The Effects of Corporate Governance on ESG-related Information Disclosure: Evidence from Japanese Firms

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Abstract: Given the voluntary nature of environmental, social, and governance (ESG)-related information disclosure in Japan, we use a sample of TOPIX firms from 2011 to 2019 to examine the relevance of internal and external corporate governance factors and ESG-related information disclosure for Japanese companies. For the internal governance factors, the results of the logistic regression analysis show that variables such as board independence and board activity significantly influence a company's ESG disclosure strategy, whereas the results of the generalized additive 2 model show that the internal governance variables are relatively less important than the external governance variables such as share ownership structure. For the external governance factors, the logistic regression results show that all the explanatory variables are significant. Although the results from the generalized additive 2 model are generally similar, non-linear relationships for institutional ownership and the Government Pension Investment Fund are also found. These empirical results suggest that the development of corporate governance frameworks such as Japan's Stewardship Code and Corporate Governance Code influences firms' ESG disclosure strategy and encourages them to disclose ESG-related information. This study provides new insights into the relationship between corporate governance and ESG-related information disclosure practices in Japanese companies.

1 Introduction

Environmental, social, and governance (ESG)-related information disclosure in Japan is not mandated by either accounting standards or laws and regulations. In addition to a firm's characteristics such as size and profitability, its corporate governance factors are important in the decision to voluntarily disclose ESG-related information. These include internal corporate governance factors such as the composition of the board of directors and external corporate governance factors such as the ownership of shares. In other words, as argued by Millstein (1991, [1]), the corporate disclosure of ESG-related information is mostly voluntary and the extent of such disclosure is ultimately a business decision influenced by the board and shareholders. However, as companies increasingly rely on voluntary ESG-related information disclosure to meet stakeholders' demands for transparency and accountability, it is increasingly important to examine the link between corporate governance and ESG disclosure.

Related frameworks on corporate governance and information disclosure have been developed, such as Japan's Stewardship Code introduced in 2014 as a guideline for institutional investors and Japan's Corporate Governance Code introduced in 2015 as a guideline for corporations. From a longer-term perspective, since the collapse of Lehman Brothers, some institutional investors, which had been the proponents of shareholder capitalism, have been shifting or expanding their fiduciary responsibility from a shareholder orientation to a stakeholder orientation, along with ESG investment. From the perspective of information disclosure, all these moves are encouraging companies to disclose a wide range of information, including ESG-related information.

Previous research both in Japan and overseas has analyzed the relationship between corporate governance and ESG disclosure. However, some issues remain to be addressed, especially for research in Japan, such as the analysis method and limited corporate governance factors analyzed. Further, although one objective of the series of corporate governance reforms underway in Japan is to improve the appropriate disclosure of information by companies, research on the relationship between the two is insufficient, particularly that focusing on ESG disclosure. To bridge this gap in the literature, this study empirically examines the relevance of internal and external corporate governance factors and ESG-related information disclosure for Japanese companies.

Methodologically, in addition to logistic regression, a machine learning-based method is adopted to perform a

more considered analysis. Specifically, we examine the impact of the expansion of ESG investment since 2015 on ESG-related information disclosure. The signing of the United Nations' Principles for Responsible Investment by the Government Pension Investment Fund (GPIF) in 2015 triggered the expansion of ESG investment in Japan. A wide range of indicators of both internal and external corporate governance are selected to examine their relevance to ESG disclosure. In particular, GPIF holdings are analyzed as one of the variables of external governance, which is unique to Japan and one of the novel features of this study.

2 Literature Review

2.1 Previous studies in other countries

First, overseas research on the relationship between corporate governance and ESG-related information disclosure has been conducted since the early 2000s. This literature review focuses on recent survey papers and major papers reviewed in previous studies in this area. First, Velte (2017, [2]) reviews studies of the link between board composition and ESG-related information disclosure. This literature review evaluates 47 empirical studies of the influence of board composition on the quantity and quality of ESG disclosure. In addition, Velte (2020, [3]) surveys 81 empirical studies of the relationship between ownership structure and ESG-related information disclosure. Fifka (2013, [4]) examines the determinants of ESG disclosure in 186 studies. Most of these studies empirically investigate the determinants of responsibility reporting and examine whether corporate characteristics such as size and industry and external factors such as stakeholder pressure influence ESG disclosure. The results indicate that researchers from different regions are taking different empirical research routes, but they do not suggest that specific determinants have different effects on ESG disclosure.

