

# BETA VOLATILITY AND ITS CONSEQUENCES FOR HEDGING SYSTEMATIC RISK WITH REFERENCE TO STOCK MARKET DURING COVID-19

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## Abstract

Hedging is frequently viewed as a high level contributing technique that supports in everyday lives and it has got nothing to do with the financial market. When a person takes life insurance to protect his family on account of his demise, this is termed as hedging. One has to pay premium on every instalment for the inclusion given by an insurance agency. Hedging is a speculation taken out to restrict the danger of another venture; protection is an illustration of a true fence. Hedging is a substantial procedure that can help ensure one's portfolio, home, and business from vulnerability. Beta is a proportion of a stock's instability comparable to the general market. Beta helps to measure stock's systematic risk. Systematic risk is the danger of significant economy-wide impacts, such as increase in interest rate, war, pandemic and so forth that influence the entire framework and not simply singular stocks. In a portfolio setting, deliberate danger is significant in light of the fact that it can't be broadened

and should be valued. In the event that a stock moves not exactly the market, the stock's beta is under 1.0. High-beta stocks should be more hazardous however give better yield potential; low-beta stocks present less danger yet additionally lower returns. A beta of more than 1 implies that it is a forceful stock and a beta of less than 1 implies that it is a cautious stock.

## Key words:

Hedging, Systematic risk, Beta Volatility, stock market

## Introduction:

The flare-up of the pandemic COVID-19 has quickly disturbed the worldwide economy; in the long run, it has prompted an emotional change on the whole business areas. However, it is erratic how long the infection episode will persevere, which has shown its top in the USA by middle of April 2020. The financial routineness only relies upon the prompt fix or immunization or crowd invulnerability increment. The expert and policymakers

accept that GDP may take a profound make a plunge 2020 and bounce back in middle 2021. The interest for items relies upon the tirelessness of COVID-19 and further the lockdown, open and social removing, and new work environment strategy. In addition, pandemic-prompted joblessness is at the pinnacle of about 10%. There have been enormous swings in the costs of numerous items. For the first run through throughout the entire existence of business, large numbers of them face a developing danger of bankruptcy. Henceforth, in this investigation, Beta Volatility and its Consequences for Hedging Systematic Risk with reference to stock market during COVID-19 dissected.

### Review of literature:

Afees A. Salisu, Xuan Vinh Vo, and Adedoyin Lawal in their article “Hedging oil price risk with gold during COVID-19 pandemic (2020)” stated that the investigation offers some critical ramifications. For example, the outcomes uncover that it is in an ideal situation to align gold in resource portfolio in order to amplify the normal utilities of danger opposed financial backers, particularly when confronted with huge upward moves in gold costs when contrasted and plunging oil costs. Moreover, the capacity of gold to fence or fill in as a place of refuge proposes shifting towards gold to lessen the developing worry about energy security and environmental change related issues related with oil. For policymakers, the discoveries recommend that approach ought to be customized towards diminishing the antagonistic impact of oil value unpredictability, which should be possible by advancing the utilization of clean energy instead of petroleum products (1).

Christopher Kantos & Dan diBartolomeo in their paper “How the pandemic taught us to turn smart beta into real alpha” have

mentioned that brilliant beta systems that are predicated on verifiable overabundance returns alone without the setting of how dangers impact resource evaluating are silly. With regards to the re-examined model, the drawn out alpha mean related with different value factors on which techniques are regularly predicated change altogether. The mean month to month alpha related with both worth and force stay positive yet become more modest in extent and are genuinely immaterial. Month to month alpha midpoints for size, influence and income inconstancy are largely negative and genuinely critical ( $P > 90\%$ ). Doing resource valuing in a nuanced design that all the more lavishly catches the danger qualities of firms is plainly ideal as it prompts a suitable system for financial backers to pass judgment on factor returns on a danger changed premise, accordingly permitting financial backers to accomplish genuine alpha (6).

