Graduate School of
Business Administration

KOBE UNIVERSITY

ROKKO KOBE JAPAN

2019-1

Do Sustainability Reports Strategically Employ Rhetorical Tone? : An evidence from Japan

Yuriko Nakao　Katsuhiko Kokubu　Kimitaka Nishitani

Discussion Paper Series

Do Sustainability Reports Strategically Employ Rhetorical Tone? : An evidence from Japan

Yuriko Nakao[i]; Katsuhiko Kokubu[ii]; Kimitaka Nishitani[iii]

ABSTRACT

Narrative content in sustainability reports can affect readers' impressions of a company, but there are no clear guidelines for companies on how to construct this content. This study examines narratives in sustainability reports to clarify factors that influence corporate disclosure strategies. We investigate chief executive officer (CEO) statements and environmental and social information sections in sustainability reports of Japanese companies over a two-year period. The results show that CEO statements tend to use an optimistic and ambiguous tone when social and environmental performance is poor, that stakeholders can influence the narrative tone of reporting, and that sustainability reporting approaches differ by industry. This is a novel approach to quantitative analyses on sustainability reporting narratives because it uniquely discusses the authenticity of textual expressions in sustainability reports. The results further an understanding of narratives' credibility issues. This study demonstrates the importance of textual expressions to encourage correct interpretations of performance information.

Keywords: DICTION; impression management; narratives; sustainability reporting; tone

1 Introduction

Since the latter half of the 1990s, sustainability reports have had an increasing influence on the impressions of corporate stakeholders[i] through the presentation of environmental, social, and governance information. Unlike financial disclosures, which are characterized by numerical information, sustainability reports consist mainly of narrative content,[ii] which is defined as descriptive, qualitative information expressed in natural language. Hereafter, sections of reports that contain narrative content will be referred to as 'narratives'.

One of the significant roles of narratives in sustainability reports is to provide interpretation of

[i] Corresponding author, Faculty of Business Administration, Tottori University of Environmental Studies, Email : y-nakao@kankyo-u.ac.jp
[ii] Graduate School of Business Administration, Kobe University
[iii] Research Institute for Economics and Business Administration, Kobe University

quantitative non-financial information about environmental, social, and corporate governance activities. However, narratives may manipulate readers through the use of rhetorical language, which can pose a critical problem for stakeholders if the true state of the corporation is not accurately conveyed (Barkemeyer, et al. 2014; Cho et al., 2010; Cho et al., 2015; Cong et al., 2014; Hopwood, 2009).

Studies of sustainability report narratives have verified the use of impression management in environmental information disclosures, particularly when a company's environmental performance has been negative. In other words, at times these narratives do not appropriately disclose the actual state of the company's affairs (Cho et al., 2010; Cong et al., 2014). Other research indicates that companies may be trying to establish legitimacy with stakeholders through strategic rhetoric[iii] (Castelló & Lazano, 2011; Marais, 2012), meaning that a company may seek legitimacy through strategic recognition of social norms in their sustainability report narratives. Another reason narratives may be subject to impression management is that they describe practical situations that are under a wide range of external influences. Unlike numerical information, there are no objective criteria to establish how this reality should be portrayed (Beattie, 2014).

Based on this prior research, this study aims to discover whether impression management acts as a rhetorical device in the narratives of sustainability reporting, and it also explores the factors of influence, provided that these narratives reflect realistic situations. We focus on narratives in three areas: CEO statements and the social and environmental information sections of sustainability reports. In addition, our study explores whether there are external factors other than performance that can influence narratives. Our study differs from prior research in its approach to the environmental information within the primary narrative and its focus on factors that influence environmental or financial performance.

The rest of this paper is structured as follows. Section 2 discusses narrative disclosure, sustainability reports, and introduces our analysis viewpoint. Section 3 explains the research design and describes the analytical results. In Section 4, we discuss the observations and conclusions derived from the analytical results.

2 Narrative Disclosure and Sustainability Reports

In this section, we discuss narrative disclosure and impression management, we and identify the factors that affect sustainability reports.

2.1 Narrative Disclosure and Impression Management

Prior research demonstrates that narrative disclosures, which are increasingly important in corporate communications, tend to obscure information (Aerts, 2005; Brennan & Merkl-Davies, 2013; Clatworthy & Jones, 2006; Merkl-Davies & Brennan, 2007; Sydserff & Weetman, 2002). In the context of narrative disclosure, it is thought that impression management can help to restore reputation, image, or legitimacy in the face of a deteriorating corporate image caused by accidents, scandals, and other external factors (Highhouse et al., 2009).

