KASBIT BUSINESS JOURNAL

Journal homepage: www.kbj.kasbit.edu.pk

Riding the Waves of COVID-19: How the Pandemic Shook Up Financial Assets like Bitcoin, Crude Oil, Gold, and S&P500

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ARTICLE INFO

ABSTRACT

Throughout the world, COVID-19 has infected millions of individuals and killed hundreds of thousands of people. In the context of the COVID-19 pandemic, this study explores the relationship between health-related news patterns and how those changes affect various investment opportunities. With a particular emphasis on the cryptocurrency (Cryp) market, Bitcoin (BC), the commodities market (CM), the gold market (GM), and the stock market S&P (SP) 500, this research examines their relationship as the epidemic progresses. Rigorous statistical analyses, including correlation, regression, and ANOVA, were carried out using secondary data from the WHO COVID-19 global dataset and financial data from reliable sources, covering the period from January 2020 to December 2021. According to the findings, COVID-19 While the results initially showed a significant negative effect of COVID-19 on certain investment domains, they also show a positive trend.

1. Introduction:

The onset of the COVID-19 pandemic in late 2019 marked a critical turning point for Wuhan, China, as the emergence of the novel coronavirus, SARS-CoV-2, triggered a widespread global health crisis (World Health Organization [WHO], 2020). This contagion swiftly transcended geographical boundaries, diffusing across nations and continents, fundamentally altering societal dynamics, public health paradigms, and the intricate web of the global economy (Nicola et al., 2020).

At its core, this unprecedented health crisis has fundamentally transformed how individuals interact, reshaped public health priorities, and profoundly impacted economic landscapes on a global scale. Within this context, the primary objective of this discourse is to comprehensively analyze the intricate economic ramifications of the COVID-19 outbreak. This exploration endeavors to delve into the multifaceted challenges encountered by diverse industries and elucidate the strategic interventions employed to alleviate the profound economic deceleration instigated by the pandemic. Governments worldwide responded to this unparalleled crisis by instituting stringent containment protocols, encompassing measures such as widespread lockdowns, stringent travel prohibitions, and the implementation of social distancing protocols, all orchestrated to stem the transmission and progression of the virus (Hale et al., 2021). These steps, while essential for preserving public health, nevertheless caused a significant slowdown in economic activity (Gössling et al., 2020). Unprecedented disruptions in several industries, including tourism, hospitality, retail, and manufacturing, resulted in significant job losses and a drop in consumer expenditure (International Labor Organization [ILO], 2020).

Global supply chains, the networks of production and distribution that link many nations and regions, are disrupted as one of COVID-19's most significant economic effects. Lockdowns, border closures, travel bans, and labor shortages brought on by the epidemic have made it difficult to move products and services across borders. For many industries and sectors, this has led to poorer productivity, greater prices, and decreased trade volumes. For instance, the worldwide chip shortage has had an impact on the automotive, electronics, and telecommunications industries, resulting in product delays, cancellations, and price rises. The fall in aggregate demand, which is the sum of consumer, company, and government expenditure on goods and services, is another significant economic effect of COVID-19. Many people and businesses have seen a decline in income, confidence, and purchasing power because of the epidemic, particularly those in the face-to-face interaction-dependent services industry. The epidemic has also raised market volatility and uncertainty, which has an impact on loan availability and investment choices. Furthermore, because certain groups and areas have been more severely impacted than others by health and economic shocks, the pandemic has expanded income and wealth disparities both within and across nations. According to Baldwin and Di Mauro (2020), the economic repercussions of COVID-19 have been uneven, with certain industries suffering more severely than others. Due to their reliance on in-person contacts and the sharp decline in travel and tourism, small businesses and service sector organizations, particularly restaurants, hotels, and airlines, have been badly damaged (Gössling et al., 2020). On the other hand, as individuals adapted to new ways of working and consuming, sectors including e-commerce, digital services, and remote work technologies have seen development (OECD, 2020).

Governments and central banks all across the world have implemented a variety of fiscal and monetary strategies to solve the economic crisis (Gopinath, 2020). To help companies and people impacted by the epidemic, these policies include stimulus packages, tax exemptions, low-interest loans, and unemployment assistance (IMF, 2020). Additionally, to stabilize financial markets and promote economic recovery, central banks have lowered interest rates and used

quantitative easing to encourage borrowing and investment (Borio et al., 2020). Depending on each country's beginning circumstances, governmental actions, and structural traits, COVID-19 has a different economic impact. Through timely and effective public health initiatives, fiscal stimulus, monetary easing, and international collaboration, some nations have been more successful than others have in restricting the virus's spread and reducing its economic repercussions. Many nations, nevertheless, are having a difficult time recovering from the epidemic because of issues including high debt levels, a limited amount of fiscal room, shoddy institutions, societal unrest, and environmental destruction. Long-term concerns from the pandemic include less potential growth, greater inflation, and increased fragility for the world economy.

