The Impact of Postponing the Olympics on Stock Markets

Yuki Suenaga¹ · Fumiko Takeda¹

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Abstract This study investigates how stock markets reacted to the postponement of the Tokyo Olympic Games, which were scheduled to be held in 2020. After the outbreak of the COVID-19 pandemic, the decision to postpone the Games was made on March 24, 2020. However, even before this decision was made, various news outlets had already reported the possibility of cancellation. Although Olympic Games had previously been cancelled five times, they had never been postponed. This event study based on the Fama French factor models provides no evidence that sponsor stock prices reacted differently from their matched firms to news related to the cancellation of the Tokyo Olympic Games. However, they reacted more positively to news of postponement, although the increase in stock returns did not compensate for the drop following the earlier news suggesting the possible cancellation of the Tokyo Olympic Games. Additionally, a cross-sectional regression shows that positive market responses to news of postponement were intensified for Worldwide Olympic Partners and sponsors with a high ratio of individual and foreign shareholders. Because investors did not believe that postponement of the Olympics would have paid off all of the sponsors' costs, future sponsors will need to place more emphasis on potential deferral risk when making investment decisions.

Keywords Sport sponsorship · Olympic Games · COVID-19 · Japan

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✉ Fumiko Takeda
takeda@tmi.t.u-tokyo.ac.jp

¹ Department of Technology Management for Innovation, University of Tokyo, 7-3-1, Hongo, Bunkyo-ku, Tokyo, Japan

Introduction

The organizing committees of the Olympic Games are sponsored for four purposes, including funding tournament operating expenses, increasing the Olympic Games' brand value, promoting the Olympic movement, and raising funds for athletes' training (Tokyo Organizing Committee of the Olympics and Paralympic Games, 2020). Sponsoring the Olympics can be useful for promoting products and services and enhancing brand value, although high sponsorship costs and ambush marketing have reduced cost effectiveness in recent years (Abril et al., 2018; Hino & Takeda, 2020). In fact, studies have investigated the impact of sponsoring the Olympic Games on stock markets and found negative results (Farrell & Frame, 1997; Deitz et al., 2013).

The Tokyo Olympics, which were scheduled to be held in 2020, were postponed due to the outbreak of the novel coronavirus (COVID-19). The decision was made on March 24, 2020 after various news reports suggested the possibility of cancellation. Although the Olympics were cancelled five times due to the two World Wars, they had never been postponed until the 2020 Tokyo Olympics. Thus, this study is the first to analyze the impact of postponing the Olympic Games. This study examines stock price reactions to news of the potential cancellation and then postponement of the Olympic Games. The study also investigates variations in stock price reactions according to sponsor and shareholder types to understand which factors are likely to affect the value of Olympic sponsorships.

Costs and Benefits of Sponsoring the Olympics

Professional sports are usually supported by sponsor companies. The Olympic Games, held once every four years, is one of the most popular sporting events in the world. There were four types of sponsorships related to the Tokyo Olympics, including Worldwide Olympic Partners managed by the International Olympic Committee (IOC), Gold Partners, Official Partners, and Official Supporters managed by the Japanese Olympic Committee (JOC). Only the Worldwide Olympic Partners could exercise various rights both in Japan and abroad. However, the contract period was 10 years, and there was only one company per industry. To become a 10-year Worldwide Olympic Partner, Toyota Motor Corporation paid 200 billion yen (Tomisawa & Hasegawa, 2020). For participating six-year sponsors, Gold Partners, Official Partners, and Official Supporters had to pay ¥ 15 billion (\$128 million), ¥ 6 billion (\$51.1 million) and ¥ 1 billion (\$8.5 million), respectively (Osborne, 2015).

According to Sandler and Shani (1993), the benefits of sports sponsorship can be categorized as creating a favorable image for the company, a marketing effect, and media utilization. As a global sporting event, Olympic Games sponsorships are expected to have a substantial impact compared to other sports sponsorships. For instance, the 1996 Atlanta Summer Olympic Games welcomed approximately

two million visitors, as well as a worldwide television audience (Farrell & Frame, 1997). In addition to such wide exposure, the overall positive image of the Olympic Games is likely to enhance the sponsor companies' brand image, leading to sales growth by increasing awareness of sponsors' products and services (Tokyo Organizing Committee of the Olympics and Paralympic Games, 2020).

