

The Impact of the Russo-Ukrainian War on US Stock Return

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Abstract: This paper makes an event study on the Russo-Ukrainian War effect of the stock return, including that of the S&P500, renewable energy industry, military industry, and catering industry, with a time window of 29 days (39 days for Tesla's event). This article will gain the normal and abnormal returns by using linear regression and the least square method. Then, the hypothesis test will be conducted using the Summation of the abnormal rate of return (CAR). The result will be shown by whether the cumulative abnormal return breaks the confidence interval according to the graph. Research results show that even though the war harms the economy, it does not entirely reduce the stock return. This empirical study would be helpful for the investors to make their investment strategy during the War period.

Keywords: event study methodology, summation of an abnormal rate of return, confidence interval, hypothesis test

1. Introduction

Russo Ukraine War had been launched on 24 February 2022, which not only impacted on Russia and Ukraine but also influenced the stock return of USA. This paper will analyze what the impact is in US stock return including that of S&P500, the stock return of renewable energy industry, military industry, and catering industry, as well as why the corresponding impact occurred in each of them respectively. This article will be divided into two major parts except the 'abstract, introduction, and conclusion'. In the first part, this paper will test whether Russo-Ukrainian war has influenced S&P 500, the stock return of American renewable energy like Tesla, that of US military industry especially Lockheed Martin, and that of the USA catering industry especially McDonald's. The second part of this article will analyze what the specific impact is on them, and why.

2. Methods

2.1. Event Definition

The event study begins with the definition of the event, i.e., the event day, the estimation window, the event window must be selected. In this study, this article aims to explore the effect of the Russo-Ukrainian War on the industries of new energy, military and food. To be more specific, this paper chooses the stock market of three representative companies: Tesla, Lockheed Martin, and McDonald's.

The article defines the three terms as follows:

The Event Day

This article uses the date of the Russian invasion of Ukraine in the Russo-Ukrainian War as the event day (February 24th, 2022).

The Estimation Window

The estimation window chosen is the period from July 02nd 2018 to December 30th, 2019, which is used to calculate the expected rate of return. This paper chooses this period before the global outbreak since this article want to reduce the impact of other variables on stock prices.

However, for the S&P 500 Index, this section changed the estimation window to from September 2nd, 2019 to December 30th, 2019 (82 days in total) since for this market, this section did not intend to use the estimation window to build a linear regression model, but rather wanted to focus on the average of the market returns. Thus, a period of 82 days is sufficient time to conduct the study.

The Event Window

The event window is 14 days before and after the date of the Russian invasion of Ukraine (February 03rd 2022 – March 16th, 2022), i.e., a total of 29 days is used to observe the stock price reaction around the invasion date.

It is worth noting that, in Tesla's stock market, this paper changes the event window from 14 days before and after the date of the Russian invasion of Ukraine to 19 days before and after that event date (January 27th, 2022 – March 23rd, 2022), i.e., a total of 39 days is used. This change is made because this paper discovered that the event has little to no effect on Tesla's stock market returns when choosing to use a time length of 29 days as the event window time length. Therefore, this section extended the event window to 39 days to see if there is a more significant impact.

2.2. The Estimation of Abnormal Rate of Return (AR)

The main purpose of investment is to obtain returns, which can be divided into normal returns and abnormal returns. Normal return is the expected reasonable return that an investor can obtain under normal circumstances; while abnormal return is the portion of the investment return that exceeds the normal return. The abnormal return (AR_{it}) is equal to the actual rate of return (R_{it}) minus the expected rate of return (R'_{it}). However, in the case of the S&P 500 Index, the abnormal returns are calculated slightly different from the abnormal returns of the other three companies this article has selected. The abnormal return (AR_{mt}) for the S&P 500 Index is equal to the actual rate of return (R_{mt}) minus the average rate of return (\bar{R}_{mt}), where the average rate of return can be calculated from the daily market return in the estimation window.

To calculate the abnormal return (AR_{it}), this section first calculated the normal return of an individual stock market can be measured by equation:

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \quad (1)$$

where R_{it} is the return of the stock market on day t , and P_{it} , P_{it-1} are the stock prices on day t and $t - 1$.

Besides, since the stock market index of all three companies selected in this paper is the S&P 500 Index, the market return R_{mt} in this article is measured by the return of the S&P 500 Index:

$$R_{mt} = \frac{P_{mt} - P_{mt-1}}{P_{mt-1}} \quad (2)$$

where R_{mt} is the market return of the S&P 500 Index on day t , and P_{mt} , P_{mt-1} are the stock prices on day t and $t - 1$. Therefore, a linear regression can be conducted with the estimation window.

$$R_{it} = \alpha_i + \beta R_{mt} + \varepsilon_{it} \quad (3)$$

Using the least squares method to estimate the parameters of the market model, the abnormal return can be obtained:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}), t \in [0, 29] \quad (4)$$

where for the case of Tesla's stock market, $t \in [0, 39]$.

