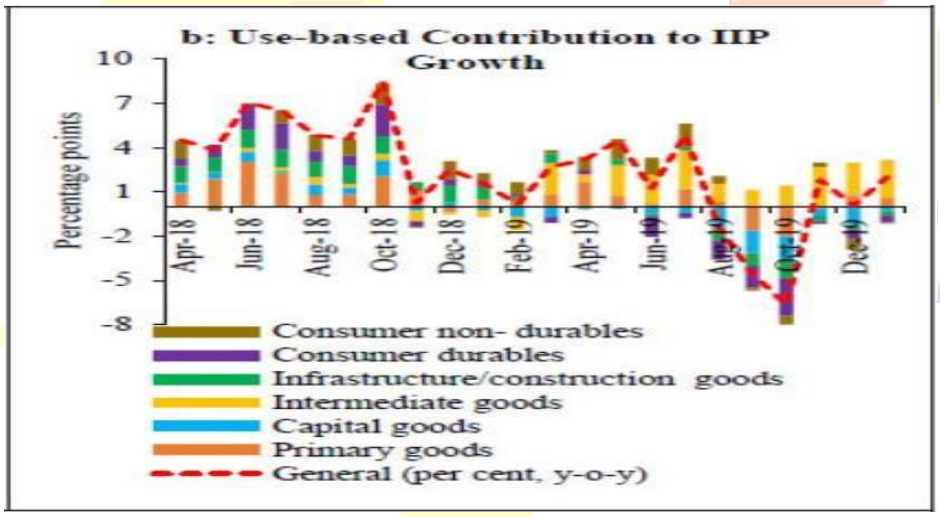


Table 4.5.2. (3): IIP of Mining, Base year (2011-12=100).

Month 2020	IIP	Month 2020	IIP	% Change
Jan 2020	124.3	**Jan 2019**	119.2	4.4%
Feb 2020	123.71	**Feb 2019**	112.31	10%
March 2020	132.7	**March 2019**	132.6	.07%

Table 4.5.2. (4): IIP of Manufacturing, Base year (2011-12=100).

Month 2020	IIP	Month 2020	IIP	%Change
Jan 2020	137.6	**Jan 2019**	135.6	1.5%
Feb 2020	133.5	**Feb 2019**	129.3	3.2%
March 2020	114.8	**March 2019**	139.6	-17.7%

Table 4.5.2. (5): IIP of Electricity, Base year (2011-12=100).

Month 2020	IIP	Month 2020	IIP	% Change
Jan 2020	155.6	**Jan 2019**	150.7	3.1%
Feb 2020	149.1	**Feb 2019**	137.7	8.1%
March 2020	149.2	**March 2019**	160.1	-6.8%

(Source: Ministry of statistics and Programme Implementation http://mospi.nic.in/sites/default/files/iip/iipjan20.pdf http://mospi.nic.in/sites/default/files/iip/iip_feb20.pdf http://mospi.nic.in/sites/default/files/iip/IIP_PR_Mar_120502020.pdf)

Note- "In view of the global COVID-19 pandemic and consequent nationwide lockdown measures implemented since March, 2020, Quick Estimates are likely to undergo revision and will be incorporated in subsequent releases as per the revision policy of IIP."

From above table, we compared IIP for Q4 2019 and Q4 2020 for industrial sector, and concluded that IIP for January and February 2020 has increased whereas for march 2020, it has fallen by 14.43% due to reduction in all sorts of industrial activity amid lockdown. Sharp fall can be seen in index for manufacturing (17.7%) and electricity (6.8%). Index for mining is almost constant with little increase of .07%.

Table 4.5.2. (6): Annual growth rates as per IIP (%) calculated with respect to previous year.

Use-based category (Goods)	Wt	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Primary	34.0	0.5	2.3	3.8	5.0	4.9	3.7	3.5	0.8
Capital	8.2	0.3	-3.7	-1.1	3.0	3.2	4.0	2.7	-13.7
Intermediate	17.2	5.1	4.6	6.1	1.5	3.3	2.3	0.9	8.8
Construction	12.3	5.4	5.7	5.0	2.8	3.9	5.6	7.3	-4.0
Durables	12.8	4.9	5.6	4.0	3.4	2.9	0.8	5.5	-8.4
non- durables	15.3	6.1	3.7	3.8	2.6	7.9	10.6	4.0	0.5

(Source: Ministry of statistics and Programme Implementation, http://mospi.nic.in/iip - IIP 2011-12 Series)

Table 4.5.2. (7): IIP (Use based classification), Base year (2011-12=100).

Use-based category	Wt	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Primary	34.0	100.5	102.8	106.7	112.0	117.5	121.8	126.1	127.1
Capital	8.2	100.3	96.6	95.5	98.4	101.5	105.6	108.4	93.6
Intermediate	17.2	105.1	109.9	116.6	118.4	122.3	125.1	126.2	137.3
construction	12.3	105.4	111.4	117.0	120.3	125.0	132.0	141.7	136.1
durables	12.8	104.9	110.8	115.2	119.1	122.6	123.6	130.4	119.4
non- durables	15.3	106.1	110.0	114.2	117.2	126.5	139.9	145.5	146.3

(Source: Ministry of statistics and Programme Implementation, http://mospi.nic.in/iip - IIP 2011-12 Series)

It is clearly evident from Table 4.5.2. (6) that IIP has been constantly increasing since 2012-13 till 2018-19 but then there is decline in IIP in 2018-19. We can see that 2019-20 witnessed the slowest growth rate and even negative growth for certain category of goods. Highest fall can be seen in production of capital goods as due to lockdown demand for capital goods declined significantly. Halt in construction and infrastructure projects lead to negative growth in construction goods. Similarly, production of consumer durables also declined significantly as due to lockdown, households were demanding only essential goods, deferring the purchase of durables.

From Table 4.5.2. (7), it is evident that IIP has been continuously increasing from FY13 till FY 19 but a fall in IIP in most of the category of goods can be seen in year 2019-20 due to contracted industrial activity owing to supply chain disruptions and contracted demand amid lockdown.

Table 4.5.2. (8): IIP (Use- based classification) compared for Q4 2020 with Q4 2019.