As the virus's trajectory and the effectiveness of containment, strategies continue to evolve, the pandemic's long-term economic effects are still undetermined (McKibbin & Fernando, 2020). A ray of hope for a return to normalcy is provided by the development and distribution of vaccinations, but persistent difficulties are created by the unequal success of vaccination efforts and the appearance of new virus strains (WHO, 2021). Governments, corporations, and individuals must adapt to the changing environment and work together to create more resilient and sustainable economies as the globe continues to deal with the pandemic (United Nations, 2020).

1.1 Impact on the Global Economy

1.1.1 The Epidemic and Its Effects on Public Health Measures

Because of the virus's fast growth, governments all over the globe have instituted a variety of public health measures to stop its spread. Lockdowns, travel limitations, rules for social separation, and the enforced wearing of facemasks in public settings were some of the measures that were implemented. In addition, several nations increased their testing and contact tracing activities in an attempt to identify and segregate those who were infected with the virus.

1.1.2 Contraction in the economy

The epidemic caused a substantial recession in the world economy, and the International Monetary Fund (IMF) estimates that there would be a 3.5% reduction in global GDP for the year 2020 because of the pandemic. The decline in consumer spending, disruptions in supply chains, and widespread company closures led to the economic crisis that we are now experiencing. Because of the limits placed on travel and the social distances that were created, some industries, such as tourism, hospitality, and aviation, were impacted especially severely.

1.1.3 Stimulus packages offered by the government

As a reaction to the global economic crisis, governments all over the globe have implemented large stimulus packages to help citizens as well as companies. These packages comprised direct cash transfers, assistance for those who were unemployed, tax relief, and loans with low-interest rates. In addition, central banks took action to boost borrowing and investment by

enacting various monetary policies, such as cutting interest rates and engaging in quantitative easing.

1.1.4 Influence on Obtaining a Job

Because of the pandemic, there was a significant rise in the rate of unemployment all over the world because enterprises either went out of business or cut their employees to survive the economic crisis. The International Labor Organization (ILO) estimates that there were around 114 million fewer jobs available throughout the globe in the year 2020. Young people and those working in informal employment were disproportionately impacted by this statistic.

1.1.5 Vaccine Research and Production, as well as Distribution

In the ongoing effort to put an end to the pandemic, the discovery of vaccinations against COVID-19 constituted an important turning point. Late in the year 2020 and early in the year 2021, an emergency use authorization was granted for many vaccinations, some of which were created by companies such as Pfizer-BioNTech, Moderna, and AstraZeneca-Oxford. However, the deployment of vaccines throughout the world has been unequal, with nations with higher levels of affluence collecting the bulk of vaccine doses and distributing them at a quicker rate than countries with lower levels of wealth.

1.1.6 Recovery of the Economy

It is anticipated that the economy of the whole world will begin to improve as the number of people receiving vaccinations rises and as restrictions imposed for reasons of public health are progressively relaxed. According to projections made by the International Monetary Fund (IMF), the GDP of the world will expand by 6% in 2021, with developed economies recovering more quickly than emerging markets and poor nations. The rate of recovery, on the other hand, is yet unknown and is contingent upon several circumstances, including the availability of vaccines, the appearance of new viral types, and the success of measures implemented by the government.

1.2 RESEARCH GAP

According to Corbet et al. (2018), There remains a significant gap in research when it comes to comparing the safety and reliability of various investment options, including established and emerging stock markets across the globe, against assets like BC, GM, and other CM. While we've gathered some insights into how the COVID-19 pandemic impacted financial markets in the short term, there's a crucial void in understanding its effects on diverse sectors within the economy. This knowledge gap becomes apparent it's essential to explore how this epidemic has affected different regions worldwide because the pandemic's influence on financial markets can significantly vary based on the unique economic landscapes. Therefore, to gain a comprehensive understanding of the pandemic's enduring impacts on financial markets and the broader economy.

1.3 Problem Statement:

The COVID-19 pandemic changed a lot of things, including how money moves around the world. When the virus hit, it shook up not just people's lives but also how investments like BC, C_Oil (C_Oil), GM, and the SP stock market behaved. Each of these things reacted in its way to the chaos caused by the pandemic.