2.3. Summation of Abnormal Rate of Return and Hypothesis Test

According to the abnormal rate of return, the cumulative abnormal return is:

$$CAR_t = \sum_{k=0}^t AR_{ik}, \quad (5)$$

where CAR_t is the cumulative abnormal rate of return from the beginning of the event window period 0 to the current period t . To observe whether the stock return has changed significantly because of the Russo-Ukrainian War, this paper conducted four hypothesis tests on the cumulative abnormal return (CAR) for the S&P 500 Index and the three companies over the event period. The hypothesis test for the cumulative abnormal returns of the S&P 500 Index is as follows:

$$H_0: \mu_1 = \mu_2$$

$$H_a: \mu_1 \neq \mu_2$$

The null hypothesis H_0 means that the average market return of the S&P 500 Index before the Russo-Ukrainian War was equal to the average market return after the war, which in other words is the event has no impact on the return of the S&P 500 Index. The change in the cumulative abnormal return of the company's share price is the result of random fluctuations. However, if the null hypothesis needs to be rejected, it indicates that the stock price changes within the event window are not random, and the war has a substantial influence on the market return.

The confidence interval conducted is:

$$(-1.96 \times \sqrt{T\sigma_\varepsilon^2}, 1.96 \times \sqrt{T\sigma_\varepsilon^2}) \quad (6)$$

Since σ_ε^2 is unknown, it should be estimated using the data in the estimation window:

$$\hat{\sigma}_\varepsilon^2 = \sum_{t \in D} \frac{(R_{mt} - \bar{R}_{mt})^2}{D-1} \quad (7)$$

where D is the number of days from the estimation window. As a result, if the value of CAR exceeds the confidence interval, then it can be concluded that there is 95% confidence to reject the null hypothesis. The hypothesis test for the cumulative abnormal returns of the three individual stocks is slightly different from the previous hypothesis test for the S&P 500 Index:

$$H_0: CAR_t = 0$$

$$H_a: CAR_t \neq 0$$

The null hypothesis H_0 means that the event has no effect on the stock price. The change in the cumulative abnormal return of the company's share price is the result of random fluctuations. Otherwise, if the null hypothesis has to be rejected, it demonstrates that the stock price changes within the event window are not random, and the event has a significant impact on the stock return. The confidence interval performed in the study is shown in Equation (6). Since σ_ε^2 is unknown, it should be estimated using the data from the estimation window:

$$\widehat{\sigma_\varepsilon^2} = \sum_{t \in D} \frac{(R_{it} - R'_{it})^2}{D-1}, \quad (8)$$

where D is the number of days in the estimation window. Similarly, if the value of CAR exceeds the confidence interval, then it can be concluded that there is 95% confidence in rejecting the null hypothesis.

3. Results

3.1. S&P 500 Index

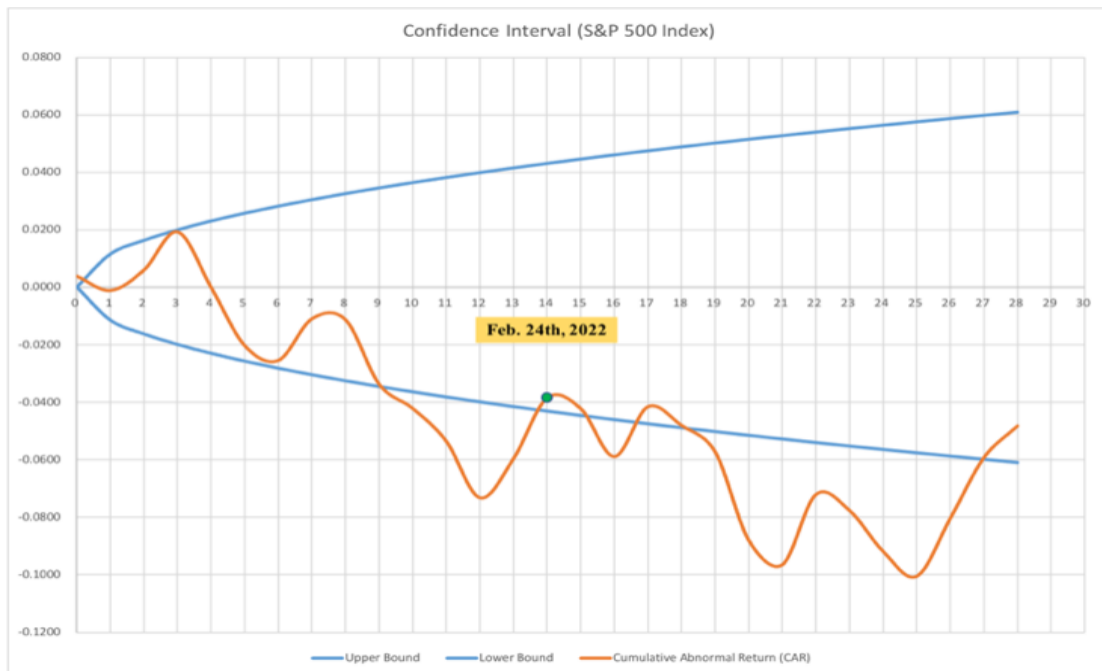


Figure 1: Confidence interval for the CAR of the S&P 500 index.