Imlak Shaihk in his article “Impact of COVID19 Pandemic on the energy markets in Economic change and Restructuring (2021)” has observed that the notable decrease in the interest for raw petroleum occurred because of more slow monetary action, worldwide travel boycott, lockdown, and international relations of unrefined petroleum among Saudi Arabia and Russia and OPEC's job in unrefined petroleum supply. The current and future unrefined situation in the US Shale makers, Brent and WTI costs during the primary quarter of 2020; raw petroleum fates first time fell underneath \$20. Prior to the pandemic flare-up, the SPXGSCI products file outflanked the SPX500, however items are as yet in virus and in reverse state. The cost of raw petroleum WTI to be conveyed in May 2020, the first run through in the set of experiences, exchanged at less \$5.33 a barrel on April 21, 2020; the settlement value tumbled to short \$37.63; specifically, this infers that

merchants should reward purchasers for taking barrels off their hands. Hence, their examination adds to a few perspectives: (1) energy market execution in the midst of COVID-19 researched as far as energy stocks, prospects, and ETF. (2) Further, energy brokers' dread and nervousness were estimated as far as OVX and OIV in the midst of pandemic and government declarations (7).

### Objectives:

- To study the significance of beta in investment of stock
- To analyse the influence of Cash Flow instability on Systematic Risk
- To check Beta Volatility and its Consequences for Hedging Systematic Risk with reference to stock market

### Significance of beta in investment of stock

Beta calculates the systematic risk of a stock. Various stocks in a portfolio have various betas and the portfolio supervisor will attempt to show up at an objective beta for the portfolio by adding or erasing certain stocks from the portfolio. High beta stocks go up more when the business sectors are bullish and go down when the business sectors are bearish. Consequently the portfolio advisor will endeavour to add a greater amount of high beta stocks when the market viewpoint is positive and will hope to add a greater amount of low beta stocks when the market standpoint is negative.

Systematic risk affects all stocks consistently, so it can't be differentiated. This risk is estimated by Beta. Beta turns out to be so significant in portfolio the executives and for our speculations. In Beta what we accept that will be, that the stock cost is a dependant variable and the index is the independent variable. The

connection between the stock value changes and the changes in index is set up through the Beta. A beta of more prominent than 1 is delegated a forceful stock while a beta of less than 1 is named a protective stock. These forceful and cautious characterizations are at the centre of stock determination when an asset chief really hopes to deal with the beta of the portfolio.

### Influence of Cash Flow Instability on Systematic Risk

One should comprehend the impact of danger decreases on the estimation of a firm. The overarching view is that lessening money unpredictability expands a company's normal income, subsequently expanding its worth. A positive relationship recommends that hazard decrease may in any case make esteem regardless of whether it doesn't build the association's normal income. A negative relationship, in any case, recommends that if hazard decrease is to make esteem, it should produce incomes more noteworthy than those expected to make up for expanded methodical danger. Firm size, monetary influence and future development frequently show up as focal determinants of an association's stock beta. Numerous scientists expect a negative connection between an association's size and its stock beta under the presumption that a bigger firm makes incomes invariant to the economy. Huge firms show a bigger beta on the grounds that bigger firms utilize more obligations in their capital designs.

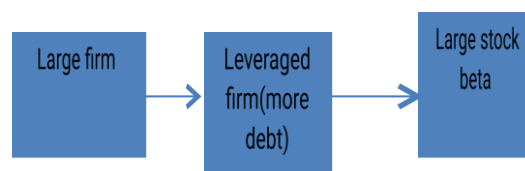
At the point when supervisors lessen the unpredictability of the income produced by the association's resources they make two contending impacts. 1, Systematic risk of assets diminishes while the systematic risk of the options increases. 2, the value of the growth options fixed in the firm's assets declines but the value of assets increases.

Accordingly, a decrease in the unpredictability of cash flow makes two sets of contending impacts. For a firm with huge resource esteem corresponding to its future chances, the net impact of a decrease in the unpredictability of income will be a decline in the association's stock beta. Conversely, when a firm has little resource esteem according to its future chances, the net impact of a decrease in the unpredictability of income will be an expansion in the company's stock beta. These outcomes stream from the unforeseen case nature of value. Higher absolute danger builds the investors' possibility of bonus benefits, while the restricted risk highlight of their stock shields them from losing more than their speculation (10).

