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Efficient Market Hypothesis during COVID-19 Pandemic

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Abstract: The impact of the COVID-19 pandemic on the efficient market hypothesis, a financial concept used to monitor the stock market. The efficient market hypothesis states that the market for securities is efficient as it reflects all the available information about individual stocks and the holistic market view. The paper assesses the impact of COVID-19 on the U.S. stock market and draws conclusions about the availability of information to stakeholders in the capital market and its effect on their returns and buying potential. The literature review includes studies that assess the efficient market hypothesis in general, specific to COVID-19, and in reference to financial crises. The objective is to contribute to the existing research by assessing capital markets and analyzing the efficient market hypothesis during a crisis, as investors tend to raise their profits by managing their portfolios to hedge funds and risks.

Keywords: efficient market hypothesis, COVID-19 pandemic, financial crises

1. Introduction

The efficient market hypothesis, a financial concept, is widely used to monitor the situation of stock markets. First, the concept of efficient capital markets is closely linked to a better understanding of the efficient market hypothesis. Efficient capital markets were observed as early as 1970 by Eugene Fama, who established that the market for securities/stocks was efficient because it reflected all the information about individual stocks and the holistic market view [1].

Thus, with the advent of any news, it is quickly reflected in the stock prices. This led individuals to believe that because of this, statistical tools or analysis are not required to forecast the variation in securities. This is where the concept of the Efficient Market Hypothesis roots from, where it is believed that investors cannot run the direction of securities markets in the long run. The capital market is, thus, considered efficient in the case where all participants, including investors and other stakeholders, have access to all the information available, whether it is past or current. And they cannot formulate strategies to beat the effect of that information on the securities' returns [2].

Studying the journey of securities in a stock/capital market during a time of crisis is relevant in context to the efficient market hypothesis. The WHO declared the outbreak of the COVID-19 Pandemic in March of 2020. On a global scale, the disease took 675,060 lives by August, and in the U.S. alone, the toll was 151,265 by the end of 2020 [3]. This means that 22 percent of the total deaths across the globe are accounted for by the U.S., and thus, it is evident that the rise of this crisis would have an impact on a country's economy and its capital markets.

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The pandemic outbreak had a very consequential and significant impact on the economies of the world, resulting in short-term implications as economic activities were limited due to newly implemented quarantine policies, as well as long-term impacts leading to failure of businesses and large-scale unemployment with sectors such as tourism and aviation being severely affected [4]. Thus, studying the efficient market hypothesis is of major importance to financial institutions during a crisis since a stressful situation/period affects the availability of information that drives the entire capital market and its securities. Several studies are available on this topic, where one assesses the impact of COVID-19 on the U.S. stock market [4]. The impact of the outbreak was felt by stock markets around the world. For instance, in the U.S., the stock market went through detrimental changes four times in about one week. The U.K.'s market index plummeted by 10 percent in 2020 due to COVID-19, and so did the Asian and European markets [4].

The objective of this paper is, thus, to qualitatively assess the impact of COVID-19 on the stock markets, especially in the U.S., in context to the efficient market hypothesis. The rationale is that the disease's outbreak affected the availability of information to the stakeholders in the capital markets and affected their returns and buying potential, and thus, by reviewing several research on this topic, we draw conclusions. The gap in these studies is that first, it has not been long since COVID-19 officially ended; thus, very little research is available. The objective is to contribute to the existing research by assessing capital markets and analyzing the efficient market hypothesis during a crisis, as many investors tend to raise their profits, for instance, by managing their portfolios to hedge funds and risks [3].

2. Literature Review

The outbreak of a crisis impacts the economic activity of a country's economy. When considering COVID-19, the disease involves respiratory complications after the entrance of the coronavirus into the human body, which leads to severe forms of breathing issues and lung complications. The virus was such that it could be transmitted via air particles and affect other members of society. Thus, it rendered governments to impose strict regulations about staying indoors through lockdowns, which had an effect on the total economic activity as people were unable to indulge in the financial markets and economy in general, in addition to losing jobs, extreme forms of unemployment have an impact on the economy as a whole. Thus, the literature review first reviews studies that assess the efficient market hypothesis in general, then specific to COVID-19, and in addition, in reference financial crisis.