Two main disadvantages have been identified simultaneously: low sponsorship awareness and rising sponsorship fees. Compared to advertising, messages from sponsors are indirect, less explicit, and more difficult to control (Walliser, 2003). In addition, ambush marketing, which is utilized by companies without formal rights as sponsors that take advantage of the Olympics, may diminish the benefits of official sponsors.¹ Furthermore, sponsor companies pay high sponsorship fees, which have escalated with the growth of the sponsorship market (Clark et al., 2009; Davis, 1996; Sandler & Shani, 1989).²

Literature Review

Several studies have investigated the economic impact of the Olympic Games on sponsors by using the event study methodology in which the Olympics' market value is measured in stock price responses to announcements of Olympic sponsorship agreements. Farrell and Frame (1997) investigated stock price reactions to announcements of 26 sponsorship agreements for the 1996 Atlanta Olympic Games. Running the market model over the 241-day estimation window, they reported significant negative average cumulative abnormal returns (ACAR) at the 5% level in the three-day (0, 2) window.

Miyazaki and Morgan (2001) also examined market reactions to the news of 27 companies becoming sponsors of the 1996 Atlanta Olympics by cross-checking firm announcement dates using Lexis-Nexis and other online sources. Unlike Farrell and Frame (1997), their event studies over the 120-day and 100-day estimation periods detected no significant negative events, but found significant positive ACAR at the 5% level in the five-day (-4, 0) window and marginally significant positive ACAR at the 10% level in the four-day (-3, 0) window.

Deitz et al. (2013) reexamined previous studies by eliminating the effects of confounding events. Their event study over the 120-day estimation window used by Miyazaki and Morgan (2001) generated significant negative ACAR at the 5% level

¹ For example, Wendy's associated itself with the 1988 Winter Olympic Games by featuring ski-racing posters, printing Olympic stories on its tray liners, and sponsoring ABC's broadcast of the Olympic Games (Sandler & Shani, 1989). Similarly, after the 1994 Winter Olympics, only 37% of surveyed television viewers correctly selected McDonald's as the official sponsor, while 57% incorrectly chose Wendy's (Miyazaki & Morgan, 2001). More recently, Nike was the official sponsor of the 2016 Rio Olympics, in which Under Armor succeeded in associating itself with Team USA Women's Gymnastics (DailyMail.com Reporter, 2016).

² For example, sponsors paid a total of \$866 million to support the Turin and Beijing Games in 2006 and 2008 combined (Balfour, 2008). More recently, Toyota invested \$835 million in a sponsorship deal for the four Olympic Games between 2017–2024 (Boudway, 2017).

in the three-day (0, 2) event window. The event study over the 241-day window used by Farrell and Frame (1997) produced significant negative *ACAR* at the 5% level in the three-day (0, 2) window. Deitz et al. (2013) also showed that markets had the most negative reactions at the 5% significance level to news about the Olympic Partner (TOP) program sponsorship, in which sponsors paid the highest sponsorship fees. In contrast, Samitas et al. (2008) investigated market reactions to sponsorship announcements of the 2004 Athens Olympics and found insignificant *ACAR* in the six-day (0, 5) window.

Events that Led to the Postponement Decision

The COVID-19 pandemic, which was initially reported to the World Health Organization (WHO) by China on December 31, 2019, changed the scheduled plan for the Tokyo 2020 Olympic Games. Google Trends (2020), which provides the Google Search Volume Index (GSVI) regarding how often a keyword is searched on Google, was used to identify the events that attracted the most investor attention to the Olympic Games.³ GSVI is a relative value, with 100 being the most searched during a specified period.

The GSVI was retrieved for the combination of keywords “Olympics and cancellation” and “Olympics and postponement” for the period from January 1, 2020, to March 31, 2020. There were two notable peaks for the keywords “Olympics and cancellation” on January 30, 2020, and February 26, 2020. After the WHO declared a state of emergency on January 30, 2020, rumors about the cancellation of the Olympics began to spread on the internet. On February 26, 2020, Prime Minister Abe expressed his intention to refrain from holding domestic sports and cultural events for two weeks. “Olympics and postponement” was the most searched keyword combination on March 24, 2020 when the IOC and Prime Minister Abe agreed to postpone the event until 2021. In other words, it is probable that investors initially made investment decisions while considering the possibility that the Olympic Games would be cancelled, and then reconsidered their investment behavior in response to the postponement of the Olympic Games.