Cash flow volatility decrease projects, supporting ought to be independently made for each firm and for explicit periods in the association's life. A recently started insurance firm ought to reduce risk, particularly during periods where the market premium is high. A similar firm ought to deal with its absolute danger all the more strongly as it develops, particularly during periods where the market premium is low.

Decrease in risk due to instability in cash flow doesn't change an investor's cost of capital. It implies there is no connection between risk management and the firm's stock beta. When there is decrease in the cash flow prompts either a decrease or an increment in the stock's beta. A firm with a resource esteem that is enormous comparable to its future chances will appreciate a lower cost of value capital due to a lower stock beta when the operating cash flow is diminished. The factual meaning of the assessed connection between complete danger decrease and beta is solid. Notwithstanding, when this assessed relationship is utilized to compute changes in an investor's expense of capital

utilizing normal market esteems, the financial meaning of danger decrease for the normal guarantor is fairly more vulnerable. Obviously, in periods where financial conditions are with the end goal that the risk free rate and the market risk premium are high the monetary meaning of risk decrease will be articulated (5).



### **Beta Volatility and its influence for Hedging Systematic Risk with reference to stock market**

Stock contributing is a dangerous business and that is valid. Beta is a factual proportion of a stock's unpredictability contrasted with that of the more extensive market. It is determined utilizing relapse investigation, a factual strategy used to discover the relationship of a needy variable with at least one independent variable. With regards to high beta stocks, the danger related with stock is a reliant variable and the unpredictability in the more extensive market is the autonomous variable. Beta depends on past information. This makes it a decent pointer of the past exhibition of the stock yet doesn't ensure that a similar pattern would precede later on. High beta stocks are commonly those given by little and midcap organizations and are subsequently seen to be hazardous. Little and midcap organizations are delicate to macroeconomic variables. In this manner, any continuous issue in the economy can very quickly affect these stocks.

Hedging fundamentally implies assurance. At the point when an investor purchase a stock, there is a danger that the stock cost could go down. That will bring about

misfortunes; either real or notional. Investor need to shield him from such misfortunes. Hedging in stock is done through futures and options. For instance an investor buys 1000 shares of Reliance Industries at a cost of Rs.1100 in the spot market. In the event that the cost goes up to Rs.1150, you can fence and bolt your benefits by selling 1000 shares of RIL fates at Rs.1150. Consequently the benefit of Rs.50, 000/ - {1000 x (1150-1100)}, turns into a benefit. Investor can likewise utilize this rationale if RIL cost goes down and lock in the misfortune by selling fates (9).

Another method of supporting your money market position is through put alternatives. If 500 RIL shares are purchased at Rs.1125, it can be hedged by purchasing at 1120 put alternative on RIL at Rs.19. Subsequently misfortune will be confined to Rs.24. Regardless of whether the RIL stock cost goes down to Rs.1000, the misfortune will in any case be confined to Rs.24 per share. The appropriate response lies in Beta Hedging. Allow us to take a gander at how to beta support. Allow us likewise to zero in on the best way to beta support a portfolio and the ideal beta hedging technique to be utilized.

Hedging technique can be applied when buying portfolio, business, or elsewhere, is tied in with diminishing or moving danger. Hedging is a substantial system that can help ensure our portfolio, home, and business from vulnerability. Other than shielding a financial backer from different sorts of hazard, it is accepted that supporting makes the market run all the more effectively. An investor can fence their long situation with put option, or a short dealer can support a position however call options. Prospects contracts and different subsidiaries can be supported with engineered instruments.

