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While the government encourages women's active participation in the economy, the evidence on the causal relationship of female participation to firm performance has been relatively unsupported in Japan. This study examines the short-term stock market response to a disclosure policy, i.e., the announcement of a collection of firms designated the "Nadeshiko Brand" that are considered to encourage women's involvement in business among the companies listed on the Tokyo Stock Exchange. Our findings based on event study analysis reveal that the stock price responded positively and significantly to the Brand announcement in three of the 17 firms on a daily basis but the effect was temporary. Judging from these results, it can be said that overall the stock market did not respond to the announcement of Nadeshiko Brand.

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1. Introduction

In recent years, the Japanese government has intensively promoted active participation by women in the economy to both revitalize the economy as well as to stimulate female labor supply to compensate for the declining labor force population (Cabinet Office (2013)). The current Abe administration pushed forward the idea and proposed new female-oriented policies in the package of the *Japan Revitalization Strategy* (approved on June 14, 2013), stating "it is essential for the 'power of women'—Japan's greatest potential which had not been leveraged fully to date—to be fully utilized…..Therefore, the Government will aim to raise the women's labor participation rate to the world's highest level by providing childcare arrangements and other services…." A similar line of debate is also ongoing outside Japan; international organizations such as IMF and OECD recommended the Japanese government to promote increased women's active involvement in the economy (Steinberg and Nakane (2012), OECD (2012)).

However, it is fair to say that the causal relationship between women's active involvement and business performance has not been well supported by empirical evidence in Japan. There are some possible reasons for these results. First, it may take a long time to reveal the policy effect, if one exists, of encouraging women to participate in business. Second, women's participation may affect business performance in terms of other factors, such as a firm's organization, which complicates the relationship to be clearly identified. Third, women's participation may be simply irrelevant to a firm's performance. In any case, it is not easy to identify the causal effect of women's active participation on business performance in reality since we need to disentangle the effect of reverse causality, i.e., a firm making a profit is more likely to hire women, and address the effect of other factors, i.e., a firm with a flexible organization is more likely to make a profit and hire more women.[1]

For these reasons, this study aims to examine the effect of a disclosing policy toward women's involvement on the stock market. By doing so, we try to capture the attractiveness of women's active participation as judged by investors in the capital market. The current disclosure policy in the Japanese security market does not legally oblige the listed companies to report any information regarding sex in the securities report or other financial reports in a uniform way and the actual data regarding women's participation in each company is usually not publicly available.[2] Cooperating with the stock market exchanges, the government shifted emphasis on the disclosing policy in order to attract investors to women-friendly firms. In the meantime, some organizations create a "brand" by which such companies can be distinguished easily.[3]

[1] Recent studies reveal adverse effects of the Norwegian female boardroom quota, an affirmative action policy mandating that 40% of the seats on company boards be filled by women, on firm performance (Ahern and Dittmar (2012) and Matsa and Miller (2013)).

[2] Until 1999, the securities report which listed companies are required to issue contained the data by sex on the number of employees, wages, and average age of employees. However, the reform in 1999 obliged the listed firms to submit the securities report based on consolidated accounting and the firms were no longer required to disclose employee details by sex.

[3] "Women Equity 50 France" which selects high-performing small- and medium-sized companies with female top executives is an example.

The Tokyo Stock Exchange announced in February 2013 the "Nadeshiko Brand,"[4] a collection of companies actively encouraging women's participation in business. If investors positively evaluate a company keen on women's participation, the stock price of that firm is assumed to respond favorably to the announcement if the market is able to efficiently process new information. The advantage to examining the effect of a disclosing policy is that we can clearly identify whether the stock market favorably evaluates active female participation in business. A tremendous volume of "event study" analysis in financial economics and other disciplines has examined this type of market response and the analytical methodology is well established. While the scope of the effect to be examined in an event study is limited to a very short horizon in the capital market and does not cover the causal effect on business performance in a long-run horizon, we aim to capture the initial phase of the attractiveness of the Brand companies as evaluated by investors in the capital market to gauge the effect of a policy encouraging women's active participation.