Classification	Jan 2020	Jan 2019	Growth rate (%)	Feb 2020	Feb 2019	Growth rate (%)	March 2020	March 2019	Growth rate (%)
Primary	133.4	131.0	1.8	130.1	121.1	7.4	135.6	140	-3.1
Capital	102.5	107.1	-4.3	97.3	107.7	-9.7	76.4	118.6	-35.5
Intermediate	147.1	127.0	15.8	145.1	118.5	22.4	125.8	154.4	-18.5
Construction	143.9	147.2	-2.1	141.2	141.1	0.1	118.4	155.4	-23.8
Durables	123.6	128.7	-5.4	117.1	125.1	-6.4	88.1	131.7	-33.1
Non- durables	158.7	159.2	-3.9	153.9	153.9	0.0	131.2	156.6	-16.2

(Source: Database of Indian Economy, RBI https://dbie.rbi.org.in/BOE/OpenDocument/1608101729/OpenDocument/opendoc/openDocument.faces?logonSuccessful=true&shareId=1)

Highest fall in growth rate in 2020 is in the month of March with capital goods leading the fall in growth rate followed by durables and construction goods. In the month of February too highest fall is seen is durables and construction goods due to impacted exports and imports owing to border closure of nations due to coronavirus.

The headline seasonally adjusted IHS Markit India Manufacturing Purchasing Managers' Index (PMI) fell to 27.4 in April, from 51.8 in March, reflecting the sharpest deterioration in business conditions across the sector.

(In PMI parlance, a print above 50 means expansion, while a score below that denotes contraction.)

Even after lockdown gets lifted, manufacturers are going to face problems due to shortage of workers as labourers who have returned to their hometowns are not going to come back easily as they might find their source of livelihood their only. Also, they might not be welcomed by landlords which would leave them with no place to stay. It is not possible to replace migrant workers with locals as they have acquired specific skills over a period of time.

Impact on Service Sector

Services sector had been significant contributor to in India's economic growth and contributes about 60% to GDP. Services sector is considered as lifeblood for economic growth and includes construction, trade, hotels, transport, communication, professional services, tourism, financial services. Under services sector, highest contributor are Financial, real estate and professional services and trade, hotels, transport and communication.

Figure 4.5.3.(1): Service sector's components percentage growth rate.

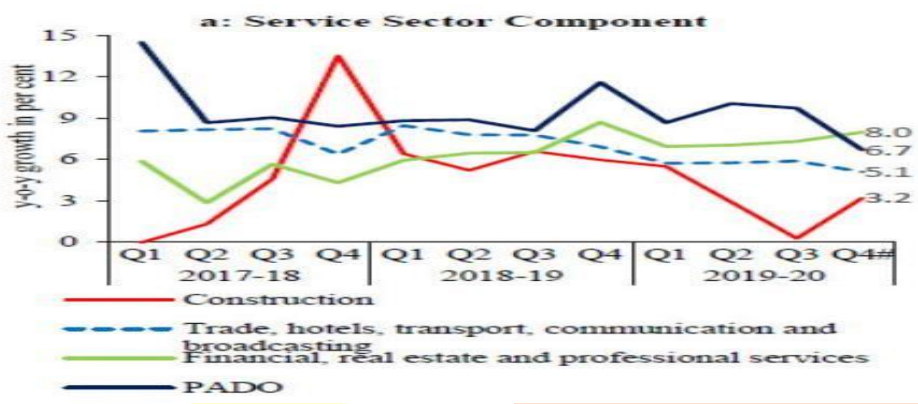


Table 4.5.3. (1): Growth rate (%) of service sector and its components.

Growth %	2018-19	2019-2020	2019-2020 (Q1)	2019-2020 (Q2)	2019-2020 (Q3)	2019-2020 (Q4)
Services	7.5	6.5	6.7	6.8	6.4	6.1
***Of which* Construction**	6.1	3.0	5.5	2.9	0.3	3.2
Trade, hotels, transport, communication	7.7	5.6	5.7	5.8	5.9	5.1
Financial, real estate and professional services	6.8	7.3	6.9	7.1	7.3	8.0
PADO	9.4	8.8	8.7	10.1	9.7	6.7

(Source:- RBI Monetary Policy Report, April 2020

https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=19439#32)

In second half of 2019-20, there has been moderation in service sector due to slow growth in construction, trade, hotels, transport, PADO, communication. Construction activities and PADO show a slowdown in Q3 and Q4 whereas growth in remaining activities was muted in second half of 2019-20.

Growth rate of overall services sector has been continuously declining in 2019-20. Decline in construction was majorly due to decline in cement production. Growth in

financial, real estate and professional services was mainly due to growth of IT companies.

Due to country wide lockdown amid coronavirus, services sector has been very hardly hit experiencing a complete halt to all major activities and witnessed a sharp rise in unemployment. There has been contraction in activities due to decelerated demand from domestic as well as external market. The incoming new businesses were very less and were insufficient to maintain the existing workforce. Companies responded to it by laying off employees and contracting the workforce which led to huge unemployment.

An all-time low in global services PMI was recorded at 5.4 in April 2020. Export of services has been severely impacted due to global lockdown. As per ICRA, growth of services sector may fall by 3-5% in FY21 against previously estimate growth of 6-8%. It has been very challenging for the sectors which primarily depend upon human interaction such as hospitality, tourism, banking and financial services, telecommunication, transportation, railways and flights services. Several organisations have taken certain measures like Work from home to continue operations along with practising social distancing.

Impact on Trade with External Sector

Being an open economy, India has trade relations with number of countries and carries out imports and exports with them. Global economies are severely hit by pandemic and witness slowing growth. Major trading partners of India (China, U.S.A, U.A.E., Saudi Arabia, Switzerland, Germany) are witnessing decline in their economic growth, thus India's trade with these nations is adversely affected.

Table 4.5.4. (1): Forecasted growth rates for India's major trading partners for FY 2020 and FY2021, As per IMF.

Country	**Growth rate in 2020 (%)**	**Growth rate in 2021 (%)**
China	1.2	9.2
U.S.A.	-5.9	4.7
U.A.E.	-3.5	3.3
Saudi Arabia	-2.3	2.9
Switzerland	-6	3.8
Germany	-7	5.2

(Source: https://en.wikipedia.org/wiki/List_of_the_largest_trading_partners_of_India

IMF-
https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD/SAU)

India's merchandise exports and imports recorded their worst fall in the last 30 years as COVID-19 took a toll on world production and demand. India's exports contracted by 60.3% in April 2020 and imports fall by 58.6%. The trade deficit reduced to US$ 6.8 billion in April 2020, (lowest since June 2016).

"Net foreign direct investment" (FDI) inflows picked up in March 2020 to US$ 2.9 billion from US$ 0.8 billion a year ago. In 2020-21 (till May 18), net foreign portfolio investment (FPI) in equities has also increased to US$ 1.2 billion from US$ 0.8 billion a year ago.

In the debt segment, there were portfolio outflows of US$ 3.8 billion during the same period as against outflows of US$ 1.4 billion a year ago. Net investment under the voluntary retention route increased by US$ 0.7 billion during the same period.

India's foreign exchange reserves have increased by US$ 9.2 billion in 2020-21 (up to May 15) to US$ 487.0 billion, (equivalent to a year's imports).