2.1. Financial Markets and Efficient Market Hypothesis

The efficient market hypothesis, as mentioned earlier, has to do with the performance of the stock market in the overall financial market based on the availability of information to the participants. In the past, many studies have, in general, assessed the efficiency of stock markets and related it to the concept of the efficient market hypothesis. Countries have been engaged in researching this aspect because they have their own stock markets that affect the economy. A study conducted analyzed the efficiency of Asian stock markets by using MF-DFA, a technique that is used to measure the efficiency of markets in context to the efficient market hypothesis [3].

This technique of measuring and analyzing market efficiency has been conducted on Italian and British stock markets [5], and thus, contributed to the knowledge about the efficient market hypothesis. Another recent study drew conclusions that the stock markets direct themselves in the form of clusters when considered in reference to market efficiency and that the efficient market hypothesis is a collective phenomenon. This research was done by studying 43 major securities and stock markets around the world and assessing patterns in the efficiency of these markets [6].

DOI: 10.54254/2754-1169/26/20230588

2.2. Performance Index during COVID-19

S&P 500 Index was used to assess the situation of the most trusted and favored investment index in the U.S. stock market and its reaction to the COVID-19 Pandemic [7]. This was divided into three different stages in which the first stage was when the Chinese authorities first took notice of the outbreak. During the first stage, the stock market showed little change, with a 1.32% rate of return and a 0.66% standard deviation [7]. This could have been to the uninformed buyers and their underreaction to the situation as it was assumed that the Pandemic would be contained within China. However, this would not be as rational due to the fact that there were already multiple thousand flights from China to the U.S. from which the markets should have predicted the outbreak [7].

The second stage in which the Public Health Emergency of International Concern (PHEIC) announced the outbreak is when the stock market showed change. The U.S. was in the lead for the most confirmed cases [4], which led to a decline of 11.95% rate of return and an increased standard deviation of 2.65% [7]. However, this change was not sudden as one might assume in the Efficient Market Hypothesis due to the uncertainty and unpredictability of the issue [1]. In the third stage or the post-declaration of the Pandemic by PHEIC, the returns gained 1.05% and further increased the standard deviation of 4.57% [7]. This stage is further divided into two segments which were the recession and the growth period. During the recession phase, the news delivered to the market was mostly negative, resulting in a 22.37% loss, however during the second phase of growth, the market materialized and resulting in a 30.17% growth as most trading days were profitable [7]. The market reflected that the Pandemic was over as it was recovering, whereas it was not the case in real life.

2.3. COVID-19 and Capital Markets

Some studies assess the efficiency of markets in the context of the efficient market hypothesis. For instance, a recent study analyzed the impact on the efficiency and on other aspects of the stock market considering the availability of information via news during the time of COVID-19 by using variables like the volatility of equity markets [8]. Another such study assessed that there was a considerable increase in markets' volatility after the impact of COVID-19 on human lives in many countries and their respective financial assets [9]. In addition, by studying the Chinese stock market, research was conducted and assessed that COVID-19 had detrimental effects on the prices of securities and was directly proportional to the number of cases reported [10].

A volatility analysis was conducted in 2020 to find relationship between risks in stock market and the Covid-19, in which the top ten countries with the most confirmed cases, including Korea, Japan, and Singapore, were assessed [4]. These countries had well-established stock markets, but studies showed the negative impact of the Covid-19 Pandemic on the stock markets. It was observed that during the Pandemic, the risk levels of all these countries rose significantly by an alarming margin, which was not only caused by long-term expectations of the populace but also due to other factors such as sentimental influences of the market which were heightened through social media leading to price fluctuations [4].

2.4. Financial Crisis and Efficient Market Hypothesis

A crisis can not only be in the form of a disease outbreak that affects the stock markets and the efficient market hypothesis. Since COVID-19 emerged only in 2019 for the first time in history, the impact on capital markets and assessment of the efficient market hypothesis in the past have been made by other forms of crisis. Several studies in the past have, thus, assessed the concepts of efficient market hypothesis during a financial crisis. The financial crisis has been studied in the context of the Asian currency crisis and the relative impact on financial markets in the context of the efficient market hypotheses [11].

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In addition, studies have also researched the performance of foreign exchange in context to the efficient market hypothesis and compared it before and after the crisis hit [12]. In light of the global financial crisis, studies have also been conducted about the emerging European markets and the impact of the financial crisis on the efficiency of the market, and thus, thereby analyzing the efficient market hypotheses in 15 countries [13]. Similarly, the Majumder conducted another study in reference to the efficient market hypothesis, where they studied whether financial and capital markets are efficient based on the available information during the time of the global financial crisis. This study was based on the industry-level data for both BRIC and U.S. capital markets [14], where it was concluded that the market remained efficient before the crisis and changed afterwards.

