The Influence of the Tokyo 2020 Olympic Games on the Stocks of Japanese Firms that are Sponsored

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ABSTRACT
With the 2020 Japan Olympic Games postponement, the 2021 Japan Winter Olympics has received increasing attention. The effect upon the stock market of domestic Japanese sponsors became uncertain because of the duration of the COVID-19 pandemic. This paper uses event study to analyze the influence of the Tokyo 2020 Olympic Games on the stocks of sponsored Japanese firms. The selected sample sponsors are Canon, Panasonic, Meiji, Toyota, Dai Nippon Printing, and Japanese airline. Measuring Abnormal and Cumulative abnormal returns are the primary methodologies to determine whether there is a positive and negative effect eventually upon the stock market. The findings found that most domestic Japanese sponsors have a negative effect on the stock market, which coronavirus pandemic is the main reason for the results. The minority of sponsors like Meiji and Dai Nippon Printing have a positive impact but at a slow rate. Therefore, the research results show that sponsoring the Olympic Games will not benefit enterprises, and they should be wary about sponsoring sports events.

Keywords: Tokyo 2020 Olympic games, stock market, Japanese firms

1. INTRODUCTION

The Summer Olympic Games are the world's most comprehensive sporting event. It is held every four years, having countries from worldwide participating, including Europe, Asia, Africa, America, and Oceania. Hosting the Olympic Games requires a considerable financial base, and corporate sponsorship has become the main element of finances and materials for the Games, according to Liu He’s reports, he found that it accounts for approximately 30% of overall revenue [1]. The Olympic Games give sponsoring companies a positive public image while also advertising and promotion opportunities. The Olympic games are expected to boost the country's economy and do honour the host country.

According to the official website of the Olympic Games, the Tokyo 2020 Games have 66 domestic sponsors. So, the Japanese government is expected to receive $3.2 billion of sponsorship for the Tokyo Olympics, which is three times the previous record.

Unfortunately, due to the spread of COVID-19, the Tokyo 2020 Olympics, which were initially scheduled for July 24, 2020, have been postponed to July 23, 2021. Furthermore, due to epidemic prevention and control, the stadium, now must hold without an audience. In TianYi Lv’s report, he found that Ticket sales for the Olympics and Paralympics were planned to total about 90 billion yen, but after announcing no audience for some events, ticket sales are expected to reach only a few billion yen, a loss of more than 80 billion yen [2]. So, for sponsors, will these unusual Games still be as lucrative as expected?

This paper mainly investigates whether and how the stocks of Japanese firms that are sponsored have been affected by the announcement of postponement and opening of Tokyo 2020 Olympic games.

The outline of the remaining paper is as follows. The next section describes the methodology. Section 3 presents and discusses the empirical results and section 4 concludes.
2. LITERATURE REVIEW

As early as the 1980s, people have begun to address sports sponsorship-related topics.

For example, in Meenaghan (1983) paper, he defined the sponsorship, classified the sponsorship goals, also provided the framework structure of sponsorship options and the measurement method of sponsorship results [3]. Kathleem Anne Farrell et al. indicate that in an efficient capital market, the net present value of all future expected earnings from an investment is included in the share price once the news comes out. Therefore, through the change of stock price on the stock market to study the influence of enterprise performance and efficiency brought by praise and help is based on the evidence [4].

By investigating the stock return changes before and after the announcement of sponsorship rights of the Atlanta Summer Olympic Games, Kathleem Anne Farrell found that the corporation value will not be improved by sponsoring the Olympic Games in marketing communication.

After the application of various models and methods, some scholars conclude that is entirely contrary to the previous scholars. Anthony D. Miyazaki et al. studied the stock market performance of the companies sponsoring the 1996 Atlanta Olympic Games using event research [5]. Unlike most scholars who criticize corporate sponsorship of the Olympic Games, they believe that the market recognizes sponsorship of the Olympic Games. Corporate involvement in sponsorship is valuable because the business may have positive cash flow in the future and the stock market will react positively.

Overall, we can see that the effect of sponsoring sports competitions is very. The different modeling could cause this, the number of sponsors, etc. The 2020 Olympics conducted in Tokyo due to the coronavirus has been postponed to 2021. Therefore, we want to use AR and CAR to measure whether a positive or negative effect on the stock market.