An investor buys put options on a stock to limit disadvantage hazard. Assume that an investor has 500 shares in an organization and that the organization's stock has taken a solid action from Rs 100 to Rs 120 over the previous year. The investor actually prefers the stock and its possibilities looking forward however is worried about the adjustment that could go with a particularly solid move. Rather than selling the shares, the investor can purchase a solitary put option, which gives them the option to sell 500 shares of the organization at the activity cost before the expiry date. On the off chance that the financial backer purchases the put alternative with an activity cost of Rs 120 and an expiry day three months later, they will actually want to ensure a deal cost of Rs 120 regardless of what befalls the stock over the course of the following three months. The investor just pays the choice expense, which basically gives some protection from disadvantage hazard.

### **Systems utilized while hedging:**

Investors when allocating resource expand portfolio with different resource classes. They invest 30% in the shares and rest in stable resource classes which assist with adjusting the ventures.

Investors invest in debentures and derivatives. Putting resources into debt securities gives security while putting resources into derivatives shields an investor from different dangers.

It incorporates choices of call and put options, which encourage getting our portfolio straightforwardly.

The beta ( $\beta$ ) is a measure of how an individual asset moves when the overall stock market increases or decreases. Thus, beta is a useful measure of the contribution of an individual asset to the risk of the market portfolio when it is added in small quantity. If one wants to know the systematic risk of their portfolio, they can

calculate its beta. Beta effectively describes the activity of a security's returns as it responds to swings in the market. A security's beta is computed by dividing the product of the covariance of the security's returns and the market's returns by the variance of the market's returns over a period (12).

$$\text{Beta coefficient } (\beta) = \text{Covariance}(Re, Rm) / \text{Variance}(Rm)$$

*Re*=the return on an individual stock

*Rm*=the return on the overall market

The affectability of stock danger to changes in the market portfolio, or the stock's beta, is controlled by factors like the association's size, market power, possibilities for future development, and influence. Beta, in this way, gauges the peripheral commitment of the stock to the danger of the market portfolio. On the off chance that all financial backers hold the market portfolio, the danger premium financial backers require, and in like manner the expense of capital, is

straightforwardly relative to beta. As opposed to explore the conflict over what different variables notwithstanding beta might be expected to precisely assess the investor's expense of capital, we rather gauge the stock's beta (8).

Hedging alludes to insurance against negative value developments. It can include assurance against drawbacks on the off chance that you are long available and security against potential gains in the event that one is short on the lookout. As such, hedging is only a protection against the instability of their portfolio. An investor brings about an expense to fence however that likewise ensures them against profound misfortunes in a most dire outcome imaginable. To support, long positions discussed. There are different ways to support their openness in the market such as hedging using: stock futures, long put options and shield by beta hedging, when they are clutching market positions as an investor or as a broker (4).

**Table 4 - Stock Beta**

Serial Number	Stock Name	Stock Beta	Investment Amount
1	Infosys	1.22	Rs.4,50,000
2	Reliance	1.15	Rs.5,50,000
3	Axis Bank	1.18	Rs.3,50,000
4	BPCL	1.45	Rs.6,00,000
5	Larsen & Toubro	1.25	Rs.2,80,000
<b>Total Value</b>	<b>Rs.22,30,000</b>		

