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Impact of COVID-19 Waves on Indian Derivative Market: Special Reference to Financial Derivative Segment

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Abstract: ***The study tries to investigate the immediate effect of COVID-19 waves on the Indian financial derivative market. The unprecedented waves of the COVID-19 virus have annihilated the financial system of numerous countries in the world. The continuous effect of the COVID-19 affects various sectors in different magnitude and intensity, which produced an unparalleled level of risk. As a result, the market became more sensitive and highly volatile. This study focuses on how the financial derivative segment of the Indian financial market has been affected by the pandemic, in addition to that, a comparative study is also undertaken in the context of the pre and post COVID [1] 19 - period performance analysis of the market. The study is based on secondary source data, which is theoretical in nature and depends on subjective exploration. The results of the study show that the growth of Indian derivative markets' turnover and the number of contracts trading has grown exponentially during the pandemic period. The utility of the financial derivative instruments to hedge the financial assets has increased during the adverse economic condition created by the pandemic. The overall impact of the pandemic on the financial derivatives market was positive.***

Keywords: COVID-19, financial derivative, volatility, pandemic, risk

1. Introduction

The COVID-19 virus was first detected in the month of December 2019 in Wuhan city and starts to spread all over the world within a short period. The unprecedented attack created a deep panic among all human beings and also starts to affect major decisions. Out of that, the financial decisions were affected severely. So in broad, it affected the general behavior of humans. The behavior and approach towards the savings totally changed because the existence of the human being was in danger. In the initial wave and the lockdowns and shutdowns and rising of the death and confirmed cases did not leave any sector to be affected. I9n India the first case was detected in the month of March 2020 after that the financial market showed a bearish trend for several days. A lot of studies undertaken to analyze the impact of COVID-19 on the stock markets of the various countries worldwide and also analyses have taken place to evaluate the effect of COVID-19 on different sectors' country - wise global sense also. But a limited study has been undertaken for scrutinizing the performance of the derivative markets.

India is an emerging economy and the role of the derivative market is enormous. During the period of the pandemic, the volatility of the cash market increased and the study focuses on how the derivative market provides any opportunity through its instrumental advantage to tackle the unparalleled volatility of the market. in the primary phase of the corona, which policy and rule to be applicable and in which way the effect of the COVID can be reduced was unknown to everyone. There were no proper mechanisms and infrastructure which can able to deal with such a huge medical emergency. So the pandemic affected all economic sector as a whole the global logistics and supply chain completely collapsed and the imports and export affected very badly.

The financial derivatives market showed its resilience during the pandemic. Moreover, an uneven bounce of volatility and which leads to mispricing of these instruments often created arbitrage opportunities for the market participants during the pandemic period. Hence Indian derivative market is matured market and all the information as are completely absorbed and shown in the pricing of these financial derivative instruments.

2. Review of Literature

(Emm, Gay, Ma, & Ren, 2022) The paper tries to examine the impact of the recent pandemic on the derivative markets by employing the event study method. The result indicates that the open interest and volume of trading increased rapidly. The interconnectedness of the markets leads to an increase to a greater extent which is the reason why the margin requirement for changes very frequently. This paper also shed additional light on the interconnectedness of the derivative markets during a time of crisis.

(Afrina, Beg, Sayed, Hossain, & Shahi, 2020) The paper investigates how the global financial derivatives market was affected by the COVID-19 pandemic. The paradigm shift in the finical derivative market has taken place during the pandemic period. The effect of the epidemic has on different sectors with different intensities and magnitude.

(He, Sun, Zhang, & Li, 2020) This paper investigates the impact of the COVID-19 on the performance of the Chinese finical market. The industries like mining, transportation, electricity, heating, tourism and environment industries have been adversely impacted by the pandemic.

(Chaudhry, Mehmood, & Mehmood, 2014) This paper shed light on how derivatives became a major source of managing the risk. The risk can be mitigated through channelizing the derivative. The paper also suggests that there is a competitive edge over the non - users of the derivative instruments, and they get proper risk man agent opportunity with these financial instruments.

(Guay & Kothari, 2003) The article examines it is not only the financial firms are using the derivative instruments but also the non - financial firms using these instruments to manage the risk exposure. The non - financial firms use the currency and interest rate derivatives. So financial derivatives are an economically crucial component of corporate risk management.