This paper proceeds as follows. Section 2 reviews the Nadeshiko Brand selection. Section 3 proposes the methodology and describes the data. Section 4 applies event study analysis to market response to the Nadeshiko Brand and discusses the results. The final section concludes.

2. **The Nadeshiko Brand**

The disclosing policy to be explored in this study is the announcement of the Nadeshiko Brand of companies that offer more opportunities to women in various aspects related to working life. In order to encourage disclosure of information on women's participation, the Tokyo Stock Market Exchange selected companies listed on the First Section from each industrial sector according to the theme "Empowerment of Women," that is, companies that "provide environments supporting the long-term employment of women and energetically promote active performance of female human resources."[5]

The Nadeshiko Brand companies were selected through scoring procedures that related to company approaches to promoting an active female workforce. The data sources were publicly available information disclosed by companies such as Corporate Social Responsibility (CSR) reports as well as other information from media outlets and NGOs.[6] First, companies were evaluated quantitatively according to two measures. One aspect was "career advancement for women" in which companies were scored in terms of (i) policies and their details in support of active diverse human resources, (ii) specific measures to support active performance of the female workforce such as training programs, and (iii) track record of women who have been promoted to managerial positions, or as executive officers/ board members. The other aspect was "support for a

[4] "Nadeshiko" is a variety of delicate pink wildflower related to the carnation and is also a synonym for the ideal Japanese woman as well as the name of the Japan women's soccer team.

[5] The Tokyo Stock Exchange has been attempting to appeal to potential investors by selecting groups of companies under specific themes such as ESG and patent. The "Nadeshiko Brand" is one of those efforts.

[6] The Nadeshiko Brand project was coordinated with the Ministry of Economy, Trade and Industry (METI) and the scoring of candidate companies was conducted by The Japan Research Institute, Limited.

work and family life balance" in which companies were scored in terms of (i) setting of policies and their details regarding a work-life balance, (ii) specific measures taken toward a work-life balance such as work-at-home systems, shortened work hours, flexible working hours system, support for return-to-work after childcare leave, and (iii) track record of the utilization of the childcare or family care leave system. After that scoring, the total score was computed by aggregating scores of each item for each company (see Tokyo Stock Exchange (2013) for detailed information on the selection).

Following the scoring process, 17 finalists had to clear two final criteria. First, a firm should attain the highest or second-highest scoring results in terms of an active female workforce in each of 33 industrial sectors. Second, the firm should have a return on equity (ROE) above the sector average. In each sector, the company was required to be in the leading position both in empowering women and attaining efficiency in terms of management to be selected as a Nadeshiko Brand issue.[7]

3. **Methodology and data**

We apply event study analysis to the stock market in Japan. The methodology is quite standardized in financial economics and related disciplines (Corrado (2011) for a review on the recent development). The essence of the methodology is to estimate abnormal return on an event day using daily stock data, calculate any deviation from the normal return measured in the pre-event period, and test statistically the difference between normal return and the return on an event day. The normal return of stock *i* in day *t* is estimated using the market model as follows (Corrado (2011)).

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$$

where R_{it} is return on stock *i* on day *t*, R_{mt} is return on the overall market on the same day. α and β are the parameters. e_{it} is a firm-specific return which is unrelated to the overall market and the expected value is zero. The abnormal return of stock *i* on the event day (t=0; 26th, February 2013 in this case), AR_{i0}, is defined as follows (E( ) is an expectation operator).

$$AR_{i0} = R_{i0} - E(R_{i0}|R_{m0}) = R_{i0} - \alpha - \beta R_{m0}$$

Market indices are commonly used to calculate R_{mt} in the literature, and the Tokyo Stock Price Index (TOPIX) is employed in this research. Closing prices of stocks of the 17 companies and TOPIX on a daily basis, obtained from "Kabuka CR-DOM" issued by Toyo-Keizai Inc. and Yahoo! Finance,[8] are the data used. To estimate normal return, we set the pre-event window (control period) to the interval from 260 days prior to 10 days before the event day, a time period which corresponds to the number of trading days in a calendar year. The results are not altered significantly if we change the length of the window to 100 days.[9] The parameters are obtained by an ordinary

[7] It is reported that Shiseido, a global brand for cosmetics, is out of the selection possibly due to its low ROE though it has three women on its board. (Toyo Keizai Online, March 1, 2013).