Source: secondary data

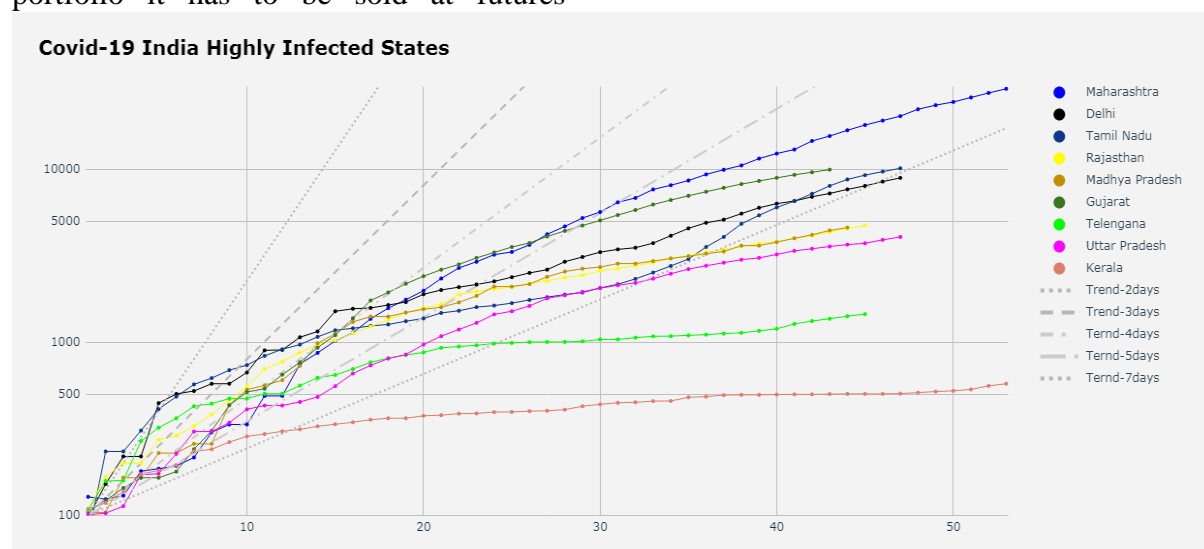
It is clear from the above table that an investor invests in five different company stocks based on past price. Infosys has a Beta of 1.22, which implies sensitivity of Infosys to changes in the Nifty is 1.22; Nifty is up by 1% then Infosys rises by 1.22% and if the Nifty goes down by 1% then the price of Infosys goes down by 1.22%. All stocks Beta are greater than 1, hence they are aggressive stocks.

**Table 5 – weighted Beta**

Stock Name	Stock Value	Stock Weight	Stock Beta	Weighted Beta
Infosys	Rs.4,50,000	20.18%	1.22	0.2462
Reliance	Rs.5,50,000	24.66%	1.15	0.2836
Axis Bank	Rs.3,50,000	15.70%	1.18	0.1853
BPCL	Rs.6,00,000	26.91%	1.45	0.3902
Larsen & Toubro	Rs.2,80,000	12.55%	1.25	0.1569
<b>Rs.22,30,000</b>	100.00%	<b>Weighted Beta</b>	<b>1.2622</b>	

It is observed from the above the weighted beta value is 1.2622. To hedge this portfolio it has to be sold at futures

equivalent, Value of Futures to be shorted = (22, 30,000 \*1.2622)= Rs 28,14,706.



