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Who is Responsible for Stock Price Crash Risk: Sentiment or Policy Uncertainty?

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ABSTRACT

The objective of this study is to examine the effect of policy uncertainty and investor sentiments on the firm-specific stock price crash risk in Indian markets during the Covid-19 pandemic. An investor sentiment index was constructed using the firm-specific technical indicators over the period from 2020 to 2021. The daily closing price of individual firms was collected from the official site of bseindia.com while the monthly index of news-based policy uncertainty was extracted from policyuncertainty.com. For the proxy for firm-specific stock price crash risk, Monthly negative-skewness and Down-to-up volatility ratios are determined from the firm-specific daily return. A linear regression model was employed to examine the association between investor sentiment and policy uncertainty towards stock price crash risk. The result did not found any significant impact from the firm-specific investor sentiment while the EPU index was found to be negatively associated with the stock price crash risk which indicates the higher EPU helps to control the future stock price crash risk over the pandemic period. The result of this study will help the retail investor as well as the regulator to make their strategy in a similar pandemic situation in the future.

Keywords: Stock Price Crash Risk, Emerging Markets, Policy Uncertainty, Investor Sentiment

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INTRODUCTION

In theoretical prospects, the firm-specific managers have significant control over the declaration of negative news. Indeed, after a certain point, the manager may not be able to control that anymore and

the accumulated negative news released at once causes the stock price crash risk. Stock price crash risk is not new in the field of financial literature, but the gap in the study is that the researcher generally focused on the activity of the corporate/ policy announcement and its impact on future stock price

crash such as CEO power (Harper et al., 2020), Language in annual report (Kong et al., 2021), employee welfare policy (Nasr and Ghouma. 2018), social trust (Li et al., 2017), consumer concentration (Ma et al., 2020; Lee et al., 2020), FII and Institutional Investor attention (Fan and Fu 2019; Huang et al., 2020; Xiang et al., 2020), Analyst coverage (He et al., 2019) and so on. Second, the majority of the study examining the stock price crash risk focused on the Chinese stock market. In addition to that, very few studies were observed during the pandemic period.

Thus the objective of the present study is to investigate the impact of firm-specific investor sentiment and the Economic Policy Uncertainty (EPU) on the stock price crash risk during the Covid period. For the empirical analysis, we considered the list of top 30 companies listed in the Indian stock market and did not found any significant impact from firm-specific investor sentiments to future stock price crash risk. It also found the EPU index negatively affects the future crash risk as well as the sentiment index over the study period, which implies that the policy uncertainty index helps to control the investor sentiment as well as the stock price crash risk in the Indian market.

The remaining session is organized as section 2 which deals with the past literature review on stock price crash risk. Section 3 and 4 discussed the methodology employed and the result discussion respectively. Finally, section 5 reported the valuable findings, future scope and the practical implication of the results.

THEORETICAL FRAMEWORK

The present section discussed the recent works which have been done on stock price crash risk as follows:

Crash Risk and Investor Sentiment

Yin and Tian (2017) investigated the interaction of financial reporting quality and short-selling constraint, in the association between investor sentiment and stock price crash risk over the Chinese firm. The study found a positive association of sentiment with the future crash risk. It also identifies the short-selling constraint and the poor reporting

quality have a significant role to magnify that association. *Fu et al., (2020)* examined the impact of firm-specific investor sentiment on the stock price crash in the Chinese market from 2005 to 2021 and found a positive and significant impact of sentiment on future crash risk. The researcher segregates the stocks based on their liquidity and reported a stronger effect of sentiment on crash risk in the case of low liquidity stocks. *Cui and Zhang (2020)* considered a large sample period from 1991 to 2014, to examine the impact of sentiment on future crash risk in USA stock markets. They observed a higher degree of association with the high sentiment period due to the high levels of firm-specific negative information withheld. And suggest the firm with a higher leverage ratio, greater default risk and large forecast disagreement strengthen the probability of Future crash risk. *Liu et al., (2021)* examined the stock price crash risk in the Chinese market using conditional skewness from the GARCH-S model. The results show, the daily observation of conditional coefficient negatively associated with the growth of confirmed cases, implies the crash risk increased over the Covid period. It also argued that where the sentiment was high, the crash risk was strongly increased by the pandemic. From the above decision we can formulate the hypothesis as follow:

Hypothesis I: There is a positive and significant relationship between firm-specific investor sentiment and stock price crash risk.

Crash Risk and EPU

Jin et al., (2019) examine the role of EPU on crash risk employing panel regression on quarterly observation of 2670 Chinese firms. The result found positive impact of EPU on crash over the study period while the degree of association was comparatively higher for the state-owned firm. *Kim et al., (2020)* taken the assumption as the increasing EPU helps to reduce the future crash risk in the USA market. The results fail to reject the hypothesis and found negative association of policy uncertainty over the study period. *Luo and*

Zhang (2020) investigated whether the crash risk increased with the fluctuation of EPU among 2745 Chinese firms by using the portfolio construction strategy. The study employed a three-factor CAPM model including the EPU as an external factor of monthly stock return and formulate two separate portfolios based on EPU beta. The result reported a positive impact of EPU on the crash risk while the degree of association was quite higher with the firm having a higher EPU beta. Dai et al., (2021) used conditional skewness as the proxy for stock price crash risk and the log difference of daily confirmed Covid cases over the pandemic period (i.e., 2017-2020) in the USA. They observed negative correlation of EPU with conditional skewness and argued the EPU plays a significant role in the increase of crash risk with the Covid breakdown. Azam (2021) considered the non-financial firm from the Pakistan stock exchange to examine the role of policy uncertainty on the stock price crash risk over ten years i.e., from 2010-2020. The result of Flexible-GLS (FGLS) found a positive and significant relationship between EPU to crash risk over the study period. It also suggested that the greater investor disagreement and state-owned enterprises (due to uncertainty in political policy) are more likely to crash risk. Huang and Liu (2021) focused on the impact of the post-Covid pandemic on the crash risk in the Chinese energy market stocks and reported decrease in stock price crash risk during the post Covid period. It shows that as CSR activities increased during the post-Covid period it helps to control the crash risk and the state-owned firm was found to be less affected during the post-Covid. Based on the above discussion regarding the association between stock price crash risk and EPU, this study uses the following hypothesis:

Hypothesis 2: There is a negative and significant relationship between EPU and stock price crash risk.

In addition to that, it can be assumed as the policy uncertainty increased, it might influence the fears of investors due to the Covid cases. Thus the present study examined the association of investor sentiment

index and EPU during the Covid period and the respective hypothesis is stated as follow:

Hypothesis 3: There is a positive and significant relationship between firm-specific investor sentiment and EPU.

DATA AND VARIABLES

Sample and Data Sources

The final sample consists of monthly firm-specific observations for the crash risk model. Initially, the daily observation of firm-specific stock price, quarterly company performance and annual report were extracted from the official site of Bombay Stock Exchange (BSE) while monthly EPU index was collected from https://www.policyuncertainty.com/india_monthly.html. The period of the study ranges from January 2020 to August 2021 which covers the first as well as the second phase of the Covid-19 pandemic. The top 30 selected BSE companies are used as a proxy for the Indian market performance.

Investor Sentiment Index

Following various past literature, we used Principal Component Analysis (PCA) to construct the firm-specific sentiment index based on six sentiment proxies: Relative Strengthen Index (RSI), Psychological Index (PI), Bull and Bear Index (BBI), Average True Range (ATR), Natural log of Trading Volume (TV) and Average Directional Index (ADX). Generally, we determine daily observation for each of the sentiment proxies, which is discussed as follows.

Relative Strengthen Index (RSI): RSI helps to identify the overbought and oversold situation in the stock price. Kim and Ha (2010), Yang and Zhou (2015) and Yang and Chi (2020) considered the RSI as the proxy for investor sentiment. If the RSI is on or above 80, it implies the market is overbought while if it is on or below 20 it indicate the oversold condition.

Psychological Index (PI): following the work of Kim and Ha (2010) and Yang and Chi (2020), the present study also uses the PI as the second proxy for the sentiment. Like the RSI, PI also indicates that the market is overbought (if PI is 75) and oversold (if PI 25).

Bull and Bear Index (BBI): Yang and Chi (2020) employed a new proxy for investor sentiment as BBI. It is a composite index of a list of moving average indexes. This study used 3-6-12-24 days simple moving average and then cross-sectional average used as the final BBI. When the stock price is below the BBI it indicates the more optimistic investor and vice versa in the marketplace.

Average True Range (ATR): As the market volatility plays an important role in the mind of an investor; we follow 14 days simple moving average of true range taken as a proxy for overall market volatility.

Natural log of Trading Volume (TV): Trading volume use as the indicator of market liquidity. High TV provides evidence of higher liquidity and assumes the investors are more informative. Following the work of Liao *et al.*, (2021), Yang and Zhou (2015) and Yang and Chi (2020) we considered the natural log of trading volume as the proxy for investor sentiment.

Average Directional Index (ADX): The final proxy for the sentiment index indicates the existence of trend or side-way market movement based on the stock price. The index ranges from zero to hundred; the value higher than 25 implies a strong trend in the stock price.

$$r_{i,t} = \alpha_i + \beta_1 r_{m,t-2} + \beta_2 r_{m,t-1} + \beta_3 r_m + \beta_4 r_{m,t+1} + \beta_5 r_{m,t+2} + \epsilon_t \dots \dots (1)$$

Where $r_{i,t}$ is the daily return of stock i at day t while r_m is the return of the market in the same day, then the firm-specific return of day t calculated by $w_{i,t}$:

All the market proxy is determined based on the daily observation of the firm-specific stocks. The monthly sentiment proxy determines simple taking the average of daily observation during a particular month. We collected the monthly Consumer Price Index (CPI) from the official site of RBI and employed linear regression on each monthly proxy as the dependent variable to overcome the orthogonal issue. The composite sentiment is constructed by taking the first PCA¹ of the residual from the simple regression. We also standardize the composite sentiment index to mean zero and unit variance.

Set of Control Variables

Following the past literature, we use a list of control variables such as average daily return in a month (Ret), the standard deviation of daily return in a month (Sig.), Leverage (LEV) Return on Asset (ROA), Size of the Firm (Size) and the lag value of Crash Index. In addition to that the dummy variable for Industry (Ind.) and Period (Month) was also taken to validate the impact of sentiment and EPU on the firm-specific crash risk.

Proxy for Stock Price Crash Risk

Following the past literature in stock price crash risk, this paper employed NCSKEW and DUVOL to measure the stock price crash risk (Cheng *et al.*, 2020; Fu *et al.* 2020 and Luo and Zhang 2020). As both the measure based on the weekly return, this study use the following regression to estimate the idiosyncratic weekly return (Zhu *et al.*, 2017; Fu *et al.* 2020):

$w_{i,t} = \ln(1 + \epsilon_t)$. Following Chen *et al.*, (2001) the probability of stock price crash risk is calculated as follow:

¹ First the PCA run by considering the raw residual as well as lagged residual. Then we compare the correlation of first PCA with the raw as well as lagged residual. Out of which

correlation is higher taken for run the PCA second time and the first PCA use as the composite Sentiment Index.

$$NSCKEW_{i,m} = - \left[n(n-1)^{\frac{2}{3}} \sum w_{i,t}^3 \right] / [(n-1)(n-2)(\sum w_{i,t}^2)^{\frac{2}{3}}] \dots \dots \dots (2)$$

$NSCKEW_{i,m}$ is the firm-specific negative coefficient of skewness in month m while n is the total number of trading days in that month m . The second alternative measure for crash risk is Down-to Up Volatility (DUVOL) of firm-specific weekly return. To calculate this, the firm-specific trading week will divide into up and down based on the monthly mean

of the daily return. If the firm-specific weekly returns are above the annual mean, called up-week, otherwise down-week. Then the standard deviation of the up & down week will be calculated separately. Finally, the ratio of $DUTVOL_{i,m}$ will be the log of the ratio of down-week standard deviation to the up-week standard deviation.

$$DUVOL_{i,m} = \log \left\{ \left[(n_u - 1) \sum_{down} w_{i,t}^2 \right] \left[(n_d - 1) \sum_{up} w_{i,t}^2 \right] \right\} \dots \dots \dots (3)$$

Where n_u & n_d represent the numbers of up and down daily returns in the month m . Generally, higher the NSCKEW and DUVOL indicate higher the probability of stock market crash risk.

of DUVOL. The normality assumption is not satisfied for most of the variables except NCSKEW, LEV and Firm Size. On the other hand, the condition of stationarity was fulfilled by all the variables with 1% levels of significance.