[8] Stock split is adjusted accordingly in the case of KDDI which did it during the pre-event and post-event period.

[9] One exception is observed in the case of Sumitomo Rubbers Industries, of which the cumulative

least-squares (OLS) regression of firm returns R_{it} on market returns R_{mt} over the control period. Then we statistically test the null hypothesis that the difference between the normal return and the return on the event day of focus is zero. Since the Nadeshiko Brand was officially announced at approximately 14:30 on the event day and the Tokyo Stock Exchange closing time is 15:00, we examine the abnormal return on the February 26th, 2013 and the post-event day (27th), as well as the prior day (25th) to capture the possibility of trades based on insider information prior to the event.

In order to evaluate the influence of the Nadeshiko Brand announcement on the stock price of selected company i on day t, we calculate test statistics by standardizing abnormal return on a day as follows.

$$SAR_{it} = \frac{AR_{it}}{\sigma_i^2}$$

We use a standard deviation of e_i during the pre-event period as σ_i^2 here. The distribution of SAR_{it} is expected to be approximated by the standard normal as the pre-event period is set sufficiently long. Under the null hypothesis, SAR_{it} would be zero if the event does not affect the price of stock i, while significantly large SAR_{it} would be observed if the event is influential. Standardized cumulative abnormal return ($SCAR_{it}$) is used to test the longer event window of two or three days, which is calculated with a standard deviation of e_i during the pre-event period as σ_i^2.

4. Empirical results and discussion

Table 1 reports the abnormal returns on the three days including the event day and test statistics for the null hypothesis that the abnormal returns are zero at the announcement of the Nadeshiko Brand. First, we look at the first three columns to see abnormal returns on the prior day (-1), on the announcement day (0) and the post-event day (+1), respectively. Among 17 companies, we observe positive and significant excess return in three companies (Daido Steel (+1), Maruha Nichiro Holdings (0), and Sekisui House (+1)), though the abnormal return is negative and significant on Maruha Nichiro Holdings (+1). Second, we expand the scope to abnormal returns on the cumulative base on those three days in the last three columns. We again see positive and significant responses for Daido Steel and Sekisui House ((0, +1) and (-1,1)), and Maruha Nichiro Holdings ((-1,0), (0,+1) and (-1,+1)).

Among the remaining 14 companies, the stock prices of eight companies did not change significantly on the brand announcement including the pre-event or post-event days. In addition, the stock price of five companies (DAIKIN INDUSTRIES, FAST RETAINING, Kao, NISSAN MOTOR, and Sumitomo Mitsui Financial Group) *declined* around the brand announcement day. These companies commonly have a relatively higher overseas business dependency ratio (more than 30%), and their stock prices could have been affected by the result of a general election in Italy on February 24 and 25 and the following uncertain expectations for the euro, or a disappointing

abnormal return for the event day and the post day is positive with 5%. The announcement of new products on February 27th is expected to contribute to the increase of return, and this might be visible with 100-day window.

announcement in the Purchasing Managers' Index in China on the 25th. KDDI experienced jumps and slumps during the event window, both significantly positive (-1) and significantly negative (0, +1). This turbulence can be explained by expected impacts of the announcement of new products with a new OS on the 25th, and that by a group of rival companies on the 26th.

Based on these observations, it might be tempting to conclude that the stock prices of three of the 17 companies increased significantly following the Nadeshiko Brand announcement. In order to relate the stock price response to the brand announcement, however, we need to further investigate stock price development in two ways.