3. METHODOLOGY

We choose three types of partners. The first is Worldwide Olympic Partners that contains Panasonic 6752.T and TOYOTA 7203.T. The second is Tokyo 2020 Olympic Gold Partners that includes Canon Inc. 7751. T and Meiji Co., Ltd 2269.T. The third is Tokyo 2020 Olympic Official Partners covers Dai Nippon Printing Co., Ltd 7912.T and Japan Airlines Co., Ltd. 9201.T. We use the AR of the sponsoring company Panasonic and the accumulated excess return CAR to obtain the sponsorship rights of the event and characterize the changes in the stock indicators of related companies at the opening of the event. We choose the 23rd of March as the day of the first event day, day 0, which is the date the IOC announced the postponement of the 2020 Olympic game.

The data are collected from the Japanese stock market and the website finance.yahoo.com. Due to the press conference has received extensive media attention and reports, the accuracy of the announcement date can be guaranteed. We define the estimation window as [-211, -11]. The event window is [-10, 10]. Therefore, the event window of this sponsor will be started from 23rd of March to 6th of April. If the day of the event happens to be a non-trading day, we will postpone the calculation to the first trading day. As the table 1.1 shows, 16th of July is a non-trading day, thus, we postpone it to the day 19th of July which is the trading-day.

The second event date started at the 23rd of July which is the opening ceremony of the 2021 Olympic game. We define the estimation window as [-211, -11]. The event window is [-10, 10]. Therefore, the event window of this sponsor will be started from 23rd of July to 10th of August. This event study will calculate the abnormal return to measure the performance of the sponsoring company in the stock market during the opening of the relevant event. Measured by AR (abnormal return) in period t and CAR (cumulative abnormal return) in a period. At period t, the abnormal return is calculated by the formula

\[ AR_t = \frac{R_t - (\alpha + \beta R_{mt})}{\sigma_t} \]

\[ CAR = \sum_{t=-T}^{T} AR_t = N(0, (T + T) \sigma_t^2) \]

(1)
The above figure 1 shows the AR and CAR of sponsor Panasonic during the 2020 Olympic games postponed. From figure 1, the AR sponsored by Panasonic fluctuates around 0, and more proportions are less than 0. Therefore, there is a significant effect act on the stock market. From the CAR row, the result is -0.36203, which is a negative number. This refers to that there’s negative effect act on the stock during the deferred period. This indicates the postponement of the Olympics has brought a particular blow to Panasonic’s stock market. Also, the emergence and continued infection of the coronavirus pandemic is one of the causes that negatively impact the stocks. Thus, the expiations of the Olympic games would be pulled down. Graph shows that the CAR had a downward tendency which can be predicted there will be a rise in the stock deficit.
The above table 2 and figure 2 are the dates of Panasonic in 2021. From Figure 2, Panasonic’s AR during the Olympic games, it can be seen that the AR sponsored by Panasonic fluctuates around 0. The proportions greater than 0 and less than 0 are similar since there’s only one more AR less than 0. This does not mean that the Olympics is not conducive to the abnormal return of Panasonic. Therefore, there is no significant effect act on the market. From the CAR row, the result is 0.0084498, which is a positive number. This refers to that there’s positive effect act on the stock during the Olympic period. Compared with Panasonic 2020, the Olympic games do bring upward benefit to the local sponsor. Also, this is the first Olympic games conducted after the coronavirus pandemic, so people are looking forward and pay more attention to this international competition. Thus, this Olympic game generates expectations and has a particular impact on the company’s stock price. In table 2, there is an upward tendency in the CAR which can be predicted that there will be a rise in the surplus of the Panasonic stock.
The above figures 3 show the AR and CAR of sponsor Japan Airline during the 2020 Olympic games, which has been postponed. From table 3, the AR sponsored by Panasonic fluctuates around 0. The proportions of AR less than 0 are more than the AR greater than 0. This means that the postponement of the Olympic games held in Tokyo is conducive to the abnormal return of Panasonic. Therefore, there is a significant effect act on the stock market. From the CAR row, the last result is -0.362561298, which is a negative number. This refers to that there’s negative effect act on the stock during the deferred period. This refers to that the postponement of the Olympics has brought a certain strike to Panasonic’s Japan Airline market. Also, due to the coronavirus pandemic, less people traveled around which can be one of the reasons that lead to the negative impact on the stocks. Graph 6 shows that the CAR had a downward tendency which can be predicted there will be a rise in the stock deficit.
Table 4: Japan Airlines 2021