Research on impression management in narratives has been conducted from a variety of perspectives. For example, Merkl-Davies et al. (2011a) analysed the psychological dimension of impression management and explained it as the result of expectations about organisational outcomes, that is, as 'impression management by means of enhancement, and retrospective sense-making' (Merkl-Davies et al., 2011a, p. 315). Brennan and Merkl-Davies (2013) indicated that '[u]nderstanding impression management communication options is critical in the support of readers for corporate information disclosure when discovering potential deception inherited in such practice' (Brennan & Merkl-Davies, 2013, p. 111). They described four perspectives on impression management in narrative disclosures: (1) economic, (2) psychological/behavioural, (3) sociological, and (4) critical. These are based on theories and ideas about the underlying motivations for impression management, its analytical foci, and its outcomes or results. The economic and psychological/behavioural perspectives are mainly derived from analyses of shareholder awareness and stakeholders with financial ties. The sociological perspective highlights the relationship between corporate image and social and environmental responsibility. It emphasizes social norms and the influence of impression management on audience awareness of corporate environmental and social performance. The critical perspective is concerned with image management for the sake of audiences who have the potential to affect corporate influence and decision-making.

Significant problems can arise from impression management in narratives because the true nature of a situation may not be transmitted to the readers. Research on narratives has indicated that impression management is executed through purposeful choices about the use of language (Clatworthy & Jones, 2006; Merkl-Davies & Brennan, 2007). Merkl-Davies and Brennan (2007) conducted a comprehensive review of narrative disclosure literature. They investigated whether

incremental information or impression management is the aspect of discretionary narrative most responsible for reducing informational asymmetry to stakeholders who are external to companies. They suggested that impression management of the discretionary information is performed to combat negative information. Furthermore, Merkl-Davies and Brennan (2007) contended that impression management is aimed at parties who are external to an organisation and that it exploits the effects of cognitive framing and limitations. The targets of impression management include numerical values, structural operations, and visuals. Moreover, when a manager manipulates language about poor performance, it indicates incremental information impression management rather than accountability.

In sum, research on impression management has shown that narrative disclosures use a rhetorical tone, the purpose of which is to gain legitimacy among organizational stakeholders.

2.2 Narratives in Sustainability Reports

Studies of sustainability report narratives have resulted in various perspectives on impression management (Arena et al., 2014; Bakar et al., 2011; Barkemeyer et al., 2014; Cho et al., 2010; Cong et al. 2014; Neu et al. 1998). These studies describe how companies achieve legitimacy through impression management in narratives.

Neu et al. (1998) conducted empirical research demonstrating that textually mediated discourses are positioned as communication strategies. They suggested that corporate legitimacy is achieved through these discourses rather than modification of corporate activities. The number of words in these discourses, which include the environmental disclosure sections of sustainability reports, then becomes a significant factor. The results provided empirical evidence that when an organisation is engaging in legitimacy-seeking communication, there are differences in the numbers of words used for highly important stakeholders than for those viewed as less important.

Bakar et al. (2011) addressed the important component of ‘readability’ in narratives. They followed prior research that demonstrated that companies faced with negative information conceal it by deliberately making reports more difficult to read. In this regard, Bakar et al. (2011) conducted statistical verification using the narratives from sustainability reports in the annual reports for listed companies in Malaysia. The results demonstrated that the obfuscation hypothesis—which assumes a higher readability of annual reports in the case of positive performance and lower readability or obfuscation in the case of poor performance—holds true for sustainability reporting.

Cho et al. (2010) explored whether biased words and word tone are present in corporate environmental information disclosures for the purpose of concealment or imputation. The subject narratives were environmental information disclosures from Form 10-K annual reports in the United States. The results showed that companies with poor environmental performance,

compared with those that have good environmental performance, use more optimistic and vague words while at the same time concealing poor performance.

Arena et al. (2014) studied whether managers provide straightforward information in order to forecast future environmental performance, or if they use impression management in environmental disclosures in order to influence the users of corporate performance information. The analytical results showed that an optimistic tone in environmental disclosures does not always indicate opportunism on the part of management but may actually indicate positive future environmental performance.