First, we examine the stock price development at a higher frequency ("walking value") basis to reveal whether the stock price response took place before or after the brand announcement (14:30 on the 26th). Figure 1 depicts the walking values of the stock prices on the 26th and 27th. For Maruha Nichiro Holdings, we observe a small jump in the stock price after the announcement (the shaded area in the figure indicates the announcement period of the Nadeshiko Brand) but the bump disappeared right after the opening of the post-event day and the stock price leveled off afterward. For Daido Steel, the stock price jumped during the closing period between February 26th and 27th but declined to the pre-announcement level on the 27th and then increased. For Sekisui House, the stock price continuously increased after the announcement on the post-event day. These observations suggest that the Nadeshiko Brand announcement positively affected the stock price of Sekisui House since the effect of women's active participation in business is expected to last in a long-run horizon.

Second, we explore the cumulative abnormal returns to determine whether the effect, if any, on the stock price is transitory or permanent. Figure 2 illustrates the CAR (cumulative abnormal returns) for the three companies. For Daido Steel, the CAR is continuously below zero, suggesting that the Nadeshiko Brand designation did not raise the stock price level, which is consistent with the observation in Figure 1. For Maruha Nichiro Holdings, the abnormal return kept a higher level after February 26th, but Figure 1 does not support that the effect was due to the Nadeshiko Brand announcement. Instead, the upward trend of the stock price of the company started on August 6th, 2012, 150 days prior to the Nadeshiko Brand announcement when the company announced repurchase of part of its own stock to increase return per share. For Sekisui House, the CAR jumped eight days later than the Nadeshiko Brand announcement and sustained but the "jump" was caused by the release of an accounts settlement showing good performance (60% increase in net profits).

These examinations show that the stock price development of the 17 Nadeshiko Brand companies was not related to the event. In other words, the Nadeshiko Brand announcement did not favorably affect the stock price of the companies designated Nadeshiko Brand issues.

5. **Conclusion**

We examined the stock market response to the Nadeshiko Brand announcement, a policy for disclosing women's active participation in business in Japan. We employed an event study analysis to identify any abnormal return on the announcement day as well as the prior and post-event days. We found positive and significant response for three of

17 firms on a daily basis. Further, we investigated the stock prices of the three companies on a walking value and a cumulative basis. We found that the stock price response was not related to the Nadeshiko Brand announcement for two companies and the cumulative abnormal returns from zero were not caused by the event for one company.

That the stock price did not respond to the Nadeshiko Brand announcement may be explained in two ways, though we cannot distinguish the two possibilities without more information on investors. First, investors did not expect that active female participation would increase discounted value of cash flow of the companies by better operational performance. Second, as investors had obtained information that the selected companies were aggressively pursuing women's active involvement prior to the announcement, perhaps the Nadeshiko Brand announcement was not news. Moreover, the selection of enterprises to include in the Brand is biased toward larger and well-known companies in which active participation by women is not a sufficiently important element to attract investors. Further studies should address the effect of other disclosing policies on the capital market inside and outside Japan.

