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Running Title: Sustainability membership and stock price

Abstract:
This paper investigates how investors evaluate a membership of sustainability index. By using the data on the Morningstar Socially Responsible Investment Index from 2003 to 2010, we estimate the impact of inclusion on and exclusion from the Index on the stock price. Result shows that the inclusion on the Index was evaluated significantly positively, while the removal from the Index did not lead to a significant drop in share prices. We also found that the average cumulative abnormal returns were negative in the earlier years but positive in later years. This could be due to change in appreciation of the concept of corporate social responsibility by investors throughout the years.

Keywords: sustainability membership; stock price; event study; Morningstar-SRI Index

JEL Classification: A13; G14; M14

I. Introduction

A great deal of attention has been paid to Corporate Social Responsibility (CSR) in developed countries as well as in emerging countries. CSR usually refers to voluntary behaviour by a firm that integrates social issues such as environmental problems into the firm's business operations without blindly sacrificing profits.

Firms in Japan have actively worked on CSR since the concept was imported and adopted by Japanese corporate bodies in the late 1990s. Japan has the largest number of firms issuing CSR reports in the world, an indication of the great efforts by such bodies to be socially responsible (KPMG, 2008). Another reflection of the attention paid by Japanese firms is the fact that they rank second in the world in acquiring ISO 14001 certifications (ISO, 2010). Firms would like to know, however, whether or not their investment in CSR will yield a profit. If investors in the share market appreciate CSR activity on the part of firms, the share prices of such firms will increase, and this would provide further incentive to firms to increase their CSR efforts. This beneficial interaction between investors and firms would lead to improvements in social welfare

without government intervention. Investors have a significant role to play, therefore, in whether or not CSR becomes established in Japan. Hence, it is important to analyse how much value investors in Japan place on the efforts of firms in regard to CSR.

This study aims, by using the Morningstar Socially Responsible Investment (MS-SRI) Index as a proxy for the highest standard of CSR, to examine whether or not Japanese investors value firms that have adopted CSR. We assume that the market appreciates inclusion on the MS-SRI Index because it means that a firm is thus perceived to be one of the highest socially responsible firms. On the other hand, if a firm were removed from the MS-SRI Index, it would be penalised for its lower level of CSR activity. Consequently, we adopt the following hypothesis to carry out our study: the announcement of inclusion on the MS-SRI Index has a positive effect on the share price, whereas removal from the Index negatively affects the share price.

We employ an event study methodology and a dummy regression analysis in our study. An event study is a widely used approach to analyse the effect of an unanticipated event on a share price. We adopt this methodology because we would like to know investors' immediate response to the announcement of inclusion on or removal

from the MS-SRI Index. In addition, studying the effect on share prices every year from 2003 to 2010 can identify any time-series change in the trend of investors' views regarding CSR. Since CSR developed rapidly in Japan during these years, such an analysis would be appropriate. On the other hand, a dummy regression analysis will reveal the average effect on the share price of such announcements for the whole research period. Using these two approaches enables us to investigate changes in investors' attitudes towards CSR through time as well as the average effect over eight years.

The contribution of our study is threefold. First, we use a more appropriate proxy for CSR—the MS-SRI Index—since SRI indexes used in previous studies, especially the FTSE4Good UK Index, limited inclusion on those indexes to economically strong firms. As a result, changes in share prices could be due to investors' appreciation of firms' economic strength. The MS-SRI Index, however, does not restrict inclusion on the Index to big firms, so it can better reflect in share prices investor response to CSR. Second, to the best of our knowledge this is the first paper to analyse how Japanese investors respond to CSR-related announcements. Earlier studies examined markets

where CSR has a much longer history than it has in Japan, and so reactions to announcements in such markets could differ from what happens in Japan. Finally, we study a longer period than was done in previous studies, and this gives a better grasp of the shift in investors' attitudes towards CSR over time.

Our study will proceed as follows. In Section 2 we review previous studies that examined the share price reaction to levels of CSR in the US and Europe. Then in Section 3 we describe our data and explain our event study methodology and dummy regression analysis. Section 4 will present our empirical results, and the implications of those results are discussed in Section 5. We then briefly summarise our findings in Section 6.