Impact on Crude Oil Prices

Crude oil is one of the most important global commodity which is traded across the world in the form of spot contracts and derivatives (futures) contracts. Only few of the countries control large oil reserves and are leading producers of oil in the world. United States, Russia and Saudi Arabia (part of OPEC) are the largest oil producing and exporting countries.

India is an oil importing country and depends heavily on other oil exporting nations due to insufficient oil reserves.

Table 4.5.5. (1): India's Crude Oil Import Statistics.

Year	Quantity of crude oil imports (MMT)	Value of crude oil imports (Rs. Billion)	Value of India's total imports (Rs. Billion)	Crude oil imports as % of total India's imports	Quantity of Crude oil production by India (MMT)*	Quantity of India's Total Requirement of crude oil (TMT)	Imports of crude oil as a % of total crude oil requirement
2011-12	171.73	6722.2	23454.63	29%	38.09	209.82	82%
2012-13	184.8	7846.52	26691.62	29%	37.86	222.66	83%
2013-14	189.24	8648.75	27154.34	32%	37.79	227.03	83%
2014-15	189.43	6874.16	27370.87	25%	37.46	226.90	83%
2015-16	202.85	4165.79	24902.98	17%	36.94	239.79	85%

2016-17	213.93	4701.59	25776.66	18%	36.01	249.94	86%
2017-18	220.43	5664.5	30010.16	19%	35.68	256.12	86%
2018-19	229.54	7981.58	35480.04	22%		229.54	
2019-20		2423.98	8836.52	27%			

*MMT- Million Metric Tonnes.

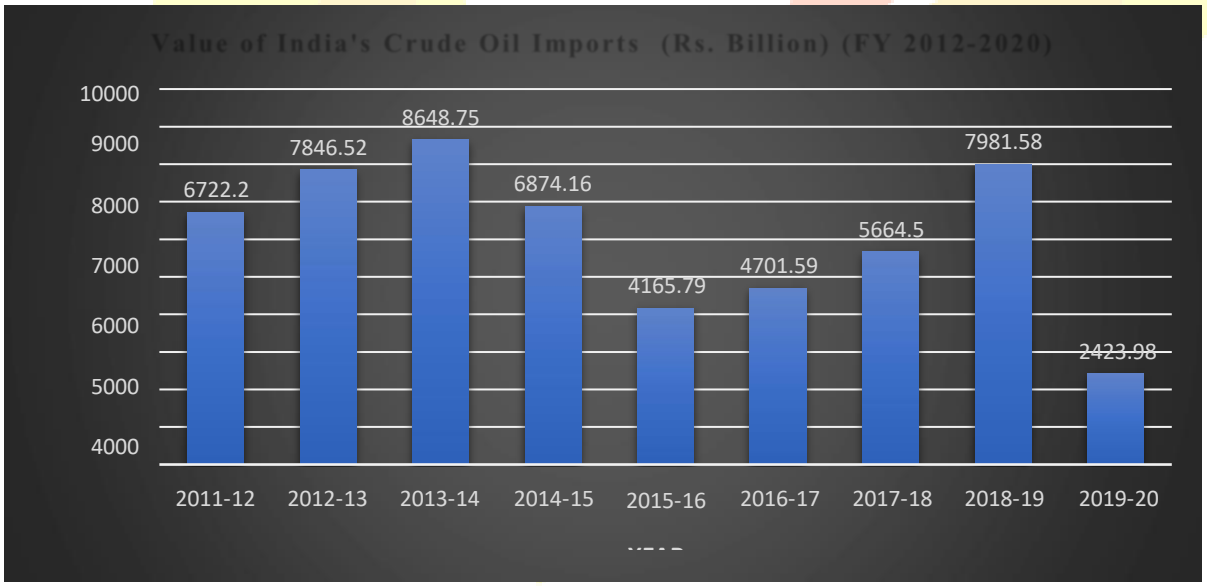
Average Imports of crude oil as a % of total crude oil requirement- 84%. (Calculated by researcher).

Average of crude oil imports as % of total Indian Imports – 24%. (Calculated by researcher).

(Source: Ministry of petroleum and natural gas, Ministry of commerce and industry, department of commerce.

https://commerce.gov.in/writereaddata/UploadedFile/MOC_636988184002556003_Press_Release_June_2019.pdf
https://commerce.gov.in/writereaddata/uploadedfile/MOC_637036322182074251_Annual%20Report%202018-19%20English.pdf
http://petroleum.nic.in/more/indian-png-statistics
http://petroleum.nic.in/documents/reports/annual-reports
http://petroleum.nic.in/sites/default/files/ipngstat_0.pdf
http://petroleum.nic.in/sites/default/files/AR_2018-19.pdf)
(Percentage figures in the above table are calculated by researcher)
(Note- Data for boxes in Yellow colour could not be found and hence boxes in green could not be calculated.)

Figure 4.5.5.(1): India's Crude Oil Imports (Rs. Billion) (FY 2012-2020).



(Plotted by researcher)

In FY 2020, India witnessed a sharp decline in oil imports due to border closures and reduced demand amidst the COVID-19 pandemic. With oil imports constituting 24% of total imports, India's heavy reliance on oil-exporting nations underscores its sensitivity to price fluctuations and impact on the current account balance. The downward trajectory of oil prices since 2014, falling from $105 to below $50 per barrel, accelerated in March 2020 due to global lockdowns. The demand plummeted as travel, shipping, and industrial activities halted. To stabilize prices, OPEC proposed production cuts, but disagreements between Russia, the U.S.A, and Saudi Arabia led to increased production, flooding the market. Consequently, Brent crude prices dropped to $32.01 per barrel in March 2020 and $18.38 in April 2020, while WTI prices fell to $29.21 and $16.55 respectively.

Table 4.5.5. (2): Brent Crude Oil Annual Spot Prices Per Barrel.