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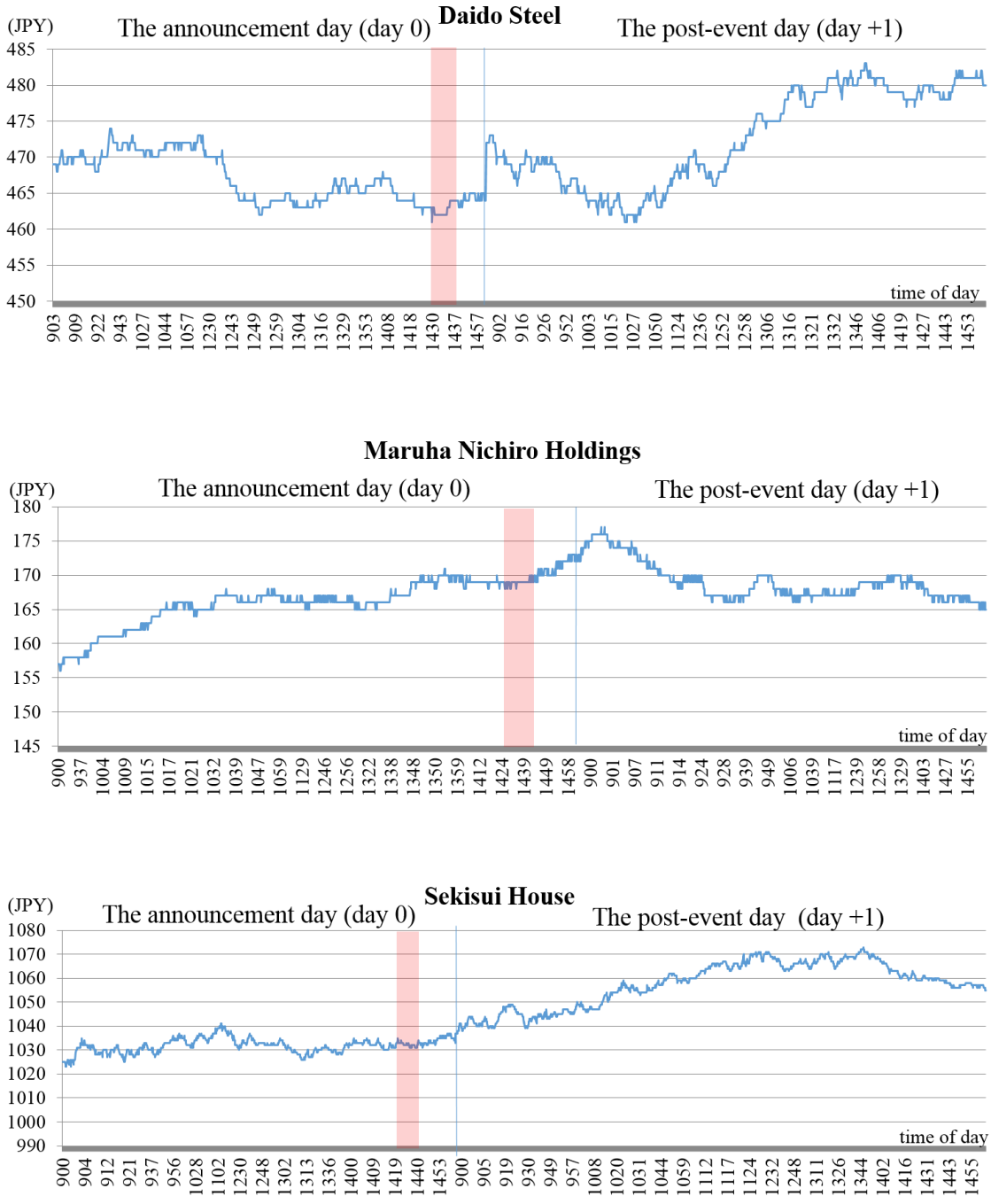
Table 1: Cumulative Abnormal Returns around the Event Day of the Announcement of the "Nadeshiko Brand" Selection