II. Previous Studies

There are a few studies that examine how share prices react in the market to the announcement of a firm's inclusion on an SRI index. For example, Curran and Moran (2007) used an event study to analyse the effect of the FTSE4Good UK Index on the

prices of shares in the UK market. They investigated five announcements of inclusion on or removal from that index in 2001 and 2002. It was found that only one of the five events had any statistically significant effect, although in general the announcement of inclusion on the index brought in positive changes in the share price, while the announcement of removal led to negative changes. Therefore they concluded that the UK market did not appreciate CSR activities, nor did it punish the shares of firms that dropped down from a high-standard certification of CSR. However, because of the criteria for inclusion on that index, companies must belong to the top 50 largest in market capitalisation after the social screening. Hence, their study could not control a change in share price that was possibly due to investors placing value on those firms' economic strength.

Consolandi et al. (2009) also used an event study methodology to investigate the effect on share prices of firms added to or removed from the Dow Jones Sustainability Stoxx Index (DJSSI), which covers European companies. As in Curran and Moran (2007), Consolandi et al. found that investors regarded inclusion on the DJSSI as good news and removal from it as bad news. In addition, they found that the market penalised

an unexpected removal from the SRI index to a greater extent than it appreciated inclusion on the index. One of the possible reasons for this market reaction is that share prices might already have reflected all the available information, including the CSR level, and so the announcement of inclusion did not have a large impact on the share price. On the other hand, an unexpected removal from the index would result in significant negative responses by investors.

Robinson et al. (2011) explored not only the short-term impact but also the intermediary impact on North American firms that were included on or removed from the Dow Jones Sustainability World Index (DJSI) using data from 2003 to 2007. It was revealed that inclusion on the DJSI led to intermediary positive effects on share price, while no immediate impact was observed. On the other hand, removal from the DJSI did not cause a significant fall in the immediate and intermediary share prices of firms. Contrary to the findings of Consolandi et al. (2009), they found that the response to inclusion on DJSI was greater than to removal from it.

In this study we take a different approach from earlier studies in several ways. First, the MS-SRI Index is more appropriate than indexes used in other studies for the purpose

of seeing more clearly the effects of CSR on share prices, because inclusion on those indexes was based not only on a firm's high standard of CSR but also on its economic strength. In such a situation it becomes possible for investors to react to the criterion of economic valuation rather than to the social responsibility criterion. In the case of the MS-SRI Index, however, firms are selected by social screening from a universe of 3,600 listed companies that includes relatively small corporate bodies. A more detailed comparison between SRI indexes is shown in Table 1 below. Second, previous studies analysed the markets of Europe and North America, where interest in CSR has a long history among investors. Although large numbers of firms in Japan are now implementing CSR actively, the concept of CSR is something relatively new to Japanese investors. For this reason this study can examine the impact on a firm's share price resulting from that firm's sustainability ranking in Japan, an impact that might be different from that in markets in Europe and North America. Japanese investors, for example, would react strongly to a firm's inclusion on the MS-SRI Index because of the fact that CSR is still a novel practice for them.

Table 1. A comparison of SRI Indexes

	MS-SRI Index	FTSE4Good UK	DJSSI	DJSI World Index
Number of firms	150	50	Variable	Variable
Universe	3,600 listed firms	The FTSE All-Share Index	DJ Stoxx 600 Index	Largest 2,500 firms in the DJ Global Total Stock Market Index
Screening	-Social Standard -Liquidity Standard -No negative screen	-Environmental, social and stakeholder, and human rights -Negative screen -Top 50 firms by market capitalisation	-The 20% most sustainable firms of each sector	-The 10% most sustainable firms of each sector -Negative screen
Market	Japan	United Kingdom	Europe	Worldwide
Year established	2003	2001	2001	1999

III. Data and Methodology

We analysed the share prices of firms included on or removed from the MS-SRI Index. Launched in 2003, the MS-SRI Index is the first Japanese index of socially responsible investment. Once a year it publishes a list of 150 firms chosen from a base of 3,600 firms. If in the course of the year any of those 150 firms does something that

negatively affects society, it would be removed from that index (as happened, for example, when the Tokyo Electric Power Company operating the Fukushima Nuclear Power Plants was removed on 6 April 2011). There are two criteria for inclusion in the Index: the social standard and the liquidity standard. The former consists of five principles: governance and accountability, market, employment, social contribution, and environment. In selecting the candidate companies the MS-SRI Index does not employ a negative screening approach. While some other SRI indexes, such as the FTSE4Good UK Index, use screening of financial performance in addition to the social criteria, in the MS-SRI Index the 150 companies that best meet the social criteria are eligible for inclusion. This allows greater opportunity for relatively smaller companies to be included in the MS-SRI Index.