Summary Statistics

Table 1 reports the descriptive statistics of major variables which are used for the analysis. The average of the two crash risk measures NCSKEW and DUVOL are 0.0095 and -0.009 respectively. The standard deviation is comparatively higher in the case

EMPIRICAL ANALYSIS

To examine the firm-specific investor sentiment and EPU on the future stock price crash risk, we employ the following regression:

$$Crash_{t+1} = \alpha + \beta_1 (SI_t \text{ or } EPU_t) + \beta_2 CV + \epsilon_t \dots \dots \dots (4)$$

The dependent variable $Crash_{t+1}$ represents the monthly NSCKEW and DUVOL while CV represents the set of the control variable. If the result of β_1 is positive and significant, it implies that the SI/EPU will cause the future stock price crash risk. On the other hand, if the coefficient is significant but negative, it indicates the investor rationality during the period of market fall. First, we run the regression (model-4) by considering only the dependent variable and target variable i.e., SI & EPU. To avoid the problem of endogeneity, we added the list of firm-specific control variables and finally run the model adding the dummy variable for the period and the industry-specific. In addition to that, this paper

employed a Newey-West estimator in the OLS regression to overcome the problem of autocorrelation and heteroscedasticity in the model residuals.

Result of Firm-Specific Sentiment and EPU on Stock Price Crash risk (NSCKEW)

The result of NSCKEW is presented in Table 2. First, two-panel of the table reported the result of OLS without any control variable and found there was a significant and negative impact of EPU on the future stock price crash risk. On the other hand, the sentiment index was not able to explain any effect

CONCLUSION

This study examines the impact of firm-specific investor sentiment and EPU on future stock price crash risk throughout the Covid pandemic. Using the monthly observation of the Indian stock market over the period from Jan. 2020 to Aug. 2021, we did not find that the firm-specific investor sentiment or EPU could be able to predict the future crash risk. On the contrary, the past month EPU helps to control the future stock price crash over the study period. Similarly, the results were also observed in the case of the sentiment index which showed that the EPU negatively affects the Firm-specific sentiment. Overall the result supports the contrarian strategy over the pandemic as the policy uncertainty increases the investor wait for the future opportunity and when the EPU decrease, the investors aggressively works in the market.

The result of this study will help the retail as well as the institutional investor to rebalance their portfolio based on the EPU and firm-specific sentiment index. The main limitation of the present study is the small sample period. Thus, it can be extended by using high-frequency data or by using conditional skewness on the daily observation.

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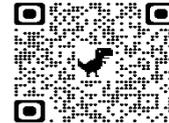
Appendix: List of Variable Details

Variable	Particulars
Crash _{t-1}	Lag value of Crash Index
Ret	Average daily return in a month
Sig	Standard deviation of daily return in a month
LEV	Leverage: Total Liability/Total Asset
ROA	Return on Asset: Net Profit/Total Asset
Size	Size of the Firm: Natural log of Total Asset
Ind.	dummy variable for Industry
Month	dummy variable for months over the sample period

An Analytical Study on Covid-19 and Indian Stock Market

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ABSTRACT

Purpose: The novel corona virus has led to unprecedented repercussions on daily life and the economy. This article analyses the effect of epidemic COVID 19 on investment behavior of investors while investing in stocks during this pandemic times. As during the pandemic market was volatile and investors were very skeptical about the market returns. **Research Design:** This study uses analytical methods to evaluate the effect of pandemic on investor's behavior. The data was collected from various secondary sources to understand the effect of COVID 19 investment trends of investors. **Findings:** The result shows that investors are now more inclined towards the options which can offer them liquidity with good significant returns as due to lockdown the economic activities had slowed down and impacted the pockets of the investors. Maximum investors were negatively affected due to the hit of the first wave with a return of the second wave as well as they were required to pay huge hospital bills. So this was one of the reasons that contributed towards change in behavior from moderate to risky. **Practical Implications:** With this analytical study the investors will be able to formulate the strategies to invest in the market and also give them the outlook of the volatility and the dynamism of the share market along with an option of liquidity and hassle-free investment. **Social Implications:** This study will encourage the new investors to understand the benefits of market returns and add on to the existing investors to analyze the market and have optimum returns from the market.

Keywords: Volatility, Investment behavior, Financial risk, Investment strategies, A trade-off

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INTRODUCTION

The rapid spread of the unprecedented COVID-9 pandemic has put the world in jeopardy and changed

the global outlook unexpectedly. Initially, the SARS CoV 2 virus, which caused the COVID19 outbreak triggered in Wuhan city, Hubei province of China in

December 2019, and with time it spread all over the globe. This pandemic is not only a global health emergency but also a significant global economic downturn too. As many countries adopt strict quarantine policies to fight the unseen pandemic, their economic activities are suddenly shut down. Transports being limited and even restricted among countries have slowed down global economic activities. Most importantly, consumers and firms have prevented their usual consumption patterns due to the creation of panic among them and created market abnormality. Uncertainty and risk created due to this pandemic, causing significant economic impact all over the globe affecting both advanced and emerging economies such as the United States, Spain, Italy, Brazil, and India. In this context, the financial market has responded with dramatic movement and is adversely affected. Economic turmoil associated with COVID-19 has affected the financial market severely which includes both stock and bond markets.

Although there is limited current literature related to the impact of COVID19 on the financial market, the existing empirical studies have provided an exciting result. Baret et al. (2020), in their research on financial markets and banks, have found that there is a fall in the share of oil, equity, and bonds throughout the world as a result of the COVID19 pandemic. Social distancing measures adversely affected the productivity of the companies and brought about a decrease in revenue, higher operating cost, and also cash flow challenges to the companies. In Europe, the Financial Times Stock Exchange 100 index witnessed a sharp 1 day fall since 1987 (BBC News, 2020). Igwe (2020) is of the view that the shock from this pandemic can increase the volatility that can negatively affect the economic and financial system of every country. Most of the developed and developing countries' financial markets are adversely affected by this unexpected pandemic. The leading economy of the world, the US stock market hit the circuit breaker mechanism four times in 10 days in March 2020 (Zhang et al., 2020). The stock market of Europe and Asia has also jumped. The United Kingdom's leading index FTSE has fallen more than 10% on March 12, 2020 (Zhang et al., 2020). Vishnoi and Mookerjee (2020) observed that the stock market in Japan had dropped more than 20% in December 2019. The stock market of Spain, Hong Kong, and China also declined to 25.1, 14.75, and 12.1% in their price from March 8,

2020 to March 18, 2020 (Shehzad et al., 2020). In his study, also found a harmful impact of the COVID-19 on stock returns of the S&P 500 and an inconsequential impact on the Nasdaq composite index. Georgieva (2020) pointed out that the COVID-19 pandemic brought the entire globe near to financial crises more hazardous than Global Crises 2007–2008.

Gradually the worst effect of the pandemic spread to the emerging economy too. If we consider the financial market of the emerging economy a gloomy picture caught our eyes as this economy is the worst-hit by the collapse of oil prices. The outbreak of the COVID-19 pandemic makes this picture more critical. The top leading emerging economies such as Brazil, Russia, and Mexico gradually moved toward hard mobility restrictions that will bring down the emerging economies to a recession of 1% in 2020 (Herfero,). In South Korea, the Coronavirus disease caused KOSPI to drop below 1,600 in their history after 10 years (So, 2020). In China, higher uncertainty due to COVID-19 results in greater volatility of stock return (Leduc & Liu, 2020). The government of India announced Janata Curfew on March 22, 2020 and a lockdown policy to maintain social distancing practices to slow down the outbreaks from March 24, 2020. As the government announced such a lockdown policy, various economic activities have been stopped suddenly. The financial market of India is witnessing sharp volatility as a result of the disruption of the global market (Raja Ram, 2020). As a result of the fallout in the global financial market, the Indian stock market also witnesses sharp volatility. It has also borne the brunt of the COVID-19 pandemic.

There are two major stock indices in India—Bombay Stock Exchange (BSE), Sensex, and National Stock Exchange (NSE), Nifty. If we look at the Bombay Stock Exchange there is a drop in the Sensex index to 13.2% on March 23, 2020. It was the highest single they fall after the news of the Harshad Mehta Scam, April 28, 1991 (Mandal, 2020). Similarly, Nifty has also declined to almost 29% during this period. Some economists have considered the impact of COVID19 on the Indian stock market as a “black swan event,” that is, the occurrence of a highly unanticipated event with an extremely bad impact. Due to the lockdown policy adopted by the government, the factories have reduced the size of their labor force as well as production level which disrupted the supply chain.

Again, because of the uncertainty prevailing among mankind, people also reduce their consumption habits leading to demand side shock. Studies have also found that the entire previous pandemic had affected only the demand chain. But this COVID19 pandemic has affected both the demand chain and supply chain.

Despite the several literature on the impact of COVID-19 on the stock market of the entire economy, there is limited study on it especially in the case of an emerging economy. To shed light on this aspect, this paper attempts to investigate the impact of COVID-19 on the two important stock markets of India. Glosten–Jagannathan–Runkle (GJR) generalized autoregressive conditional heteroscedasticity (GJR GARCH) model is used to make the study more significant in terms of volatility in stock index prices due to the outbreak of the pandemic and lockdown policy adopted by the Indian Government. Major findings of the study reveal the volatile nature of BSE Sensex and NSE Nifty, the two prominent stock markets of India.

Research Questions

- Do any change in investment behavior witnesses during pandemic?
- Was volatility of Stock market may affected due to pandemic?
- What is different factors influence investment behavior?
- What is impact of retail investors on stock market volatility?

Pandemic Precedence of the Indian Investors

Due to the uneven impact of pandemic on different sectors and categories of the society lead to difference in consumer prospective, the optimistic trend have emerged both in terms of consumption and investment patterns during the pandemic.

The work from home culture resulted in transformation of the consumer behavior, coupled with prioritizing personal and family health which facilitated increase in elective spending and saving money among Indian consumers. Also work from home and lockdown gave the opportunity to investors to analyse their investments and track them which

contributed to in-depth analysis of trading and exploring the new alternatives for creating liquid assets.

Many sectors were benefitted due to paradigm shift in consumer behavior such as pharmaceuticals, telecom, FMCG, Banking, financial services including insurance. This effected positively Indian indices which have recorded optimistic gains from the due to the negative corrections in market in March 2020.

Following the market sell-off, this broad-based equities rally drew in additional retail investors, who were attracted by favorable stock prices. Over the previous financial year, foreign portfolio investors (FPIs) invested Rs 2,74,034 crores in Indian stock markets, which, together with mutual fund inflows of Rs 96,000 crore, helped the Nifty and Sensex to trade well above their pre-pandemic levels and near all-time highs today. In fact, the Rs 9,182 crore SIP mutual fund inflows in March 2021 was the largest in the previous 12 months, indicating a decline in income uncertainty and restored investor optimism.

Apart from equities, a growing number of Indians are diversifying their portfolios to include real estate, debt, insurance products, and gold due to a variety of variables. A combination of decreased pricing in major markets, tax benefits granted by various state governments, and the follow-on effect of WFH culture, which has mandated separate quarters for both working members of a typical nuclear family, have encouraged real estate investments. Many first-time homebuyers are hurrying to close on their dream homes, as evidenced by the rise in sales. Housing loans are now available at rates as low as 6.75 percent, and some state governments are easing stamp duty for registrations.

Due to the cultural and social importance associated with the yellow metal, India has traditionally been a top consumer of actual gold. However, in the aftermath of the pandemic, Indian consumers are looking at alternative investments such as gold exchange traded funds, gold mutual funds, and sovereign gold bonds (SGBs) to take advantage of gold's relative price stability and long-term return potential. Due to the cultural and social importance associated with the yellow metal, India has traditionally been a top consumer of actual gold. However, in the aftermath of the pandemic, Indian

consumers are looking at alternative investments such as gold exchange traded funds, gold mutual funds, and sovereign gold bonds (SGBs) to take advantage of gold's relative price stability and long-term return potential.

According to surveys, more than 70% of Indians are now putting more attention on raising their debt and insurance allocations in order to protect themselves in the event of another pandemic or tragedy in the future. As a result, traditional instruments such as fixed deposits and Public Provident Fund (PPF) have seen an increase in capital allocation, while knowledgeable investors are actively investing in mutual fund debt schemes, which provide a larger return potential than an FD or PPF. Because of increased consumer awareness of the importance of insurance in the post-pandemic era, the general and life insurance sectors have benefited the most. In addition to traditional life and medical insurance products, consumers are also buying home insurance to protect their real estate investments. Both life and general insurance businesses appear to be prepared to benefit from this trend, and their insured bases are expected to grow significantly in the coming years.

Furthermore, as outlined in the Union Budget for 2021, the foreign investment limit in Indian insurance companies has been raised from 49% to 74%, allowing foreign insurance firms to bring in international best practises, technology, processes, and long-term resources to help make insurance more accessible to the masses.