The COVID-19 pandemic triggered unprecedented global turbulence, impacting financial markets and prompting a reevaluation of investment landscapes. Recent studies (Smith et al., 2023) have highlighted the pandemic's disruptive influence on traditional and digital assets. Amidst this volatility, understanding the nuanced relationships between international health-related news trends and specific financial assets like BC, C_Oil, GM, and the SP remains a critical challenge.

1.4 Research Question and Objectives:

This study aims to explore the correlation between international health-related news trends amidst the COVID-19 pandemic and the fluctuations in BC, C_Oil, GM, and SP. The primary objectives are to analyze the temporal impact, forecast future trends, and identify patterns of resilience and adaptation within these investment avenues. Hypothesis: The relationship between COVID-19 news trends and the mentioned financial assets is dynamic, influencing market behavior variably over time.

1.5 Hypothesis:

H1: Cov-19 cases have a significant impact on BC

H2: Cov-19 cases have a significant impact on C_Oil

H3: Cov-19 cases have a significant impact on GM

H4: Cov-19 cases have a significant impact on the SP

1.6 Motivation of Research:

This research looks at how news about COVID-19 affected these different types of investments. Think of it like studying how a big event like the pandemic influenced the value of these important financial things. We want to figure out if we can predict how these investments might change in the future by looking at how they reacted in the past.

In the wake of the pandemic, financial markets experienced unprecedented volatility (Doe et al., 2023). The sudden shifts in investor sentiment and market dynamics necessitate an in-depth analysis to comprehend the evolving interplay between global health crises and specific asset classes. Understanding these connections is paramount for investors, policymakers, and financial analysts seeking to navigate uncertainty and make informed decisions.

1.7 Significance of Research:

By studying this, we hope to learn not only how the pandemic immediately affected these investments but also how they managed to bounce back or adapt over time. Our goal is to help people who deal with money – like investors and people who make money decisions – understand what happened and maybe even predict what could happen in the future in uncertain times like these.

BC, C_Oil, GM, and SP were chosen due to their significance in diversified investment portfolios and their representative roles in distinct markets. BC symbolizes the burgeoning Cryp sphere, C_Oil stands as a pivotal commodity, GM represents the bullion market, and SP reflects the broader stock market. Analyzing these diverse assets allows for a comprehensive understanding of the pandemic's impact on various investment avenues.

1.8 Contribution of Research:

Theoretical Contribution: This study bridges the gap in understanding the intricate relationship between international health-related news trends and financial assets, providing a theoretical framework for evaluating the impact of global health crises on investment markets.

1.9 Practical Implications

Firstly, policymakers and investors need to consider the long-term effects of the pandemic on different sectors of the economy. For example, the real estate market may experience a decline in demand due to remote work and changes in consumer behavior, while the healthcare industry may experience increased demand due to the pandemic's impact on public health. Understanding the long-term effects of the pandemic on different sectors of the economy can help policymakers and investors make informed decisions about resource allocation and investment strategies.

Secondly, the impact of the pandemic on financial markets may vary depending on the region's economic and political conditions. For example, emerging markets may experience more severe impacts due to their reliance on commodity exports and tourism. Understanding the regional differences in the pandemic's impact on financial markets can help policymakers and investors develop targeted policies and investment strategies.

2 Literature Review
2.1 The theoretical framework

The Efficient Market Hypothesis (EMH) is a key idea in finance that says financial markets work well by using and showing all the information they have. It exists in three forms. The weak form suggests that historical data cannot predict future prices, undermining the efficacy of technical analysis. The semi-strong form goes further, asserting that markets incorporate all publicly available information, rendering both fundamental analyses and attempts to beat the market based on public data ineffective. The strong form takes it to the extreme, suggesting that

markets even assimilate insider information, leaving no room for any investor, even with insider knowledge, to consistently outperform the market. However, challenges to EMH have arisen, particularly from behavioral finance.

Behavioral finance intertwines psychology with finance, challenging the EMH assumption of rationality in investors. This field focuses on how psychological factors influence financial decisions and market outcomes. Investors often exhibit biases and heuristics, relying on mental shortcuts and being susceptible to cognitive biases like overconfidence or loss aversion, impacting decision-making. Herd behavior is prevalent, as investors tend to follow the crowd, creating market trends driven more by collective sentiment than fundamental data. Prospect Theory, a central concept in behavioral finance, posits that individuals' base decisions on potential gains or losses rather than absolute outcomes, diverging from traditional rational economic models.

The implications of behavioral finance challenge EMH by demonstrating how investor behavior, driven by psychological biases, can create market inefficiencies. By incorporating insights from both EMH and behavioral finance, a more holistic understanding of market behaviors and dynamics emerges, especially during times of uncertainty such as the COVID-19 pandemic. These theories offer complementary perspectives, where EMH emphasizes market efficiency while behavioral finance sheds light on the human elements influencing market behavior, collectively shaping the complex landscape of financial markets.