Morningstar provided us a list of the 150 companies selected from 2003 to 2010. For our analysis, we excluded the dead fund from our sample. We employed two methods of investigating the effects of inclusion on or removal from the MS-SRI Index: an event study and a dummy regression analysis. Our event study examines the relationship between a particular unanticipated event and changes in share prices. Since a public

announcement of inclusion or removal is made once every year, there were eight events in our sample period from 2003 to 2010. For our sample, firms had to survive during the whole of the research periods shown in Table 2. Table 3 gives sample numbers for included firms and Table 4 gives sample numbers for removed firms. It is important to note that a firm must be included in the Index at least once before it can become a removed firm, and so the year 2003 is not the subject of our investigation for removal analysis.

The dummy regression analysis investigates the average effect resulting from inclusion on or removal from the Index throughout the whole of a research period. While the annual data sets in the event study only contain share price data for the analysed year, in our dummy regression analysis we use all of the share price data as long as firms are included in the Index at least once. Consequently, our sample consists of the share prices of 239 included firms and those of 124 removed firms. Since some firms have included or removed more than once, the numbers of firms above are smaller than the aggregated numbers of inclusion or exclusion in tables 3 and 4.

Table 2. Research periods of event study analysis

Year	Announcement day	Estimation window	Event window
2003	30th May	16th October (2002) – 28th May	29th May – 2nd June
2004	1st September	26th January – 30th August	31st August – 2nd September
2005	1st September	24th January – 30th August	31st August – 2nd September
2006	1st September	26th January – 30th August	31st August – 4th September
2007	1st September	25th January – 30th August	31st August – 4th September
2008	1st September	24th January – 28th August	29th August – 2nd September
2009	1st September	22nd January – 28th August	31st August – 2nd September
2010	1st September	22nd January – 30th August	31st August – 2nd September

Table 3. Sample numbers of firms included on MS-SRI Index, by year

Year	Number of Firms
2003	122
2004	130
2005	132
2006	136
2007	137
2008	140
2009	142
2010	148

Table 4. Sample numbers of firms removed from MS-SRI Index, by year

Year	Number of Firms
2004	32
2005	20
2006	30
2007	18
2008	15
2009	9
2010	9

For the purpose of our event study we defined the three-day event windows shown in the last column of Table 2. Each event window is the period examined for any changes in the share prices of the firms involved. In addition, we determined that our estimation windows would be 150 transaction days before the event windows. First of all, we calculated the return of a share from its price:

$$r_{i,t} = \log(P_{i,t} / P_{t-1}), \tag{1}$$

where $r_{i,t}$ is the share return and $P_{i,t}$ is the share price on day t for firm i. Next, we estimated the counterfactual return, that is, the return if the event does not occur, using data from the estimation windows. In order to calculate the counterfactual return, we estimated the market model, under the assumption that the return of the market index and the return of each share have the following linear relationship:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t}, \tag{2}$$

where $r_{m,t}$ is the return of market proxy (TOPIX in our study) and α_i and β_i are unknown parameters. The residual has a zero mean and the variance is σ_i^2. With the estimated parameters, we can calculate the abnormal return (AR): the return obtained by subtracting the counterfactual return from the realised return.

$$AR_{i,t} = r_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i r_{m,t}). \tag{3}$$

Although AR is calculated for each day of the three-day event window, we would like to obtain the total effect of the whole event window. Therefore, we needed to calculate the cumulative abnormal return (CAR) by adding the ARs of firm i for each day of the event window.

$$CAR_i(T_{-1}, T_1) = \sum_{t=T_{-1}}^{T_1} AR_{i,t}. \tag{4}$$

In order to evaluate the average effect that the announcement of inclusion or removal had on a firm, we needed to calculate the averaged cumulative abnormal return (ACAR),

as follows:

$$ACAR(T_{-1},T_1) = \sum_{i=1}^{N} CAR_i(T_{-1},T_1) / N. \tag{5}$$

The variance of ACAR can be obtained by using the following equation:

$$VAR[ACAR(T_{-1},T_1)] = \frac{1}{N^2}\sum_{i=1}^{N} \hat{\sigma}^2(T_{-1},T_1). \tag{6}$$