Despite the crushing effects of the first statewide lockdown in March 2020, the Indian economy has recovered stronger than ever, with most high-frequency lead indicators of consumption and investment demand strengthening through the third quarter of fiscal year 2020-21. The low-interest environment has acted as a further stimulant for both private consumption and investment, encouraging more Indians to spend their excess cash in a variety of financial products and asset classes. India presents a potential structural development storey for the next few decades, with a wide representation of attractive and high-return sectors such as technology, healthcare, consumer, and banking on its indices. Long-term prospects for the Indian economy remain bright if inflationary pressures are contained and the

low-interest rate environment is maintained, and investors would do well to remain involved across the many financial markets accessible today

Objective of the study

- (1) Capture the behavior of NSE before and after impact of Covid 19
- (2) Analyze the co-movement of NSE during before and after Covid 19.
- (3) Examine both symmetric and asymmetric volatility of before and during and select the best suitable model to define this volatility

Stock Market Volatility

Stock market volatility refers to risk and uncertainty associated with movement of stock market indexes such as Nifty or Sensex. In finance volatility denoted as σ , when rapid change in price of stock in either positive or negative, is volatility. Volatility can measure in specific time frame with reference to historic prices of stock. Volatility of stock market can be accessed on the basis of past data and other is market price of traded security. There are various models of volatility models i.e. traditional estimators, extreme value estimators and conditional models. With advancement of research that the financial market volatility is time varying and having volatility clustering effect, conditional models came into picture, as unconditional models lost its relevance as compare to conditional models. One of the model that has the ability to model conditional volatility or variance after incorporating these characteristics is Generalized Autoregressive Conditional Heteroskedasticity (GARCH) which was proposed by Bollerslev (1986). heteroscadicity (ARCH) that was given by Engle in 1982, it provides us more flexible approach to understand dynamic structure of conditional variance (Chou, 1988).

EGARCH was promulgated by Nelson in 1991, TGARCH was bring out by Zakoinin in 1994, GJR-GARCH by Glosten, Jganathan and Runkle in 1993. The GARCH processes are generalized ARCH processes in the sense that the squared volatility is allowed to depend on previous squared volatilities, as well as previous squared values of the process.

SYSTEMATIC LITERATURE REVIEW

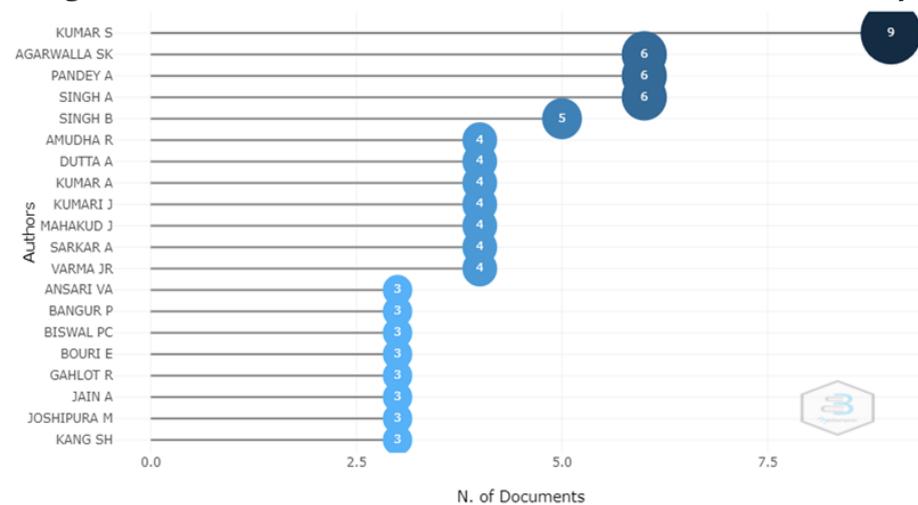
Table I: Main Information

Time span	2003-2021
Sources (Journals, Books, etc)	136
Documents	297
Average years from publication	4.89
Average citations per documents	6.067

Table 1 showing study conducted on stock market volatility, it showing most of study conducted during

2003 to 2021, in total 433 works done at the rate of 4.89 publications per year.

Image 1: Most relevant Author worked for stock market volatility



Chou (1988), a study conducted in the US market for the period 1962 to 1985 for determination of volatility and risk aversion scenario with help of GARCH model. Uncertainty was there in 1974, that causes the markets to plunge causing increase in volatility by 26%. Lamoureux and Lastrapes (1990) in their study contributed to the empirical evidence in usage of ARCH to capture the heteroskedasticity in stock returns. Conclusions found to be valid in the cases of analyzed stocks and this study further paved the way for the employment of ARCH and GARCH models in studying behavior of asset prices.

Blair et al. (2002) made comparative study of the S & P100 index and all its elementary stocks by estimating ARCH and TARARCH Model, with conclusion that a

majority of stocks have larger volatility response for negative returns compare to positive returns. Deb et al. (2003) did predictive analysis for the monthly responses of market indices and its volatility for BSE and NSE volatility Indian capital markets using eight different univariate models. Out-of-sample forecasting performance of these models shows that GARCH (1, 1) model outperforms the other models.

Ng and McAleer (2004) used simple GARCH (1, 1) and TARARCH (1, 1) models for testing, estimation and forecasting the volatility of daily returns in S&P 500 Index and the Nikkei 225 Index. Their empirical results indicate that the forecasting performance of both models depends on the data set used. Karmakar (2005) used conditional volatility models to estimate

the volatility of 50 individual stocks of Indian stock exchange and observed that the GARCH (1, 1) model gives fairly good forecast. Pandey (2005) showed that extreme value estimators perform better than the conditional volatility models in the case of Indian stock market. Banerjee and Sarkar (2006) for Indian stock market, observed that the asymmetric GARCH models provide better fit than the symmetric GARCH model, confirming the presence of leverage effect. Magnus and Fosu (2006) estimated GARCH type models for daily returns of the Ghana Stock Exchange Market and found that the GARCH (1, 1) model outperforms.

Trilochan Tripathy & Luis Gil-Alana (2010) has examined the suitability of various volatility forecasting model for National Stock Exchange of India. The data included in the study were the daily closing, high, low and open values of the NSE returns from 2005 to 2008. The study consist five models which were Historical/Rolling Window Moving Average Estimator, Exponentially Weighted Moving Average (EWMA), GARCH models, Extreme Value Indicators (EVI) and Volatility Index (VIX). The model comparison was done on the basis of which models were explained the ex-post volatility well. The study was revealed that the GARCH and VIX models to be the best methods for volatility forecasting based on Wald's constant test. The study concluded that due to low frequency data extreme value models fail to forecast.

Emenike, Kalu O (2010), investigated the volatility of stock market returns in Nigeria using GARCH (1,1) and the GJR-GARCH (1,1) models. Volatility clustering, leptokurtosis and leverage effects were examined for the NSE returns series from January 1985, to December 2008. The results from GARCH (1,1) model show that volatility of stock returns is persistent in Nigeria. The result of GJR-GARCH (1,1) model shows the existence of leverage effects in Nigeria stock returns. Also, the shape parameter estimated from GED reveals evidence of leptokurtosis in the NSE returns distribution. Finally, volatility.

Aastha KHERA & Dr. Miklesh Prasad YADAV (2020), studied to examine and forecast the volatility of the stock exchanges of emerging countries. It is found that the volatility of every stock return can be forecasted. Both ARCH and GARCH terms are

significant in all the cases. Their sum of the coefficients are large enough to denote the persistence of the volatility. The overall persistency of shock is largest in China's stock return and lowest in case of Chile's stock exchange as their parameters sum is highest and lowest respectively. The sum of α_1 & α_2 is less than one ($\alpha_1 + \alpha_2 < 1$) implies the mean reverting GARCH model. Comparing the result of short run and long run shock persistency, it is found that long run shock is more persistent than short run as their α_2 is larger than α_1 .

Table 2: Most Relevant Country's Contribution

Country	No of documents published	Country	No of documents published
INDIA	404	AUSTRALIA	8
USA	24	MALAYSIA	6
FRANCE	14	BANGLADESH	5
UK	14	SAUDI ARABIA	5
TUNISIA	11	BAHRAIN	4

Table 2 showing number of publication on the topic, India is contributed 404 document with maximum 939 citations. University of Delhi and Indian Institute of Management contributed most.

DATA COLLECTION AND RESEARCH METHOD

Data Collection: To study the effect of Covid-19 on market Volatility and its impact on NSE and BSE market, we taken data from website of National Stock Exchange and data taken from March 1 2019 to September 03, 2021, in total 618 observations. Data of Nifty and Sensex taken for trading days i.e Monday to Friday, effect of Saturday and Sunday seen on Monday when market open for trading.

Research Methods: To understand the effect of Covid-19 news and its reaction on Market Volatility, we taken data from March 1 2019, when everything was normal and market volatility can be seen due to others factors.

1. Volatility Clustering- Volatility cluster was checked by plotting graph of log value of Nifty value
2. Arch Effect in Data set – Arch Test conducted on data set
3. To stationary on data set Augmented Dickey-Fuller Test conducted and outcome is shown in data analysis section.

Augmented Dickey fuller test conducted to check the stationary of data set.

Pre Testing on Data Set

1. Volatility Clustering

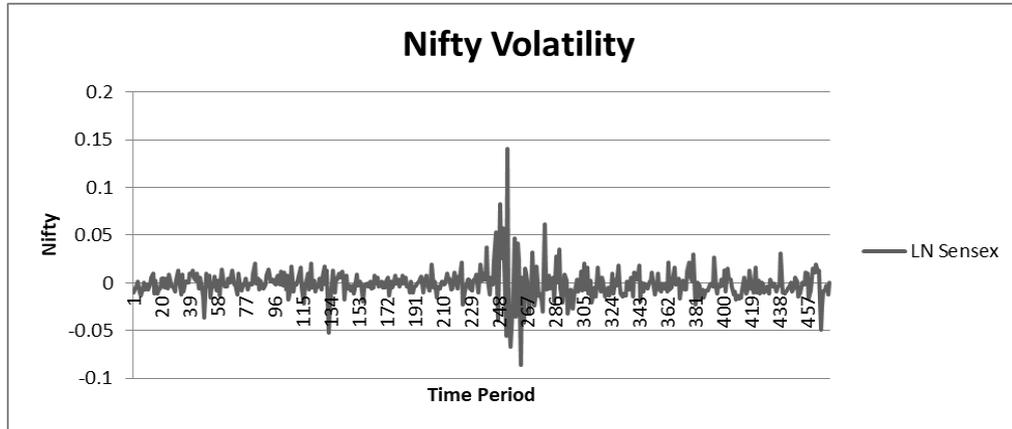


Chart 1: Time period Taken from March 1, 2019 – September 3, 2021

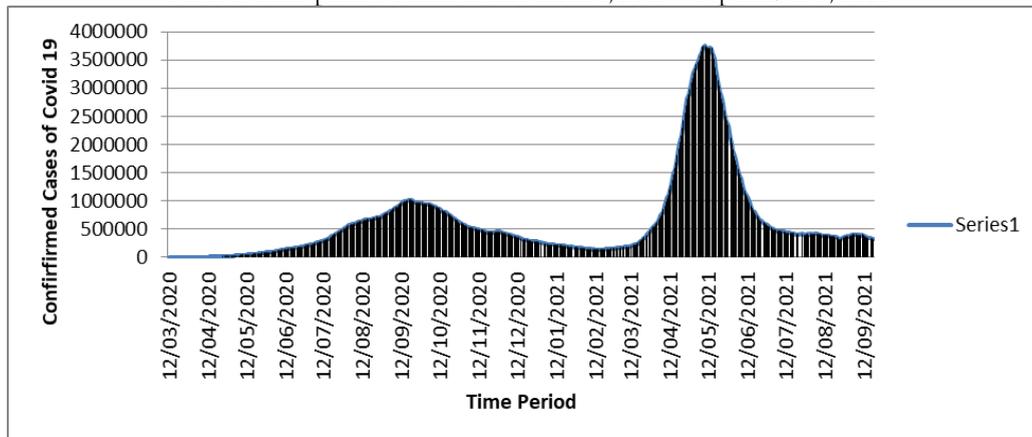


Chart 2: Time period Taken from March 1, 2020 – September 3, 2021

Above graph plot showing number of cases of due to Covid-19 spotted and registered with respect to time period. When we coincide this two above plots we can see volatility clustering in Nifty data.