| stock code | event date | trading date | stock price | index | dividend return rate | market return rate | dif | predicted returned | AR | CAR |
|------------|------------|--------------|-------------|-------|----------------------|-------------------|-----|-------------------|----|-----|
| 9201       | 2021-07-23  | 2021-07-08   | 28118.0293  | -0.26294127 | 0.000703934 | -10 | 0.00160591 | -0.02859004 | -0.02859004|
| 9201       | 2021-07-23  | 2021-07-09   | 28940.41992 | 0.012642741 | 0.01874256 | -9 | -0.0003417 | 0.012984475 | -0.01560566|
| 9201       | 2021-07-23  | 2021-07-12   | 28569.01953 | -0.004823863 | 0.000526899 | -8 | 0.00190088 | -0.006733747 | -0.022339313|
| 9201       | 2021-07-23  | 2021-07-13   | 28781.24023 | 0.001214083 | 0.00390189 | -7 | 0.00212805 | -0.00091363 | -0.02323273|
| 9201       | 2021-07-23  | 2021-07-14   | 23959.28608 | 0.001932094 | 0.0036019 | -6 | 0.00217797 | -0.03411065 | -0.05783341|
| 9201       | 2021-07-23  | 2021-07-15   | 28279.08984 | -0.004592902 | 0.001305808 | -5 | 0.00060428 | -0.00519777 | -0.062560518|
| 9201       | 2021-07-23  | 2021-07-16   | 2003.08008 | -0.001258389 | 0.00928817 | -4 | 0.00123499 | -0.002493381 | -0.0650539|
| 9201       | 2021-07-23  | 2021-07-19   | 27652.74023 | -0.02859429 | 0.00394697 | -3 | 0.00212054 | -0.03067973 | -0.059733872|
| 9201       | 2021-07-23  | 2021-07-20   | 27388.16016 | -0.026805015 | 0.003832718 | -2 | -0.003861 | -0.023204031 | -0.118937865|

Figure 4: Japan Airlines 2021

The above table 4 and figure 4 are the dates of Japan Airline in 2021. From the figure 8, Japan Airline AR during the Olympic games, the AR of the stocks fluctuate around 0. The proportions less than 0 are more than AR less than 0. This shows that the Olympic game is not conducive to the abnormal return of Japan Airline. Therefore, there is no significant effect act on the market. From the CAR row, the result is -0.125486081, which is a negative number. This refers to that there’s negative effect act on the stock during the Olympic period. Comparing with the result of Japan Airline 2020, the Olympic games did not bring upward benefit to the local airline. This could be due to the coronavirus pandemic, since Olympic games won’t reduce the risk of travelling and infected by the virus. Thus, although the Olympic game does bring some rotation of the Japan Airline, the process will be slower than other sponsors. In the figure 4, there is an upward tendency in the CAR which can be predicted the stock of Japan Airline will be slowly improved.
The CAR data shows a more obvious result while all the figure is negative. At last, the data responds with -0.17545, showing there’s a negative effect act on the stock in 2020. To conclude, in 2020 Canon has a downward trend on their market because of the postponed of the Olympic. Couple of reasons could explain the drawbacks. Not only because of the delay of Olympics, the Covid-19 might also play an important role in the defect.
Table 6 Canon 2021