By performing the hypothesis test of the S&P 500 Index [1], Figure 1, which shows the confidence interval of the cumulative abnormal return of the S&P 500, can be obtained. As shown in Figure 1, the line representing the cumulative abnormal return breaks the confidence interval on the 10th day. Therefore, it can be concluded that there is 95% confidence to reject the null hypothesis that the

average market return of the S&P 500 Index was at the same level before and after the Russo-Ukrainian War. What's more, it can be observed that the stock return of S&P 500 was declining due to the Russo-Ukrainian War (see Figure 1).

3.2. Tesla

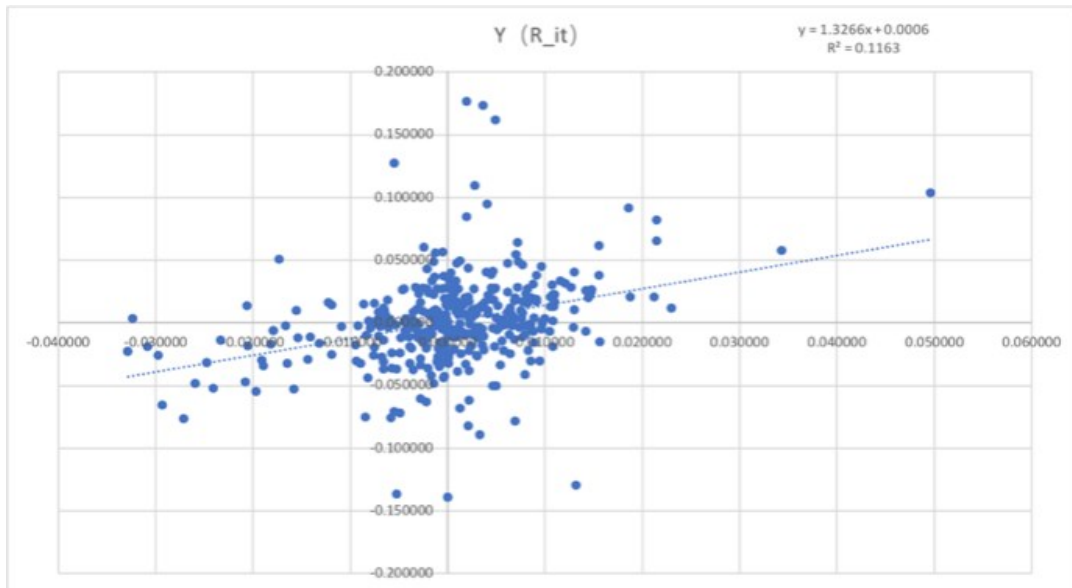


Figure 2: Linear regression model between Tesla's stock market return and the S&P 500's return.

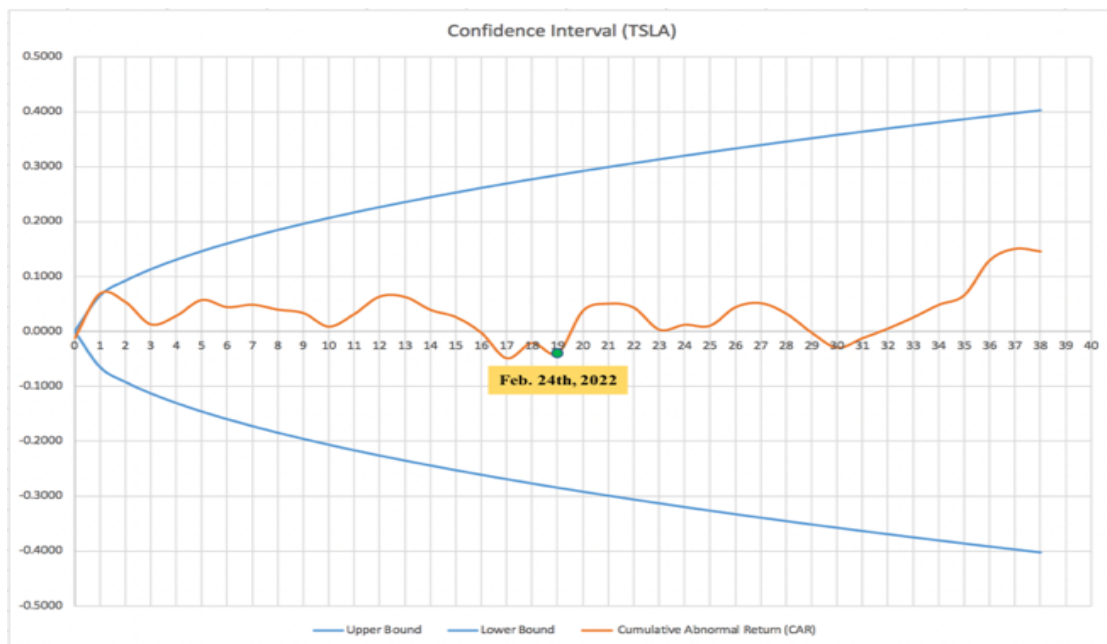


Figure 3: Confidence interval for the CAR of Tesla's stock market.