Hypothesis of Study

H0₁: Nifty has a unit root (Non-Stationary)

H1₁: Nifty has not unit root (Stationary)

Augmented Dickey-Fuller Test

data: $rNifty = \text{diff}(\log(\text{Nifty}))$

Dickey-Fuller = -7.628, Lag order = 8, p-value = 0.01

alternative hypothesis: stationary

H0₂: Nifty has no Arch effect

H1₂: Nifty has Arch effect

ARCH LM-test; Null hypothesis: no ARCH effects

Chi-squared = 208.12, df = 12, p-value < 2.2e-16

GARCH Model - Conditional Variance Dynamics

Coefficient(s): a0 a1 b1
 01 5.276e-06 1.712e-01 8.054e-

GARCH Model : sGARCH(1,1)

Mean Model : ARFIMA(0,0,0) Distribution : normal

LogLikelihood : 1906.626 Information Criteria

Asymptotic Critical Values (10% 5% 1%)

Joint Statistic: 1.07 1.24 1.6 Individual Statistic: 0.35 0.47 0.75

RESEARCH FINDINGS

<p>Optimal Parameters</p> <p>Estimate Std. Error t value Pr(> t)</p> <p>mu 0.001039 0.000323 3.2204 0.00128</p> <p>omega 0.000005 0.000006 0.8057 0.42041</p> <p>alpha1 0.157673 0.029787 5.2933 0.00000</p> <p>beta1 0.817882 0.032386 25.2538 0.00000</p> <p>Mu- Overall Mean of series</p> <p>Omega - is Constant</p>	<p>Robust Standard Errors</p> <p>Estimate Std. Error t value Pr(> t)</p> <p>mu 0.001039 0.001110 0.93568 0.349438</p> <p>omega 0.000005 0.000034 0.14615 0.883800</p> <p>alpha1 0.157673 0.051647 3.05288 0.002267</p> <p>beta1 0.817882 0.247889 3.29939 0.000969</p>
<p>Weighted Ljung-Box Test on Standardized Residuals</p> <p>statistic p-value</p> <p>Lag[1] 0.6958 0.4042</p> <p>Lag[2*(p+q)+(p+q)-1][2] 0.6961 0.6083</p> <p>Lag[4*(p+q)+(p+q)-1][5] 2.9691 0.4127</p> <p>d.o.f=0</p> <p>H0: No serial correlation</p>	<p>Weighted Ljung-Box Test on Standardized Squared Residuals</p> <p>statistic p-value</p> <p>Lag[1] 0.2152 0.6427</p> <p>Lag[2*(p+q)+(p+q)-1][5] 0.5227 0.9541</p> <p>Lag[4*(p+q)+(p+q)-1][9] 1.1222 0.9806</p> <p>Degree of freedom =2</p>
<p>Weighted ARCH LM Tests</p> <p>Statistic Shape Scale P-Value</p> <p>ARCH Lag[3] 0.008068 0.500 2.000 0.9284</p> <p>ARCH Lag[5] 0.334684 1.440 1.667 0.9309</p> <p>ARCH Lag[7] 0.547849 2.315 1.543 0.9739</p>	<p>Nyblom stability test</p> <p>Joint Statistic: 1.2768</p> <p>Individual Statistics:</p> <p>mu 0.1658</p> <p>omega 0.2076</p> <p>alpha1 0.1156</p> <p>beta1 0.1082</p>
<p>Sign Bias Test</p> <p>t-value prob sig</p> <p>Sign Bias 1.9871 0.04736 **</p> <p>Negative Sign Bias 0.8685 0.38544</p> <p>Positive Sign Bias 0.7513 0.45278</p> <p>Joint Effect 4.0064 0.26077</p>	<p>Adjusted Pearson Goodness-of-Fit Test:</p> <p>group statistic p-value(g-1)</p> <p>1 20 45.10 0.0006628</p> <p>2 30 61.73 0.0003748</p> <p>3 40 67.51 0.0030907</p> <p>4 50 85.79 0.0009019</p> <p>Elapsed time : 1.062779</p>

Conditional SD (vs |returns|)

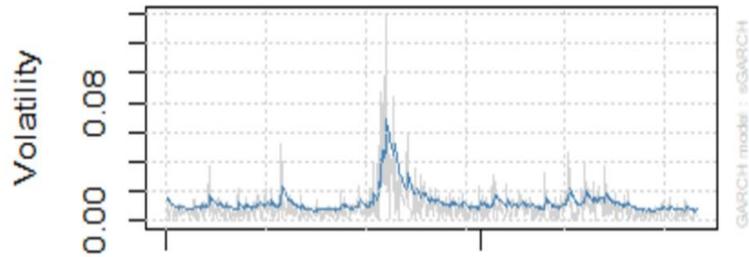


Image1: Conditional SD graph

Standard Conditional Standard deviation Curve is time varying and its showing the variation in Nifty

data Clearly visible. News Impact Curve – It showing Symmetrical GARCH mode

News Impact Curve

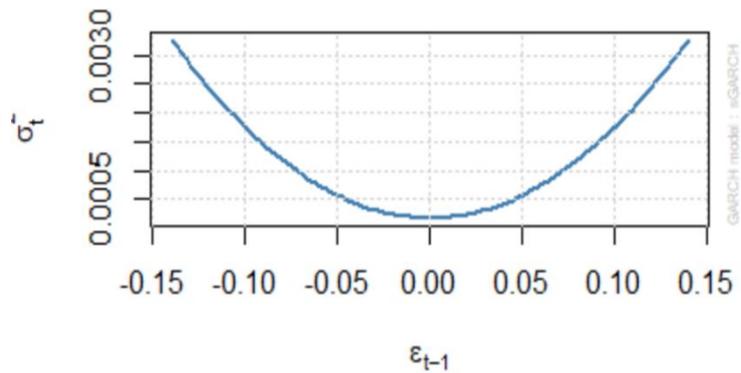


Image 2: News Impact Curve

To check the Covid-19 effect Taken Covid-19 as Dummy Variable and regression analysis taken Nifty as dependent variable.

Null Hypothesis: LN_NIFTY has a unit root

Lag Length: 0 (Automatic - based on SIC, maxlag=17)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-23.31299	0.0000
Test critical values:	1% level	-3.444009	
	5% level	-2.867457	
	10% level	-2.569984	

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LN_NIFTY)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_NIFTY(-1)	-1.073102	0.046030	-23.31299	0.0000
C	-0.000925	0.000717	-1.289794	0.1978

*MacKinnon (1996) one-sided p-values.

Source: Collected from www.nseindia.com and computed using E Views

It is found from the analysis that the selected sample index has obtained high volatility -1.074027 (-1.073102 0.000925) during the study period. That is 106 percent of volatility exist in the selected sample index during

the study period. Hence the hypothesis “The Index price returns of sample indices are not volatile” is rejected.

Heteroskedasticity Test: ARCH				
F-statistic	83.83623	Prob. F(1,469)		0.0000
Obs*R-squared	71.42597	Prob. Chi-Square(1)		0.0000
Test Equation:				
Dependent Variable: RESID ²				
Method: Least Squares				
Included observations: 471 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.97E-07	2.12E-07	3.757102	0.0002
RESID ² (-1)	0.389450	0.042534	9.156212	0.0000
R-squared	0.151647	Mean dependent var		1.31E-06
Adjusted R-squared	0.149839	S.D. dependent var		4.82E-06
S.E. of regression	4.44E-06	Akaike info criterion		-21.80754
Sum squared resid	9.25E-09	Schwarz criterion		-21.78990
Log likelihood	5137.677	Hannan-Quinn criter.		-21.80060
F-statistic	83.83623	Durbin-Watson stat		1.909313
Prob(F-statistic)	0.000000			

P value is less than 5% of value thus Covid 19 significantly affected volatility of trading in NSE and this impact was reflected in Nifty index.

FINDINGS OF STUDY

Graph chart of log return series of Nifty showing volatility clustering having fat tail with highly leptokurtic.

Augment dicker fuller test was applied to check and verify stationary or presence of unit root p value is less than 0.05, null hypothesis was not accepted means series is stationary. Arch Test results showing p value is less than 0.05 thus null hypothesis was not accepted, means Nifty series had Arch effect.

To knowing the order of GARCH Model, its result shown that GARCH model of order (1,1) and symmetrical GARCH or standard GARCH estimated.

In GARCH Model- Alpha 1 and Beta 1 is positive, it was showing that if any news in the market is significant, means this news had significantly affected volatility.

Standard Conditional Standard deviation Curve is showing time varying and the variation in Nifty data, it was clearly visible in Curve. News impact curve depicting that what was news in the market it was captured and its showing symmetrical volatility, means its showing variation on both whether positive or negative news it was equally captured.

To check and verify the impact of news on Covid-19 and its impact on Nifty index, we were conducted regression analysis as taken number of Covid-19th cases registered as Dummy Variable and Nifty as dependent variable.

It is found from the analysis that the selected sample index has obtained high volatility -1.074027 (-1.073102 0.000925) during the study period. That is 106 percent of volatility exist in the selected sample index during the study period. Hence the hypothesis "The Index price returns of sample indices are not volatile" is rejected.

CONCLUSION

Stock market volatility refers to the risk and uncertainty associated with the movement of stock market indices such as nifty and stock market. Volatility can measure in specific time frame with reference to historic prices of stock. There are various models to study volatility of share market such as traditional estimators. To analyze the impact of Covid-19 and Indian stock market systematic literature review was also done as it was showing most of the study was done during 2003-2021 with total 433 works done at the rate of 4.89 publications

per year. Most Relevant Country's Contribution was from India where the major contribution was by Author S.Kumar. During the pandemic Indian investors were very optimistic as there was the transformation of the consumer to work from home culture and they were utilizing the time to analyze their investments. Due to a variety of factors, Indians are diversifying their portfolios to include real estate, debt, insurance products, and gold. To take advantage of gold's relative price stability and long-term return potential, Indian consumers are turning into alternative assets such as gold exchange traded funds, gold mutual funds, and sovereign gold bonds (SGBs).

Therefore the study was conducted to analyze the impact of COVID - 19 on Stock Market with specific reference to National Stock Exchange. Result from the GARCH (1, 1). The impact of COVID - 19 and higher amount of equities been sold significant impact on index in India. Hence with the results of all the analysis it can be understood that the COVID-19 in India made an adverse impact in automobile sector during the study period. The sudden fall of stock values affect the industry manufacturing process and it has been influenced the stock market for a period and it may recover soon with optimum potential.

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- <https://groww.in/p/volatility/>

COVID-19: Global Macroeconomics

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ABSTRACT

The Corona Virus (COVID-19) outbreak has already brought human suffering and major economic disturbance. While the world economy was predicted to grow by 3.3% in 2020, after having experienced a 2.9% growing in 2019, the irruption of the COVID-19 has distressed the world and imposed an epoch-making shock on the fragile condition of the world economy. In order to better understand expected economic outcomes, this paper investigate different Macroeconomic scenarios of how Corona Virus might evolve in the coming year using a molding technique formulated by McKibbin and Lee (2003) and prolonged by Sidorenko and McKibbin (2006). It analyze the impacts of various scenarios on macroeconomic outcomes and financial markets in a worldwide hybrid DSGE/CGE general equilibrium theory. The study concludes the possible costs that can be prevent through global cooperative investment on public health in improving the quality of life and as a operator of economic growth.

Keywords: COVID-19, Macroeconomics, DSGE, Global Economy

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INTRODUCTION

World are facing health crisis unlike any in the 75-year history of the United Nations -one that is spreading human suffering, killing people and upending lives of people. The corona virus disease (COVID-19) is attacking societies at their core. The IMF has just reassessed the expectation for growth for 2020 and 2021, declaring that we have move into a recession – as bad as in 2009. The IMF expected improvement in 2021 only if the global countries succeeds in incorporate the virus and take the necessary economic measures. In the look of such an

unprecedented condition in recent history, the creativeness of the effect must match the specific nature of the crisis – and the importance of the effect must match its scale. No country will be able to exit this situation alone. Whole world must come together. Every nation must step up with public and private collaborating from the outset. But on their own, national-level activity will not match the global scale and complexity of the crisis. This moment demands integrated, crucial, and innovative policy activity from the world's leading economic and maximal financial and technical assistance for the poorest and most vulnerable people, who will be the hardest hit. Given the world's large economic and

social interrelation and trade— we are only as strong as the anaemic health system.

This paper seek to quantify the expected global economic costs of COVID-19 under different possible premise. The goal is to provide message to policy makers to the economic benefits of globally-coordinated plan of action responses to tame the virus. The paper used the world macroeconomic theory (G-Cubed) for the study, highlighting its capability to assess the macroeconomics of diseases and describes how macroeconomic sectors focused to develop a series of economic impact that are input into the world economic model and concludes the paper sum-up the main findings and discusses some policy implications.

THE HYBRID DSGE/CGE GLOBAL MODEL

The researcher apply a global intertemporal general equilibrium model with heterogeneous agents known as the G-Cubed Multi-Country Model. This is a composite of Dynamic Stochastic General Equilibrium (DSGE) and Computable General Equilibrium (CGE) Models developed by McKibbin and Wilcoxon (1999, 2013). The approach corporate in the G-Cubed model is registered in McKibbin and Wilcoxon (1998, 2013). Different key features of the standard G-Cubed model are worth highlighting here.

First, the theory entirely accounts for framework and flows of physical and financial possession. For example, budget deficits accumulate into government debt and current account deficiency accumulate into foreign debt. The model imposes an inter temporal budget constraint on all households, firms and countries. Thus, a long-run stock balance acquire through the improvement of asset prices, such as the interest rate for government fiscal opinion or real exchange rates for the proportion of payments. However, the improvement towards the long run balance of each economy can be slow, occurring over much of a time period.