A study conducted by Šonje et al. showed similar effects on stock price volatility in the Croatian and U.S. stock markets from 2002-2010. There was a trend observed which showed that volatility started to increase before the early 21st century, with minor growth up to 2007. However, in the financial crisis of 2008, the volatility skyrocketed, and the prices fluctuated in both U.S. and Croatia. The financial crisis, however, did not affect certain countries with weak form efficiencies capital markets, such as Romania, Greece, Latvia, Turkey, and Russia [13]. The similar results of the U.S. and the Croatian market were quite surprising as the U.S. market was more liquid compared to the Croatian market. However, it is to be observed that the U.S. market might not be as efficient over time, and other market forces could have affected the characteristics of the stock market in the long run, altering the efficiency of various markets, with risk aversion being one of the major suspected determinants [2].

3. Research Methodology

This paper will leverage the use of qualitative research methodology, more specifically, in context to Grounded Theory where certain documents, existing research papers, literature reviews, facts and figures presented in the respective papers are comprehensively analyzed to comment on the conclusions regarding the impact of COVID-19 on the efficiency of securities market and insights about the efficient market hypothesis. The research papers used to collect qualitative data are recent, considering the COVID-19 outbreak initiated in 2019 for the first time in history.

It must be noted that the efficient market hypothesis is analyzed by measuring the efficiency in the market, and this is done by further measuring the returns on stocks in a capital market. To make the data more comprehensive, the returns on stocks are measured both daily and cumulatively as standard deviations in the research [3]. This has been conducted in reference to the U.S. market, where S&P 500 indexes' performance is analyzed during the COVID-19 Pandemic. S&P 500 index includes stocks from 500 companies belonging to different sectors in the U.S., and the index's market capitalization represents 80 percent of the total market cap of the U.S. financial markets. Thus, choosing data from S&P 500 index provided accurate results. Similarly, in another research paper used as a base for qualitative data, the average log returns on stocks are used in context to particular times during the COVID-19 outbreak and across companies from 11 different sectors [3].

Daily returns on stocks of these companies are taken into consideration with the objective of comparing the impact of a crisis on the efficiency in markets and, thus, the efficient market hypothesis. The crisis mentioned in this research is the global financial crisis and COVID-19. In these papers, the data collected from S&P 500 index companies in the form of either daily returns, cumulative returns, average log returns, and standard deviations are presented in graphical figures and tables, which helps us assess the impact and the respective availability of information about COVID-19 on the efficiency of the market, and variations in stocks and their prices. Thus, using this qualitative methodology and grounded theory, we draw comprehensive conclusions about the

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efficiency and efficient market hypothesis by analyzing actual data presented in the abovementioned papers.

4. Results and Findings

When the daily and cumulative returns in the research papers mentioned earlier are assessed, the results are assessed during three periods, the first being the initial notice of COVID-19 in China by the Chinese government when the outbreak was observed in Wuhan, the second period suggests the official outbreak up to its official declaration by WHO, and the third period represents post-pandemic declaration situation, in context to market efficiency and efficient market hypothesis. Similarly, returns are also tabulated and assessed across different sectors in the U.S. and analyzed under the global financial crisis, and the COVID-19 Pandemic, and then they are compared.

At the beginning of COVID-19, as referenced to the first period, the stock market returns and standard deviations indicate a performance similar to that of a normal period, i.e., without a prospect of any crisis on the horizon. The reason for this is that participants in the financial markets did not consider at the time that the outbreak would have any serious impacts on the economy and, thus, on the efficiency of the market because they thought it would be managed within China. However, some suggested various outcomes and reactions to the unfamiliar situation in which different approaches were observed, such as if the problem were to exceed, slow down, or it was to be ignored, but were mainly speculations as the worldwide Pandemic could not be predicted.

In context to the efficient market hypothesis, this performance is thus rational as per the news about COVID-19, which was not considered worrying. During the second period, when COVID-19 started spreading, and thus, the returns on stocks declined by 11.95 percent, and the standard deviation increased by 2.65 percent [3]. This shows that the market started to experience the outbreak of an international-level crisis, which reflected in the returns of stocks, and thus, as per the efficient market hypothesis, this information variated the securities' prices. The fluctuation in stock prices was also elevated by social media, which influenced market sentiments and reduced efficiency in capital markets leading to increased volatility and uncertainty [4]. Some behaviorists suggested that a reason for short-term momentum or short-run correlations between stock prices could be due to the underreaction of buyers to new information [1], such as the news regarding the COVID-19 Pandemic. The buyers supposedly could not predict the degree of impact of the Pandemic even after it was announced; this was reflected in the near-normal performance of the rate of returns and standard deviations even after the COVID-19 Pandemic was announced.