(Petersen & Thiagarajan, 2000) The paper shed light on how the risk can be managed by using or not using derivatives. The different mechanisms of managing the risk included a certain amount of operating cost and different needs of levels of capital.

(Bash, 2020) The article signifies the impact of the COVID-19 on the international market. The COVID-19 affects the market very badly and most of the stock market returns were in downward trends as well as negative returns from the market. During the period of lockdown and shutdown, the COVID-19 outbreak diminishes all the hope for living and the financial market in a

Research questions

- With the adverse economic conditions how the derivative market is performing in India?
- Investment avenues or hedging mechanisms which of the providing extra leverage to the derivative market participants?
- Does the derivative market help to minimize the economic risk during pandemics?

3. Methodology

The study is based on a secondary source of data, which is theoretical in nature and depends on subjective exploration. To examine the impact of a COVID pandemic on the Indian financial derivatives market. For the accomplishment of the objective mostly the secondary resources have been considered. The secondary data were collected from various websites, books, news television and other sources of media. The study has undertaken the financial derivative segment of both BSE and NSE countries' major exchanges and most of the exchange - traded derivatives undertaken above the exchanges. The paper meticulously examined the pre and post period analysis of the Indian financial derivative market.

4. Results and Discussions

Derivative market in a global scenario

The pandemic hits all the sectors of the economy in numerous ways. The virus dragged the economy to its knee. The spillover effect of the one sector to other sectors generated a huge risk magnitude among the industries. The cash market has been affected the most and many market participants accumulate a huge loss. During that period, the derivative market stands as a protective layer against volatility. All the asset class investors had undergone a protection approach to save their financial securities. During the period of the market participants accumulated some abnormal returns from the derivative market by taking the positional advantages with various instruments.

Globally the future and options market grew exponentially during the adverse economic condition. Among the financial instruments, the option instrument attracted a huge number of investors. In the same way, due to the uneven factors created an atmosphere all the production and other the exchange and interest rate of various countries was a very sensitive due to the disturbances in international business. The world economy is an integrated closed economy as a whole, so one country's economic condition can affect the other nations' economy it may be in terms of numerous ways. So in the international financial market, the exchange and interest rate play a major role. So due to the pandemic affect the exchange and the interest rate became the most sensitive factor for market participants both domestic and international. During the repressive economic condition the investors not hoping to generate a huge amount of return instead of that they want to save their economic assets from the sensitive exchange and interest rate. in that way, the exchange and interest rate derivatives play an important instrument to protect their Economic assets and international transactions. The global exchange and interest derivative market data evidenced that the use of these instruments increased dramatically during the pandemic period.

The trade group for the exchange industry reported that derivatives trading volume surged by 40.4% in 2020, which was more than triple the rise in volume the previous year when trading activity rose by 11.4%. The hostile economic condition develops a better environment for the world derivative market it is not only the financial derivative market but also the commodity derivative market also showed a positive trend during the pandemic time. The percentage growth represents an abnormal growth in the derivatives segment of the market.

The ETF options market rebounded in 2020, the WFE said, noting that trading in ETF derivatives rose by 65.1% during the year, after an 8.8% decline in 2019

The outbreak of the COVID-19 pandemic can cause a significantly positive influence on the crude oil market (returns) and stock market (returns). Therefore, based on our results, we can argue that the spread of the COVID-19 pandemic may not damage economic performance at least for the data sample. (Liu, Wang, & Lee, 2020)

Indian derivative market during pandemic

The diagram represents an upward trend of the no of contract trading and the market turnover in the equity derivative segment market. During adverse conditions the market was not dragged down it shows how much the market is potential and it also discovered that the derivative instruments have the potential to protect the financial assets during the adverse economic conditions. The period 2020 - 2022 is said to be black years for the economy when the world economy had been growing at a faster pace, the pandemic stand as a bigger obstacle and most emerging markets' demand and production of goods and services reached the bottom of the pyramid. When the cash market had been not performing very well during the period of the pandemic how the derivative market performed exponentially is the topic of concern. Does the hedging nature of the derivative instruments or the better return opportunity lead to generating an upward movement of the market is a topic of discussion? "The study finds the evidence of a positive AR around the present lockdown period and confirms that the lockdown has a positive impact on the stock market performance until the situation improves in the Indian context".