Figure 2 shows the linear relationship between the stock return of Tesla and the market return of the S&P 500 Index, which can be expressed as: $R_{it} = 1.3266R_{mt} + 0.0006$. After conducting a hypothesis test and constructing a confidence interval on Tesla's stock market, Figure 3 can be obtained. Figure 3 shows the confidence interval of the cumulative abnormal return for Tesla's stock market [2]. As shown in Figure 3, the cumulative abnormal return does not exceed the confidence interval

throughout the whole event window. Thus, the study cannot reject the null hypothesis that the Russo-Ukrainian War has no effect on the stock price of Tesla.

3.3. Lockheed Martin

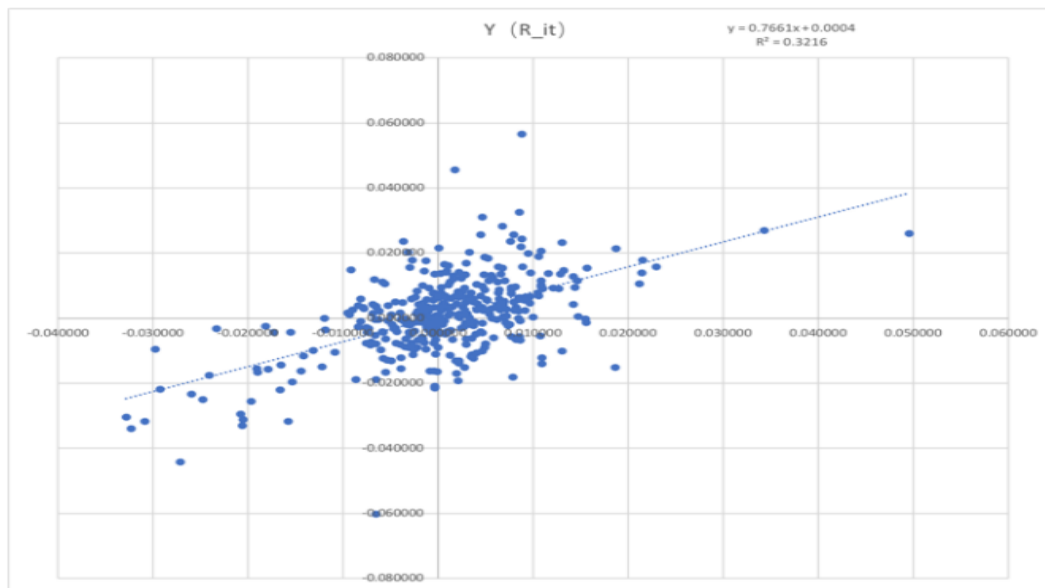


Figure 4: Linear regression model between Lockheed Martin's stock market return and the S&P 500's return.

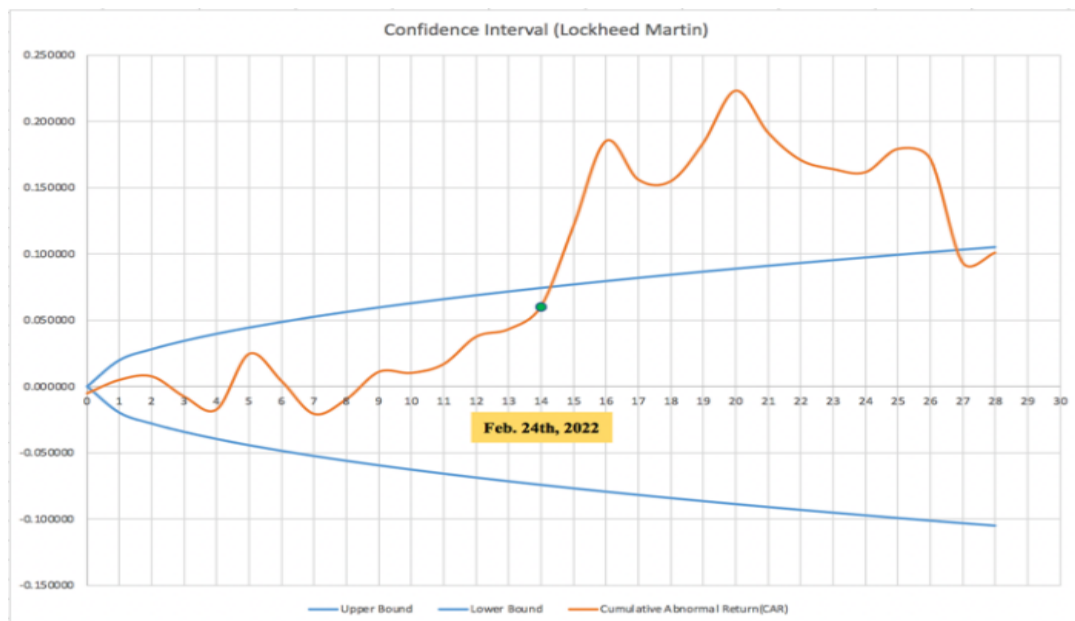


Figure 5: Confidence interval for the CAR of Lockheed Martin's stock market.