In the third period, after officially declaring the rise and spread of COVID, the returns on stocks decline further, and the standard deviation increases as well. The result reflects the efficient market hypothesis again, where the availability of information about the deaths caused by the outbreak and the subsequent decline in economic activity is reflected in the performance of financial markets. The result of the performance index showed that the market was stabilizing and the Pandemic was over, even though that was not the situation in real life. Similar results are shown in the research that analyzed different sectors of the U.S. economy in the context of market efficiency [3]. Sharp variations in the stock's returns in reference to different sectors and the respective companies in the S&P 500 index during the Pandemic and the financial global crisis exhibit traits of an efficient market hypothesis.

These findings suggested that the average return, in general, on securities in the U.S. stock market was greatly impacted by COVID-19, even more so than the global financial crisis. The difference exists because the roots of both crises are different from one another, which explains the difference in impact. Moreover, the analysis via S&P 500 companies in the consumer discretionary sector, which includes companies like Starbucks, McDonald's, and Disney, proved to be the most efficient in the

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securities market and abiding by the concepts of efficient market hypothesis. At the same time, the utility sector of the economy proved to be the least efficient, which can be explained by the fact that the government highly regulates this sector and have a sufficient dividend payout. Another insight provided lies in the fact that the consumer staples sector exhibits high returns with the outbreak of COVID-19 and, thus, incorporated the information and represented the efficient market hypothesis. This can be explained by the changed behavior amongst consumers upon the news of COVID-19, where they started purchasing and stocking up on more staples to survive lockdown periods.

5. Conclusions and Implications

The concept of the efficient market hypothesis suggests that changes in stock prices incorporate as soon as an event takes place and news travels. Even though this fits true, however, the degree to which the variations take place and across what time spans in the securities market and the subsequent stocks' prices after the Pandemic hit suggests that the efficient market hypothesis does have some degree of inefficiency, which means that it may not fully incorporate all the information and reflect that in the securities market. This is evidenced by the performance of stocks prices during the period when official declarations about the outbreak of COVID-19 had been made by the Public Health Emergency of International Concern, yet the variation in the stocks' prices took place with only a meager degree, which should not have happened because the outbreak had a catastrophic impact on the entire economy, of many countries across the globe. Similar findings during the global financial crisis also supported these results as the fluctuation and volatility of the stock prices were caused by market forces such as risk aversion leading to inefficient markets and did not affect counties with weak-form efficiency markets.

Many countries did not take steps to combat COVID-19 even after the official declaration, and people were traveling across the globe, and there were no strict measures taken for quite a significant amount of time about lockdowns, social distancing, and wearing masks. Buyers thought that the outbreak would be contained by China; however, this could not have been the rationale as before the declaration by PHEIC, the Chinese government had already taken notice of the outbreak in Wuhan, and there had already been thousands of flights from China to the U.S. which could have meant that COVID was already present in the U.S. [3]. This underreaction could have been solved if the market had taken notice of this development before it eventually exceeded expectations.

During this period, some stocks still showed a positive return [3], which implicates the theory and concept put forth by the efficient market hypothesis because, by that logic, stocks should have plummeted to a greater degree. A possible explanation for this can be drawn from past research, where authors concluded that once a capital market has been dislocated by irrational traders, rational traders cannot undo it efficiently and in time [15]. However, as time went by, the capital market finally began to adopt the information about COVID-19 and reflect it in the securities price, so it was consistent with the efficient market hypothesis.

The outbreak of COVID-19 and its impact on the stock market is a point of debate when it comes to contextualizing it with the efficient market hypothesis. However, research extends the existing insights about the topic. The implications for this study, and all studies in general, is the fact that it may have been difficult to gather data during COVID-19 as people were locked in their homes, and capital markets' concerns lay below the health concerns in all countries. Moreover, the comprehensive analysis of an efficient market hypothesis would have to involve data collection about stocks on a larger scale by adding more industries and the respective companies across several more nations, which is one of the major implications for conducting the study.

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