The graphical representation below indicates a significant growth of the Indian financial derivative segment. The data shows that the market maintains its normal growth till 2019. After 2019 the market has undergone a super annual growth. The uses of the derivative market were critical and it needs a proper investigation and proper understanding of the market instruments. The pandemic increases the volatility in the market. Here are two major stock indices in India—the 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 fall after the news of the Harshad Mehta Scam, on April 28, 1991. Similarly, the Nifty has also declined to almost 29% during this period. Some economists have considered the impact of COVID-19 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 labour 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 COVID-19 pandemic has affected both the demand chain and supply chain. (Bora & Basistha, 2021)

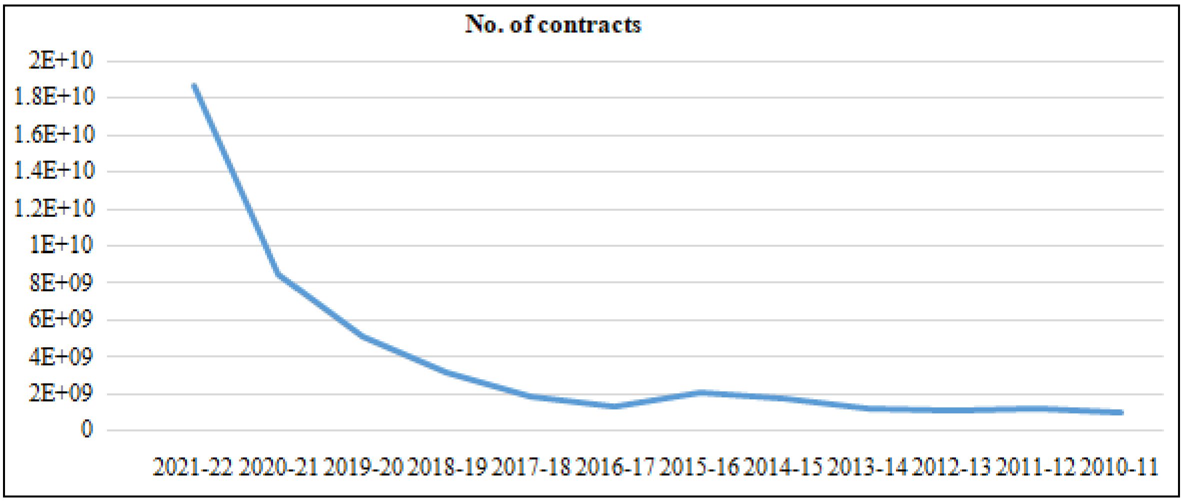

Chart 1

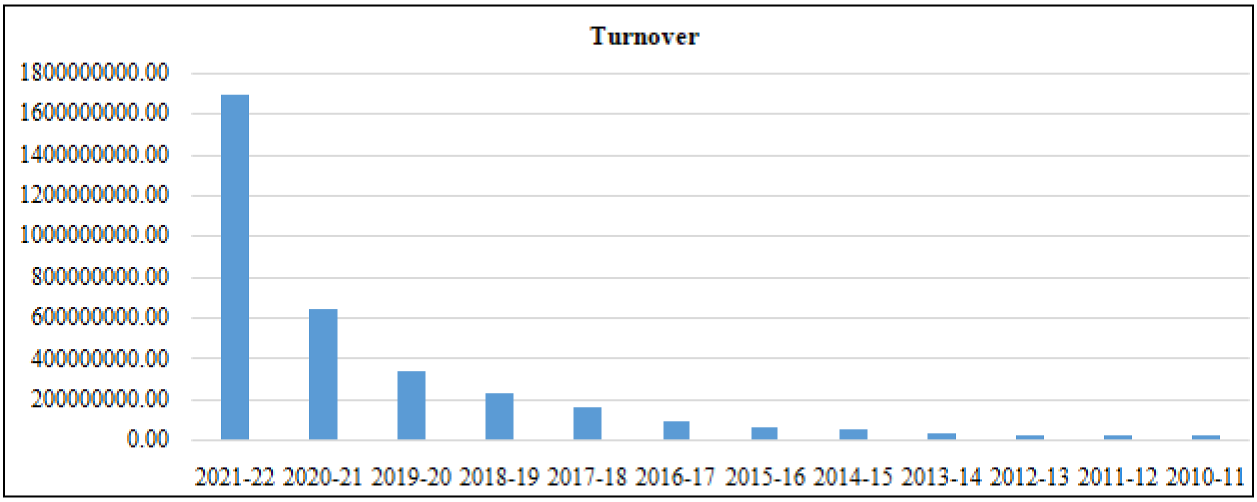

Chart 2

The above table - 1 represents not only the index and stock options showing an upward trend but also the currency derivative market segment also in a commanding growth during waves after waves. The reason behind such an upward trend in the adverse situation is due to the international market effect. In the initial stage of the pandemic, the export - import market hit hardly the international transition a reached its bottom level. So to hedge against the international financial risk the demand for the currency derivative increases dramatically. The international currency fluctuates and the currency volatility has increased due to international remittance and export - import dependency which was existed in the market but the pandemic creates an uneven increment of volatility in the currency market.

Instrument wise rise in the volume and turnover of the contracts

Table 1: NSE currency derivative

Year	Total	
	No. of contracts	Turnover* (₹ cr.)
2021 - 2022	2, 79, 18, 78, 847	2, 11, 73, 862.36
2020 - 2021	1, 60, 50, 87, 295	1, 24, 00, 138.83
2019 - 2020	1, 34, 02, 62, 184	99, 64, 085.04
2018 - 2019	1, 19, 83, 84, 221	85, 18, 351.52
2017 - 2018	76, 49, 63, 729	50, 28, 502.17

Data source - NSE

Table 2: Credit derivatives NSE

Year	Volume (Contracts)	Turnover (₹ cr.)
2021 - 2022	13, 53, 692	26, 357.08
2020 - 2021	48, 00, 806	97, 390.50
2019 - 2020	1, 76, 61, 885	3, 60, 811.14