As shown in Figure 4, the linear relationship between the stock return of Lockheed Martin and the market return of the S&P 500 Index can be expressed as: $R_{it} = 0.7661R_{mt} + 0.0004$. Furthermore, the study constructed a confidence interval for the cumulative abnormal return of Lockheed Martin's stock market (see Figure 5) [3]. As can be seen from Figure 5, the line representing the cumulative abnormal return breaks the confidence interval on the 15th day. Therefore, there is 95% confidence

to reject the null hypothesis that the Russo-Ukrainian War has no effect on the stock price of Lockheed Martin. Besides, according to Figure 5, the stock return of Lockheed Martin had generally increased due to Russo-Ukrainian War.

3.4. McDonald's

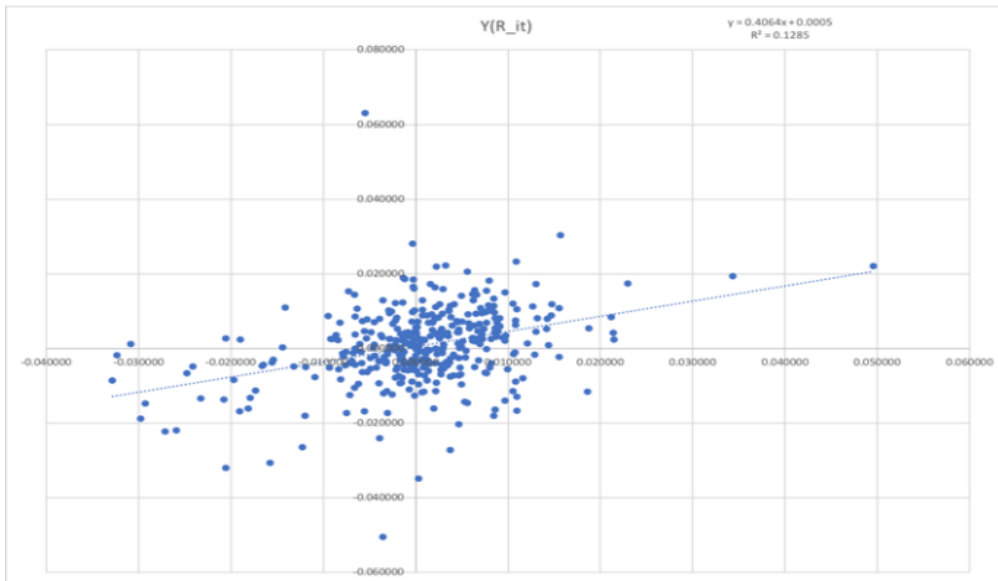


Figure 6: Linear regression model between McDonald's stock market return and the S&P 500's return.

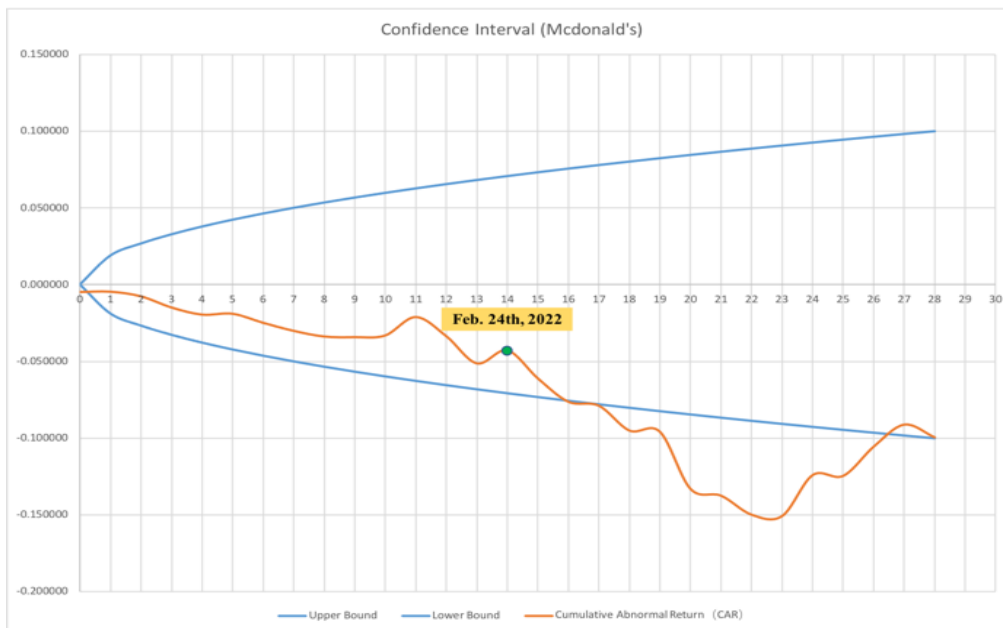


Figure 7: Confidence interval for the CAR of McDonald's stock market.

Figure 6 shows the linear regression model between the stock return of McDonald's and the market return of the S&P 500 Index[4]. The linear relationship can be expressed as: $R_{it} = 0.4064R_{mt} + 0.0005$. After performing the hypothesis test and constructing the confidence interval, Figure 7 can be gained. Figure 7 demonstrates the confidence interval of the cumulative abnormal return for

McDonald's stock market. It can be found that the cumulative abnormal return exceeds the confidence interval on the 15th day (see Figure 7). Therefore, it can be concluded that there is 95% confidence in rejecting the null hypothesis that the Russo-Ukrainian War has no impact on the stock price of McDonald's. In addition, Figure 7 illustrates that the stock return of McDonald's was generally decreasing.