Year	Spot Price per barrel (U.S. $)	Year	Spot Price per barrel (U.S.$)
2000	28.66	2012	111.63
2001	24.46	2013	108.56
2002	24.99	2014	98.97
2003	28.85	2015	52.32
2004	38.26	2016	43.64
2005	54.57	2017	54.13
2006	65.16	2018	71.34
2007	72.44	2019	64.35
2008	96.94	2020 Jan	63.65
2009	61.74	2020 Feb	55.66
2010	79.61	2020 March	32.01
2011	111.26	2020 April	18.38

(Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rbrte&f=a)

Figure 4.5.5.(2): Brent Crude Oil Annual Spot Prices Per Barrel

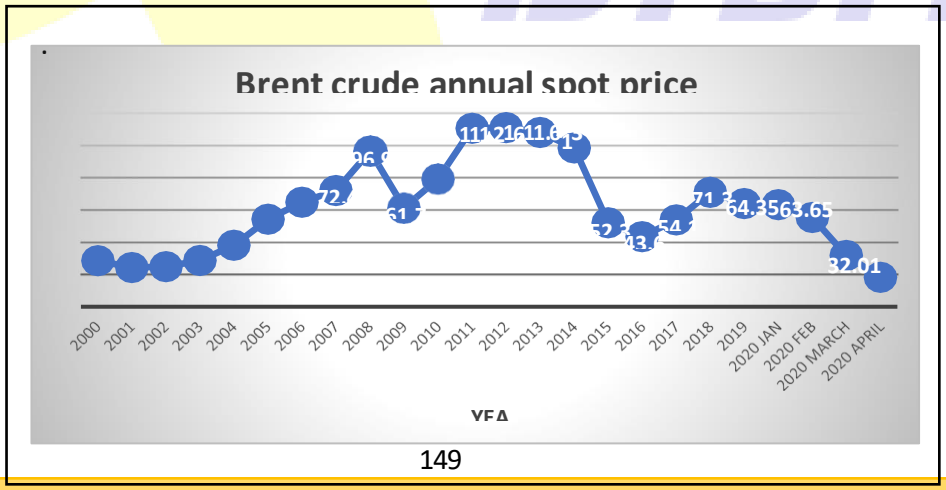
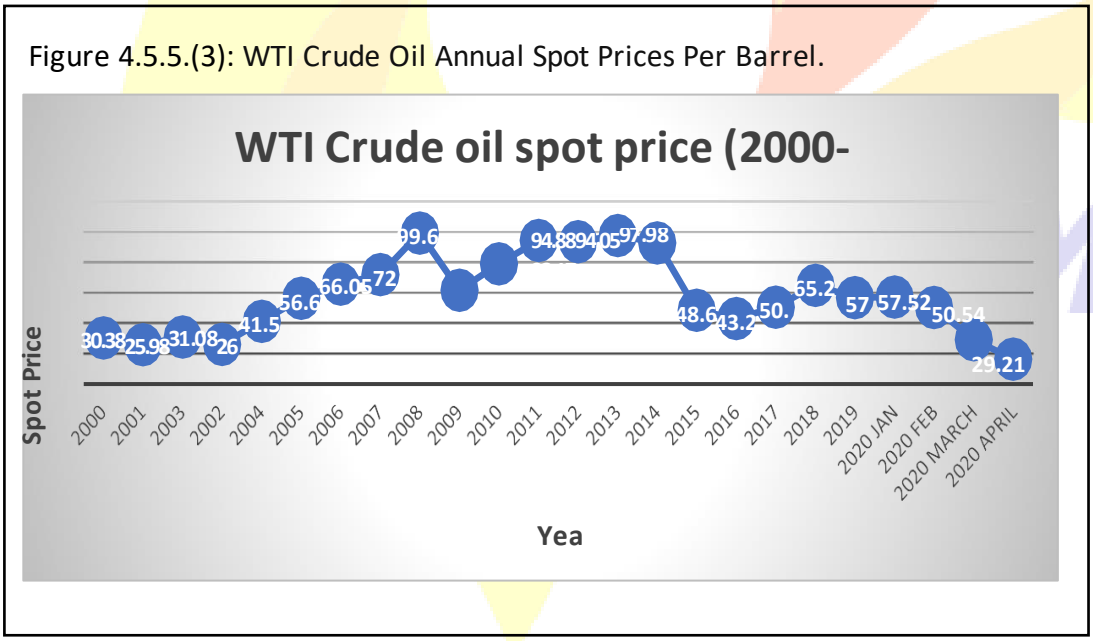


Table 4.5.5. (3): WTI Crude Oil Annual Spot Prices Per Barrel.

Year	Spot price per barrel (U.S.$)	Year	Spot price per barrel (U.S.$)
2000	30.38	2012	94.05
2001	25.98	2013	97.98
2003	31.08	2014	93.17
2002	26.18	2015	48.66
2004	41.51	2016	43.29
2005	56.64	2017	50.8
2006	66.05	2018	65.23
2007	72.34	2019	57
2008	99.67	2020 Jan	57.52
2009	61.95	2020 Feb	50.54
2010	79.48	2020 March	29.21
2011	94.88	2020 April	16.55

(Source: https://datahub.io/core/oil-prices)

Figure 4.5.5.(3): WTI Crude Oil Annual Spot Prices Per Barrel.



The COVID-19 pandemic severely impacted future oil prices, with May WTI contracts plummeting to negative values as sellers paid buyers to take delivery due to storage constraints amid lockdowns. Speculators unwound positions, exacerbating illiquidity. Brent prices remained higher due to its larger market and varied delivery locations. India stands to benefit from the oil price crash in two significant ways. Firstly, the reduction in oil prices will lower the import bill, alleviating pressure on the current account balance amid reduced exports due to lockdowns. Secondly, India can capitalize on low prices to build up oil reserves, leveraging the advantageous situation. Despite the opportunity for buyers to purchase oil at low prices, storage limitations prevent them from doing so, as both floating and land storage are at capacity. Additionally, the transportation cost of WTI from the U.S. to Asia, being higher than from Europe, limits the market for WTI. Contrastingly, Brent contracts offer delivery at various offshore locations, contributing to its higher prices. Therefore, India's ability to benefit from the oil price crash is significant, as it offers relief to the economy amidst challenging export conditions and provides an opportunity to enhance oil reserves at lower costs.

Impact of Foreign Exchange Rate on Crude Oil Prices

Table 4.5.5.1.(1): Percentage change in Brent oil prices in terms of U.S. Dollar and INR and exchange rate.