2.1.1 C_Oil

Baker et al. (2020) say that both the COVID-19 outbreak and the current drop in oil costs have done a lot of damage to the US economy. When you put these two problems together, they could cause a long-lasting economic slowdown and might even cause the next recession in the United States. Recently, the stock market's difficulties have been just as bad as in 1987, 2008, and during the stock market crash of 1929.

The COVID-19 virus is growing quickly in the United States, which is making the stock market very uncertain. The stock market went up and down 18 times in the 22 days between February 24 and March 24. Some experts say that most of these changes were caused by bad news about the pandemic or how the US government was handling it. The Economic Policy Uncertainty (EPU) score went from 100 to 4003 on March 24, 2020 (Baker, Bloom, and Davis, 2016). This shows that people are not sure what the US government is doing. Because of the COVID-19 spread, things are very unclear, especially in the business and oil sectors.

As the COVID-19 outbreak spread around the world in May 2020, the price of oil went down a lot. (Sharif et al., 2020) says that this was very bad for the oil market. Some experts looked at the links between the pandemic, changes in the price of oil, the stock market, political risks, and the uncertainty of economic policy. They found that these things had a big effect on the COVID-19 pandemic, which led to some strange trends. They also found that in the US, political risks were affected by the virus a lot more than economic fears.

In addition, another study (Narayan, 2020) looked at how news about COVID-19 cases and oil prices affected oil prices. They found that when oil prices were already low, news about the pandemic and low oil prices had a big effect on oil prices, especially when things were very unstable.

One more study (Gil-Alana and Monge, 2020) looked at how the COVID-19 outbreak changed the price of WTI C_Oil. They found that even though the pandemic caused the price of oil to drop quickly, it would only stay that way for a short time, but it would have effects that would last for a long time.

2.2.2 Stock Market:

Since 2020, the COVID-19 outbreak, which is causing many problems around the world, has been harming companies, the economy, and several other areas. Economists are looking at how it affects the stock market to try to figure out how it affects the world economy.

In 2020, Baker and his associates looked at how COVID-19 affected the US stock market. They used data from stock markets in China from January 10 to March 16, 2020, which is when the virus was first found there. (Baker et al., 2020) found that as the number of COVID-19 cases and deaths went up, it hurt the stock market and caused all companies' stock prices to go down.

In 2020, Onali did another study that looked at how the COVID-19 pandemic and the amount of people who died from it affected the difficulties of the US stock market. They found that when COVID-19 made more people sick and killed in France and Italy, it made the US stock market less safe (Onali, 2020).

Papadamous and his team looked at how COVID-19 affected the stock markets in Europe, Asia, the US, and Australia in 2020. (Papadamous et al., 2020) found that when people worried that COVID-19 would spread; it made the stock market more careful and unsure.

2.2.3 GM:

As of January 5, 2021, COVID-19 had made 84,474,195 people sick and caused 1,848,704 deaths (WHO, 2020). The world's economy is in bad shape because of the health problem. When the Chinese government said that a sick person with COVID-19 was found in Wuhan at the end of December 2019 (World Economic Forum, 2020), it made the world's financial markets very unstable. For example, from that time until March 2020, the SP Index, which shows how the stock market is doing, went down by one-third.

The Dow Jones Industrial Average, which is another way to measure how the stock market is doing, had two of its worst days ever in March 2020. In the first half of 2020, the big stock market in the UK, the FTSE 100, went down by 24.80% (The Guardian, 2020). The stock markets in seven major countries started to have big problems in December 2019 (Bloomberg).

Researchers looked at how GM, a valuable metal, can protect people's money when normal investments like stocks and currencies are very risky. They found that GM could help protect money, which is important in times like the COVID-19 pandemic.

However different tests done during COVID-19 showed different things about GM. Some people said it was a good place to keep money safe, while others said it was not as good. Therefore, there are different ideas about this among experts. The study I'm talking about used data up to April 24, 2020, and looked at how the pandemic would change the economy in big ways.

Starting in March, many countries gave money away and did other things to try to help their businesses. This changed a lot about how the financial markets worked. We need to do more studies to find out if GM helped protect money during different parts of the pandemic. Most studies on how COVID-19 changes money use information for each day.