Second, firms and households in G-Cubed must use money issued by central banks for all proceedings. Thus, central banks in this theory set short term nominal interest rates to target macroeconomic

outcomes such as unemployment, inflation, exchange rates, etc. based on Henderson-McKinney-Taylor rules. These are planned to approximate potential monetary regimes in each country or area in the model. These monetary concept tie down the long-run inflation rates in each nation as well as allowing short term improvement of policy to smooth move in the real economy.

Third, nominal wages are gluey and adjust over time based on country-specific labor acquiring assumptions. Firms hire labor in each sector up to the points that the marginal product of labor equals the real wage outlined in terms of the output price level of that sector.

GLOBAL EFFECT

Initially, the perceptual experience was that the COVID-19 epidemic would be decentralized in China only. It later dispersed across the world through the movement of people. The economic pain became intense as people were asked to stay at home, and the intensity was felt in different sectors of the economy with travel bans moving the aviation industry, diversion event cancellations affecting the sports industry, the prohibition of mass gathering affecting the events and entertainment industries (Horowitz, 2020; Elliot, 2020). There are parallels between the COVID-19 situation and the events of 2007: as in 2020, many people in the beginning recession assumed the impacts would mostly be localized (in that case based on an disruption caused by COVID-19 is not only devastating but also has spillover implications because it created demand and supply shocks in almost every area of human endeavour (El-Erian, 2020).

Travel Industry

The COVID19 occurrence led the governments of many nation to impose restrictions on non necessary travel to countries affected by COVID-19, emphatically suspending tourism travel, work visas and immigrant visas. Some nation placed a complete travelling ban on all forms of inward or outward travelling, shutting down all airports in the country. At the peak of the coronavirus pandemic, most airplanes flew almost empty due to mass passenger cancellations. The travel restrictions obligatory by governments subsequently led to the reduction in the

demand for all forms of travel which forced some airlines to temporarily suspend dealings such as Polish Airlines, LOT, Air Baltic, La Compagnie, and Scandinavian Airlines. Such travel restraint cost the tourism industry alone a loss of over \$200 billion worldwide, excluding other loss of revenue for tourism travel, and were predicted to cost the aviation industry a total loss of \$113 billion reported to IATA. US airlines sought a \$50bn bailout fund for the US Airline industry alone. The GTBA reported that the business travel sector would lose \$820 billion in revenue due to the COVID19.

Hospitality Industry

Restaurants have been affected during the pandemic primarily through the government declared 'social distancing' and 'stay-at-home policy' movement restriction imposed by the government in many nation. This led to rapid shutdowns in cities and states to control the spread of the coronavirus, which threw restaurants and hotels across the world into sudden shock. Hotels across the world witnessed booking cancellations worth billions of dollars, and the hotel industry sought a \$150bn bailout. Restaurant enforcement laid off staff as they shut down their businesses temporarily as many people stayed at home, choose to eat cooked meals at home. Some restaurant executives criticized governments for imposing the stay-at home and social distancing policy which exterminated many small restaurants and pub businesses in small cities. They argued that governments' announcement of social distancing and stay-at home policies was an indirect way of telling masses not to come to the hotels, pubs and restaurants, which was a way of mutely destroying the hospitality industry during the pandemic. Hotels many counties announced the temporary suspension of normal operations which puts the approximation loss of jobs to 24.3 million globally, and 3.9 million in the US alone due to the decrease in hotel occupancy during the pandemic period. The economic effect of the pandemic on the hotel business was more severe than the 9/11 and 2008 recessions combined.

The Sports Industry

The sports sector was severely affected during the coronavirus occurrence. In the football segment, major European football leagues in England and

Scotland declared the immediate suspension of football matches for 6 weeks until 30th April. The Turkish super league was the last leading European league to suspend its matches. In Formula One, the Monaco Grand Prix was called off. The Tokyo Summer Olympic and Paralympic games were also deferred. The major league rugby (MLR) was cancelled for the residue of the 2020 season. In the snooker segment, the World snooker championship to be held in Sheffield from 18th April to 4th May, was postponed. In the swimming segment, the 2020 European Aquatics Championship scheduled for 11th to 24th in Hungary was postponed until August. In the baseball section, all major baseball league season games were called off in Mexico and Puerto Rico. In hockey, the 2020 hockey games in England was postponed. England's FIH Pro League games scheduled for 2nd to 3rd and 16th to 17th May were postponed. The Motorsport in Portugal was postponed after the Portuguese government declared a state of emergency and suspended all sporting events in the country.

The Oil Price War and the Effect on Oil-dependent Countries

Early in 2020, the oil price fell due to the oil price war between Russia and Saudi Arabia. The coronavirus epidemic worsened the condition through the reduction in the demand for oil products. The imposed travel limitation during the pandemic, which led to a reduction in the movement of people and goods, effect in a fall in demand for aviation fuel, coal and other energy products, which afterward led to a fall in oil price due to low demand. The coronavirus crisis also affected a wide range of energy markets such as the coal, gas and renewable energy marketplace, but its impact on oil markets was more severe because it stopped the movement of people and goods, which led to a drastic decrease in the demand for transport fuels. When Saudi Arabia later provide excess oil to the world, the marketplace was flooded with too much oil, exceeding demand during the COVID-19 pandemic, and afterwards leading to a fall in oil price. The outcome of the pandemic on oil-dependent countries was intense. The global decrease in oil price composed with the low demand for oil products in the international marketplace led to a significant shortage in oil revenue to oil-dependent countries, which enhanced current account deficits

and worse the balance of payment position of numerous oil-dependent countries such as Angola, Venezuela and Nigeria. These countries also faced increasing pressure on their foreign exchange reserves, which afterwards led to the decrease of local currencies against the dollar. Countries like Nigeria, Kenya and South Africa intimate a reduction in the price of petrol in the local gas stations. National budgets were also struck. The sustained decline in global oil price due to the COVID-19 meant that the current national budget became obsolete for most oil-dependent countries, and had to be altered because it did not show the current economic reality since the budget was priced at a higher oil price from 2019. Accordingly, the national budget of some oil-dependent nation ran into large deficits which forced some countries to either (i) seek new budget that was priced using the current low oil price in the global market or (ii) create a foreign loan from the IMF to fund their budget deficits.

Import Dependent Countries

Many import-dependent nation were badly affected during the coronavirus pandemic. Many countries imported their necessary good from major exporting countries and depend mostly on these countries for the consumption of essential commodities that are imported. The decrease in goods flowing through the global supply chain and significant reliance on China for imported goods, led to shortfall of supplies to import dependent nation as China shut down many of its export plant. This led to increases in the price of the leftover stock of imported supplies already in import-dependent country, which also triggered inflationary pressures on the price of basic commodities despite the general low demand for imports due to the coronavirus pandemic. During the coronavirus outbreak, it was challenging to seek alternative imports after China's shut-down because many nation had partly or fully closed their borders which strangled international trade at the time.

The Financial Sector: Banks and Fintech

The macroeconomic slowdown led to a growth in nonperforming loans in the banking sector by 250 basis points. Private sector banks had the highest influence to credit risk during the eruption. Nonperforming loans arose from loans issued to small

and medium scale enterprises (SMEs), tour operators, airlines, hotels, retail, restaurants, construction and real estate businesses. During the epidemic, there was a general decrease in the volume of bank proceedings, a decline in card payments and a fall in the use of ATM cash machines globally. This led to fewer fees collected by banks which negatively affected banks' profits. FinTech businesses were also affected. Some Fin-tech businesses percipient very low patronage by consumers. There was a significant flight to safer spend by consumers, which negatively affected the venture capitalists that funded existing and new FinTech firms. This made many venture capitalists begin to hoard new assets which led to the drying up of financing for some Fin Tech businesses.

The Financial Markets

The most visual outcome of the COVID-19 situation on financial markets was the outcome in the global stock market. Global stock markets lost \$6 trillion in worth over six days from 23 to 28 February, reported by S&P Dow Jones Indices. Between February 20 and March 19, the FTSE 250 index fell by 41.3% (from 21,866 to 12,830), the S&P 500 index fell by 28% (from 3,373 to 2,409), and the Nikkei fell by 29% (from 23,479 to 16,552). In the same time, large worldwide banks witnessed a drop in their share price, for example, JP Morgan Chase's share price fell by 38% (from US\$137.49 to US\$85.30), Citigroup's share price fell by 49% (from US\$78.22 to US\$39.64), and Barclays' share price fell by 52% (from £181.32 to £86.45). Although the oil price war, in which Saudi Arabia and Russia were impulsive down oil price by growing oil production, played a part in the fall in stock markets indices, the consequent fall in stock market indices in March was primarily due to investors' flight to area during the coronavirus pandemic.

The Event Industry

The event sector contributed significantly to the economy prior 2020. In 2018, for example, business events hosted more than 1.5 billion associate across more than 180 countries (Oxford Economics). The circumstance industry create more than \$1.07 trillion of direct spending, produce business events, correspond spending to plan business events, business events-related travel and direct

disbursement by exhibitors. The business also created 10.3 million direct jobs globally and create \$621.4 billion of direct GDP. During the COVID19 occurrence, the events industry was hit financially by a large number of cancellations — evidence, conference, live music shows, parties, weddings, brand launches, corporate events, trade shows and more. Several big events were off, for instance, Informa delayed or canceled events worth £400m over coronavirus pandemic. The E3 and SXSW tech events were canceled which led to direct losings beyond \$1 billion. The 2020 Met Gala was postponed emphatically. In the US, many big event governance institution that were hit financially by the coronavirus appealed for national aid from the U.S. government. The outcome ticketing segment of the industry was also affected. One of the biggest global ticketing and events company 'Eventbrite' proclaimed that the COVID-19 outbreak materially affected its business mindset for 2020. The effect of the increasing nullification on Eventbrite was so bad that the company had to withdraw its previously published 'positive outlook' for the first quarter of 2020. The effect of the eruption on global live events was worse by the social distancing policy imposed by several governments.

The Entertainment Industry

The global film industry subject a \$5 billion loss during the coronavirus outbreak. Various Hollywood movie productions were postponed. The International Alliance of Theatrical Stage Employees (IATSE) reported that an approximation 120,000 below-the-line diversion industry jobs were lost due to the coronavirus epidemic, most of which were theatrical stage employees. The pandemic shutdown outcome in the loss of 120,000 jobs held by its 150,000 members, and the IATSE advocated that the entertainment industry should be enclosed in the planned federal stimulus (or bailout) package. In Italy, the COVID-19 happening severely affected the entertainment industry which incurred losses approximation to run into the millions of euros per week: from February 23 to March 1, 2020. There were estimated losses of 7.2 million euros in the theater segment, 2.5 million euros in the dance activities segment, 7.3 million euros in the film screening sector, 4.1million euros in the live music segment and 1.8 million euros in the exhibition segment. In the UK, an

figuring 50,000 industry freelancers were expected to lose their jobs as a result of the COVID-19 epidemic according to BECTU (Broadcasting, Entertainment, Communications and Theatre Union). Jointly, unemployment levels in the entertainment business rose to unprecedented highs, and yet there were uncertainty as to whether the entertainment industry would acquire part of the planned federal stimulus bundle as many lawmakers argued that the entertainment industry was not a main driver of the economy, and some present that the entertainment industry does not bring much to economic activities compared to the banking and manufacturing sectors.

The Health Sector

The services of public hospitals grew in high demand but the majority of the testing equipment was in private hospitals. China temporarily closed all health facility in the central city of Wuhan, the epicentre of a COVID19. Iran's hospitals endeavor to cope with the coronavirus eruption. In Spain, government nationalized all private hospitals and healthcare providers as the virus was spreading very rapidly. Singapore had adequate healthcare facilities and workers to deal with the growing number of COVID-19 patients, and private hospitals were invitatory and accepting foreign COVID-19 patients. The Ministry of Health (MOH) in Singapore afterwards advised all doctors in public and private hospitals, and private specialist clinics, to instantly stop accepting new foreign patients who do not live in Singapore. The coronavirus eruption also affected the pharmaceutical supply chain. Drug makers around the world trust heavily on component made in Chinese factories. Around 60% of the world's active pharmaceutical ingredients (API) were made in China and the coronavirus outbreak caused severe supply effort as China shutdown majority of its factories including factories that produce drugs. Many pharmaceutical institution did not store up considerable amounts of APIs prior to the coronavirus outbreak, and as a result, some necessary drugs were in short supply. The pharmaceutical companies that had stored up a significant amount of APIs in their warehouse refused to sell them for fear of running out of supplies while others were prepared to sell only at a very high price. The over reliance on Chinese API business posed the biggest risk to the global pharmaceutical industry and

the COVID-19 outbreak enlarge the risk even further. Health insurers were also struck.