Research on CEO statements in sustainability reporting includes that of Cong et al. (2014). Their study analysed the response of senior management to environmental issues in the form of CEO letters, which are not subject to audit in annual reports. Barkemeyer et al. (2014) also studied CEO statements, which, unlike environmental and social activities, can be easily compared over the long term. Cong et al. (2014) verified the relationship between environmental performance and the status of environmental information disclosure in CEO letters. Their results support the legitimacy theory in statements from senior management because the CEO letters were used to inflate the environmental performance of the companies particularly apparent to make them appear more successful than they actually were. This trend was obvious for companies with notably poor performance.

Barkemeyer et al. (2014) maintained that the purpose of financial report narratives is the provision of accurate information about performance to decision-makers and that this purpose rests on a long tradition of strict standardisation of rules for financial reporting. Similarly, the Global Reporting Initiative (GRI) has a standardisation role in sustainability reporting. This suggests the possibility that the ability of sustainability reports to accurately reflect corporate sustainability performance has advanced. Barkemeyer et al. (2014), on the other hand, studied CEO narratives in relation to sustainability and financial reports. Based on analogical inference in financial reports, they showed that actual performance is not reflected in sustainability reports, suggesting that sustainability reporting has not yet matured. Barkemeyer et al. (2014) indicate that sustainability reports manage public awareness for the purpose of legitimisation. These results demonstrate that the use of particular words and tones can be indicators of poor environmental performance. These studies suggest that impression management acquires legitimacy through the narrative of the sustainability report.

2.3 Stakeholder Pressure and Sustainability Reports

Freeman (1984) indicated that corporate behaviour influences stakeholders, and in turn, stakeholders can influence corporate behaviour. Using these ideas, Ullmann (1985) presented a

theoretical framework in which corporate social activities are based on stakeholders' influence. Building on Ullmann's (1985) framework, Roberts (1992) supported the stakeholder theory approach, which suggests strong empirical evidence for stakeholder influence on corporations' social activities.

In studies of Japanese companies, influential stakeholders are predominantly consumers and investors (Higashida et al., 2005; Kokubu et al., 2002; Kokubu et al., 2012). According to these studies, companies are closely related to consumers in terms of public exposure. Kokubu et al. (2012) analyse the influence of stakeholders on the status of environmental information disclosure for the top 100 sales companies among Japanese companies that publish environmental reports. Their results show that companies in which investors exert strong influence positively disclose environmental information. Nishitani (2014) shows that companies engaged in environmental activities positively disclose environmental information and show high shareholder value. This demonstrates a relationship between the amount of disclosure in sustainability reports and impact on shareholders, which highlights the relationship between stakeholder pressure and sustainability reports. In particular, Japanese studies show that consumers and investors affect sustainability reports.

2.4 Influencing Factors on Sustainability Reports

For more than 20 years, research on sustainability reports has shown that companies in sensitive environmental industries disclose significant amounts of environmental information in response to pressure and in order to obtain legitimacy from stakeholders(e.g. Cho et al, 2007; Parsa & Kouhy, 2008; Sotorrío & Sánchez, 2010). The trend of issuing sustainability reports in industries with high environmental impacts is observable in Japanese companies. Furthermore, companies with sensitive environmental information show a strong tendency toward impression management in narrative disclosures.

The GRI is a non-profit organisation that pioneered global guidelines for sustainability reporting. GRI Sustainability Reporting Standards have been widely adopted as a framework for ESG information worldwide, and they encourage companies to report negative and positive societal impacts in a balanced manner. Companies striving for more accountability and transparency refer to the GRI guidelines (Fernandez-Feijoo et al., 2014a; Fernandez-Feijoo, 2014b; Hahn & Regin, 2014). However, these studies suggest that corporations view reference to the GRI guidelines as an opportunity to acquire legitimacy. Therefore, referring to these studies, this study examines the influence of industries and the GRI on the narrative information of sustainability reports.

3 Research Design

3.1 Analysis Method

Previous studies have shown that impression management in narrative disclosure is used to acquire legitimacy (Clatworthy & Jones, 2006; Merkl-Davies & Brennan, 2007), that there is a relationship between narrative information in sustainability reports and poor environmental performance (Cho et al., 2010; Arena et al., 2014; Cong et al., 2014), and that stakeholder pressures influence sustainability reports (Roberts, 1992; Kokubu et al, 2002; Kokubu et al, 2012). Studies have also found that operating in environmentally sensitive sectors and referring to the GRI are factors that influence companies to acquire legitimacy through sustainability reports. We analyse the influence of environmental performance, stakeholders, industries, and the GRI on the narrative information of sustainability reports using OLS regression. Until now, these factors have not been considered in the analysis of sustainability report narratives. We extend previous research, such as Arena et al. (2014) and Cho et al. (2010), to cover not only the narrative information of environmental sections, but also CEO statements and narrative information in social sections.