Hypotheses Development

Previous studies on Olympic sponsorship have provided evidence consistent with the concern that escalating costs may exceed potential benefits, resulting in a decrease in sponsors’ stock prices. If sponsoring the Olympic Games is not value-enhancing, cancellation of the Olympics may not decrease the value to sponsors.

³ The GSVI is useful for measuring the degree of attention to specific events, which cannot be assessed from a newspaper article. In the finance field, many researchers have employed Google Trends to explain stock price movements using the search intensity as a proxy for investor attention (Adachi et al., 2017; Da et al., 2011; Takeda & Wakao, 2014).

Thus, Hypothesis 1 (H1) is that stock price reactions of official Olympic sponsors to news suggesting that the Olympic Games were cancelled were not different from those of their matched firms.

COVID-19 was discovered only six months before the scheduled 2020 Tokyo Olympic Games. If the event was cancelled, sponsors would have lost the opportunity to recover their investment, but postponement of the Olympics enabled sponsors to recover. Because such recovery could compensate for the expected loss from cancellation to some extent, the news of postponing the Olympic Games was likely to improve the future cash flows of sponsors. Thus, Hypothesis 2 (H2) is that stock price reactions of official Olympic sponsors to news about the postponement of the Olympics were more positive than those of matched firms.

Deitz et al. (2013) indicated that the stock returns of Olympic sponsors vary across sponsorship ranks, whereby larger investments result in larger market reactions. The potential recovery from the loss expected by canceling the Olympic Games could have been greater for sponsors that paid more in sponsorship fees than for those that paid less in sponsorship fees. Thus, Hypothesis 3 (H3) is that stock price reactions of sponsors that invested larger amounts of sponsorship fees were stronger in response to news of postponing the Olympics than those of sponsors that invested smaller amounts of sponsorship fees.

Methodology and Data

Event study methodology was employed to test these three hypotheses. The event study method is based on the efficient market hypothesis, in which only unexpected news can affect stock prices that reflect the future cash flow of firms. As previously described, the selected three events that attracted high attention were the two events suggesting the cancellation of the Olympics (January 30, 2020 and February 26, 2020) and the confirmation of postponement (March 24, 2020). Considering the possibility that the potentially confounding events could contaminate the effects of this study's targeted events, this study focused solely on one-(0,0) or two-day (0,1) event windows.

The 250-day estimation window was set prior to December 31, 2019, before the outbreak of COVID-19. Fama-French's three- and five-factor models were then estimated in the estimation window (Fama & French, 1993, 2015). Using the estimated coefficients, the cumulative abnormal returns (CAR) and ACAR were calculated across the companies in a subgroup. The following two statistics were then used to test whether the null hypothesis could be statistically rejected (MacKinlay, 1997; Patell, 1976):

$$J_1 = \frac{ACAR(t_1, t_2)}{\hat{\sigma}_i(t_1, t_2)} \sim N(0, 1), \quad (1)$$

where

$$\hat{\sigma}_i(t_1, t_2) = \sqrt{\frac{1}{N^2} \sum_i \sigma_i^2(t_1, t_2)}, \text{ and} \quad (2)$$

$$J_2 = \sqrt{\frac{N(L-6)}{L-4}} \overline{SCAR}(t_1, t_2) \sim N(0, 1), \quad (3)$$

where

$$\overline{SCAR}(t_1, t_2) = \frac{1}{N} \sum_i \frac{CAR(t_1, t_2)}{\hat{\sigma}_i(t_1, t_2)}. \quad (4)$$

(t_1, t_2) indicate the start and end dates of the event window, respectively, and zero indicates the event day. N represents the number of companies, σ_i^2 is the estimated variance of CAR , and L is the length of the estimation window, that is, $L=250$.