Many health insurers in the US could not cope with the insurance payments to hospitals and the insurers sought to be enclosed in the planned federal ease stimulus package as the health sector's economic outlook was negative. The S&P 500 Managed Health Care index fell to 7% in February show that investors felt the health care sector would be badly hit. Moody's rating agency downgraded the nonprofit and public healthcare sector's outlook from stable to negative because of the continuing spread of the coronavirus disease (COVID-19). Moody's reported that the health sector was probable to see lower cash flow in 2020 compared to 2019 and decreasing revenue due to the cancellation of electoral surgeries. The ratings agency also declared that even if the coronavirus outbreak could be restrained, nonprofit healthcare companies were already facing rising cost and widespread uncertainty. Also, investment financial institution that invested heavy in health care force health care companies and medical supply firms to regard ways through which they can profit from the crisis by increasing prices. The effect of the outbreak on the health sector was the growth in the number of deaths due to the short supply of drugs, insufficient number of hospital beds, lack of vaccine to cure the patients, and insufficient isolation centers to cater for the rising number of COVID-19 cases.

The Education Sector

The coronavirus disrupted the \$600 billion higher education. Educators and students around the world felt the rippling effect of the coronavirus as colleges and universities were instructed to shut down after the coronavirus was declared a public health emergency in many nation. There were school closures of some kind in 44 nation on four continents, including Africa, with millions of students around the global facing disturbance. The outbreak had a more terrible consequence on schools that did not have an online learning program. Moody's, a credit rating agency, downgraded the higher education of U.S. outlook from 'stable' to 'negative', because 30% of the colleges and educational institution in the US already had a weak operational performance, and it was challenging for these colleges and universities to adapt with the financial and academic changes needed

to cope with the coronavirus occurrence. Also, UNESCO reported that the COVID-19 eruption disrupted the education of at least 290 million students internationally. Public schools in the US were closed, Australia shut down some schools, while countries like Israel, Italy, Nigeria, France, Egypt and Spain shut down all schools, and this results some form of unemployment for teachers.

Northern Ireland's authorities suspended all examinations in its colleges and universities. Multiple universities in U.S that ran a study abroad program overseas instructed students to return home from France, Italy and Spain as the coronavirus occurrence became severe in those countries. On the positive side, there were proposition that the coronavirus increased the importance of online education and distance learning, but the realism was that only a small percentage of the world's education is taught online. For instance, in the US alone, about 2.4 million undergraduates which is equal to 15% of the total undergraduate students in the US studied entirely online in the fall of 2019. Moreover, few schools had the capability to lay a distance learning program for their students. Finally, countries like UK, Canada, and US combined lost billions in education revenue as foreign students either quit their studies or were sent back home, while other foreign students looked elsewhere for quick education when the travel regulation prevented them from studying in UK, Canada and US during the outbreak.

ECONOMIC FORECASTS

Global Growth

The economic situation remains highly unstable. Uncertainty about the duration and depth of the health crisis-related economic effects are fueling perceptual experience of risk and volatility in financial markets and corporate decision-making. In addition, uncertainties concerning the global epidemic and the effectiveness of public policies supposed to curtail its spread are adding to market volatility. Accumulation the economic situation is a historical drop in the price of crude oil that reflects the global decrease in economic activity, prospects for disinflation, and contributes to the decline of the global economy through various channels. On April 29, 2020, Federal Reserve Chairman Jay Powell

declared that the Federal Reserve would use its “full range of tools” to support economic activity as the Commerce Department according a 4.8% drop in U.S. GDP in the first quarter of 2020. In assessing the state of the U.S. economy, the Federal Open Market Committee discharged a statement indicating that, “The ongoing public health crisis will weigh to a great extent on economic activity, employment, and inflation in the near term, and poses considerable risks to the economic attitude over the medium term.” The Organization for Economic Cooperation and Development (OECD) on March 2, 2020, down its forecast of global economic growing by 0.5% for 2020 from 2.9% to 2.4%, supported on the assumption that the economic effects of the virus would peak in the first quarter of 2020.

However, the OECD estimation that if the economic effects of the virus did not peak in the first quarter, which is now apparent that it did not, global economic growth would change by 1.5% in 2020. That forecast now seems to have been highly optimistic. On March 26, 2020, the OECD altered its global economic predict based on the continued effects of the pandemic and measures governments have adopted to incorporate the spread of the virus. According to the

updated estimate, the current policy measures could reduce global GDP by 2.0% per month, or an yearly rate of 24%, approaching the level of economic decrease not experience since the Great Depression of the 1930s. The OECD estimates in Table 1 will be altered when the OECD releases updated country-specific data. Labeling the projected decline in global economic activity as the “Great Lockdown,” the IMF released an updated prediction on April 14, 2020. The IMF concluded that the global economic system would undergo its “worst recession since the Great Depression, surpassing that seen during the global financial crisis a decade ago.” In addition, the IMF estimation that the global economy could decrease by 3.0% in 2020, before increasing by 5.8% in 2021; global trade is proposed to fall in 2020 by 11.0% and oil prices are planned to fall by 42%, also shown in Table 1 This prediction assumes that the pandemic fades in the second half of 2020 and that the plan of action measures can be turned rapidly. The IMF also declared that many countries are facing crisis like, health, a domestic economic crisis, capital outflows, falling external demand, and a collapse in commodity prices. In accumulation, these various effects are interacting in ways that make prediction difficult.

Table 1. OECD and IMF Economic Forecasts Percent change in Real GDP Growth

OECD March 202				IMF April 2020			
	Projection				Projection		
Countries	2019	2020	2021	Countries	2019	2020	2021
World	2.9%	2.4%	3.3%	World	2.9%	-3.0%	5.8%
Canada	1.6	1.3	1.9	Canada	1.6	-6.2	4.2
Euro Area	1.2	0.8	1.2	Euro Area	1.2	-7.5	4.7
Germany	0.6	0.3	0.9	Germany	0.6	-7.0	5.2
France	1.3	0.9	1.4	France	1.3	-7.2	4.5
Italy	0.2	0.0	0.5	Italy	0.3	-9.1	4.8
Japan	0.7	0.2	0.7	Japan	0.7	-5.2	3.0
Mexico	-0.1	0.7	1.4	Mexico	-0.1	-6.6	3.0
U.K	1.4	0.8	0.8	U.K	1.4	-6.5	4.0
USA	2.3	1.9	2.1	USA	2.3	-5.9	4.7
China	6.1	4.9	6.4	China	6.1	1.2	9.2
India	4.9	5.1	5.6	India	4.2	1.9	7.4
Russia	1.0	1.2	1.3	Russia	1.3	-5.5	3.5

Source: OECD Interim Economic Assessment: COVID-19: The World Economy at Risk, Organization for Economic Cooperation and Development. March 2, 2020, p. 2; World Economic Outlook, International Monetary Fund, April 14, 2020, p. ix.

Before the COVID-19 occurrence, the global economy was struggling to recover a broad-based recovery as a result of the lingering impact of growing trade

protectionism, trade conflict among major trading partners, falling trade good and energy prices, and economic uncertainty in Europe over the impact of the

UK departure from the European Union. Individually, each of these issues conferred a solvable situation for the global economy. Collectively, however, the issues weakened the global economy and decreased the available policy flexibility of many national leaders, particularly among the leading developed economies. In this situation, COVID-19 could have an outside impact. While the level of economic effects will sooner or later become clearer, the response to the pandemic could have a significant and enduring effect on the way businesses create their work forces, global supply chains, and how governments move to a global health crisis. The OECD estimation that increased direct and indirect economic costs direct global supply chains, decreased demand for goods and services, and decrease in tourism and business travel mean that, “the adverse consequences of these improvements for other countries (Non-OECD) are epoch-making.” Global trade, measured by trade volumes, slowed in the last quarter of 2019 and was expected to decline further in 2020, as a result of weaker global economic activity connected with the pandemic, which is negatively affecting economic activity in different sectors, including hospitality, airlines, ports, and the shipping industry. According to the OECD’s updated forecast:

- The impact of these restrictions will be on retail and wholesale trade, and real estate services, and in professional although there are notable differences between nations.
- Business closures could reduce economic output in advanced and major emerging economies by 15% or more, other emerging economies could experience a decline in output of 25%.
- Countries dependent on tourism sector could be affected more, while nations with large agricultural sectors could experience less severe effects.
- Economic effects likely will vary across nations reflecting differences in the timing and degree of containment measures.

In addition, the OECD argues that China’s emergence as a global economic actor marks a epoch-making departure from past global health episodes. China’s growth, in accumulation with globalization and the interconnected quality of economies through supply chains, capital flows, and foreign investment, amplify

the cost of containing the spread of the virus through isolation and restrictions on labor mobility and travel. China’s global economic function and globalization mean that trade is performing a role in spread the economic effects of COVID19. More broadly speaking, the economic effects of the pandemic are being dispersed through three trade channels:

- Directly through supply chains as decreased economic activity is distributed from intermediate goods manufacturer to finished goods producers.
- As a result of a drop whole in economic activity, which decrease demand for goods in general, including imports; and
- Through decreased trade with commodity exportation that supply producers, which, in turn, bring down their imports and negatively affects trade and economic activity of exporters.

POLICY IMPLICATIONS

The first step is to climb the most robust and cooperative health effect the world has ever seen. Health system disbursal must be scaled up right away to meet urgent needs and the surge in demand for tests, expanded attention facilities, adequate medical supplies and more health care workers; and for health system readiness and response in countries where the virus has not yet apparent or where there is no community transmission to date. The strongest activeness must be furnish to the multilateral attempt to conquer transmission and stop the pandemic, led by the World Health Organization (WHO), whose content must be fully met. Scientific cooperation in the search for a vaccine and effective medicine must be promoted through drive such as the WHO sponsored commonality trials. Universal approach to vaccines and treatment must be assured, with full respect for human rights, gender equality and without stain.

The second step is to do everything attainable to cushion the knock-on effects on millions of people’s lives, their support and the real economy. That means the direct supply of resources to support workers and households, scale-up of social protection, provision of health and unemployment insurance, and support to

businesses to prevent bankruptcies and massive job losses. That also means scheming fiscal and monetary responses to assure that the burden does not fall on those nation who least can bear it. A large-scale, interconnected and comprehensive joint response amounting to at least 10 per cent of global GDP is needed now more than ever. This crisis is genuinely global. It is in everyone's involvement to ensure that developing countries have the best chance of managing this crisis, or COVID-19 will risk becoming a long-lasting constraint on economic recovery.

The third step is to acquire from this crisis and build back better. Had we been farther advanced in gathering the Sustainable Development Goals and the Paris Agreement on Climate Change, we could better face this situation - with stronger health systems, a healthier natural environment, less gender inequality, fewer people living in extreme poverty, and more resilient societies. We must seize the possibility of this crisis to strengthen our seriousness to implement the 2030 Agenda and the 17 Sustainable Development Goals. By making progression on our global roadmap for a more inclusive and sustainable future, we can better act to future crises.

CONCLUSIONS

This paper has conferred some preliminary estimates of the cost of the COVID-19 eruption under seven different scenarios of how the disease might develop. The goal is not to be determinate about the virus outbreak, but rather to provide information about an extent of possible economic costs of the disease. At the time of writing this paper, the chance of any of these scenarios and the range of arguable alternatives are highly uncertain. All major countries need to take part actively. It is too late to act once the disease has taken hold in many other nation and attempt to close borders once a epidemic has started. There needs to be immensely more investment in public health and development in the affluent but also, and especially, in the poorest countries. This study point the possible costs that can be confront through global cooperative investment in public health in all countries. This critical policy engagement for decades, yet politicians continue to disregard the scientific evidence on the role of public health in rising the quality of life and as a operator of economic growth. The recession which many countries intimate was a reflection of the

difficult choice that policy makers had to make in pick out whether to save the economy before saving the people or to save the masses before saving the economy; many countries chose the latter. There were criticisms that the policies were immature or insufficient, too fast, and that the policies deviate one another in some areas, for instance, the accommodating monetary policy encouraged economic agents to engage in economic activities while the lockdowns and social distancing (stay-at-home) policy ventilated economic activities from taking place. Finally, the coronavirus-induced public health situation created an opportunity for many governments to make permanent reforms in the public health sector.

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Microeconomic Impact of COVID 19: Global Perspective

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ABSTRACT

Pandemic as it is known and used has a more devastating effect compared to just diseases outbreaks which affect a portion of the globe. For pandemic in terms of its very nature was complex as it used to be an unknown ailment that defies known medical knowledge and therefore demands immediate research and intervention so also commitment on the part of states in order to curtail its spread, effect and come up with antidotes and vaccines to ameliorate its devastating consequence. Also resources and efforts need to be channeled properly and be utilized to counter the scourge. Since December 2019, the world health governing body of the United Nations –the World Health Organization (WHO) received the information of an infectious disease linked to the viruses identified with some types of common cold and flu such as the Severe Acute Respiratory Syndrome (SARS) and Pneumonia which was discovered in Wuhan of the People’s Republic of China- then referred to as 2019-n Cov, later renamed COVID 19 as Co-stands for Corona; Vi for virus and D for Disease. While 19 denotes the year it was discovered. Following these development, COVID 19 continue to spread to the extent that no part of the globe is immune from it. Thus, the Socio-economic impact is being felt as individuals rights were restrained and social gatherings were prohibited which in-turn slow down economic growth and development generally as: opportunities for individuals were narrowed, many businesses collapsed, jobs were lost, savings halted, dis-investment, low purchasing power of essential commodities, poor family health, and profits depletion and sometimes losses. It is in the light of the above issues aforementioned this paper would focus as the effect of the pandemic at the microeconomic level is concerned.