32 Sample Companies

As with Arena et al. (2014) and Cho et al. (2010), this study employs ESG rating scores from STOXX ESG Leaders Indices[iv,v] as proxies for ESG performances. Hence, the sample companies for the analyses are Japanese companies that issued sustainability reports in English in 2011 and 2012 as well as being listed in the STOXX ESG Leaders Indices. STOXX is a European index provider, and STOXX's ESG rating scores are formulated based on the research data of Sustainalytics,[vi] Europe's SRI research entity. Accordingly, CEO messages from 80 companies, environmental information from 126 companies, and social information from 120 companies are analysed.[vii]

33 Variables

3.3.1 Explained Variable: Narratives in Sustainability Reporting

We applied the CATA software DICTION[viii] to the narratives that had a particular focus on two variables: 'Optimism' and 'Certainty'. Hart and Carroll (2013) developed DICTION 7.0 to manage these variables. They defined Optimism as 'language endorsing some person, group, concept or event, or highlighting their positive entailment' (Hart & Carroll, 2013, p. 7) and Certainty as 'language indicating resoluteness, inflexibility, and completeness and a tendency to speak ex cathedra' (Hart & Carroll, 2013, p. 6).

Studies of accounting narratives have considered these two variables as rhetorical tones (Cho et al. 2010; Demers & Vega, 2010; Demers & Vega, 2014; Patelli & Pedrini, 2015; Short & Palmer, 2008; Sydserff & Weetman, 2002). According to these studies, when Optimism is employed in sustainability reporting, it masks the company's true ESG performance, particularly if the company is performing poorly. Further, when Certainty is employed in sustainability reporting, it tends to reflect positive ESG performance for the company. We replicate these studies and use DICTION's two variables to examine the three parts of sustainability reporting with respect to performance and narratives.

The variables given below are proxies for narratives in sustainability reporting.

- CEO Statements Optimism
- CEO Statements Certainty
- Environmental Information Optimism
- Environmental Information Certainty
- Social Information Optimism
- Social Information Certainty

The narratives analysed in this paper are not available in hard copy but are reported online in HTML or PDF format. Charts with environmental information or social information are not analysed.

3.3.2 Explanatory Variables

The explanatory variables that may influence sustainability report narratives are as follows.

- ESG performance[ix]
- Pressure from stakeholders
- Registration in the GRI database
- Industrial characteristics

The logarithm of STOXX's ESG rating scores (environmental rating score, social rating score, and governance rating score) is the proxy of ESG performance. Because the GRI's G4 Sustainability Reporting Guidelines and the Japanese Ministry of the Environment's Environmental Reporting global and local guideline for sustainability reporting indicate that information disclosed in the stand-alone sustainability reports differs among the sections (GRI, 2013, pp. 20–23; Japanese Ministry of the Environment, 2012, pp. 111–120). ESG performance may also influence narratives in sustainability reporting and should also differ among the sections. Thus, we use a different proxy for ESG performance when analysing the CEO statements and the environmental and social information of the stand-alone sustainability reports. Thus we use three different proxies for ESG performance: the first for the CEO statements, the second for the environment and he third for the social information.

CEO statements must contain a generic discussion of companies' environmental activities,

social activities, important topics related to governance, and strategies. Further, the focus of messages in CEO statements should be on describing general corporate sustainability strategies.[x] Hence, the logarithm of the aggregated score of environmental rating, social rating, and governance rating is used as the proxy of ESG performance in CEO statements.

The results of environmental activities represent environmental performance and allow for the examination of the relationship between information narratives and environmental performance. The results of social activities represent social performance. Together with environmental information narratives, these are required in order to examine the relationship between social information narratives and social performance. Thus, the environmental score for environmental rating is used as a proxy variable indicating environmental performance, and the social score for social rating is used as a proxy variable indicating social performance. Governance in this paper is assumed to be the influence which governance has exerted on narratives. This assumption is based on Mallin et al. (2012), who empirically demonstrated a positive relationship between corporate social responsibility (CSR) performance and sustainability reporting. Hence, STOXX governance rating scores are used as proxy variables for governance performance. Because good governance (structure and processes) is important in all organisations, it is foundational to corporate environmental and social activities. Thus, it is necessary to verify the relationship between environmental information and governance performance, and between social information and governance performance.