To test H3, multivariate regressions were performed to estimate CAR based on the following model:

$$CAR = \alpha + \beta_1 World + \beta_2 Gold + \beta_3 Official + \beta_4 Individual + \beta_5 Financial + \beta_6 Foreign + \varepsilon, \quad (5)$$

where *World*, *Gold*, and *Official* are dummy variables that take the value of 1, depending on whether the sponsor is classified as a Worldwide Olympic Partner, Gold Partner, or Official Partner, respectively. *Individual*, *Financial*, and *Foreign* are the shareholders' ratio of individual investors, financial institutions, and foreign investors, respectively. Variables were included that present ownership structure because Farrell and Frame (1997) reported that this would affect CAR for the announcement of the Olympic Sponsorship Agreement.

This study's sample consists of 47 sponsors listed on the First Section of the Tokyo Stock Exchange, the largest and most liquid stock market in Japan.⁴ The sponsors included four Worldwide Olympic Partners, 14 Gold Partners, 18 Official Partners, and 11 Official Supporters. To test the hypotheses, matched companies were selected that satisfied the following conditions: (1) those classified into the same industry as the official sponsor based on the Nikkei industry classification; (2) those listed on the Japanese market; and (3) those with the closest market capitalization to the official sponsor as of January 1, 2020. Table 1 presents a list of sample companies and matched companies.

⁴ The study focused on the companies listed on the Japanese stock exchanges, which are supposed to be nationally congruent with the Tokyo Olympics. This is because several prior studies reported that national congruence between the event venue and the nationality of corporate sponsors positively influences the impact of sports sponsorships (Abril et al., 2018; Hino & Takeda, 2020; Reiser et al., 2012).

Table 1 List of official sponsors of the 2020 Tokyo Olympics and their matched companies

Type	Sponsors	Matched Companies
The Worldwide Olympic Partners	The Coca-Cola Company Bridgestone Corporation Panasonic Corporation Toyota Motor Corporation Meiji Co., Ltd. Asahi Breweries, Ltd. ENEOS Corporation LIXIL Corporation NEC Corporation Fujitsu Limited Canon Inc. ASICS Corporation Sumitomo Mitsui Financial Group Mizuho Financial Group, Inc. Nomura Holdings, Inc. Tokio Marine & Nichido Fire Insurance Co., Ltd Mitsui Fudosan Co., Ltd. Nippon Telegraph and Telephone (NTT) Corporation	Toyo Suisan Kaisha, Ltd. Yokohama Rubber Co., Ltd. Sharp Corporation Honda Motor Co., Ltd. Yakult Honsha Co., Ltd. Kirin Holdings Company, Limited Idemitsu Kosan Co., Ltd. UACJ Corporation Ricoh Co., Ltd. Seiko Epson Corporation Tokyo Electron Ltd. Nifco Inc. Japan Post Bank Co., Ltd. Resona Holdings, Inc. Daiwa Securities Group, Inc. Dai-ichi Life Holdings, Inc. Sumitomo Realty & Development Co., Inc. NTT DOCOMO, INC.
Tokyo 2020 Olympic Gold Partners		

Table 1 (continued)