2018 - 2019	1, 27, 64, 150	2, 45, 407.18
2017 - 2018	1, 61, 86, 719	3, 21, 208.12

Data source - NSE

The table no 2 represents But one of the exception in the credit derivative market that this market showed a negative trend and hit hardly by the pandemic. The industrial borrowing and lending had decreased due to the decrease in production operation and the less employee and other curbs like less demand less transportation efficiency due to these kind of reason which arises due to the pandemic reduced the uses of the credit derivatives. The credit derivative segment showing a negative trend because no new project5s has undertaken by any industries and the construction industry reached its bottom low. So the credit derivative instruments use gradually decreases. But the table no represents a different picture that the BSE credit derivative segment market shown a upward trend and the NSE shows a negative trend the preference has given to the BSE derivative segment market for the purpose of credit derivative instruments.

Table 3: Overall derivative market in BSE

Year	No. of contracts	Turnover
2021 - 2022	67, 05, 21, 024	6, 60, 78, 327.85
2020 - 2021	33, 81, 60, 958	3, 50, 60, 169.07
2019 - 2020	26, 81, 883	2, 62, 268.62
2018 - 2019	31, 167	2, 250.11
2017 - 2018	44, 701	3, 262.66

Data source - BSE

The table 3 represents the overall derivative segment market in BSE India. The data indicates that market has growth dramatically and a double fold increment in no of contract trading over the Sensex and the turnover also. The above data evidenced and supports the study that the use of the derivative has increased dramatically during the pandemic period. If we compare the data of non - pandemic periods it shows a normal growth in those years or in a steady growth of the de4rivative market but the adverse economic condition of the world compelled to rise in the volatility it may affect different countries with a different intensity the volatility differs country to country. To tackle these uneven volatility the market participants included the derivative instruments in their portfolio to give a protection towards their asset. In other way around the derivative instruments can be used as investment avenues to the market participants. So the derivative market somewhat reduced the countries risk. The properties in the derivative instrument provide an additional leverage to the investors.