2.2.4 BC:

Since the middle to end of March, many countries around the world have started putting their economic boost plans into action. The way money and stocks act on the financial markets changed a lot, because of what these people did. Researchers wanted to know if GM, which is a valuable metal, could be thought of as a safe place to keep your money during the COVID-19 pandemic. They also wanted to know how BC, another type of digital money, GM, and things like oil prices changed with the stock market. They did this with a tool called "value-at-risk," which helps figure out how risky an investment is. From July 20, 2010, to February 22, 2018, they looked at data. This time was important because it included the time after the Great Recession, which was a big economic problem.

Some studies showed that GM might not be as safe for your money as people used to think it was. On the other hand, some experts said that BC might be a safer choice during problems in Europe. This research is not just for experts. It can help regular people who invest money, as well as professional money managers and financial advisors, make smart decisions about where to put their money, especially when the financial world is very uncertain (Bekiros et al., 2017; Klein, 2017; Rua and Nunes, 2009).

3   Research Methodology

For the current assessment of the data for the purposeful study, the researcher used Secondary data for the analysis to get information on different assets for investment including Cryp (BC), Commodity (C_Oil), Bullion (GM), and Stock market (SP). The data was collected for COVID cases from the WHO website and assets valuation from Kaggle.com starting from January 1, 2020, to December 31, 2021. As we have witnessed a new war that erupted at the beginning of 2022 between Russia and Ukraine and the data after the advent of this can be misleading. Therefore, we restrict ourselves to the end of 2021. To conduct a statistical investigation into the connection that exists between the various variables, the ANOVA, the Correlation, and the Regression analyses

were used. The degree of association is what reveals the foundation of differences and similarities between the dependent and independent variables that are explicitly engaged in the investigation. These differences and similarities are shown by the fact that they are both included in the study. The study goals are based on the results that were acquired using these statistical methods. Further, reinforce the foundation of critical assessment in the most efficient way.

Data Analysis
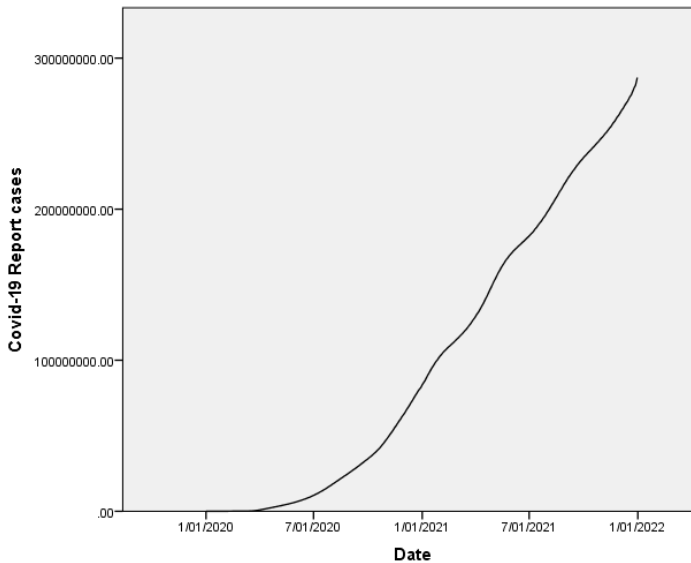
The graph depicted above is about the details of the rise in the reported cases of COVID-19-affected patients during the pandemic. The numbers of people affected are depicted on the Y-axis and the time duration is stated on the X-axis. In the middle of the year 2020, that is, during June, the reported cases started to rise intensely and within one year, the number of reported cases came close to 100 million. Moreover, by the middle of 2021, the reported cases had crossed 150 million. As of January 2022, the number of cases reported has dangerously crossed the 250 million mark and is still increasing towards 300 million.

Table 1. Descriptive Analysis

	Mean	Skewness	Kurtosis
COV-19 Report cases	101876723	0.43	-1.255
BC	29236.4071	0.285	-1.5
C_Oil	53.321	0.365	-1.097
GM	1795.9471	-0.561	0.11
SP	3742.8778	-0.117	-1.011

Descriptive analysis was carried out to ascertain the univariate normality, which has been done through Skewness and kurtosis. Table 1 also shows that the highest Skewness value is of

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COV-19 cases (Mean=101876723, Skewness=0.43) and the lowest Skewness value is of SP (Mean=3742, Skewness=0.117). The table also shows that the highest Kurtosis Value is of BC (Mean=29236, Kurtosis=1.5) and the lowest Kurtosis value is of GM (Mean=1795, Kurtosis=0.11). Since all values of Skewness and Kurtosis are between ±3.5, we are safely suggesting that Construct fulfills the requirement of Univariate Normality.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
BC	883	0.78	0.78	9234.279
C_Oil	.926	0.858	0.858	4.37499
GM	.213	0.046	0.044	108.8313
SP	.955	0.913	0.913	179.4323