Company name	(-1)	(0)	(+1)	(-1, 0)	(0, +1)	(-1, +1)
ASAHI GLASS	0.0014	0.0071	0.0152	0.0085	0.0222	0.0237
(Glass & Ceramics Products)	(0.0934)	(0.4623)	(0.9955)	(0.5557)	(1.4578)	(1.5512)
Asahi Group Holdings	0.0076	-0.0014	-0.0031	0.0062	-0.0044	0.0032
(Foods)	(0.8565)	(-0.1546)	(-0.3444)	(0.7019)	(-0.4990)	(0.3575)
Daido Steel	0.0075	-0.0122	0.0560	-0.0047	0.0438	0.0513
(Iron & Steel)	(0.4350)	(-0.7093)	(3.2435)***	(-0.2743)	(2.5341)***	(2.9691)***
DAIKIN INDUSTRIES	-0.0143	-0.0167	-0.0004	-0.0310	-0.0171	-0.0314
(Machinery)	(-0.9591)	(-1.1158)	(-0.0264)	(-2.0749)**	(-1.1422)	(-2.1013)**
FAST RETAILING	0.0184	-0.0308	-0.0068	-0.0124	-0.0376	-0.0192
(Retail Trade)	(1.0009)	(-1.6741)**	(-0.3682)	(-0.6733)	(-2.0423)**	(-1.0414)
Kao	0.0103	-0.0074	-0.0123	0.0028	-0.0197	-0.0095
(Chemicals)	(1.0260)	(-0.7452)	(-1.2313)	(0.2808)	(-1.9765)**	(-0.9505)
KDDI	0.0278	-0.0134	-0.0156	0.0144	-0.0290	-0.0012
(Information & Communication)	(2.3072)**	(-1.1137)	(-1.2949)	(1.1934)	(-2.408)**	(-0.1015)
Maruha Nichiro Holdings	-0.0050	0.0911	-0.0320	0.0860	0.0590	0.0540
(Fishery, Agriculture & Forestry)	(-0.3599)	(6.4957)***	(-2.2848)**	(6.1358)***	(4.2109)***	(3.851)***
NIKON	-0.0054	-0.0159	0.0139	-0.0213	-0.0020	-0.0074
(Precision Instruments)	(-0.2493)	(-0.7319)	(0.6392)	(-0.9811)	(-0.0927)	(-0.3420)
NISSAN MOTOR	-0.0244	-0.0056	0.0032	-0.0301	-0.0024	-0.0269
(Transportation Equipment)	(-1.8343)	(-0.4219)	(0.2406)	(-2.2562)**	(-0.1813)	(-2.0156)**
Sekisui House	-0.0023	-0.0051	0.0315)	-0.0074	0.0265	0.0242
(Construction)	(-0.2548)	(-0.5704)	(3.5302)***	(-0.8252)	(2.9598)***	(2.705)***
Sumitomo Metal Mining	0.0216	-0.0177	0.0088	0.0039	-0.0089	0.0127
(Nonferrous Metals)	(1.42119	(-1.1623)	(0.5764)	(0.2588)	(-0.5859)	(0.8352)
Sumitomo Mitsui Financial Group	-0.0065	-0.0006	-0.0144	-0.0072	-0.0150	-0.0215
(Banks)	(-0.7375)	(-0.0699)	(-1.6197)	(-0.8073)	(-1.6896)**	(-2.427)**
Sumitomo Rubber Industries	0.0001	0.0011	0.0147	0.0012	0.0157	0.0159
(Rubber Products)	(0.0100)	(0.0878)	(1.2200)	(0.0977)	(1.3077)	(1.3177)
TOKYU	0.0042	-0.0003	-0.0009	0.0039	-0.0013	0.0029
(Land Transportation)	(0.4518)	(-0.0356)	(-0.1000)	(0.4162)	(-0.1356)	(0.3162)
TORAY INDUSTRIES	-0.0005	-0.0045	0.0134	-0.0050	0.0089	0.0084
(Textiles & Apparels)	(-0.0476)	(-0.4304)	(1.2818)	(-0.4780)	(0.8514)	(0.8038)
Toyota Tsusho	0.0069	-0.0222	0.0083	-0.0153	-0.0139	-0.0070
(Wholesale Trade)	(0.6900)	(-2.2278)**	(0.8340)	(-1.5378)	(-1.3938)	(-0.7038)