Haniffa and Cooke (2005, [5]) argue that corporate governance and cultures may affect social disclosures. Velte (2017, p. 24) notes that "[m]any studies rely on Haniffa and Cooke (2005) as one of the first empirical studies worldwide that recognizes the link between board composition and corporate social responsibility reporting." The empirical results of Haniffa and Cooke (2005) indicate a significant relationship between corporate social disclosure and boards dominated by executive directors, chairs with multiple directorships, and foreign share ownership. Rupley, Brown, and Marshall (2012, [6]) examine the associations among specific aspects of corporate governance, media coverage, and the quality of voluntary ESG-related information disclosure. Using a sample of 127 U.S. firms from 2000 to 2005, the results suggests that voluntary ESG-related information disclosure is positively associated with external media coverage as well as the board attributes of independence, diversity, and expertise.

2.2 Previous studies in Japan

In Japan, fewer studies of the disclosure of ESG-related information focus on its relevance to corporate governance. For example, Kimura and Omori (2016, [7]) point out that fewer studies analyze the determinants of ESG disclosure in Japan than in other countries. As mentioned by Kimura and Omori (2016), Tanimoto and Suzuki (2005, [8]) and Hayashi (2014, [9]) both analyze the determinants of ESG-related information disclosure for Japanese companies. Tanimoto and Suzuki (2005) examine 300 Japanese companies and find that those that disclosed sustainability reports in accordance with the Global Reporting Initiative (GRI) were large, belonged to specific industries such as the energy industry, had high foreign shareholdings, and had high overseas sales. Hayashi (2014) also examines the relationship between firms' characteristics and ESG disclosure using cross-sectional data from FY2012 for approximately 200 large Japanese companies, finding that characteristics such as overseas sales, size, profitability, and growth potential affect ESG disclosure.

However, no recent studies in Japan have directly examined corporate governance and ESG-related information disclosure. Although not related to ESG disclosure, Motta and Uchida (2018, [10]) do examine the relationship between ESG ratings and the investor-specific ownership of companies, an aspect of corporate governance, in Japanese firms. The analysis finds that institutional ownership is positively associated with the probability of subsequent improvement in the environmental rating of Japanese companies and that this result is pronounced for domestic institutional investors registered with the Principles for Responsible Investment. Saka and Noda (2013, [11]) examine the influence of stakeholders on CSR disclosure for a sample of over 180 listed Japanese companies and find that the informational needs of external stakeholders such as the governments, creditors, consumers, and local residents encourage companies to disclose CSR information, while internal stakeholders have no influence on CSR disclosure. In a

recent study, Miyamoto and Sato (2019) examine the corporate governance and ESG-related behaviors of more than 1,500 Japanese companies. They point out that the traditional governance structure of Japanese companies, which is insider- or manager-dominated, does not lead to ESG behaviors, whereas the introduction of independent directors does.

3 Research Design

3.1 Sample Design and Data Collection

To examine a large number of firms, this study analyzes those firms that make up the Tokyo Stock Price Index (TOPIX) as of the end of FY2019. Some previous studies in Japan have focused on the firms in Nikkei Stock Average (Nikkei 225) constituent stocks because ESG-related information disclosure is concentrated in large firms. The analysis period runs from FY2011 to FY2019. However, the model that includes the GPIF as an explanatory variable runs from FY2015 to FY2019 because of data constraints. The extension of the sample in both the time series and the cross-sectional directions is one of the strengths of this study compared with previous studies in Japan.

As proxy variables for ESG-related information disclosure, we use dummy variables for whether GRI Standards-based ESG disclosures are made. The dependent variable of $GRI_{i,t}$, which indicates that disclosures are made based on the GRI Standards, is hand-collected from the GRI's Sustainability Disclosure Database. The dependent variable of $GRI_Citing_{i,t}$, which indicates partial reference to the GRI Standards elements in ESG-related information disclosure, and other variables such as corporate governance-related variables and controls are obtained from Bloomberg.

3.2 Logistic Regression Model

First, we test our hypotheses on the determinants of ESG-related information disclosure using logistic regression as our baseline model. To address reverse causality, the explanatory variables except he control variables are lagged by one period . The external factors are estimated using separate regression models. The specific regression equation is as follows:

$$\Pr(GRI_{i,t}) = Internal + External + Controls \\ + D_{YEAR} + D_{INDUSTRY} + \varepsilon_{i,t} \quad (1)$$

$GRI_{i,t}$ is a binary variable coded 1 for companies that disclose ESG information based on the GRI Standards and 0 for companies that do not. $GRI_Citing_{i,t}$, which is coded 1 for companies that disclose ESG information by referring to the GRI Standards elements and 0 for companies that do not, is used instead of $GRI_{i,t}$ to analyze the determinants of the ESG disclosure of firms that disclose a relatively large amount of ESG information.

3.3 Generalized Additive 2 Model

In our analysis, we use the generalized additive 2 model (GA2M) , a type of machine learning approach, to handle the large number of variables and complex structures. The GA2M features both high predictive accuracy with complex models and the high interpretability of the estimation results. Although commonly known machine learning methods such as random forests, support vector machine, and neural networks can build complex models and achieve high predictive accuracy, they cannot interpret the relationship between the explanatory variables and dependent variables in detail owing to their complexity. Hence, using the GA2M provides a more intuitive interpretation of which explanatory variables affect the dependent variable.