Month	Brent oil price $ per barrel	Brent oil price $ per litre (1 barrel= 159 litres)	% Change	(USD- INR) exchange rate	% Change	Per barrel price in INR	Per litre price in INR	% change
15-04-2018	72.11	0.453522		66.61		4803.25	30.21	
15-05-2018	76.98	0.484151	6.75%	67.43	1.23%	5190.76	32.65	8.07%
15-06-2018	74.41	0.467987	-3.34%	68.80	2.03%	5119.16	32.20	-1.38%
15-07-2018	74.25	0.466981	-0.22%	68.68	-0.16%	5099.86	32.07	-0.38%
15-08-2018	72.53	0.456164	-2.32%	71.40	3.96%	5179.00	32.57	1.55%
15-09-2018	78.89	0.496164	8.77%	72.51	1.55%	5720.31	35.98	10.45%
15-10-2018	81.03	0.509623	2.71%	73.65	1.57%	5967.86	37.53	4.33%
15-11-2018	64.75	0.407233	-20.09%	69.92	-5.06%	4527.32	28.47	-24.14%
15-12-2018	57.36	0.360755	-11.41%	69.92	0.00%	4010.75	25.22	-11.41%
15-01-2019	59.41	0.373648	3.57%	71.12	1.71%	4225.24	26.57	5.35%
15-02-2019	63.96	0.402264	7.66%	71.19	0.10%	4553.31	28.64	7.76%
15-03-2019	66.14	0.415975	3.41%	69.43	-2.47%	4592.10	28.88	0.85%
15-04-2019	71.23	0.447987	7.70%	69.81	0.55%	4972.69	31.27	8.29%
15-05-2019	71.32	0.448553	0.13%	69.98	0.24%	4990.97	31.39	0.37%
15-06-2019	64.22	0.403899	-9.96%	69.32	-0.94%	4452.05	28.00	-10.80%
15-07-2019	63.92	0.402013	-0.47%	69.08	-0.36%	4415.43	27.77	-0.82%
15-08-2019	59.04	0.371321	-7.63%	71.68	3.77%	4232.00	26.62	-4.15%
15-09-2019	62.83	0.395157	6.42%	70.50	-1.65%	4429.43	27.86	4.67%
15-10-2019	59.71	0.375535	-4.97%	70.99	0.70%	4238.81	26.66	-4.30%
15-11-2019	63.21	0.397547	5.86%	71.72	1.03%	4533.55	28.51	6.95%

15-12-2019	67.31	0.423333	6.49%	71.31	-0.57%	4799.94	30.19	5.88%
15-01-2020	63.65	0.400314	-5.44%	71.64	0.46%	4559.89	28.68	-5.00%
15-02-2020	55.66	0.350063	-12.55%	72.15	0.71%	4015.87	25.26	-11.93%
15-03-2020	32.01	0.201321	-42.49%	75.40	4.50%	2413.55	15.18	-39.90%
15-04-2020	18.38	0.115597	-42.58%	75.25	-0.20%	1383.10	8.70	-42.69%

(Source: https://datahub.io/core/oil-prices#resource-brent-month https://in.finance.yahoo.com/)

Volatility in international crude oil prices impacts India's economy, compounded by exchange rate fluctuations. Despite a drop in global oil prices, domestic petroleum prices may not decrease proportionately, raising concerns among consumers. Exchange rate instability is the key factor; a weaker domestic currency reduces purchasing power, necessitating higher expenditures for crude oil imports. Consequently, the government may be unable to fully pass on the benefits of lower international prices to consumers. Analysis of 2018-19 and 2019-20 data reveals that when international crude prices fall alongside Indian currency depreciation, the percentage decline in rupee terms is less than in dollar terms. Conversely, when international prices rise with Indian currency depreciation, the percentage increase in rupee terms exceeds that in dollar terms. COVID-19 led to a sharp drop in crude oil prices, with the highest percentage fall in Q4 2020. During this period, Indian currency depreciated by 4.5%, resulting in a lower percentage fall in rupee terms. However, in April 2020, as imports and exports declined due to lockdowns, demand for foreign exchange decreased, leading to rupee appreciation. Thus, the fall in prices in rupee terms exceeded that in dollar terms. This underscores the significant role of exchange rate fluctuations in determining crude oil prices and consumer goods prices

Impact on Capital Market

In India, Nifty and Sensex are two most important indices of stock markets that keep on fluctuating as per investor sentiments about economic developments. There are different factors influencing the fluctuations and differ from time to time. Looking at the **trend analysis** since 2011, we figured out various factors responsible for fluctuations in stock markets.

Table 4.5.6. (1): Annual Returns from Nifty (FY 2011-2020), FPI And Forex Rate.

YEAR	NIFTY 50 INDIA	FPI in Equity (INR Crores)	Total FPI (Equity+ Debt+ Debt VRR + Hybrid) (INR Crores)	USD-INR exchange rate
2010-11	10.53%	1,10,121	1,46,438	45.47
2011-12	-7.90%	43,738	93,726	48.24
2012-13	8.28%	1,40,033	1,68,367	54.44
2013-14	13.05%	79,709	51,649	60.82
2014-15	26.80%	1,11,333	2,77,461	61.22
2015-16	-5.42%	-14,172	-18,176	65.76
2016-17	16.87%	55,703	48,411	67.02

2017-18	8.70%	25,635	1,44,682	64.56
2018-19	8.24%	-88	-38,930	70.06
2019-20	-26.82%	6,153	-27,528	71.13
January 2020	-7.95%	-	-	71.64
February 2020	-23.25%	-	-	72.15
March 2020	14.68%	-	-	75.4
April 2020	-8.05%	-	-	75.26

(Source: https://in.finance.yahoo.com/ https://www.fpi.nsdl.co.in/web/Reports/Yearwise.aspx?RptType=5, NSDL Website) Note: - calculations for % change in returns of Nifty is done by researcher

Note :-(For 2020-2021 (till 2 June) FPI inflows in equity are Rs. 15,823 crores and total FPI are Rs. Minus 14,981).

In FY11, the Indian capital market rebounded from the 2008 Global Financial Crisis, recording a 10.5% return with high FII inflows. FY12 saw an 8% wealth erosion due to factors like low economic growth and FII outflows amid the European Debt Crisis. FY13 witnessed an 8% return with investor optimism despite challenges like a weak rupee and US Fed tapering. FY14 saw a 13% return, fueled by UPA reforms ahead of the Lok Sabha elections. FY15 recorded a record 26.8% return driven by Modi's majority win, low crude oil prices, and FII inflows. FY16 faced a 5.5% loss due to FIIs pulling out amidst poor monsoons and shrinking profits. FY17 saw a stellar 17% return aided by insolvency resolution mechanisms and robust economic growth. FY18 ended with a 9% return, buoyed by domestic and overseas investment, GST introduction, and robust equity shopping. FY19 delivered 8.24% returns amidst liquidity concerns, with investor confidence in PM Modi's government. FY20 witnessed wild market swings due to Lok Sabha elections, the NDA government's budget, and COVID-19 impacts, culminating in a global market panic and record single-day percentage falls, triggering circuit breakers. Indices like Nifty 50, BSE Sensex, Dow Jones, Euro Stoxx 50, Nikkei 225, and SZSE Component Index were highly volatile, moving significantly on investor expectations and government economic packages.