Type	Sponsors	Matched Companies
Tokyo 2020 Olympic Official Partners	Ajinomoto Co., Inc.	Kewpie Corporation
	Earth Corporation	KUMIAI CHEMICAL INDUSTRY Co., Ltd.
	Kikkoman Corporation	ARIAKE JAPAN Co., Ltd.
	KNT-CT Holdings Co., Ltd.	GECCO CORPORATION
	SECOM Co., Ltd.	M3, Inc.
	ANA HOLDINGS, Inc.	PASCO CORPORATION
	SOHGO SECURITY SERVICES Co., Ltd. (ALSOK)	SCSK Corporation
	Dai Nippon Printing Co., Ltd.	TOPPAN FORMS Co., Ltd.
	Daiwa House Industry Co., Ltd.	Sekisui House, Ltd.
	Tokyo Gas Co., Ltd.	Osaka Gas Co., Ltd.
	TOTO, Ltd.	NGL INSULATORS, Ltd.
	Toppan Printing Co., Ltd.	Nissha Co., Ltd.
	NISSIN FOODS HOLDINGS Co., Ltd.	ITO EN, Ltd.
	JAPAN POST HOLDINGS Co., Ltd.	Nintendo Co., Ltd.
	Japan Airlines Co., Ltd.	Asia Air Survey Co., Ltd
	East Japan Railway Company	Central Japan Railway Company
	Hisamitsu Pharmaceutical Co., Inc.	ROHTO Pharmaceutical Co., Ltd.
	Mitsubishi Electric Corporation	Hitachi, Ltd.
	YAMATO HOLDINGS Co., Ltd.	NIPPON EXPRESS Co., Ltd.
	Recruit Holdings Co., Ltd.	Nomura Research Institute, Ltd.
	AOKI Holdings, Inc.	NEXTAGE Co., Ltd.
	KADOKAWA CORPORATION	RIZAP GROUP, Inc.
	KOKUYO Co., Ltd.	PILOT CORPORATION
	SHIMIZU CORPORATION	Obayashi Corporation
Tokyo 2020 Official Supporters	Nomura Co., Ltd.	Create Restaurants Holdings, Inc.
	PARK24 Co., Ltd.	AEON MALL Co., Ltd.
	Pasona Group, Inc.	S-Pool, Inc.
	Marudai Food Co., Ltd.	FUKUTOME MEATPACKERS, Ltd.
	Z Holdings Corporation	OBIC Co., Ltd.

Notes: Matched firms are selected based on the industry classification, stock exchange, and market capitalization. Source: Tokyo Organizing Committee of the Olympics and Paralympic Games (2020).

Results

The event study results are presented in Table 2, including the *ACAR* of sponsors and matched companies, and the difference in *ACAR* between sponsors and matched companies. J_1 -stat and J_2 -stat show whether the *ACAR* and average *SCAR* based on Eq. (4) are statistically significant, respectively. The t-stat shows whether a difference in *ACAR* between sponsors and matched companies is statistically significant, and the z-stat shows the result of the Wilcoxon signed-rank test. The estimations conducted by Fama-French's three- and five-factor models are represented by FF3 and FF5, respectively.

According to Table 2, the *ACAR* is negative around January 30, 2020, and statistically significant at the 1% level based on J_2 -stat in the two-day event window (0, 1) for the FF3 and FF5 models. Following February 26, 2020, the *ACAR* is significantly negative at the 1% level based on both J_1 - and J_2 -stats in the two-day (0, 1) window of the FF3 and FF5 models. Comparing the *ACAR* between sponsors and matched companies, no *ACAR* significantly differs between sponsors and matched companies for both events in January and February. These results are consistent with those of H1.

In contrast, around March 24, 2020, the *ACAR* is significantly positive at the 1% level based on both J_1 - and J_2 -stats in the one-day (0, 0) window for the FF3 and FF5 models. In the two-day (0, 1) window, the *ACAR* is significantly positive at the 5% level based on J_1 -stat for the FF3 model and at the 1% level based on J_2 -stat for the FF3 and FF5 models. Comparing the *ACAR* of sponsors and matched companies, sponsors have significantly larger median *CAR* than matched firms at the 5% significance level based on the z-stat in the two-day (0, 1) window of the FF3 model, while the t-stat of the same window is at the 10% level, which is at best borderline significant. These results are consistent with those of H2.

Table 2 shows that the market reacted negatively to the news regarding the potential cancellation of the Olympic Games and positively to the news of its eventual postponement. The next question is whether the rebound following the announcement of their postponement was sufficient to compensate for the drop following the news suggesting their cancellation, or if the value was simply adjusted to mitigate the negative effects. Figure 1 shows the *ACAR* accumulated on January 6, 2020. Both the *ACAR* based on the FF3 and FF5 models declined sharply after the second event on February 26, 2020, which was not recovered by the market rebound after the third event on March 24, 2020.