Keywords: Collapse of Businesses, Poverty, Poor Health, Low Purchasing Power, Non-investments and Poor Savings

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INTRODUCTION

The China's province of Wuhan (Zhu et al., 2020) was the first place on the earth where symptoms relating to common cold which were later diagnosed as not the known cold but, rather, a different disease not fully understood and therefore categorized as Pandemic - since its sudden spread is spontaneous and if proper care is not taken to arrest the situation could wipe out a proportion of the earth's population. The fear among the other foreseeable sorrows regarding the new pandemic, led to the widespread intellectual and careful scientific investigations and analysis in health sciences and in epidemiology in particular with the aim to put halt to its spread and treat those infected so also prevent the rest of the world who have not yet contacted the disease. The outcome of such endeavour was the discovery of another form of respiratory disease called COVID 19. Most people infected with COVID 19 Virus will experience mild to moderate respiratory illness and to some extent young people may not require treatment to combat the disease; while older people and those with underlying medical health problems such as: heart diseases, diabetes, cancer and other respiratory tract infections are more likely to develop serious illness and so often may die as a result (WHO, 2021). So, in view of the above scenario, immediate proactive measures and advises were put forwarded and popularized so as to contains the situation. Apart from report to health authorities of any suspected case of the disease, the general public was enjoined to take actions as: hands washing on regular intervals, using sanitizers and antiseptics on public places like handles in a stairs and others, avoidance of crowd and social gatherings, and to practice respiratory etiquettes. For example: to cover your nose and mouth with cloth material when coughing or when one sneezes in public or coughing into a flexed elbow (WHO, 2021) as the virus could be spread through easily.

Therefore, under listed and discussed hereunder were some of the microeconomic impacts of COVID-19 as thus: Time Demand of the Health Personnel and Collapse of their Businesses

As it was well known by all those who are within the working age group that time was the most economic scarce resource at the micro-economic level; and perhaps without it we cannot accomplish our life's

tasks. So, with the outbreak of COVID 19, the time demand on the part and duties of the health personnel in order to tackle the pandemic was increased by the authorities and other private health operators in the sector. For instance, there was a total number of 69807 medical staff in central areas of Wuhan Province (Zhang et al., 2020) were engaged actively to deliver information on the early symptoms of the disease. These number of health personnel were denied ample time to see to their personal business, which in turn serve to counter balance the financial deficits that cannot be met simply by serving under any organization.

This limits their opportunities as vibrant economic drivers in the localities, as some of the personnel came out of the pandemic bankrupted and down financially to the extent that meeting one's needs seems to be a distant objective considering the time and effort made in the past to source the capital to start over the business again. This was not to suggest that the pandemic was peculiar to China only but also in European countries as evidence of workload on health workers especially nurses whose duties was doubled many times over. For in Belgium, COVID-19 significantly increases the nursing time in the intensive care unit and the ideal nurse to patient is close to 1:1 as oppose to the regulation of 1:3 as recommended by the health policy (Arnaud et al., 2021). Also nurses are required to maintain shifting duty after more than 10-12 hours per day. Therefore, this has clearly shown that COVID-19 patients require more time in the activities of monitoring and the time spent on each patient during the pandemic, and had sapped the nursing attendants' time which could be put to other productive economic venture instead (Arnaud et al., 2021). The effect of such time demanding due to the pandemic was that; some of the local pharmaceutical stores were owned and operated by these nurses and other lower and middle level health personnel. And due to that they could not have time to offer services and continue to ensure supply of stocks which is the basic of the business which finally could lead to collapse of their businesses.

JOBS LOSSES, RETRENCHMENT AND POVERTY

Jobs and employments are central and remain the basic means of sustaining families' in terms meeting daily needs and wants socially. Not only families and individuals rely on it for their existence, but also it promotes the sense of dignity and prestige in the society to employers and employee as well. However with the surge in the COVID-19 pandemic, some businesses and enterprises were forced to halt operations as a way to curtail its spread. Therefore, the resultant consequence was that as the businesses tend to record lower profits and sometimes no profit at all; the employers resorted to reduce the number of the employed so as to minimize profit losses. For according to the world economic monitoring bodies such as the International Labour Organization (ILO), World Bank and International Monetary Fund (IMF) analyzed the situation of job losses during COVID-19 and put it forward as:

Global unemployment increased by 33 million in 2020, with the unemployment rate rising by 1.1 percentage points to 6.5 per cent. While 81 million workers quit the ranks of labour markets altogether, and millions of enterprises were forced to close or sharply curtail their activities (ILO., 2021).

From the above statement, it is enough to see the impact of the Pandemic as many people were retrenched due measures imposed by the authorities in order to curtail the spread of the virus, this action by many enterprises and businesses did not only spelt poverty in the society, but also widen the gap of inequalities due to ones economic status as global labour income decline by 8.3% which amounts to US \$ 3.7 trillion and is equals to 4.4 % of global GDP (ILO., 2021).

In the field of businesses, most hit by the pandemic were sole proprietorship businesses. That is not to suggest that other group businesses were immune from the situation. For instance: the lockdown had caused many travel and hospitality businesses to close shop; as most hotels that closed counted losses for maintenance, while staff, most of who are breadwinners were laid off. According to an account of one employee who was a chef in one of the five star

hotels in Abuja, the Nigeria's capital city, he lamented that: I was laid off unexpectedly after I was paid march salary (Ayoade., 2021). While some organizations cut the number of their employees and the few that remained had their salaries slashed (Ayoade, 2021).

It is evident to say that small firms and medium enterprises have gone out of business. For instance; the Chinese small and medium businesses witnessed an estimated exit of about 18% of businesses between February and May 2020 and which account for about 14% of total employment (ILO et al., 2021). Out of such proportion, women and youth whom constitute majority of the bulk within the class experienced sharpest drop in disposable income.

Other parts of the world such as in Africa, it was reported that as a result of job losses and lockdown due to Covid-19 pandemic there was rising food and consumables prices which worsened due to lack of functioning social security system to bring succour to many families through cash transfers and food handouts as epitomized by Aniete Ewang, a Human Rights Watch researcher on Covid-19 who stated that: 'with people battling everyday for survival, the pandemic has highlighted the critical need for a functioning social security system...'. Such analysis was affirmed by the World Bank forecast in January 2021 which stated that 'the Covid-19 crisis will result in an additional 10.9 million Nigerians entering poverty by 2022 (HRW, 2021).

POOR HEALTH

Good health care and delivery services are so central to the development of society and economy as well. Whereas, poor health condition of individuals especially workers will affect production quality and efficiency in the economy generally.

In regards to Covid-19 pandemic, due to international trade restrictions and work from home policy, many consumable products were allowed to be marketed and consumed globally including foods and drugs which have a direct consumer effect on health and well being of people. And in such a situation, fake, counterfeit and unwholesome products find their ways into homes and perhaps the only easily accessible product available during the scourge. The

resultant consequence of the situation was the decline in health status of people generally, and especially those above 65 years of age and the vulnerable toddlers. This was due to the suspension of some of the quality control measures in the actual production, packaging and transportation. For instance: the United States agency for Food and Drug Administration FDA-the highest authority in food and medicine safety, during the time of Covid-19 pandemic announced that it would suspend the inspection of manufacturers (Nutrition., 2021), and this has affected the quality of consumables and imported raw materials and in turn such items could be widely circulated and consumed by the public as was noticed that during the period that: there was a high volume of fake and substandard medicines especially in developing countries and those products could lead both directly to further illness and death (OECD and EUIPO., 2020). Based on this, an estimated total of value of counterfeit pharmaceuticals traded worldwide to be as much as EUR 4.03 Billion (OECD and EUIPO, 2020). To show the reality of this statement, there were reports of several deaths during the pandemic in the northern Nigeria's business hub-city, Kano (Oyimye, 2020). Though some part of the report was not accepted by the general public, but there is validity to suppose that fake drugs in circulation during the pandemic were responsible for the health complications leading to the deaths of many aged persons in the state.

Not only that, those in processing and manufacturing sectors by the provisions of the law were enjoined to maintain some level of personal hygiene and health status, but ironically some of them feared that if they disclosed their true health status to the employees, they may end up losing their job which may result in many of them not able to feed their families or save for investment.

On the part of the health workers themselves, due to their overexposure to Covid-19 patients and lack of safety measures in place, some of them became infected with the disease (Covid-19) and some of them were not able to survive it and they eventually died. Report of the World Health Organization (WHO) highlighted the extent to which protecting health workers is key to ensuring a functioning health care in all communities (WHO, 2020).

LOW PURCHASING POWER

Simply put; purchasing power refers to the value of currency expressed in terms of the number of goods or services that a unit of currency can buy (Investopedia, 2021). From the time of the pandemic it was reported that many times people have switched to consuming only the essentials such as: hand sanitizers, detergents, soap base and perhaps cooking gas. Expenses as taxi cab charter, eating in a restaurant and night hangouts were reduced or nonexistent in many parts of the world. These activities were subsided due to loss of jobs, which spelt poverty across families and so often some family breadwinners became frustrated, fall sick and died as a result. This heightened the poverty level and poor living condition across the globe. For instance: the US economy contracted by 32.9% in 2020 as employment fell by 10.4% between February and June. More so, unemployment rate increased to 11.1% from 3.5% of the same year (Barua and Levin, 2020).

The above scenario created a sense of experience not only in the US, but across major economies, as job losses and inflation rate continue to pose threat to many wage earners to the extent that it had tempted them to holding on to their earnings and cut down expenses except when necessary such as rents, food and medicaments; while it has become evident that the magnitude and duration of the pandemic seems to take too long to address. This assertion was aptly highlighted as:

The economic impact of COVID-19 continue to constrain food access for poor households in urban and rural areas across the region, primarily due to a decline in household purchasing power resulting from the loss of formal and informal employment, declining remittance, and above average staple food prices (USAID, 2020).

From the above, it is clear that job losses during the pandemic, industries closure, panic buying and above all inflation of staple foods coupled with individuals thrifty spending contributed immensely to limit the amount of money in circulation, and therefore low purchasing power which transformed to economic hardship at the microeconomic level.

LOW INVESTMENT AND SAVINGS

Savings and investment of capital are the cardinal principles upon which many working age group relied on for meeting their short and long term plans as their earn income is concerned. This idea revolves around three cardinal principles as thus: spending, saving and investment (Shashikant, 2020). However with the surge of Covid-19 pandemic, these cardinal principles were shook right from its very foundation, as families and individuals within the working age group neither prepare nor ready for emergencies like pandemic which swept far across the world societies and affected their means of sustenance and financial plans.

For this reason, job losses and pay cuts result in non-savings financially as many families continue to struggle to meet basic necessities as inflation rate and panic buying in preparation for the lockdown and restrictions had devalued the currency and the purchasing power was lessened. More so, it was reported that most individuals save a lot during the pandemic, but all the way investment in stocks, bonds and shares so also in consumer goods purchases were relatively low; as there was the fear on how long has the lockdown will go coupled with the uncertainty in the magnitude and duration of the pandemic which deterred many of those who have capital to hold on to their capital.

In the raging situation of the Covid-19 pandemic, once a drastic change in the pandemic is discovered, investors go through the search engines to make quick and swift decisions. It was learnt that during severe market turbulence, investor's attention to the stock increases substantially, and to avoid risks some investors divert their stocks and interests to a less risky stocks so as to ensure returns (Gozgor, 2021). Subsequently, epidemic stocks related to the pandemic assures quick returns in most search engine results such as Baidu and Google search engines (Gozgor 2021) and (Jiang, 2021). So, stocks and medical investments related to the pandemic were most sought for and did not register shocks compared to crude oil markets which continue to dwindle and slipped to about less than \$29 per barrel during the Covid 19 pandemic.

CONCLUSION

In view of the foregoing financial and economic uncertainties as a result of Covid-19 pandemic, it could be learnt that unforeseen financial and economic meltdown could be contained with proper financial discipline and advice to families and individuals so as to curtail, mitigate or even avoid some of the negative impact it might have cause. Not only that, economically wise, fortunes could be made from such pandemics and financial shocks no matter the situation especially through investing in related business as it has shown that some pharmaceutical giants as Johnson & Johnson, Pfizer, AstraZeneca, Sputnik V et. al- have registered huge profits as a result of their investment in health related medicaments for the treatment and preventive purposes of the Covid-19 Pandemic.