A significant amount of research exists on the determinants of stakeholder pressure with regard to sustainability reporting (Belkaoui & Karpik, 1989; Corminer & Mangan, 1999; Haddock-Fraser & Tourelle, 2010; Roberts, 1992). In studies of Japanese companies, influential stakeholders are predominantly consumers and investors (Higashida et al., 2005; Kokubu et al., 2002; Kokubu et al., 2012). According to these studies, companies are closely related to consumers in terms of public exposure. In Europe and North America, judging from the large size of the SRI market, investors are concerned about ESG information. Thus, it is believed that consumers and foreign investors influence narratives. In this context, we adopted two variables that may affect narratives: the ratio of sales-to-advertising expenses as a proxy variable for the influence of consumers, and the ratio of foreign investors' shareholdings as a measure of the influence of foreign investors.

The means of acquiring legitimacy is given a proxy in the form of a GRI dummy, which takes a value of 1 if the company has a registered GRI database and 0 otherwise.

Prior studies have also shown that industry characteristics can influence narratives in sustainability reporting. Industry type dummies act as proxies of industrial characteristics. Such dummies take a value of 1 if a company belongs to the following industries: raw materials (chemicals, ceramics, steel industry, non-ferrous metals and metal products, and pulp and paper),

processing and assembly (electrical equipment, precision instruments, machinery, and transport equipment), other manufacturing (foodstuffs, textile, rubber products, and other manufacturing), infrastructure (electric power and gas, land transportation, shipping, and air transportation), or non-manufacturing (real estate, construction industry, service industry, wholesale trade, information and communications industry, and retail). Because industry characteristics are different in manufacturing, this industry is further subdivided into processing and assembly, and other manufacturing industries. In the estimates, industry type dummy 2 (processing and assembly) is set as the reference,[xi] and industry type 2 is excluded.

- Industry type dummy 1 (raw materials): chemicals, ceramics, steel industry, non-ferrous metals and metal products, and pulp and paper
- Industry type dummy 2 (processing and assembly): electrical equipment, precision instruments, machinery, and transport equipment
- Industry type dummy 3 (other manufacturing): foodstuffs, textile, rubber products, and other manufacturing
- Industry type dummy 4 (infrastructure): electric power and gas, land transportation, shipping, and air transportation
- Industry type dummy 5 (non-manufacturing): real estate, construction industry, service industry, wholesale trade, information and communications industry, and retail

4.3.3 Control Variables

Various factors are believed to play a role in the issuance of corporate sustainability reports. Thus, control variables are added in this study to more fully elucidate the interplay between the above explanatory variables and sustainability reporting narratives. They are as follows.

- The size of the company
- Profitability
- Safety
- Year of issue

The proxy for the size of the company is the logarithm of total assets, with a larger value representing a larger size. Return on assets (ROA) is the proxy of profitability (net income/total assets). A higher ROA indicates higher profitability. Leverage is the proxy of safety (debt/total Assets). Highly leveraged companies have significant debt funding from banks and are thus riskier. The year dummy is 1 if the sample is set in 2011 or 2012 and zero otherwise to control for macro factors in each year.

Financial data on these variables are obtained from Nikkei NEEDS Financial QUEST. Further, although the subject of the study is sustainability reports for the years 2011 and 2012, the content in these reports is for the years 2010 and 2011. Thus, the analysis used two-year data for the years

2010 and 2011, the years for which sustainability reports are available.

5 Analytical Results

OLS estimates were formulated using Optimism and Certainty in sustainability reporting narratives as the explained variables. In addition, corporate ESG performance and the influence of corporate characteristics, which include stakeholders and industry type, were used as the explanatory variables. OLS estimation results are shown in Table 4.