4. Discussion

Based on the investigation above, the Russo-Ukrainian War is playing no impact on Tesla. This section will address the influence of Russo-Ukrainian War on the Stock return of S&P 500, Lockheed Martin, and McDonald's respectively.

4.1. The Impact on the S&P 500 Index

The Russo-Ukrainian War had decreased the return of S&P 500. To begin with, Russo Ukraine War had increased the volatility of the natural gas price level. According to the data released by EIA [5], the Russo-Ukrainian War had increased the volatility of natural gas price: the annualized volatility of it in February 2022 had increased into 179%. However, both the supply side including industry sector, catering industry and the demand side like daily-life activities including cooking rely on natural gas to a very large extent, which means the increased volatility in natural gas price level will inevitably increase the volatility, that is, instability and risk, in both the supply side and demand side, damaging both the supply side and demand side of the USA economy by reducing the aggregate supply and aggregate demand of it. This had reduced the stock return of S&P 500 as the development of American economy had been damaged in both supply side and demand side while S&P 500 is a reflect of American economy's development to a large extent. Moreover, as the American economy's volatility has increased in both sides, the volatility had also increased in S&P 500 due to the increased volatility in American economy. Even S&P 500 Dow Jones Indices (n.d.) had illustrated in 'S&P 500 12-Month Realized Volatility Index' that the volatility of S&P 500 was constantly increasing in February [6]. This had increased the risk for investing S&P 500 in the sense that the higher the volatility the higher the risk for investment, reducing investment in S&P 500, which had in turn reduced stock return of S&P 500.

Apart from that, Russo-Ukrainian War had increased the price of oil. EIA (March 2022) had pointed out in the report 'Short-Term Energy outlook' that in the USA, the price of oil in February 2022 was 11\$ per barrel (b) higher than that in January that year [7]. Nonetheless, as it has been previously mentioned in this paper, the Russo-Ukrainian War is not increasing the stock return of American renewable-energy and is therefore not promoting the development of USA renewable energy industry, and that there is a time-lag in developing renewable energy, while the current renewable energy technology in USA still cannot completely replace the use of oil. In this case, USA failed to find substitute like renewable energy to the up-priced oil to a large extent, so the USA still needed to use the oil whose price level had increased. Consequently, cost-push inflation increased because residents, firms, and enterprises there still needed to use oil when transferring products so the cost for production increased, leading to the reduced stock return of S&P 500.

4.2. The Influence on the Stock Return of Lockheed Martin

The Russo-Ukrainian War, nevertheless, is increasing the stock return of Lockheed Martin. First and foremost, Russo-Ukrainian War has stimulated the USA to supply weapons to Ukraine. As the largest military enterprise in the USA, Lockheed Martin was playing an indispensable role in supplying weapons to Ukraine, which is why this would inevitably influence the stock return of Lockheed Martin.

Notably, the stock return of Lockheed Martin had increased sharply on 1st March 2022 as shown by the data released by the Yahoo Finance in 2022 [8], with three main different causations as follows.

First and foremost, investors anticipated that the USA would provide Ukraine with more weapons as the USA needed to do so not only for protecting Ukraine from being subjugated by Russia which is the rival country of the USA but also for preventing Russia from invading the NATO. Even the news ‘Biden Sends Heavy Weapons as Ukraine Faces New Russia Offensive’ reported by Bloomberg. (13 April 2022) showed that President Joe Biden was providing Ukraine with heavy weapons [9]. Nonetheless, when sending weapons to Ukraine, the USA government needed to purchase weapons from Lockheed Martin, which would expand the market demand for Lockheed Martin. This had attracted more investors to invest Lockheed Martin in the sense that increased market demand would increase profits of Lockheed Martin, resulting in the increased stock return of Lockheed Martin dramatically on 1st March 2022. Meanwhile, to meet the increased demand for military equipment caused by assisting Ukraine militarily, Lockheed Martin needed to increase the aggregate supply of its products. Selinger. M. (May. 2, 2022) had reported in the news ‘Ukraine conflict: Lockheed Martin to boost production capacity for popular weapons.’ that Lockheed Martin was increasing the aggregate supply of its weapons by purchasing more equipment, hiring more employees, and allocating more factory space [10]. Increased aggregate supply for meeting the market demand would help to meet market equilibrium, increasing the profits of Lockheed Martin. A volume of investors anticipated that this would happen and therefore invested Lockheed Martin by 1st March 2022, increasing the stock return of Lockheed Martin that day. Meanwhile, Lockheed Martin also needed to improve the capacity of its products, that is, weapons, by investing Research and Development (R&D) to help Ukraine defeat Russia and protect NATO from being invaded by Russia, which would improve the capacity of weapons produced by Lockheed Martin and thus shift the opportunity cost curve outward, increasing profits of Lockheed Martin. This in turn stimulated investors to increase investments in Lockheed Martin and therefore increased the stock return of it dramatically on 1st March 2022. In particular, the Eurasian Times (27 August 2022) reported in the news ‘6th-Gen Fighter Jet: American NGAD, British Tempest Programs Could Collaborate — Top USAF Official’ that the American NGAD was inventing the 6th-Gen fighter jet with the British Tempest Programs [11]. The Breaking Defense (1 June 2022) also reported the news ‘The Air Force’s secret next-gen fighter has reached development phase’ that the NGAD was being led by Lockheed Martin [12]. These news showed that the Lockheed Martin was the main role doing R&D in developing the 6th-Gen Fighter Jet that would protect both Ukraine and NATO from being invaded by Russia more efficiently. A considerable number of investors anticipated that Lockheed Martin would become the main role who invent 6th-Gen Fighter Jet hence they invested Lockheed Martin, boosting its stock return on 1st March 2022 highly rapidly. Eventually, based on all these reasons and causations, the stock return of Lockheed Martin had increased dramatically due to the massively increased investment in it that day, as a great deal number of investors anticipated that all these news would happen.