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A Comparative Study of the Microeconomic Impacts of COVID-19 Pandemic

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ABSTRACT

One of the most important questions Economists need to answer post covid is the microeconomic impacts of the pandemic. This question is vital because it enables understanding of how firms deal with pandemics in the modern era and more importantly the challenges faced by economies when there is a widespread pandemic and their ways of coping with it. Until recently, there had been very little quantitative testing of the microeconomic impacts of the COVID-19 pandemic. However, the pandemic did have numerous effects such as a rise in scarcity of goods and increased demand for products that were short in supply. As the impacts vary, this paper examines all of them in depth along with contextually interpreting their cause and the approach taken or required in order to reduce their consequences. Further, this paper schemes through a variety of ways by which the global economy struggled and also the policies implemented by countries to fight the microeconomic impacts of the pandemic. To attain this purpose, crude statistics are employed, a brief definition of microeconomic concepts are mentioned and examples are provided for a comprehensive understanding of the topic. Accordingly, the effects also vary in length as some are only short-term and some long-term. Further, the unprecedented crisis also jeopardized many achievements in the global economy-many falling in the micro sector. To analyze all the effects in depth and complement the findings, case studies have also been provided and statistical tools have been employed in order to interpret the data's collected throughout.

Keywords: Microeconomic Impacts, Pandemic, Firms, Modern Era, Economies, Quantitative Testing, Scarcity, Increased Demand, Global Economy

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INTRODUCTION

Unprecedented health crises is a hot-button issue across many of the world's economies, and many governments use health safety as a tool to determine

everything from economic prosperity to citizen satisfaction. However, health is a challenge for all societies, and this became clear with the outbreak of COVID-19. Everything starting from global economic stability to the way economic forces act have been heavily affected by the pandemic, enabling humanity

to discover the impacts of a pandemic throughout an economy. However, the microeconomic impacts of the epidemic have been quite significant since its inception. This part of the economy deals with individual behaviours and decision making mechanisms present in a society and would present a clear picture on how a pandemic can affect the way firms and economic forces interact and the way they tend to allocate scarce resources which play a vital role throughout the economy.

In this perspective, this paper takes an attempt to address the various microeconomic impacts of the COVID-19 pandemic and the varying time lengths for which they took place. Furthermore, analyses have been made to address the continuing difference between each of the impacts of the alongside the required policies that need to be implemented in order to bring back the economy to its original form. Finally, this paper examines the changes in behaviours of small individuals and how it is likely to be relatable in the case of future outbreaks and epidemics.

Key Effects of the Pandemic (COVID-19) on the Microeconomy

- Reduction in the competitiveness of the market- Firms and individual retailers were forced to shut down upon facing large debt and reduced revenue.
- Effects on demand and supply- Reduced production and the willingness and ability to acquire goods have taken place globally.
- Slower decision making- Uncertainty resulting from the pandemic has caused a decrease in the pace at which individuals and market forces make decisions.
- Low investment made by market forces- As there is uncertainty, consumers and producers are unwilling to invest large funds.
- Price fluctuation- Since demand and supply are constantly changing, the prices asked for certain goods are also rapidly changing.

OBJECTIVES OF THE STUDY

- To understand the microeconomic impacts of pandemics and the recent outbreak of the COVID-19.

- To analyze how entities are affected with changed decision making.
- To interpret the effects on consumers and producers of an unprecedented health crisis using statistical tools and measures.
- To examine the effects on reduced international trade on demand and supply.
- To determine the factors that lead to uncertainties amongst entities existing in a market.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

For this study the author refer to the following case studies:

Case I:

John E. Ataguba (April 2020) proposed in the study COVID-19 Pandemic, a War to be Won: Understanding its Economic Implications that the inception of the Coronavirus disease has led to growing concerns and uncertainties. Furthermore, the study referred to Africa in order to determine the microeconomic impacts the region has to deal with post covid. The study summarized that Africa has seen a reduced level of transactions, leading to reduced demand for goods in the market. Hence, production has fallen and it is the underlying problem of uncertainty to blame.

Case II:

Oyinlola Abodunrin, Gbolahan Oloye, Bola Adesola (March 2020) Justified in the study Coronavirus Pandemic And Its Implications On Global Economy that aside from being a health issue, COVID-19 had a thorough impact on all levels of the society and market. A major impact of the pandemic is that it reduces the supply of labor in the market, which contributed to the abatement of production. Overall, this microeconomic impact has also facilitated the unprecedented freefall of the components of aggregate demand.

Case III:

Alexander A. Auzan (April 2020) Found through conducting the study The Economy Under The Pandemic And Afterwards that despite the global economic crisis being undertaken by a shock because of the pandemic, globalization has come to a stoop end. Meaning, export and import has been reduced to a whole new extent, which was not seen since the early times of the Industrial Revolution (1760). As a result, the reduced level of international trade has minimized production and the microeconomy sector has been shaken. Moreover, firms and forces in the market have begun becoming more dependent on the government’s financial interventions. Hence, the way producers, consumers, or any individual makes decisions in the market in the future will be quite different from the recent past and their approaches to investments will be unlike.

DATA REPRESENTATION

To analyze the data available and interpret them to come to a conclusion, the study made use of statistical tools such as bar graphs, pie charts and histograms, as a means of data representation; on the other hand, to evaluate responses, tables are provided.

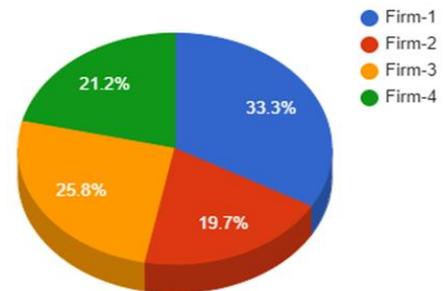
The microeconomic branch is considered to be responsible for studying how human behaviors change and how the market is affected by individual decisions. A major behavioral change followed by the pandemic was the change in the consumer’s expenditure and their pattern of investment. To analyze this change in depth, we need to first firmly scrutinize the stock markets and the changes they had to overcome post COVID.

Undoubtedly, since 2020 the stock market has seen big shifts. Primarily, low investment and reduced level of expenditure is responsible for this change. However, trade between companies and consumers is also something that needs to be considered. Post COVID, trading(including exports and imports) done by companies have plunged, this may also add to the cause behind the reduction in stock trading.

	Company1	Company2	Company3	Company4
Changes in share trading	-17%	-22%	-11%	-13%

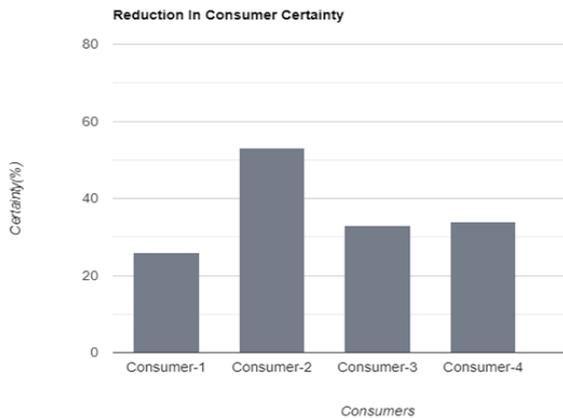
The table above demonstrates the reduction in share trading that took place in four companies. For unbiased analysis, the names of the companies have been kept anonymous. However, each company has seen a reduction in trade of more than ten percent of its usual.

Reduction In Profits Earned By Firms In %



One of the biggest microeconomic impacts of any pandemic is the reduction in profits earned by firms. As discussed earlier, due to increased consumer uncertainty, expenditure in the market has reduced. But to what extent has the reduction taken place?

The statistical tool above is employed to demonstrate the reduction in profit earned by four firms. Each firm had a reduction of approximately 20% or more in their total profits earned. On average, the business entities say profits have decreased by 25% since the inception of the pandemic.



One factor from which the other microeconomic impacts originate is the reduction in consumer certainty. This factor deals with the level of uncertainty that consumers have in a period for which their expenditure in the market abates. To analyze the repercussions of low consumer expenditure in depth, some economic conditions and results need to be first thought of.

In a market, if there subsists less expenditure, it implies that the level of economic activity, meaning trade is low. Hence, aggregate demand will contract and the price level of goods in the economy will reduce. Because the pandemic has made it harder for entities to trade internationally, reduction in national demand means reduced gross demand for them as there exists no other factors in the global economy which can increase the demand for their goods. So, this reduced-price level reduces firms' motivation to increase their output and as a result of the low level of willingness and ability to acquire goods in the economy, firms tend to decrease their supply. All these originate from low consumer certainty and hence this microeconomic impact worsens the economy by different means.

Reduction In production(Gross Output)			
Frim 1	Firm 2	Firm 3	Firm 4
16%	18%	22%	9%

To deeply understand major microeconomic impacts such as reduced sales and business certainties, the extent to which production is reducing in an economy

needs to be first recognized. The table above demonstrates the reduction in sales, or in economic terms by taking account of four firms. It can be seen that each firm saw a reduction in their total output by approximately 10% or more.

This plays a key factor in analysing why profits earned by firms reduced (another key microeconomic impact) and more importantly how many other impacts had risen.

Need for the Study

For years, economists and researchers were concerned about the economic impacts of a pandemic-more so a pandemic in the modern day- and it has been a prevailing issue for individuals in an economy to ponder upon. However, what was often overlooked was the microeconomic impacts of a pandemic and how entities existing in a market would be affected by it. This study, looks over the overlooked and tries to conclude the means by which the microeconomy is affected by a pandemic, especially in this digital era.

Limitations of the Study

While this study does take into account a number of impacts that the pandemic had on the microeconomic sector of the economy, it is safe to assume that there still exists a number of impacts which are not mentioned because of its insignificant nature and little effect on the economy. As a result, it can be inferred that this study has potential limitations. The data interpretations and case studies provided are based on interventional and prospective observational studies. Hence, they may be subject to biases and confounding which may have influenced the conclusions and estimates. The empirical results reported herein should be considered in the light of some limitations; nonetheless, carrying out surveys across the world can be an alternative methodology which can abate the limitations presented.

RESEARCH METHODOLOGY

Both primary and secondary sources form a significant portion of the data provided in the study. In the context of primary sources, the study has used qualitative methods to analyze non-numerical data's

and interviews as a source of collecting non-numerical data's for the first time. On the other hand, secondary sources were collected through articles, online media and interviews done by others.

Research Design

This project is based on exploratory as well as descriptive study. The descriptive research presented is carried out to report about the microeconomic impacts of the pandemic in depth, and the exploratory study is presented to clarify and define the most suitable reasoning behind the causes of the impacts. Overall, exploratory studies have been used as a means of gaining ideas and insights to the topic and descriptive research to come to a conclusion. The uses of the exploratory studies came in the form of first formulating the topic for further investigation; then, building the appropriate hypothesis; next, setting priorities for furthering the research; finally, rising familiarity with the topic and coming to a justified conclusion. On the other hand, descriptive research was also used to come to a justifiable conclusion. It was in the means of setting out questionnaires, personal interviews and observations.

FINDINGS

There is prevailing evidence to suggest that the pandemic-COVID-19- had numerous microeconomic impacts. A significantly indirectly proportional relationship between expenditure and uncertainty exists in economies. Safety is a major factor considered before making investments. Low investment can harm entities in an economy. Crises can have adverse effects on the way decisions are made in the economy. Gross outputs of firms reduce with underlying uncertainty. Profits and income reduce which reduce trade in an economy. Safety of investing on investment schemes plays a big role while individuals invest in a market, and during the pandemic this factor of safety decreases to the extent where entities feel discouraged to employ their funds in the market. Due to fall in income in large, demand for goods in an economy abated, which fluctuated price and hence the overall production in the economy. As the crisis prolongs, entities in the market tend to find ways by which they can return to their original state and increase their chances of making profits and income.

Suggestions

“Covid-19 will reshape our world. We don't yet know when the crisis will end. But we can be sure that by the time it does, our world will look very different.” -- Josep Borrell (High Representative of the European Union for Foreign Affairs and Security Policy)

The covid-19 pandemic is undoubtedly an unexpected torment for the global economy. This prevailing health crisis had numerous effects on our economy; however, it is important that entities pick themselves up and determine how to battle this crisis alongside being able to grow further. Moreover, it can be construed that hard times dawns on the economy on a frequent basis and even though prolonged, entities existing in the economy should prepare themselves accordingly.

CONCLUDING STATEMENT

After the analysis and interpretation of data by the researcher it is concluded that the major microeconomic impacts faced by an economy post COVID (or any other pandemic) are: underlying uncertainty, reduction in demand and supply, constant fluctuation in price, reduced profits and income earned by producers and consumers in the market, changes in share trading. All these merges to play a significantly large role when it comes to the extent to which the microeconomic impacts vary in an economy. Moreover, the effects of each impact differ, which is essential to mention.

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