In the GA2M, a non-linear function is first estimated for each explanatory variable. The non-linear function is the key factor to the GA2M's combination of high predictive accuracy and interpretability because it incorporates the complex effects of each explanatory variable on the dependent variable into the model; at the same time, it separates the relationship between an explanatory variable and the dependent variable from that with the other explanatory variables. In addition, the GA2M not only uses the input explanatory variables, but also adds the interaction terms of the explanatory variables (the product of two explanatory variables) as new explanatory variables to account for complex effects and improve the predictive accuracy of the model. GA2Ms can be written as the following form:

$$Y = \beta_0 + \sum_j f_j(x_j) + \sum_{i \neq j} f_{ij}(x_i, x_j) \quad (2)$$

4 Discussion and Conclusion

Research attention on ESG-related information disclosure has recently grown. Previous research in Japan has considered firms' financial performance and governance factors as drivers of ESG-related information disclosure. However, the majority of research has limitations in terms of small sample sizes and unsuitable analysis methods. To

address these issues, this study uses a large sample of firms and analyzes both a logistic regression model and a GA2M, thereby providing valuable empirical evidence on the relationship between corporate governance factors (both internal and external) and ESG-related information disclosure for Japanese companies.

First, the results of the logistic regression analysis show that internal governance factors such as board independence and board activity are significant as hypothesized, suggesting that they influence a company's ESG disclosure; however, the results of the GA2M analysis show that internal governance variables are less important than external governance variables. The GA2M results also suggest that gender has a relationship with the probability of ESG disclosure, which rises as the proportion of female directors increases within a certain range. In addition, a board of about 10 people has the most positive effect on ESG disclosure and the probability of ESG disclosure decreases as the board size moves away from this number. However, the probability of ESG disclosure based on the GRI Standards is unrelated to the age diversity on the board.

For external governance factors, the logistic regression results show that all the explanatory variables (foreign ownership, institutional ownership, insider ownership, and the GPIF) are significant, suggesting that all four influence a company's ESG disclosure. Although the results of the GA2M are generally similar, non-linear relationships for institutional ownership and the GPIF are found. In addition, when $GRI_Citing_{i,t}$ is examined as the dependent variable, few of the explanatory variables become significant, suggesting that the effect of external governance depends on the extent of ESG disclosure. However, the background to the relationship is unclear and future research is thus needed.

The results of these analyses suggest that the development of corporate governance frameworks such as Japan's Stewardship Code and Corporate Governance Code is encouraging companies to disclose ESG-related information. In other words, the strengthening of corporate governance systems in companies is likely to play a role in ESG disclosure as originally expected. We hope that companies will continue to accelerate the disclosure of appropriate ESG-related information and that the virtuous cycle between companies and investors will continue.

Although the present study makes significant contributions, it is not without its limitations. First, public attention on ESG-related information disclosure has increased recently, and more globally standardized and unified rules and regulations on ESG-related information disclosure may be introduced in the future . It would thus be meaningful to observe the impact of such regulatory changes on the estimation results. In particular, ESG disclosure is not guaranteed by a third party because it is voluntary and differs by company. In this regard, using a dummy variable for ESG disclosure based on the GRI Standards or its elements is insufficient to measure the fullness of ESG disclosure. If global standards for ESG disclosure are unified and made mandatory, companies' ESG disclosure could change. Analysis from this perspective is also a topic for the future. Indeed, if ESG disclosure becomes mandatory for all companies, it would be necessary to analyze the relationship between disclosure quality and firms' characteristics such as corporate governance.

Second, this study does not examine governance factors at the institutional or individual level. In particular, expanding the sample of companies to be analyzed to include overseas companies as well as Japanese companies would make it necessary to add these factors as explanatory variables and conduct a more precise analysis. The influence of CEOs on management decisions including ESG disclosure, particularly in small and medium-sized companies, is high and it would therefore be meaningful to examine the relationship between such CEO characteristics and ESG disclosure.

Third, for the analysis of external governance factors, although the ratios of institutional investors and foreign investors are adopted as explanatory variables, it is desirable to conduct a more precise analysis. For instance, the variable of institutional investors refers to a wide range of investment strategies (e.g., active and passive management) and investment periods. In relation to ESG disclosure, it is thus important to consider such investment strategies and investment periods. For example, since the ESG activities of a company are generally considered to be related to its long-term performance, investors with a longer investment period are expected to be more involved in ESG disclosure. In this study, we could not conduct such an in-depth analysis due to data limitations; future research on this topic is thus encouraged.

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