Source: Secondary data

**Volatility in stock market during COVID-19**

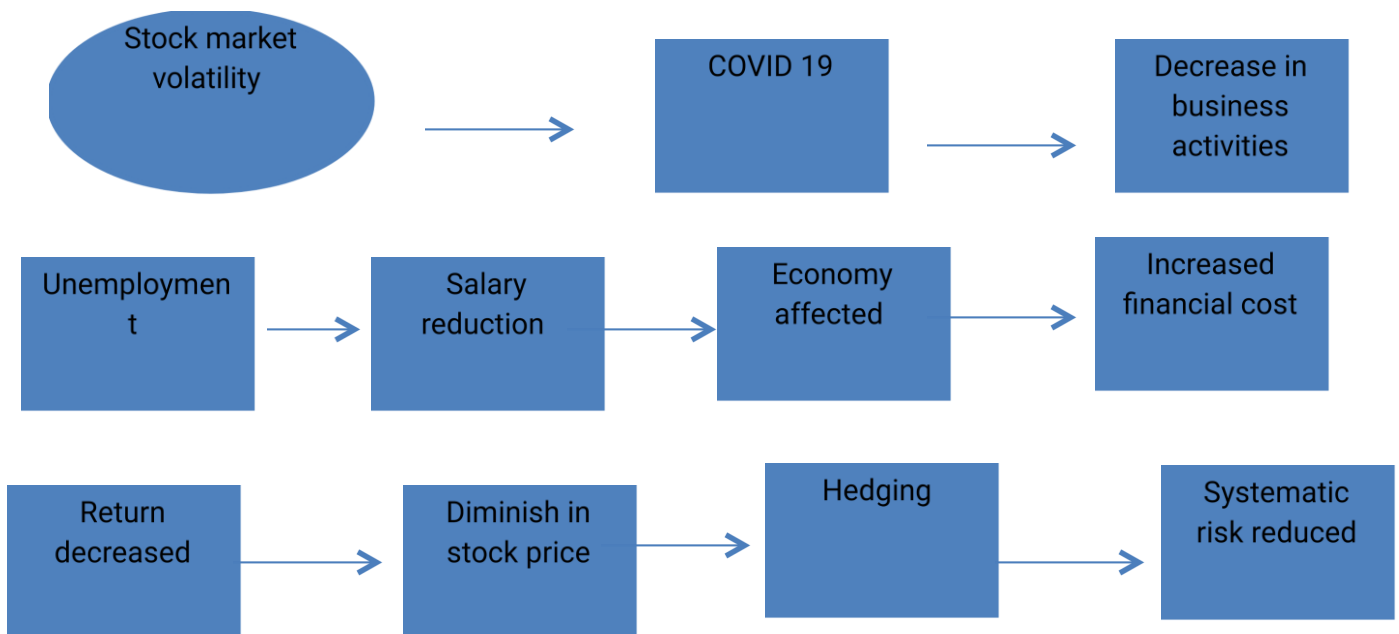
During lockdowns because of COVID-19 across the world has seriously influenced both genuine and monetary areas. The recurrence of stun transmission in India has gone up generously which have prompted more prominent instability co-development. Recognizable proof and estimation of unpredictability overflows assists with checking the sectoral interdependencies enhance the hazard and smoothen the impact of stun transmission. A positive co-development between

returns on stock and oil cost was seen during COVID-19 which recommends a negative impact of declining oil costs on the securities exchange. For India, there was a unidirectional causal nexus between unfamiliar portfolio speculation streams and stock returns inferable from COVID-19. Coronavirus when contrasted with demonetization and the GST had extreme unfavourable impact on the stock returns in India. Albeit securities exchanges incidentally over-responded to COVID-19 stun yet bit by bit showcases have merged. We find that energy followed by the oil and gas areas were biggest net transmitters of instability to other people while FMCG followed by telecom areas were biggest net beneficiary of unpredictability stuns from others. Assembling area didn't show huge instability co-development (2).

**Figure-1 - Volatility Spill overs (Sectoral Return Volatility)**



It is observed from the figure volatility spill overs between different sector indices. This volatility is from January 8, 2015 to October 9, 2020. Instability busts were incited by the stuns from Chinese securities exchange crash of 2015-16, demonetization (November, 2016), BREXIT declaration (March, 2017), GST (July, 2017), significant defaults and tricks like framework renting and monetary administrations trick, Punjab and Maharashtra co-employable bank trick, and Punjab National Bank trick lastly the COVID-19 pandemic (2020). The impact of GST and PNB trick on the unpredictability overflows incorporates a delay as demonstrated in the plot (13).





Proof recommends that instability overflows were the most elevated during COVID-19 pandemic inferable from increased vulnerability and monetary movement grinding to a halt. The overall effect of the pandemic is extending and dissolving the government assistance acquires accomplished more than a very long while. What is significant is that the last overflow cycle because of the pandemic is a long way from being done at this point the spike has not shown any opposition at the upper level. Accordingly, absolute unpredictability overflow because of the pandemic is the most noteworthy (69%) during the investigation time frame that saw a few different stuns (3).

The top 25 organizations were altogether beating the market even before the pandemic's monetary stun. Among areas, progressed hardware, cutting edge, and clinical innovation were moreover effectively ahead of the pack when the COVID-19 emergency gave them an extra shock. Then again, banks' feeble market execution has been exacerbated by the pandemic, as has been the situation with media communications and energy ventures. The movement area and its connected aviation providers are the one exemption, influenced by the close to suspension of worldwide travel that is a novel result of this emergency (14).