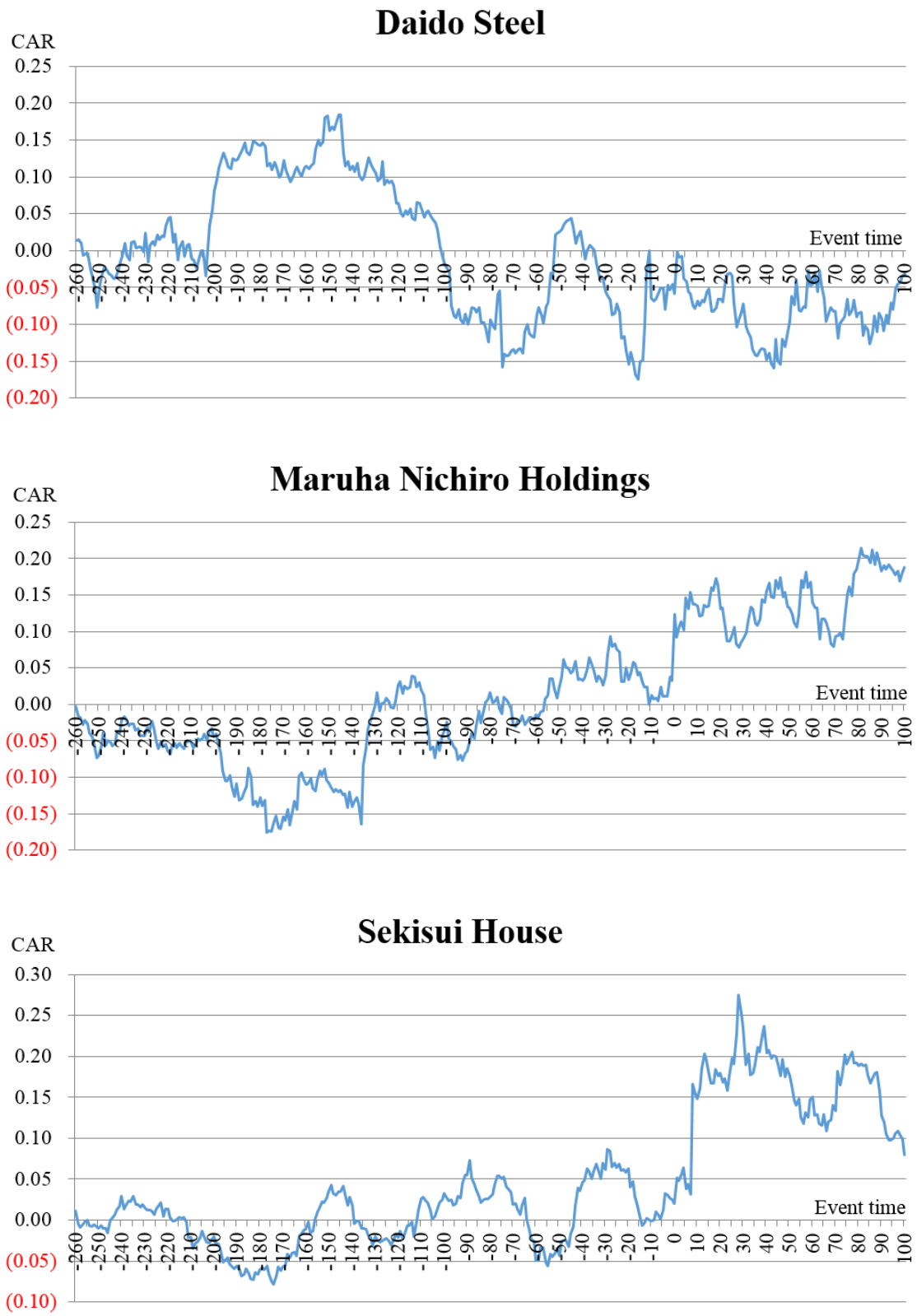
(Note) The figures in the upper rows are cumulative abnormal returns (CAR) and those in the lower rows are standardized CAR (SCAR) as test statistics. ** and *** refer to 5 percent and 1 percent significance. The timing to measure the abnormal return is as follows.
(-1) The day before the announcement; (0) The announcement day; (+1) The day after the announcement. (-1, 0) The day before and the day of the announcement; (0, +1) The day of and the day after the announcement; (-1, +1) The day before, the day of, and the day after the announcement.

Figure 1: Walking Value of Three Companies with Positive Signs



(Note) The figures are a walking value on the stock price of Daido Steel, Maruha Nichiro Holdings, and Sekisui House on February 26th and 27th, 2013. The shaded areas indicate the period that the Nadeshiko Brand was announced.

Figure 2: Cumulative Abnormal Returns of Three Companies with Positive Signs



(Note) The figures are cumulative abnormal returns for the three companies.