In addition, Russia was lack of performance during the Russo-Ukrainian War, which would also boost the stock return of Lockheed Martin as failing to eliminate Ukraine will reduce the confidence for Russian military industry in the market and thus stimulate more countries like India to reduce the purchase of Russian weapons while buying more American weapons instead, which would expand the market of Lockheed Martin and would therefore boost the stock return of it. Specifically, as it has been reported by New York Times (8 March 2022) in the news ‘Quoting Churchill and Shakespeare, Ukraine Leader Vows No Surrender’ that the Ukraine President Zelensky was not going to surrender to Russia [13]. This would expand the market for Lockheed Martin as it revealed that the military power of Russia including the capacity of its military equipment was declining and this would therefore attract more countries like India to buy less weapons from Russia while purchasing more military equipment from the USA especially that produced by Lockheed Martin. For instance, The Indian

Express (March 4th, 2022) reported in the news ‘India cancelled orders of Russian jets, weapons: US official at Senate hearing.’ that India was reducing the purchase of military equipment from Russia [14]. Banerjee. V. and Tkach. B. (12 April 2022) had also pointed out in the article ‘AFTER UKRAINE, WHERE WILL INDIA BUY ITS WEAPONS?’ that India had been trying its best to increase the import of defense system from the USA [15]. It follows that India was purchasing less weapons from Russia while importing more military equipment from the USA, increasing the stock return of Lockheed Martin as this increases its profits due to the increased market demand for its products. A considerable number of investors anticipated that Ukraine would not surrender and therefore India would import less weapons from Russia while buying more military equipment from the USA instead, so they invested Lockheed Martin, boosting the stock return of it dramatically on 1st March 2022.

Apart from that, Sweden and Finland would join NATO to protect themselves from being invaded by Russia, which would expand the market for Lockheed Martin as countries in NATO frequently purchase weapons from the USA and these two countries need to buy weapons from the USA to prevent the invasion of Russia. For instance, The Washington Post (28 June 2022) had reported in the news ‘Turkey drops opposition to Finland, Sweden joining NATO’ that Turkey agreed to help Finland and Sweden to join NATO, with the aim of protecting these two countries from being invaded by Russia [16]. This would increase the market demand for the products of Lockheed Martin as these two countries needed to buy more weapons to protect themselves from being invaded by Russia. This would expand the market for Lockheed Martin as the USA allies are the main market for Lockheed Martin, which would increase the profits of this company and would thus attract more investors to invest in it. A volume of investors anticipated that these two countries would join NATO, and that the Turkey would help them join NATO. Consequently, these investors invested in Lockheed Martin, leading to a sharp increase in its stock return on 1st March 2022.

Furthermore, increasing number of investors anticipated that all these events mentioned above would happen, which stimulated more investors to invest in Lockheed Martin. This further increased the stock return of Lockheed Martin dramatically on 7th March 2022. Also, the news ‘India cancelled orders of Russian jets, weapons: US official at Senate hearing.’ reported by the India Express on 4th March 2022 had also showed the finance market that the India is reducing the import of Russian military equipment [17], which had also convinced more investors to expect that India would buy more American military weapons instead before long, stimulating more investors to invest in Lockheed Martin. This had also further boosted the stock return of it sharply on 7th March 2022.

4.3. The Impact on the Stock Return of McDonald’s

The Russo-Ukrainian War, nonetheless, has a negative impact on the stock return of McDonald’s. There are two main reasons why decreased stock return occurred in McDonald’s. One of them is the increasing prime cost after the war, another is that McDonald quit the Russian stock market.

When the war began on Feb 24th, 2022, there was an immediately sharp decrease of its stock price, and that downward trend had been lasting until March 9th, 2022. From a comprehensive report of McDonald’s Corporation in Aug 18th, 2022, the annual return of McDonald in 2022 is the lowest in the recent ten years and is the only negative year from 2015 to 2022 [18]. The return is -1.81%, which is quite a strike compared with 2021’s 27.79% [18].