Figure 4.5.6.(1): Q4 2020 NIFTY

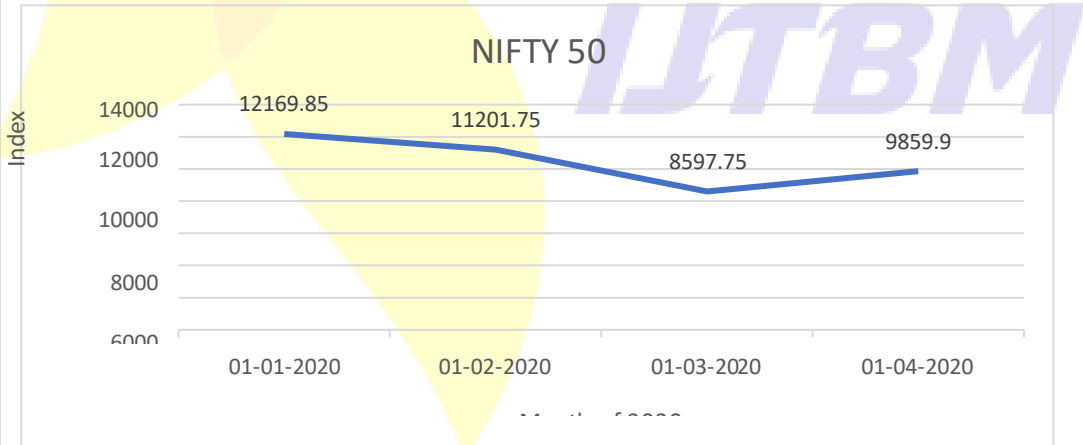


Figure 4.5.6.(2): Q4 2020 SENSEX

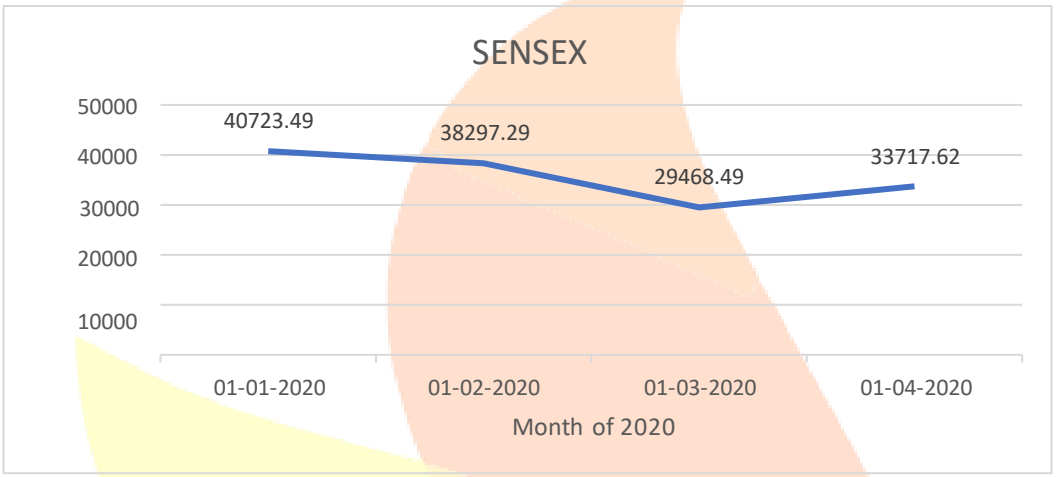


Figure 4.5.6.(3): Q4 2020 DJI

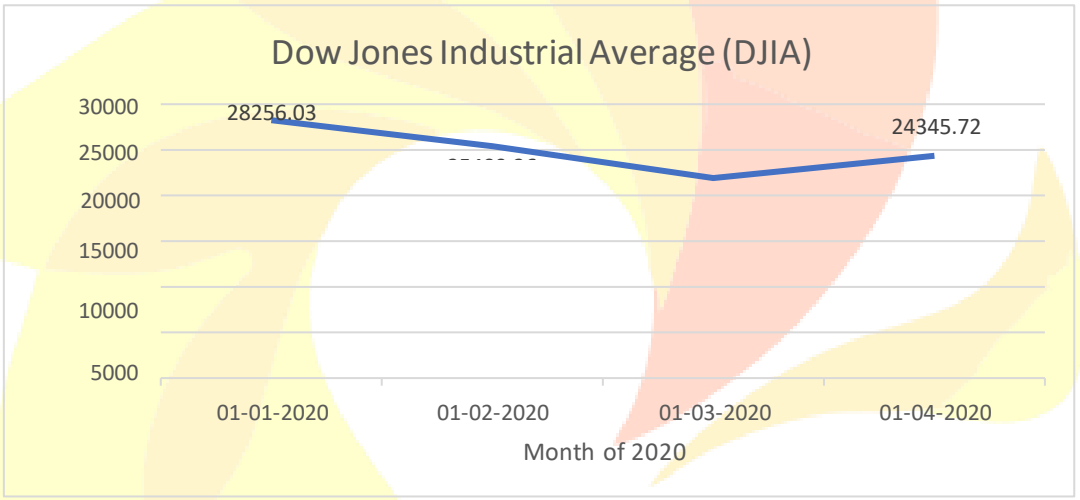


Figure 4.5.6.(4): Q4 2020 EURO STOXX 50

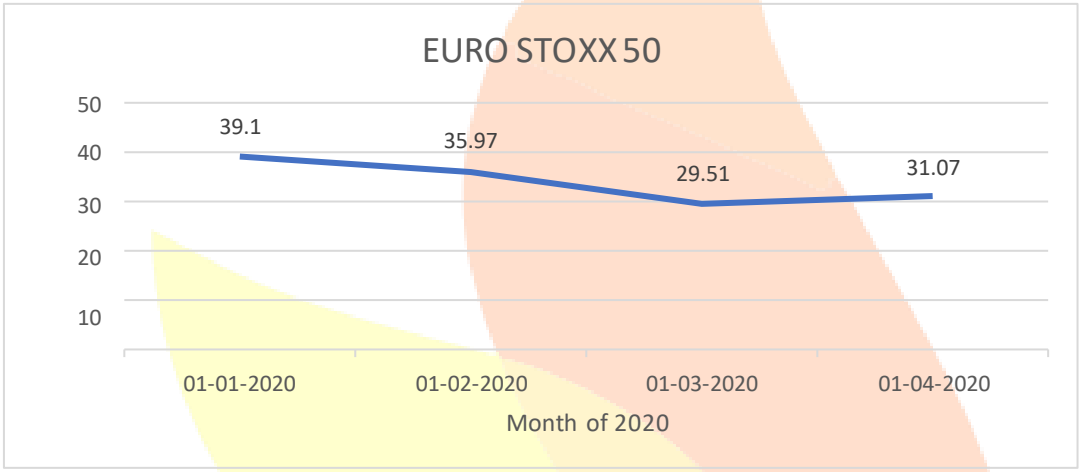
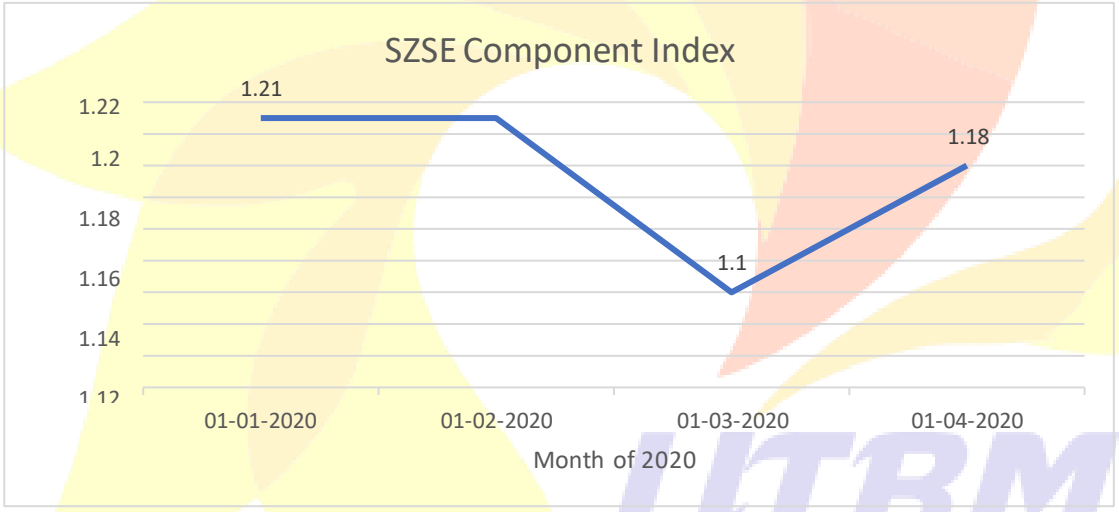