| stock code | event date | trading date | stock price | index | individual n | market return | dif | predicted_i_AR | CAR |
|------------|------------|--------------|-------------|-------|---------------|---------------|-----|----------------|-----|
| 7751       | 2021-07-2  | 2021-07-01   | 2465        | 28118.03 | -0.00484      | 0.000704      | -10 | 0.002177       | -0.00702 |
| 7751       | 2021-07-2  | 2021-07-01   | 2477        | 27940.42  | 0.004866      | 0.001874      | -9  | 0.001366       | 0.003508 |
| 7751       | 2021-07-2  | 2021-07-01   | 2505        | 28569.02  | 0.011304      | 0.005527      | -8  | 0.002301       | 0.009003 |
| 7751       | 2021-07-2  | 2021-07-01   | 2545        | 28718.24  | 0.015968      | 0.00039       | -7  | 0.002296       | 0.013572 |
| 7751       | 2021-07-2  | 2021-07-01   | 2565.5      | 28608.49  | 0.008055      | 0.00036       | -6  | 0.002417       | 0.005636 |
| 7751       | 2021-07-2  | 2021-07-01   | 2534.5      | 28279.09  | -0.01208      | 0.001306      | -5  | 0.001757       | -0.01384  |
| 7751       | 2021-07-2  | 2021-07-01   | 2514.5      | 28003.08  | -0.00789      | 0.000927      | -4  | 0.002022       | -0.00991  |
| 7751       | 2021-07-2  | 2021-07-01   | 2479        | 27652.74  | -0.01412      | 0.000395      | -3  | 0.002393       | -0.01651  |
| 7751       | 2021-07-2  | 2021-07-01   | 2708        | 27388.16  | 0.092376      | 0.003833      | -2  | -0.72E-06      | 0.092383  |
| 7751       | 2021-07-2  | 2021-07-01   | 2628.5      | 27548.98  | -0.02936      | 0.000901      | -1  | 0.002039       | -0.0314   |
| 7751       | 2021-07-2  | 2021-07-01   | 2620.5      | 27833.28  | -0.00304      | 0.000304      | 0   | 0.002456       | -0.0055   |
| 7751       | 2021-07-2  | 2021-07-01   | 2639.5      | 27970.22  | 0.007251      | 0.001067      | 1   | 0.001924       | 0.005326  |
| 7751       | 2021-07-2  | 2021-07-01   | 2594.5      | 27581.66  | -0.01705      | 0.00049       | 2   | 0.002327       | -0.01938  |
| 7751       | 2021-07-2  | 2021-07-01   | 2501.5      | 27782.42  | -0.03604      | 0.04E-05      | 3   | 0.002634       | -0.03867  |
| 7751       | 2021-07-2  | 2021-07-01   | 2496.5      | 27283.59  | 0.035138      | 0.001908      | 5   | 0.001337       | 0.032911  |
| 7751       | 2021-07-2  | 2021-07-01   | 2582        | 27781.02  | 0.034248      | 0.001927      | 6   | 0.001253       | 0.012496  |
| 7751       | 2021-07-2  | 2021-07-01   | 2617.5      | 27641.83  | 0.013749      | 0.002027      | 0.028202 |
| 7751       | 2021-07-2  | 2021-07-01   | 2626.5      | 27584.08  | 0.003438      | 0.001927      | 7   | 0.002607       | 0.000831  |
| 7751       | 2021-07-2  | 2021-07-01   | 2625.5      | 27728.12  | 0.00057       | 0.00234       | 8   | 0.001035       | -0.00161  |
| 7751       | 2021-07-2  | 2021-07-01   | 2620.5      | 27820.04  | -0.00171      | 0.001354      | 9   | 0.001723       | -0.00344  |
| 7751       | 2021-07-2  | 2021-08-01   | 2615.5      | 27888.15  | -0.0021       | 0.001971      | 10  | 0.001293       | -0.00339  |

On the contrary, the data from Canon in 2021, when the Olympic had conducted, shows a different view. The AR are also float around 0, 12 of them are negative while 9 of others are positive. The data shows no abnormal return. In conclusion there’s still no significant effect in Canon in 2021. However, the CAR data shows a different result. In 2021, most of the CAR of Canon are more than 0, and the last figure is 0.020597, which means there is a positive effect on Canon’s stock in 2021. Comparing with the result in Canon in 2020, the upwards tendency proves that the Olympic Games do bring some upward effect to the factor, leads to this upward tendency.
Though the Olympic 2009-6 10-7 10-0 0-0 0-0 0-0 0-0