To begin with, the raw food material’s price increased dramatically after the war. For example, the wheat price increased 55.7% (From 793.76 USD/Bbl. in Feb 23rd, 2022, to 1235.5 USD/Bbl. on Mar 7th, 2022) [19]. The USA was faced with skyrocketing prices in food because of the maritime embargo that Russia has enforced since the war against Ukraine, which increased the cost and risk for transferring products. Ukraine is imprisoning over 20 million tons of exporting grain. After this year’s grain harvest is finished, according to Ukrainian President Zelensky, the amount could reach 75

million tons [20]. Up to 30% of the 86 million tons of grain that Ukraine typically produces won't be harvested, according to Laura Wellesley, a food security specialist at the British think tank Chatham House [21]. Previously, Ukraine produced 16% of the world's corn, 9% of the world's wheat, and 42% of the world's sunflower oil [22]. Additionally, Russia, the biggest exporter of wheat worldwide, had a decline in its overall export volume this year. Although Russian agriculture is not specifically mentioned in the Western sanctions on Russia, the Kremlin feels that the sanctions have raised insurance costs, disrupted payments, and thus hampered exports. The entry of Russian ships carrying agricultural goods into EU ports is not prohibited. Therefore, with the price increase of raw food material, McDonald must increase price of some products which lower its sales volume. What's more, after the war, the crude oil price also increased out of control. From the data on TRADING ECONOMICS, the crude oil price increase 34.8% from 25th 2022 to Mar 8th, 2022 [23]. Russia exports around 5 million barrels of crude oil per day, or 11% of all exports worldwide, according to data on the country's crude oil export volume over the years. Russian crude oil exports in 2020 were 4.6535 million barrels per day, coming in second only to Saudi Arabia's 6.6586 million barrels per day, which ranked second in the world. Although the major theater of the Russian-Ukrainian war is in Ukraine, and there is little chance that the Russian mainland, particularly the key regions producing crude oil, will be directly impacted by the conflict, the conflict may have an impact on producers' confidence going forward. At the same time, the UK announced it will gradually stop importing Russian oil and petroleum products by the end of 2022, while the United States formally issued an executive order banning the import of Russian energy. Since food companies need to transport fresh food material every day, the increasing crude oil price would cause the increasing transport fare, which is also a tough problem for McDonald.

Apart from the increasing transport fare of raw food material, the increased crude oil price may have some other negative effect [24]. Because of the Covid-19, many McDonald outlets only receive drive through and takeout orders. Because of the higher gasoline price, people are less willing to drive to McDonald and take the food. What's more, unfortunately, the takeout applications such as Uber Eats increased its deliver fare because of higher crude oil price. So, in short, people may consume less McDonald products because of the increased crude oil price.

In addition, McDonald's quitting Russian market caused a big loss. According to RNZ (May 17th, 2022), McDonald's has said it will permanently leave Russia for more than 30 years and has started to sell its restaurant [25]. After this news had been released on May 17th, 2022, its stock price per share has a drop sharply downward trend until May 19th, 2022. McDonald has 850 outlets within Russia, and it is worth mentioning that most of these stores are direct-sales stores, which means a much larger loss than the franchise stores counterpart. As McDonald quit the market, the market share left for local brands in Russia increased. For example, the Russia local new brand Uncle Vanya made a huge golden letter B as its logo, which is quite like McDonald's logo letter M. Their products are similar, too. Much of McDonald's market share before would be taken over by these local brands. What's more, with the development of food companies selling similar products to McDonald, these developing competitors could be threat for McDonald, either. Lastly, comparing to this uncountable loss of McDonald, the direct loss is over 100 million USD [26]. According to the corporation, McDonald's write-off from leaving Russia will range from \$1.2 billion to \$1.4 billion [27]. Just shutting down its eateries for the first two weeks in Russia had a major negative impact on company earnings, costing it \$127 million. On the one hand, McDonald need to pay a large amount of salary even if it closed its outlets because of the employ contract. On the other hand, the food inventories of the 850 outlets are another huge cost.

5. Conclusion

In conclusion. Even though the war is a negative and destructive event, its impact largely varies for stock returns in different types of industries and S&P 500 in the USA. For S&P 500 and the stock return of McDonald's, the Russo-Ukrainian War is playing a negative impact on them and is reducing the stock return of them. The Russo-Ukrainian War, nevertheless, has no impact on the stock return of Tesla, and the Russo-Ukrainian War had also increased the stock value of Lockheed Martin dramatically. Moreover, it is highly significant that investors gain increased return through following things.

To begin with, when there comes to a war, investors must have a certain level of military literacy to predict and analyze the future war situation to formulate their own investment strategies based on the future war situation. For instance, investors needed to succeed in predicting that the Zelensky would not surrender, and that the USA will assist Ukraine by providing it with military equipment, so that investors can gain increased returns by investing Lockheed Martin in time. In addition, during the state of war, investors must gather enough information regarding both warring sties so that they avoid losing returns while gaining increased return. After predicting that there will be war between Russia and Ukraine, investors needed to realize that the cost for producing food would increase as Russia and Ukraine produce oil that cars carrying raw food raw materials need to use and raw material for food, after which investors needed to reduce investment in catering industry like McDonald's to avoid loss of return due to the decreased stock return in McDonald's, while investing Lockheed Martin more and thus gain more returns.

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Laijun Xu and Ruohan Zhao contributed equally to this work and should be considered co-first authors. Ancheng Wang and Jiayi Yan ontributed equally to this work and should be considered co-second authors.

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