(Table 4 here)

In Table 4, six sustainability-reporting narratives are the explained variables: CEO Statements Optimism, CEO Statements Certainty, Environmental Information Optimism, Environmental Information Certainty, Social Information Optimism, and Social Information Certainty. First, ESG performance is positively significant with regard to Optimism in CEO statements ($p < .10$)[xii] and non-manufacturing is positively significant with regard to Optimism ($p < .05$). The ratio of advertising expenses to net sales and the GRI dummy are negatively significant with regard to Certainty in CEO statements ($p < .05$). Second, the GRI dummy is negatively significant with regard to Optimism in environmental information ($p < .05$), while raw materials are negatively related to Optimism ($p < .05$). The ratio of advertisement expenses is negatively significant with regard to Certainty in environmental information ($p < .01$), and the GRI dummy is negatively significant with regard to Certainty ($p < .05$). Raw materials are negatively significant with regard to Certainty ($p < .05$). Third, infrastructure is positively significant with regard to Optimism in social information ($p < .05$). Governance performance is positively significant with regard to Certainty in social information ($p < .10$),[xiii] while the GRI dummy is negatively significant with regard to Certainty ($p < .05$).

In sum, the relationship between ESG performance and Optimism in the narratives of CEO statements shows significant results, while no significant results are shown in the relationship between environmental information and environmental performance and that between social information and social performance. Regarding corporate characteristics, a common theme for environmental information in CEO statements is that companies with low ratios of advertisement expenses to net sales tend to use Certainty in narratives.

A common theme for CEO statements, environmental information, and social information is that companies without a registered GRI database also tend to use Certainty in narratives. For industry type CEO statements, environmental information, and social information, each of these demonstrates a different trend.

6 Discussion and Conclusion

Our study examined three sections of sustainability reports: CEO statements, social and environmental information sections, and the governance (ESG) performance section. In particular, we looked at factors that influence narratives. The results show that the influence of such factors on narratives differs throughout the sections of the sustainability report.

First, the results found a connection between poor ESG performance and the optimistic and ambiguous tone in CEO statements. This suggests a trend in the use of an optimistic and ambiguous tone in CEO statements to mask actual circumstances among companies with weak environmental or social activities and governance systems. In addition, the results showed an association between good governance performance and a tone of certainty in social information. It can be inferred that companies with good governance systems express themselves in careful language, using a tone of certainty, when presenting social information about human rights, labour, safety, and consumer issues.

Second, the results showed no relationship between ESG performance and an optimistic and ambiguous tone in environmental and social information. However, as mentioned previously, a correlation exists between poor ESG performance and optimistic and ambiguous tone in CEO statements. Thus, tone could be relevant with regard to information other than content. In this regard, environmental and social information includes quantitative information. Thus, it is possible that an optimistic and ambiguous tone is not used in these sections because they mainly serve to relay facts.

Furthermore, the results demonstrated no relationship between ESG performance and a tone of certainty in CEO statements, environmental information, and social information. This indicates that there was not a tendency to use a certain tone even when performance was positive. This result differs from that of Cho et al. (2010), who discovered a correlation between positive environmental performance and a tone of certainty. Hence, it is possible that sustainability-reporting narratives from Japanese companies do not use a tone of certainty when environmental, social, and governance performance is positive. Instead, they provide support for positive statements in the form of numerical verification and external assurances, such as those related to greenhouse gas emission levels, or they disclose key performance indicators (KPIs) in performance reporting data.

Third, the results showed that companies with close relationships with final consumers do not use a tone of certainty in CEO statements or in environmental information. Because these companies often use their environmental and social activities (such as products, services, or social and charitable corporate activities) for public relations (PR)[xiv] through mass media, a tone similar to the one used in PR is also used in sustainability reporting narratives. Thus, it is likely that in

such narratives, a PR-style tone is used rather than a tone of certainty.

Fourth, regarding the GRI database registration, companies use an optimistic and ambiguous tone in environmental information, but not a tone of certainty. They also tend not to use a tone of certainty in CEO statements and social information. The means of acquiring legitimacy is given a proxy in the form of a GRI dummy. It is conceivable that in order to boost its legitimacy, a company uses an optimistic and ambiguous tone in environmental information. It is also conceivable that such companies ensure the disclosure of GRI guideline indicators instead of using a tone of certainty. Fifth, with respect to influence on narratives in certain industries, results showed different trends in the three sections of CEO statements, environmental information, and social information.