To test H3, the *CAR* was estimated for news postponing the Olympics on March 24, 2020, which generated the most significant market reactions. Table 3 presents the multivariate regression results based on Eq. (5). Models 1 and 2 estimate *CAR* using the FF3 model, while Models 3 and 4 employ FF5. White heteroskedasticity-consistent standard errors and covariance were used. Variance inflation factors (VIF) are confirmed to be less than five for all models. For all models, the coefficients of *Gold* and *Official* are not statistically significant, while the p-values of the coefficients on *World* are 0.035 for Model 4 and 0.085 for

Fig. 1 ACAR for all sponsors of the 2020 Tokyo Olympics based on FF3 and FF5 models. Notes: FF3 and FF5 mean that ACAR was estimated based on the Fama-French's three- and five-factor models, respectively. Source: The Fama-French factors were retrieved from French (2020), and the other data were sourced from Bloomberg (2020)

Model 2. Because the Worldwide Olympic Partners paid the largest amount of sponsorship fees, these results are consistent with H3.

Individuals have significantly positive coefficients for all models, with p-values of 0.056, 0.018, 0.036, and 0.014 for Models 1-4, respectively. *Foreign* has significantly positive coefficients for the three models with p-values of 0.001, 0.000, and 0.084 for Models 1, 3, and 4, respectively. Both individual and foreign shareholders are regarded as outsiders in Japanese corporate governance, which has been classified as stakeholder governance characterized by affiliated shareholders (Hoshi & Kashyap, 2001; Shleifer & Vishny, 1997). Because individual and foreign shareholders are likely to make investment decisions more rationally than affiliated shareholders, their positive responses to news regarding postponement seem reasonable.

Concluding Remarks

This study investigated how stock markets reacted to the postponement of the Tokyo Olympic Games scheduled to be held in 2020. Event study analyses revealed that sponsor stock prices reacted negatively to news of the cancellation of the Tokyo Olympic Games, but the degree of the decline did not differ between sponsors and matched firms. Instead, sponsors' stock prices reacted more positively than matched firms to news regarding postponement. The cross-sectional regression showed that positive market responses to news of postponement were intensified for

Table 3 Factors that affect CAR in the event of postponing the 2020 Tokyo Olympics

Variable	Model 1			Model 2			Model 3			Model 4		
	FF3 CAR (0, 0) Coefficient	Prob.	VIF	FF3 CAR (0, 1) Coefficient	Prob.	VIF	FF5 CAR (0, 0) Coefficient	Prob.	VIF	FF5 CAR (0, 1) Coefficient	Prob.	VIF
Constant	-4.803	0.099*		-9.741	0.010**		-5.034	0.087*		-9.969	0.011**	
<i>World</i>	1.047	0.655	1.494	3.849	0.085*	2.213	1.725	0.449	1.457	4.771	0.035**	2.160
<i>Gold</i>	-1.625	0.386	2.645	0.534	0.811	3.031	-1.757	0.377	2.158	0.054	0.980	2.980
<i>Official</i>	-0.621	0.719	2.962	1.680	0.406	3.484	-0.853	0.631	2.545	1.583	0.443	3.188
<i>Individual</i>	0.107	0.056*	1.478	0.137	0.018**	1.764	0.114	0.036**	1.406	0.143	0.014**	1.755
<i>Foreign</i>	0.210	0.001***	1.640	0.092	0.159	1.727	0.225	0.000***	1.579	0.114	0.084*	1.886
<i>Financial</i>	0.002	0.968	1.442	0.124	0.067*	1.974	-0.011	0.848	1.360	0.103	0.139	1.790
Adjusted R ²	0.189			0.167			0.184			0.152		
F-stat	2.791**			2.532**			2.730**			2.378**		

Notes: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. FF3 and FF5 mean that CAR was estimated based on Fama-French's three- and five-factor models, respectively. VIF indicates variance inflation factors. N = 47. Source: The Fama-French factors were retrieved from French (2020), and the other data were sourced from Bloomberg (2020).

Worldwide Olympic Partners and sponsors with a high ratio of individual and foreign shareholders.

Given that Olympic sponsorship requires a large amount of investment, the postponement of the Olympic Games was more beneficial for sponsors than cancellation because sponsors had a chance to recover investment to some extent. Recovery was more important for top-tier sponsors with the largest investments and sponsors with high ratios of individual and foreign shareholders, who were considered to be more sensitive to changes in the future cash flows of investee companies. However, investors did not believe that the postponement of the Olympics would have paid off all of the sponsors' costs. For this reason, future sponsors will need to place more emphasis on potential deferral risk when making investment decisions.

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