Finally, we needed to test the null hypothesis that the event does not affect the share price, before assessing how the event does affect the share price, by estimating ACAR with the following J-statistics:

$$J = \frac{ACAR(T_{-1},T_1)}{\sqrt{\frac{1}{N^2}\sum_{i=1}^{N} \sigma^2(T_{-1},T_1)}} \sim N(0,1). \tag{7}$$

While our event study methodology employs three-day event windows, our dummy regression analysis uses only a one-day event window, namely, the day of the

announcement. The market model of dummy regression is as follows:

$$r_{i,t} = c_i + \phi_i r_{m,t} + d_i D_{i,t} + \upsilon_{i,t}, \tag{8}$$

where D_i is the dummy variable taking one if the firm is added to or removed from the index; $r_{i,t}$ and $r_{m,t}$ are the returns of the share i and the market proxy in period t, respectively; c_i, ϕ_i, d_i are unknown parameters; $E[\upsilon_{i,t}] = 0$ and $Var[\upsilon_{i,t}] = \sigma_i^2$. Since the event occurs annually, the maximum frequency of ranking is eight for inclusion analysis and seven for removal analysis.

IV. Empirical Results

Results of event study

Table 5 shows the ACARs of shares of firms included on the MS-SRI Index and the J-statistics to represent the statistical significance by each year. While the ACARs are significantly negative in 2003, 2004, and 2008, they are significantly positive in 2006 and 2007.

Table 5. ACARs of included-firms

Year	ACAR	J-statistics
2003	-0.005	-2.695***
2004	-0.004	-2.246**
2005	0.001	0.988
2006	0.004	3.522***
2007	0.005	3.753***
2008	-0.005	-3.030***
2009	0.003	1.547
2010	0.000	0.316

The empirical results of the effect on shares induced by removal of a firm from the Index are shown in Table 6. While more than half the ACARs in Table 5 are significant, Table 6 shows that only the ACAR of 2004 is significant. It reveals that share prices were not affected by an announcement of removal from the MS-SRI Index except in 2004.

Table 6. ACARs of removed-firms

Year	ACAR	J-statistics
2004	-0.007	-2.082**
2005	0.005	1.673
2006	0.004	1.586
2007	0.003	0.836
2008	-0.007	-1.324
2009	0.003	0.397
2010	0.005	1.228

Results of dummy regression analysis

We used Equation 8 to estimate the impact on share prices of both inclusion on and removal from the Index. First of all, let us look at how inclusion on the MS-SRI Index affects share price. We found that 13 out of 239 firms showed a statistically significant effect, as shown in Table 7. Of these 13 firms, nine exhibited a positive effect and four showed a negative effect. On the other hand, in line with the results of our event study, an announcement of removal from the MS-SRI Index did not affect the share price. Only 2 out of 124 firms showed a significant negative impact on their share prices, as we see in Table 8. In addition, these tables also break down the results on the basis of the frequency with which firms are included or removed. They show

that the frequency of ranking in or out of the MS-SRI Index did not affect the direction of the result.

Table 7. Impact on share price of inclusion, by frequency

Frequency of Ranking	1	2	3	4	5	6	7	8	Total
Number of Firms	45 (18%)	25 (10%)	26 (10%)	24 (10%)	24 (10%)	14 (5%)	33 (13%)	48 (20%)	239 (100%)
Number of Significance	3 (23%)	1 (7%)	2 (14%)	1 (7%)	2 (14%)	2 (14%)	0 (0%)	2 (14%)	13 (100%)
Positive	1 (11%)	1 (11%)	2 (22%)	1 (11%)	1 (11%)	2 (22%)	0 (0%)	1 (11%)	9 (100%)
Negative	2 (50%)	0 (0%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)	1 (25%)	4 (100%)

Table 8. Impact on share price of removal, by frequency

Frequency of Deletion	1	2	3	4	Total
Number of Firms	115 (93%)	9 (7%)	0 (0%)	0 (0%)	124 (100%)
Number of Significance	2 (100%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)
Positive	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (100%)
Negative	2 (100%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)

V. Discussion

At this point we can discuss the key estimated results of our study: asymmetric reaction, different reactions from investors in Europe, and changes in investor behaviour towards CSR through time. First of all, as discussed in the previous section, the results of the event study suggest that investors significantly reacted to the event of a firm's inclusion on the MS-SRI Index. On the other hand, announcement of a firm's removal from the Index did not effect a change in its share price. We found a similar result with the dummy regression analysis. Of the 239 firms that were added to the Index at least once, 13 showed a significant effect on share prices, while only 2 of the 124 firms removed from the Index experienced a significant change in their share prices. From this we can conclude that investors in the Japanese market in large part reacted to the announcement of a good assessment of CSR on the part of a firm, while they did not seem to consider removal from the Index a factor leading to a negative reaction.