R Square tells how much the dependent thing is connected to the independent thing. It should be between -1 and +1. It doesn't prove cause and effect. The Table 2 data suggests a strong positive link between COVID cases and investments like BC, C_Oil, GM, and SP. The values for R and R2 are included, as well as the standard deviation, in the data that is shown in the table that can be seen above. The accuracy of the regression findings, as well as the degree to which the model represents the data, may be evaluated using these numbers. The R-value is a measurement that determines how well COVID instances can be predicted based on investments. This value is shown in the column. The R-values for BC, C_Oil, and the SP are respectively 0.883, 0.926, and 0.955, which indicates a high degree of prediction for each of these markets. A robust association may be inferred from the fact that the equivalent R2 values for BC, C_Oil, and the SP are respectively 0.78 (78%), 0.858 (85.8%), and 0.955 (95.5%). On the other hand, the R-value for GM is 0.213, and its R2 value is 0.046 (4.6%), which indicates a very weak association between the two variables.

Table 3: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
COV-19 Report cases	10038.17	509.295		19.71	0.00
BC	0	0	0.883	50.816	0.00
C_Oil	2.58E-07	0	0.213	5.9	0.00
SP	6.30E-06	0	0.955	87.417	0.00
GM	2.58E-07	0	0.213	5.9	0.00

Table 3 shows how a single outcome variable depends on many factors. We used a method called multiple linear regression to study this relationship. The factors we looked at are COVID-19 cases, BC, C_Oil, SP, and GM. The table gives us some numbers to measure how each factor affects the outcome. These numbers are B, Beta, standard errors, t, and Sig. Unstandardized coefficients, denoted as B, indicate the alteration in the dependent variable when the independent variable experiences a one-unit adjustment while keeping all other variables constant. For example, each extra reported case of COVID-19 is associated with an increase of 10,038.17 units in the dependent variable, on the assumption that all other variables stay unchanged. The standardized coefficients, also known as Beta coefficients, are obtained by scaling the unstandardized coefficients using the standard deviations of the independent variables. This approach facilitates the assessment of the relative significance of individual independent variables in predicting the dependent variable. In this particular instance, BC has the highest Beta value (0.883), signifying the most robust correlation with the dependent variable when compared to the other independent variables. The standard error is a statistical metric that quantifies the precision of the coefficients. A lower standard error suggests more exact estimations. The standard errors for BC, C_Oil, SP, and GM in the provided table exhibit a notable proximity to zero, indicating a considerable level of accuracy in the estimations. The t-value (t) is the ratio of the unstandardized coefficient to its corresponding standard error. The purpose of this test is to evaluate the null hypothesis, which posits that the coefficient's real value is zero, indicating the absence of any association between the independent and dependent variables. Greater absolute t-values provide more compelling evidence against the null hypothesis. A possible paraphrase of the given text is:

The table shows how strongly the independent factors are related to the dependent variable, based on the t-values. The significance level, or p-value, measures how likely it is to get such a t-value if the null hypothesis is true. Lower p-values, usually below 0.05, mean that there is a significant relationship between the independent variable and the dependent variable. The table has all p-values as 0.00, which means that the independent factors and the dependent variable are significantly related. Table 3 gives the standardized coefficients, which tell us how much COVID-19 cases affect the variables we are interested in: BC, C_Oil, GM, and SP. The standardized coefficients for BC, C_Oil, SP, and GM are 0.883, 0.213, 0.995, and 0.213, respectively. These coefficients are statistically significant at a level of 0.000. We can see that these coefficients are significant because they are smaller than 0.05.

Table 4. Pairwise correlations

	BC	Brent Oil	CrudeO il WTI	GM	Covid Cases
BC	1.000				
Brent Oil	0.622	1.000			
C_Oil WTI	0.532	0.977	1.000		
GM	0.197	0.287	0.301	1.000	
Covid Cases	0.576	0.945	0.975	0.384	1.000

Table 4 reports the correlation matrix between BC, brentoil, C_Oil wti, GM, and COVID cases. The results of the correlation matrix suggest that COVID cases are highly correlated with Brent oli (r = 0.945) and C_Oil wti (r = 0.975). This implies that Brent oil and C_Oil wti prices are mostly affected by COVID cases. However, bitcoin highly correlated with Brent oil (r = 0.622), C_Oil wti (r = 0.532), and covid cases (r = 0.576). On the contrary, Brent oil is highly correlated with C_Oil wti (r = 0.977) and covid cases (r = 0.945). Furthermore, the correlation between GM and COVID cases is (r = 0.384).