Table 4: Equity derivative market in BSE

Year	No. of contracts	Turnover
2021 - 2022	67, 05, 21, 024	6, 60, 78, 327.85
2020 - 2021	33, 81, 60, 958	3, 50, 60, 169.07
2019 - 2020	26, 81, 883	2, 62, 268.62
2018 - 2019	31, 167	2, 250.11
2017 - 2018	44, 701	3, 262.66

Data source - BSE

Table 5: Currency derivative BSE

Year	No. of contracts	Turnover
2021 - 2022	86, 44, 80, 102	64, 54, 525.83
2020 - 2021	69, 04, 69, 634	51, 23, 763.42
2019 - 2020	94, 45, 17, 559	66, 83, 273.75
2018 - 2019	1, 05, 24, 52, 157	73, 52, 274.40
2017 - 2018	69, 02, 33, 859	44, 36, 430.43

Data source - BSE

Table 4 and 5 represents the data regarding the currency and the equity derivative segment market of the BSE. Both the market has grown exponentially during COVID-19 period. Markets turnover and no of contracts trading over this market segment represents a positive trend and generates a hopes among the market participants to protect their asset as well to generate a healthy return from the market.

It was very astonishing that when all the market and economy is in a declining stage how the derivative market showed its resilience and a matureness during economic halt. The question is why the performances of financial derivatives markets overall world in a positive trend the simple answer is it may be for the reason that it offers a protection with an investment avenues for the market participants. Not only the financial firms like bank, insurance and other financial i9nstitutuiins but also non finical institutions and industries using financial derivatives to avoiding various kind of risk which may be arise in numerous ways.

From the above data representation these discussion are taken into consideration

Preventive measures and its impact on derivative market segment

As world economy creep drowning in a deep crisis due to the phenomenal effect of the COVID-19. The year 2020 was a black year for the whole world and as well the whole world's economy. During the pandemic time the government has taken a lot of effort to prevent and less spared corona virus to the society. The corona has affected the Indian economy in a numerous ways the demand for special category products like luxurious goods, automobile and various service industries are in the bottom of the demand pyramid. The loss of jobs and providing the basic health amenities to the large population puts extra fascial burden on the government. The sentiment of investors got affected by the COVID pandemic due to limiting the investment avenues. During the time of health crises governments' step towards talking the situation was commendable because this kind of situation is being never been experienced. So even though numerous steps has undertaken by the government to some decisions are favoring to talking the health hazard and in another way it also making various economic losses for the country and it also, if the steps are not favors it also has some cost which the government to bear. Moreover the overall effect of the COVID-19 was negative for the economy. During that time the market volatility has increased rapidly and investing in the market was a difficult task and very risky too. Amid this negative situation the derivative market has evolved as a most accessed market for the investors. The data also represents during the time of pandemic the Indian derivative market attracted a huge number of investors towards them. This also evidenced that the derivative market generates some extra leverage for the participants which in another way helped to the economy to generate some finance from the public.

Diversification and derivatives different approaches to managing the risk during a pandemic

Derivative instruments are preferred more over the diversification strategy to manage the risk during the pandemic period. When investing itself was challenging for the market participants and the return from the real assets was very low or negative that so diversification of assets was a difficult task for fund managers and market participants. When all the sectors excluding some few, generated a surviving income and tries to overcome such an adverse situation that time generating a healthy return was out of the course. So managing risk through diversification of financial assets was almost not possible during that period the derivative market was the hope of a shrinking boat in the deep River. The properties of the derivative market reduced the risk in the economy as a whole and start to recover the economy at a greater speed. As India, is an emerging nation export and import has hit enormously the market economy and production also.

Why diversification failed during the pandemic to provide a substantial tool for reducing the volatility. Even though the results of various studies represent the pandemic initially affected the cash market drastically because of the fear but after some time the market has shown a positive return. But the question is whether average investors want to commit their funds during a risky situation. So that compels most of the market participants to play defensively rather than playing in a highly volatile environment. This approach of the investors generates an ample opportunity to choose a derivative instrument as a hedging instrument over the diversification.

Cost and benefit of derivative instrument

"With the development of the financial market and continuous research in that particular area bring spectacular progress in the derivatives segment. The market has developed last four decades but shows maturity and stability as compared to other markets because of the nature of the instrument its deals with. The technological advancement and new tools and software had a profound effect on market participants and the market. The dematerialization of documents and digitalization of the market creates an investor regulator face to face".