### Findings:

The Indian value market bobbed back boldly as of late, however the Sensex actually shut 20% underneath the pinnacle accomplished two months prior. Investors can get some limited consolidation that different business sectors have fallen more. The spread of the infection has set off alarm across the world and shaken the certainty of financial backers.

In India investor concerns have led to foreign portfolio investors (FPI) selling

values worth 60000 crores, higher single deals by abroad investors.

In the pre-COVID-19 period, the cost was high however during the COVID-19 period it showed a declining pattern up to the first lockdown time frame for example to the furthest limit of March yet after this, it again took an upward development progressively. It is by virtue of the unwinding added to the lockdown strategy by the Indian government

BSE Sensex became unstable during the pandemic time frame. On account of another stock record, NSE Nifty, it was discovered that there is no such critical effect of the COVID-19 period on the instability of NSE stock costs.

There is a fall in the portion of oil, value, bonds all through the world because of the COVID-19 pandemic.

The worldwide monetary market hazard has expanded significantly in light of the pandemic. Investors are enduring adequate misfortunes because of dread and vulnerability. For instance, because of the effect of this pandemic, the worldwide financial exchange has struck out about US\$6 trillion of every multi week from 24th to 28th February, 2020.

Monetary business sectors and banks have discovered that there is a fall in the portion of oil, value, bonds all through the world because of the COVID-19 pandemic.

Because of social removing measures, the efficiency of the organizations got antagonistically influenced, and it leads to diminishing in income, higher working expense, and income difficulties to the organizations.

The pandemic shack has expanded the unpredictability that contrarily influenced the monetary arrangement of most of the

countries. A large portion of the created and non-industrial nations' monetary business sectors are antagonistically influenced by this unforeseen pandemic.

The epic Covid has especially influenced monetary business sectors everywhere on the world. It made an exceptional degree of hazard, making investors endure critical misfortunes in a couple of days. In March 2020, the US financial exchange hit the electrical switch instrument multiple times in ten days. The cost of WTI unrefined petroleum changes seriously over the time of study going from - 37.630 to +40.460 dollars a barrel. This negative unrefined petroleum cost recorded on April 20, 2020, was considered as a notable decay brought about by the COVID19 pandemic effect on the market interest developments in oil markets. Taking into account that financial exchanges has been hit by two stuns—the spread of COVID-19 and the sharp decrease in oil costs during the time of study, we tried the connection between the unrefined petroleum value (WTI) and the variety in the Crude Oil Volatility Index (OVX) and the securities exchange returns in the GCC nations. Our outcomes demonstrate that oil value influences emphatically the GCC securities exchanges returns, while these profits are adversely affected by the suggested instability varieties in the worldwide oil market. These discoveries recommend that the securities exchanges in the GCC nations, which are still exceptionally reliant on oil incomes, are delicate to the oil cost and the unpredictability levels in the worldwide oil market (11).

### Conclusion:

The COVID-19 pandemic hit the world economy severely, at light-speed, prompting fractional joblessness and production lines' closure around the world, leaving specialists, policymakers, finance managers, operational supervisors,

information researchers, and residents in chaos. With the isolate in real life in most industrialized nations from mid-March until the finish of-year 2020, numerous business analyst eye witnessed anticipate a profound downturn for 2021–22. Securities exchanges plunged in March–April 2020, because of the stunning information on the infection spreading around the planet. Among the primary main impetuses, government limitations on business action and deliberate social separating are the fundamental explanations for the U.S. securities exchange plunge.

This investigation can help the investors and portfolio directors evaluate the danger dependent on the overflow transmission elements and settle on choices on ideal assignment of resources and portfolio enhancement. Investors can profit by remembering the stocks from feebly coordinated areas for their portfolio which may diminish their openness to delayed vulnerability. Better comprehension of overflow elements among monetary business sectors, can likewise help the controllers in evaluation of effect of unpredictability overflows during affliction.

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