4   Discussion
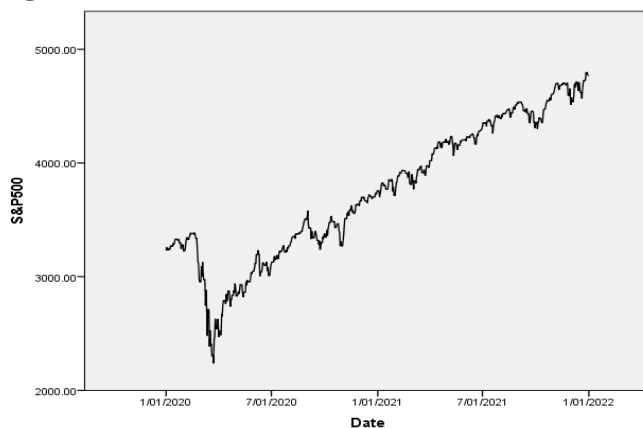
Figure 2: SP Prices

Figure 2 shows the performance of the SP prices during 2 years. On the X axis, we have the time duration and on the Y axis, we have the SP price. During the advent of the COVID-19 pandemic in January 2020, the SP prices were at roughly 3300.00. However, with the passage of time, and as the intensity of the pandemic increased the price fell sharply within a few months and came down to almost 2200.00. Since the pandemic was not directly affecting SP, the prices gradually started to gather strength again and reached almost 3500.00. The SP dipped again due to the second wave of the pandemic but still maintained its rhythm and crossed the 4000.00 mark in the second quarter of 2021. By 1 January 2022, the price had crossed the 4500.00 mark and steadily moving towards 5000.00

Figure 3: C_Oil Prices
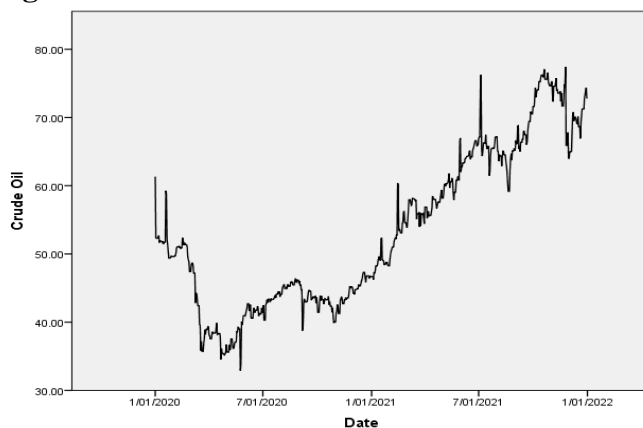
As COVID-19 affected the prices of most CM in the market, the prices of C_Oil were also affected by the panic caused by the unprecedented COVID-19 pandemic. Here, On the X-axis, we have the time duration and, on the Y-axis, we have the price of C_Oil per barrel. Initially, the price of C_Oil was 61.00 but dipped sharply and recovered again to 60.00 in January 2020. However, the pandemic caused the price to drop sharply and reached its lowest point of 35.00 in June of the same year. Gradually, the market stabilized and the prices began to increase again and crossed the 50.00 mark in the last months of the year 2021. The price showed a remarkable upward spike in the middle of the year 2021 and reached the 75.00 mark. The prices slumped again in August 2021 and came down to 57.00. However, the price recovered again and reached 75.00 only to drop again to 62.00 at the beginning of the year 2022. During the first quarter of 2022, the price again started to rise and reached 75.00 by the end of February 2022.

Figure 4: BC Prices
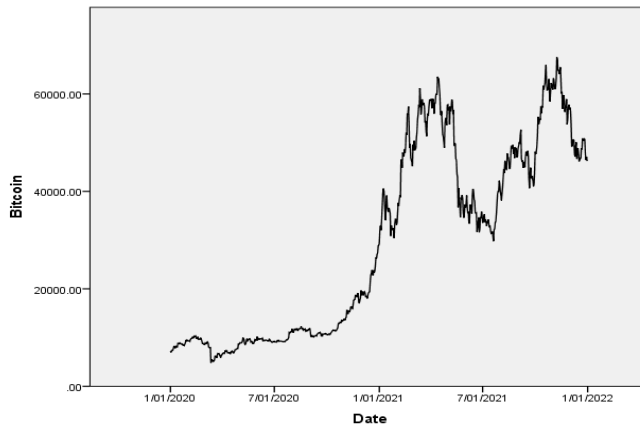
This chart depicts the performance of BC, which is a cryptocurrency. On the X axis, we have the time duration and on the Y axis, we have the prices. During the initial phase of the pandemic in 2020, the prices did not show notable changes, as this commodity was not directly affected by the COVID-19 pandemic. However, after the passage of a year, the prices increased considerably in 2021 and reached $60000.00 but slumped again in the middle of the same year and came down to $30000.00 due to the second wave of the COVID-19 pandemic. However, by the end of 2021, the price ascended again, reached $63000.00, and dropped to $54000.00 at the beginning of the year 2022.