"The derivative instruments provide a hedging opportunity against the asset. Moreover, hedging requires some cost. In a simple sense the hedging is not free of cost there is cost with the derivative instruments. Especially considering the option the option has a price to whether option writer or option buyer. The option buyer has to pay a certain price to buy either of the options on a certain asset in the same way the option writer has to bear the huge risk to participate in the options market. so there may be an arbitrageur opportunity speculative opportunity through which the market participants can make money. But leaving apart the return from the derivative market concentrating on the main objective of the derivative market is for hedging the asset. now the market participants are evaluating how much the risk can be covered and what will be the cost of hedging. So there is an advantage in the market with a cost".

Even though the derivative instrument incurs some cost but the confidence protects against any kind of loss. The mechanism of the finical derivative segment is to provide a hedge and in another way, it also generates a good amount of the return by plying safely. During the time of financial stress, the market participants prefer the purchase a derivative market. the question is whether the volatility can incur more loss than the cost of the derivative instrument. The derivative instrument approach became the tool for tackling the risk. By analyzing cost - benefit the purchasing of a derivative instrument was more secure and more benefitted for market participants.

Those who are speculators take advantage of the high market fluctuation during the COVID-19 waves. By taking various positional advantages for a short period. The prediction of the speculators that the market will come down and the speculators also have taken numerous advantages can generate short term profit for them.

Corporate sectors and uses of derivative during COVID period

During the pandemic period, both the cash and derivative market showed an uptick trend and significant growth in the market. The use of the financial derivative instrument by both financial and non - financial sectors was very high, the reason behind is to hedge the financial securities against the unprecedented market volatility. In the same way, the financial firms use both for the hedging and diversifying their asset investment including both cash as well a significant consideration to the derivative instruments. Most significantly the corporate sectors majorly want to hedge their fund by playing with the derivative instruments.

Finical firms also use derivative instruments to maximize the return and strategically hedge their funds. The borrowing lending market affects tremendously by the health hazards. It not only affects human health it also majorly affects the economic health of the world. No new projects no extension of existing projects had undertaken the production has affected drastically which results to reduce the requirements for fresh funds for the economy so in that sense the lending borrowing market got affected hugely.

Insurance backed financial securities and the role of derivative

Amid all these looming economic condition the derivative insurance backed properties attract a huge no of investors including retail investors towards this segment of the market. When the cash market became more unpredictable and the momentum of the market had been changed very sharply with the disturbances in the health sector due to the pandemic. The international markets spillover was a roll costar for the domestic cash market investor it not only the international markets spill over impact but also the production and the service industry was completely shut down its production traumatize the growth of the market. Meanwhile the investors shifted towards another market which is more secure and like insurance backed instruments were readily available for the market participants. So the derivative instruments have a additional advantages over other financial securities due to its property. The individual investors slowly understand the market and try to put some amount of money in it. During pandemic the enough time was there to understand the market from different sources. With the unfavorable economic condition the instrument like derivative has helped a lot to minimizing the risk whether it may generate a good return or not most of them were more curious about investing in the new kind of instrument in a different market whose mechanism is totally different from the other market. So the derivative instrument stands as a strong instrument to fight against highly volatile market, as well financial risk of the investors.

Retail investors' scenario during pandemic in derivative market segment

The Indian securities market is comprises various instruments with different properties. The investors are majorly two categories like large scale investors like institutional investors, portfolio investors, and other categories like small scale investors or individual investors. Even though the contributions of the retail investors are marginal but its plays a significant role in both the market and nudge towards the development of the securities market. The retail investor also plays a significant role in derivative market. Most of the institutional investors are using the derivative instruments for the purpose of hedging but the retail investors using derivative instruments for the purpose of gaining some benefit.

5. Conclusions

The outcome of the above discussion is that the derivative market was affected by the initial wave only that even for a short period and the time goes the market adjusted to the extreme volatility arisen by unprecedented health hazards. Moreover, in the time of the first wave, the market has shown great resilience against the increased economic risk. But in the subsequent waves, the market performed above the normal course of action. As a result, the derivative market also to some extent helped the cash market to regain its normality. The currency and interest derivative market's performance reduced the international financial risk which arises due to the pandemic. The overall performance of the financial derivative instruments was above the normal growth. The major use of the derivative instruments to tackle the uncertainties resides in the market. Furthermore, the derivative market instruments were more reliable and a handy income generating avenue for the market participants. So during the adverse economic condition, the growth of the derivative market evidenced that the Indian finical system has the capacity to absorb the shock and the sense of maturity of the market can able to generate a healthy return for its participants.

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