Next comes to the stock of Meiji in 2020 with the postponed Olympic game. During the period, 12 of the AR show on the table are positive, while the other 8 of them are negative. Yet, all the data are around 0. As a result, there isn’t any significant effect in Meiji in 2020, and the data shows the normal return of this company. Coming the next is the CAR row. On that row, the data that over 0 is far more than data less than 0. Only 4 figures are smaller than 0. At last, the number stop at 0.151067, which is positive, means that the postponed Olympic game did not bring any negative effect on Meiji company’s stock market. The Covid-19 didn’t bring a horrible effect in this kind of domestic company and Meiji as an example still run well although the Olympic has delayed.
Similar in 2021, when the Olympic game conducted on time, the Meiji company as one of the most important domestic sponsorships is also affected by the game. AR on the table showing that the sponsored by Meiji are fluctuate between 0.1 and -0.1, 11 of them are positive. Only 10 of them are negative. Yet the figure 15 still shows Meiji has a normal return. Therefore, the Olympic game did not have a significant effect in Meiji’s stocks. Speaking of the CAR, shows on the table 16, the only negative data are shown in the first day. All the other data are positive. At last, the number stop at 0.046274, which means there is a positive effect act on the stock in 2020. It is showed that the Olympic game do bring some benefit to Meiji on their market that leads to an upward tendency. Compare with the data shows in 2020, the stock in Meiji shows a general improve, which means that the Olympic game do brings benefit to the company who sponsor it.
The above figure shows the sponsor Toyota's AR and CAR performance during the announcement of postponement Tokyo 2020 Olympics. As can be seen from the table, From the CAR line, the result is -0.0617593452, which is a negative number. This refers to the delay for the stock of Toyota is a negative impact. Since the Tokyo Olympics announced the postponement, Toyota investors have become less and less optimistic about how much the Olympics will bring to the brand itself.
The table 10 and figure 10 above shows Toyota’s figures for 2021. It can be seen from the AR line that the AR sponsored by Toyota fluctuates around 0, and the proportion of positive and negative numbers is almost the same. This means that the Olympics is beneficial to normal return of Toyota. Therefore, it has a significant impact on the market. From the CAR row, the data of the last CAR is -0.022644184. This is a number less than 0. This refers to actions that have a negative impact on stock of Toyota during the Olympics. At the same time, the rest of Toyota’s stock is expected to continue its downward trend as CAR data shows a downward trend.
This refers to that there’s negative effect act on the stock during the deferred period. This refers to that the postponement of the Olympics has brought a certain strike to Dai Nippon Printing corporation. Figure 11 shows that the CAR had a downward tendency which can be predicted there will be a rise in the stock deficit.
Table 12 Dai Nippon Printing 2021