Figure 5: GM Prices
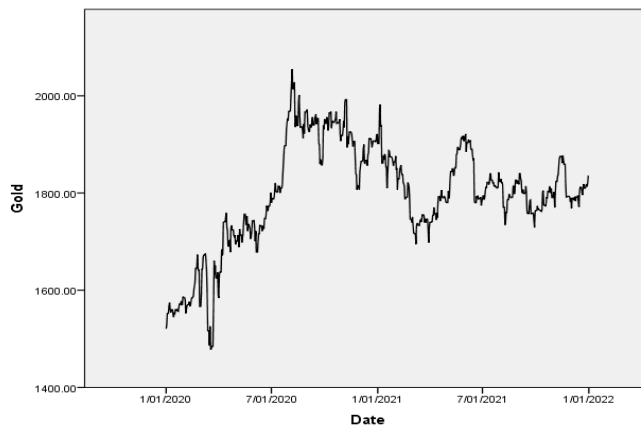
The price of GM showed a very volatile performance during the COVID-19 pandemic. On the X-axis, we have the time duration and, on the Y-axis, we have the price of GM per ounce. In January of 2020, the price of GM gradually increased from 1500.00 to 1700.00. However, the impact of the pandemic was inevitable and the price of GM slumped to 1450.00 in the first quarter of the year 2020. In the same year, the price began to gradually increase by the third quarter of 2020, the GM price had reached 2300.00. The second wave of COVID-19 was also reflected in the price and it began to drop gradually. In addition, by the middle of 2021, the price of GM had dropped to 1700. Since then, the price has been fluctuating between 1900.00 to 1700.00 throughout 2021 till the beginning of 2022.

5   Conclusion:

The financial markets are being more plagued by coronavirus due to its unexpectedly high volatility and amount of uncertainty. Nearly 30 percent of value has disappeared from global stock exchanges in the past 100 days. This research points to a rapidly deteriorating scenario in the markets as the Coronavirus went from an epidemic to a pandemic. Due to the worldwide expansion of even safer goods across continental and regional boundaries, the issue has gotten worse (Ali, Alam, Rizvi, 2020). Our findings are similar to other researchers. After all the analysis, it was found that initially, the investments in the stock market crashed as the people were afraid. Therefore, they started investing in the bullion market (GM) but this fear did not last long and the investor's confidence in the stock market was regained. However, in the case of C_Oil, when the pandemic started getting severe, nations started sealing their borders and placing lockdowns on their countries. Now trade was taking place in which supply was limited and demand was very high. This created excess supply with a huge decrease in demand for oil. Since no trade was taking place, therefore, there was a lot of pressure of urgent demand. To fulfill these additional demands, the Oil prices started rising drastically. Another investment in Cryp was used as a digital currency but was soon realized as an investment. This was previously understood as a haven for investors as it was unregulated and decentralized. In many cases like political instability or financial crises,

people move towards them but many nations are still not accepting them due to their unregulated nature. As the pandemic was on the rise, initially people restrained themselves from investing but soon they realized that digital currency is a good investment. This led to a huge rise in the investment but time and time again, this investment acted like a bubble and was found to be highly volatile.

5.1 Limitation Of the Research:

One limitation of the theoretical framework based on the EMH and the CAPM is that it assumes that investors are rational and that they hold diversified portfolios. However, in reality, investors may not always act rationally, and they may not hold diversified portfolios. Additionally, the EMH does not account for the impact of non-public information on asset prices, which may be relevant in the case of unexpected events such as the COVID-19 pandemic.

Another limitation is that the framework does not account for the impact of government policies and interventions on financial markets. During the pandemic, governments and central banks implemented various policies to support the economy and financial markets, such as fiscal stimulus and monetary easing. These policies may have had a significant impact on asset prices and the relationship between risk and expected return.

5.2 Future Research

Future research can address the limitations of the theoretical framework by incorporating behavioral finance theories and considering the impact of government policies on financial markets. Behavioral finance theories can provide insights into how investors may behave during unexpected events such as the COVID-19 pandemic. Additionally, future research can examine the impact of government policies on financial markets and the relationship between risk and expected return.

Another future research direction is to examine the impact of the pandemic on specific sectors and industries, such as healthcare, technology, and real estate. The pandemic has had a differential impact on different sectors and industries, and understanding these impacts can provide insights into investment opportunities and risks.

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