In regard to asymmetric reaction, we found that investors in Japan and Europe react differently to the inclusion on, or removal from, an SRI index. As we saw in Section

II, investors in Europe punished removal from such an index more than they rewarded inclusion on it (Curran and Moran, 2007; Consolandi et al., 2009). Our results, however, show that Japanese investors reacted positively to inclusion on the MS-SRI Index, whereas announcement of removal from the Index did not significantly affect a firm's share price. This suggests to us that investors in Japan might not expect firms to implement socially responsible activities as much as investors in Europe do, therefore, they greatly appreciate the social contribution of firms. For exactly the same reason, they did not penalise firms that were removed from the MS-SRI Index. The view obtained from our estimation reveals that investors in Japan have yet to consider CSR to be as indispensable an investment factor as investors in Europe do. Robinson et al. (2011) also found an asymmetric stronger response to inclusion on an SRI index in the US market, which shows that investors in the US evaluate CSR in a manner similar to Japanese investors.

Finally, we can observe from the empirical results shown in Table 5 that investors in Japan have changed their attitudes towards CSR through time. In the first two years, 2003 and 2004, investors did not seem to understand fully what CSR was and how it

affected the management of a firm. They did not properly appreciate the fact that implementing CSR adds to a firm's costs and involves some sacrifice.. However, ACAR turned positive the following year and has remained positive except for 2008. It can be argued that in earlier years investors valued CSR negatively because of ignorance regarding how CSR affects a firm's operations, but that they gradually began to appreciate the socially friendly approaches of firms.

VI. Conclusion

This study examined, by using an event study and a dummy regression analysis, the impact on the share prices of Japanese firms of inclusion on, or removal from, the MS-SRI Index. While most results from inclusion on the Index were significantly positive, the announcement of removal from the Index did not lead to a significant drop in share prices. This suggests that investors in the Japanese market greatly appreciate the highest CSR standard of firms, while they did not react to removal from the Index when making their investment decisions. This result contrasts with what was found in

a previous study using data from European countries (Consolandi et al., 2009) and suggests a difference of appreciation of CSR between investors in Japan and Europe. The results of our event study also indicated that the ACARs were negative in the earlier years but positive in later years. This could be due to less appreciation of the concept of CSR by investors when it was introduced into Japanese society. In later years, as the benefits of CSR became better appreciated, however, investors began to evaluate inclusion on an SRI index positively.

Previous studies revealed that inclusion on an SRI index has positive impacts on the share prices of firms in the European and US markets (Curran and Moran, 2007; Consolandi et al., 2009; and Robinson et al., 2011). Our study also showed that being sustainability leaders has been evaluated positively by investors. The result suggests that CSR activities are not merely altruistic activities for the benefit of society, but they could also contribute to the ultimate objective of corporate bodies, that of maximizing their own value. This could persuade firms to enhance CSR activities in Japan. Although inclusion on the MS-SRI Index was negatively evaluated in the beginning, it can be seen in a positive light after some years of trial. Such a result will prove

important for countries that are going to introduce CSR activities from now on.

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References

Consolandi, C., Jaiswal-Dale, A., Poggiani, E. and Vercelli, A. (2009) Global standards and ethical stock indexes: the case of the Dow Jones Sustainability Stoxx Index, *Journal of Business Ethics*, 87, 185-197.

Curran, M. M. and Moran, D. (2007) Impact of the FTSE4Good Index on firm price: an event study, *Journal of Environmental Management,* 82, 529-537.

ISO (2010) *The ISO Survey of Certifications 2009*.

KPMG International (2008) *KPMG international survey of corporate responsibility*

reporting 2008.

Robinson, M., Kleffner, A. and Bertels, S. (2011). Signaling sustainability leadership: empirical evidence of the value of DJSI membership. *Journal of Business Ethics*, 101, 493-505.