| stock code | event date | trading date | stock price | index | individual return | market return | rate | predicted_return | AR | CAR |
|------------|------------|--------------|-------------|-------|-------------------|---------------|------|------------------|----|-----|
| 7912       | 2021-07-23 | 2021-07-08   | 28118.0293  | -0.01166667 | 0.000703934  | -10           | 0.00096684 | -0.01263507 | -0.01263507 |
| 7912       | 2021-07-23 | 2021-07-09   | 28740.41992 | 0.002107926 | 0.001874256  | -9            | 0.000336738 | 0.001771188 | -0.010862318 |
| 7912       | 2021-07-23 | 2021-07-12   | 28569.01953 | 0.029869584 | 0.000526889  | -8            | 0.01062269 | 0.28807315 | 0.17944996 |
| 7912       | 2021-07-23 | 2021-07-13   | 28718.24023 | 0.007761438 | 0.000390189  | -7            | 0.00113576 | 0.006625679 | 0.024570674 |
| 7912       | 2021-07-23 | 2021-07-14   | 28509.49023 | 0.029590596 | 0.00036019  | -6            | 0.001151912 | 0.23636844 | 0.05309358 |
| 7912       | 2021-07-23 | 2021-07-15   | 28279.08984 | -0.019291329 | 0.001305808  | -5            | 0.0064279 | 0.01954129 | 0.03375229 |
| 7912       | 2021-07-23 | 2021-07-16   | 28003.08008 | 0.012043356 | 0.000956817  | -4            | 0.00648648 | 0.012890196 | 0.020185033 |
| 7912       | 2021-07-23 | 2021-07-19   | 27552.74023 | 0.006907761 | 0.000394697  | -3            | 0.001133333 | 0.00574428 | 0.02595461 |
| 7912       | 2021-07-23 | 2021-07-20   | 27388.16016 | -0.010086781 | 0.000382718  | -2            | -0.007177 | -0.009371081 | 0.1668938 |
| 7912       | 2021-07-23 | 2021-07-21   | 27548       | 0.023644517 | 0.000901442  | -1            | 0.00860502 | 0.022784015 | 0.03927396 |
| 7912       | 2021-07-23 | 2021-07-26   | 27833.28906 | 0.011150936 | 0.000304089  | 0             | 0.00118216 | 0.009968776 | 0.04934117 |
| 7912       | 2021-07-23 | 2021-07-27   | 27907.2207  | 0.024025207 | 0.001066583  | 1             | 0.000771589 | 0.023253619 | 0.072594798 |
| 7912       | 2021-07-23 | 2021-07-28   | 27581.66016 | 0.015      | 0.00049005  | 2             | 0.001081995 | -0.01681995 | 0.056512794 |
| 7912       | 2021-07-23 | 2021-07-29   | 27782.41992 | 0.00819922 | 5.0408165  | 3             | 0.001318699 | 0.006881223 | 0.063394017 |
| 7912       | 2021-07-23 | 2021-07-30   | 27283.58984 | -0.006196747 | 8.67029E-05 | 4             | 0.012808081 | -0.07494827 | 0.0589919 |
| 7912       | 2021-07-23 | 2021-08-02   | 28107.01953 | 0.017147311 | 0.001970825  | 5             | 0.000318664 | 0.016282647 | 0.072728737 |
| 7912       | 2021-07-23 | 2021-08-03   | 28284.05008 | 0.00689552 | 0.002027119  | 6             | 0.00254436 | 0.006421164 | 0.079389953 |
| 7912       | 2021-07-23 | 2021-08-04   | 28584.08008 | -0.003805175 | 8.73676E-05 | 7             | 0.01298061 | -0.005103776 | 0.074661777 |
| 7912       | 2021-07-23 | 2021-08-05   | 27728.11914 | -0.001909585 | 0.002339862  | 8             | 8.65048E-05 | 0.00199591 | 0.072207267 |
| 7912       | 2021-07-23 | 2021-08-06   | 27620.03906 | -0.02579411 | 0.001354063  | 9             | 0.0061681 | -0.023196221 | 0.049074046 |
| 7912       | 2021-07-23 | 2021-08-10   | 27888.15039 | -0.003132343 | 0.001971069  | 10            | 0.00284613 | -0.003416955 | 0.045657092 |

Figure 12 Dai Nippon Printing 2021

The above table 12 and figure 12 are the dates of Dai Nippon Printing in 2021. From the table 12, Dai Nippon Printing AR during the Olympic games, the AR of the stocks fluctuate around 0. From the CAR row, the result is 0.045657092, which is a positive number. This refers to that there’s positive effect act on the stock during the Olympic period. Comparing with the result of Dai Nippon Printing 2020, the Olympic games did bring upward benefit to the company. In graph, there is an upward tendency in the CAR which can be predicted the stock of Dai Nippon Printing will be slowly improved.

5. CONCLUSIONS

This study aims to analyze the existence of abnormal returns, differences in abnormal returns before and after the announcement of the postponement and opening ceremony of the Tokyo 2020 Olympics in the sponsor companies listed on the Japanese Stock Exchange. It is found that, except for Panasonic, the cumulative abnormal return rate of most sponsoring enterprises is significant. The postponement announcement positively
impacted Meiji and a negative impact on Canon, Dai Nippon Printing, Japan Airlines, Panasonic and Toyota, as measured by abnormal returns and cumulative daily returns. In addition, the opening of the Olympic Games has a negative impact on Canon, Japan Airlines, Panasonic, Toyota, and a positive impact on Meiji and Dai Nippon Printing.

Combined with the above conclusions, the postponement of the Olympic Games has a negative impact on most sponsoring enterprises, and the opening of the Olympic Games has not improved the performance of most sponsoring enterprises. Therefore, we believe that sponsoring the Olympic Games will not benefit enterprises, but many enterprises ignore the considerable cost of sponsoring the Olympic Games. Enterprises should be more cautious and rational before evaluating and thinking about sponsoring sports events.

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