Figure 4.5.6.(5): Q4 2020 SZSE Component Index



In the graphs above, we have plotted the values of six global indices for January 2020, February 2020, March 2020 and April 2020 to see the impact of COVID-19 on financial markets. We can clearly that all the six indices were at peak in January from where they started declining and hit their lowest peaks in March 2020 due to panic selling by investors. In April, markets started recovering and had shown an upward trend in April.

Nifty 50 recorded a very steep fall in March, falling from around 12000 and settling at around 8000. Same is with Sensex, where it had fallen to as low as 29000. Same is the scenarios with DJI, Euro Stoxx 50, SZSE and Nikkei.

Table 4.5.6.(2): (Q4 2020) Global Indices Value.

Month (2020)	Nifty 50	BSE Sensex	DJIA	Euro Stoxx 50	SZSE Component Index	ikkei 225
January	12169.85	40723.49	28256.03	39.1	1.21	23205.18
February	11201.75	38297.29	25409.36	35.97	1.21	21142.96
March	8597.75	29468.49	21917.16	29.51	1.1	18917.01
April	9859.9	33717.62	24345.72	31.07	1.18	20193.69

(Source: https://in.finance.yahoo.com/

IMPACT OF AGGREGATE DEMAND ON OVERALL ECONOMIC GROWTH (GDP): EMPERICAL ANALYSIS

Regression analysis

This chapter analyses statistically the impact of aggregate demand in overall economic growth (GDP) of India. This has been done using regression analysis, as the statistical tool. The Regression Analysis is used to estimate the relationship among independent and dependent variables.

The results of the analysis are presented in tabular form containing various parameters showing how much the dependent variable is related to the independent variables under study. The parameters used here are as follows:

1. R square: This shows how much of the changes in the dependent variable could be explained by the changes in the independent variables. In other words, it explains the unknown variations in the dependent variable with the help of known changes in the independent variables. (Regression statistics table).
2. P-value: The p-value is used to determine the significance of the independent variables in determining the dependent variable. Statistically, a p-value of less than 0.05 shows that the independent variable is significant in determining the dependent variable. (Anova Table).

3. Statistical model: A linear equation showing the relationship between independent variables and dependent variable is formed with the help of coefficients found in the Regression coefficients table. (tabular depiction of the Regression analysis).

Following is the Summary output of Regression Analysis taking components of aggregate demand (Government Final Consumption expenditure, private final consumption expenditure, gross fixed capital formation, net exports) as the independent variables and GDP as a dependent variable. The summary below is based on the data points taken from year 2010-11 to 2019-20 quarterly.

Table 6.1.(1): Regression Output.

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.997652722							
R Square	0.995310953							
Adjusted R Square	0.994775062							
Standard Error	49349.99393							
Observations	40							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	4	1.80932E+13	4.52331E+12	1857.300798	3.23014E-40			
Residual	35	85239766523	2435421901					
Total	39	1.81785E+13						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-66867.15952	40482.47395	-1.65175576	0.107529669	-149050.9508	15316.6318	-149050.9508	15316.6318
GFCE	0.666929506	0.185283283	3.599512562	0.000976867	0.290784444	1.043074569	0.290784444	1.043074569
PFCE	1.122071319	0.093351791	12.01981568	5.58713E-14	0.932557108	1.31158553	0.932557108	1.31158553
GFCF	1.067375134	0.188722777	5.655783312	2.19541E-06	0.684247528	1.45050274	0.684247528	1.45050274
NET EXPORTS	0.560702302	0.169634294	3.305359363	0.002197632	0.216326377	0.905078227	0.216326377	0.905078227

(Researcher's Contribution)

The regression analysis shows that around 99.53% (which is the value of R square) or 99.47% (which is the value of Adjusted R square as more than 1 independent variable is used) changes in GDP could be explained by changes in the aggregate demand.

(Note: - Adjusted R square is used when more than 1 independent variable is used.)

The overall p-value of entire model which is zero approximately (Column "Significance F"- 3.23014E-40) obtained in the ANOVA table, as a part of the regression result shows that the aggregate demand is highly significant in determining the GDP as p- value is less than .05.

(If p value < 0.05, it indicates that independent variable is significant in determining dependent variable, hence Null hypothesis is rejected and alternative hypothesis is accepted).

As 3.23014E-40< .05, thus, the null hypothesis (H0) which states that there is no significant relationship between the

aggregate demand and Gross Domestic Product is failed to accept, whereas, the alternate hypothesis (H1) which states that there is a significant relationship between aggregate demand and Gross Domestic Product is accepted.

(Individual P-value of all the variables is also less than .05, therefore all the variables are significantly related to GDP).

The statistical model which could represent the interrelation between aggregate demand and GDP is as follows:

GDP = -66867.15952+0.67*(GFCE)+1.12*(PFCE)+1.06*(GFCF)+0.56*(Net Exports)

Correlation analysis

Correlation measures the strength of association between two variables. It measures the "degree to which two variables move in relation to each other" or "the extent to which two or more variables fluctuate together". Correlation ranges from -1 to +1 where -1 denotes weak relation between the variables whereas as we move from -1 to +1, relationship between the variables grows stronger. (-) denotes opposite relationship between variables whereas (+) denotes positive relationship.

This section analyses the association of each of the independent variables (GFCE, PFCE, GFCF, Net Exports) with GDP.

Following is the Summary output of Correlation Analysis taking components of aggregate demand (Government Final Consumption expenditure, private final consumption expenditure, gross fixed capital formation, net exports) as the independent variables and GDP as a dependent variable. The summary below is based on the data points taken from year 2010-11 to 2019-20 quarterly.

Table 6.2.(1): Correlation Matrix.

	GFCE	*PFCE*	*GFCF*	*NET EXPORTS*	*GDP*
GFCE	1				
PFCE	0.823581	1			
GFCF	0.838508	0.971262	1		
NET EXPOI	-0.00031	0.161838	0.078137	1	
GDP	0.849445	0.993798	0.981919	0.167369891	1

(Researcher's Contribution)

It is evident from the above table that GDP has positive relationship with all four variables which means the independent variables (components of aggregate demand) and dependent variable (GDP) move in same direction.

GDP is relatively more strongly correlated with PFCE with correlation measure of 0.99 denoting the strongest association with PFCE, followed by GFCF having a correlation measure of 0.98. Relation of GFCE with GDP ranks third with a measure of 0.85. Net Exports and GDP have a relatively low correlation of 0.16.

PROJECTION OF GDP FOR FY 2021

In this chapter, we will be projecting growth rate of Indian economy for FY 2021, based on regression equation formulated in chapter 7 and certain projections made by RBI.

As per "RBI, Bi-monthly publication, survey of professional Forecasters", following are the **forecasts made by RBI for PFCE, GFCF and Net Exports for FY 2021.**

Table 7.1: Forecasts of components of aggregate demand by RBI for FY 2021.

Component of aggregate demand and GDP	Growth rate (%) FY 2021
PFCE	-0.5%
GFCF	-6.4%
Net Exports	-11.6%
GDP	-1.5%

Note: No information regarding GFCE growth rate was given in the source. (Source: RBI, Bi-monthly publication, survey of professional Forecasters, https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=19457)

Based on 2019-20 (annual) figures for PFCE, GFCF and Net Exports, **estimated figures for 2020-2021(annual)** are as follows-

Table 7.2: Forecasted figures for FY 2021

Component of aggregate demand and GDP	019-2020 figures (in crores)	Forecasted growth rate as per RBI	Forecasted figures for 2020-2021 (in crores)
PFCE	83,25,907	-0.5%	82,84,277
GFCF	43,34,091	-6.4%	40,56,709
GFCE	16,52,367	No information available (Assume: 0%)	16,52,367
Net Exports	-2,97,728	-11.6%	-2,63,192
GDP	1,45,65,951	-1.5%	1,43,47,462

(Source: Ministry od Statistics and Implementation and Researcher's contribution.)

Note: (As no information regarding forecasts of GFCE growth rate are given in RBI report, we will take GFCF for FY 2021 equal to GFCE amount in FY 2019, i.e., GFCE growth rate= 0% for making projection of GDP for FY 2021).

GDP PROJECTION USING REGRESSION MODEL

Regression equation from chapter 7-

GDP = -66867.15952+0.67*(GFCE)+1.12*(PFCE)+1.06*(GFCF)+0.56*(Net Exports)

Putting values in table 8.2 in regression equation, we get,

GDP = -66867.15952+ 0.67 *(16,52,367) + 1.12*(82,84,277) +1.06*(40,56,709) + 0.56*(-2,63,192)

PROJECTED GDP GROWTH RATE FOR 2021
= (Forecasted GDP for FY 2021- GDP for FY2020/ GDP for FY 2020) *100
= (1,45,13,152.72 - 1,45,65,951/ 1,45,65,951) *100
=

-0.36 %

As per our model, **GDP is expected to contract by 0.36% in FY 2021.**

FORECASTS MADE BY DIFFERENT ORAGNISATIONS FOR INDIA'S GDP GROWTH RATE FOR FY 2021.

Table 7.3: Forecasts by Different Organisations for India's GDP For FY 2021.

Organization	Forecasted growth rate (%) FY 2021
RBI	-1.5%
IMF	7.4
World bank	-3.2%
Moody's	0%
Fitch	-5%
CRISIL	-5%
S&P	-5%
ICRA	-5%
Goldman Sachs	-5%

Source: (https://economictimes.indiatimes.com/news/economy/indicators/unexpected-rallying-point-for-india-bulls-as-sp-

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CONCLUSION AND RECOMMENDATIONS

Conclusion

The COVID-19 pandemic significantly aggravated India's economic slowdown, impacting key sectors such as agriculture, industry, and services. Private consumption, a major driver of domestic demand, experienced a notable decline. Despite challenges like labour shortages, the agriculture sector displayed resilience, particularly in food grain production. However, industrial output suffered a severe contraction of 21%, particularly in manufacturing. The service sector faced a surge in unemployment, prompting a rapid adoption of remote work practices. Exports witnessed a staggering decline of 60.3%, while crude oil prices plummeted due to decreased demand. To address the economic challenges, accommodative monetary policies were implemented to stimulate demand, but structural reforms predominantly targeted the supply side. Regression models anticipate a negative GDP growth of -0.36% for FY 2021. Overall, the pandemic has underscored the need for comprehensive measures to address the multifaceted economic impacts and foster recovery

Recommendations

- As significant relation is established between aggregate demand (GFCE, PFCE, GFCE, Net Exports) and GDP, therefore, for economic revival, it is necessary to focus more on stimulating aggregate demand.
- Cash transfers to poor and vulnerable sections could help in pushing aggregate demand as it will leave people with more money in their hands.
- It could help if schemes are more linked to providing cash rather than providing credit.
- Focus should be more on attracting foreign investors (by providing conducive business environment and ease of doing business) to make India a manufacturing hub.
- Following the lines of “Atma Nirbhar Bharat” could greatly help in reducing dependency on imports and expansion of manufacturing sector.
- Realising the importance of labours and working for their welfare could help us in getting our economic growth back.

Limitations of the study

All economic researches suffer from some or the other lacuna and this study is no exception.

1. For the period under study, the other factors contributing to economic growth of the

country like social and political stability and technological development has been assumed to remain constant.

2. For studying the impact of aggregate demand on GDP, four components of aggregate demand have been considered, i.e., Government final consumption expenditure, Private final consumption expenditure, Gross fixed capital formation and Net Exports. 'Change in stock' and 'valuables' have not been studied.

3. As COVID-19 is an ongoing thing, new developments keep happening every day, therefore information and data in the report are last updated on 31 May 2020.

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