This paper presents an empirical analysis of sustainability reporting by Japanese companies. It also presents statistical results examining the influence that performance, stakeholders, registration in the GRI database, and industry characteristics have on sustainability reporting narratives. In particular, this paper analysed three main disclosure sections of sustainability reports: CEO statements, environmental information, and social information. The findings demonstrated a relationship between poor ESG performance and an optimistic tone in CEO statements, as shown in the results of prior research.

Furthermore, the study did not find a clear connection between poor performance and narratives in environmental or social information. CEO statements differ from environmental and social information in that they rely on narratives rather than charts and graphs to convey meaning. Analytical results showed that the impetus for impression management that is achieved through word tone and word choice differs in these statements compared to the textual content in environmental or social information.

Meanwhile, according to this study, the narratives in environmental and social information are not determined by performance, as shown in prior research. This is because environmental and social information disclose a wider variety of indicators in their narratives. However, the results did demonstrate that narratives are influenced by company characteristics, including stakeholders, GRI database registration, and industry attributes. This suggests the tendency of certain companies to use optimistic and ambiguous tones as well as a tone of certainty in environmental and social information. This finding adds to the concern that tone manipulation may lead to misunderstanding on the part of readers.

This study sought to clarify differences in rhetorical usage in narratives among sections of sustainability reports. This is a novel approach to the quantitative analysis of sustainability reporting narratives. The results of this paper contribute to the further understanding of the credibility issues of narratives. Until recently, the reliability of the external assurance of performance data (e.g. greenhouse gas emission levels) has been actively discussed in

sustainability reporting. However, the credibility of narratives is not addressed. Thus, we suggest the importance of appropriate narratives that enhance the interpretation of performance data in sustainability reporting.

A limitation of our research is that we only selected two variables in the context of the narratives: Optimism and Certainty, as stipulated in the CATA software DICTION. No other language characteristics were considered. Since narratives have grown more sophisticated following the development of CATA software, it would be reasonable to explore additional variables in future research. Moreover, it is necessary to consider the index of narratives not specified in the DICTION variable, thereby enhancing the credibility of research for stakeholders.

Endnotes

[i] There is a stakeholder theory (Roberts, 1992), which holds that because sustainability reporting constitutes voluntary disclosure of information, its rationale is to disclose information in order to fulfil the needs of stakeholders. There is also legitimacy theory (Patten, 1992), which holds that information disclosure demonstrates that the state of an organisation matches its external values.

[ii] For example, quantitative information pertaining to greenhouse gas emissions and waste emissions is disclosed in environmental information; quantitative information pertaining to initiatives for employees, suppliers, and consumers is included in social information; and quantitative information such as risk management, internal controls, materiality selection, and CSR management is disclosed in governance reporting.

[iii] For example, Cicero positions rhetoric as a debating skill for the purpose of effective persuasion and as a skill that combines word placement and combinations of words (Cicero, 2000).

[iv] As an independent company under the umbrella of the Deutsche Börse and the Swiss Stock Exchange Group, STOXX is the global leader specialising in indices. STOXX offers index solutions to markets throughout the world. The indices are provided to world leaders in financial products, asset management companies, and so forth.

[v] The ESG Leaders Indices cover companies that lead the world in ESG fields. Data related to the ESG of analysed companies are based on surveys of each company conducted by Sustainalytics. The index model is developed by STOXX.

[vi] Sustainalytics' ESG surveys are conducted based on Deutsche Vereinigung für Finanzanalyse und Asset Management's (DVFA) 2010 *KPIs for ESG–Key Performance Indicators for Environmental, Social and Governance Issues*, formulated in collaboration with EFFAS (The European Federation of Financial Analysts Societies). The DVFA (2010) report reflects the perspectives of investors, analysts, rating companies, and so forth. These parties set the KPIs that can be used for evaluations.

[vii] The number of observations differs because companies with CEO statements in spoken format are outside the scope of this paper's study due to colloquial styles and the lack of wording uniformity. Furthermore, companies whose environmental and social information is presented online and whose CEO messages are listed in integrated reports in non-financial reporting media are outside the scope of this paper's study. This is because of the prevalence of financial reporting and mid- to long-term plans, which are not related to environmental and social information in these CEO statements. Because there are also companies that include only

environmental information and do not include social information, the number of social information observations differs from the number of environmental information observations.

[viii] According to Hart and Carroll (2013), each score from 31 word lists compiled from the 50,000 texts included in DICTION is standardised by DICTION prior to the calculation of any of the five general features. While this only represents the addition and subtraction of low scores from word lists, it is believed that the same score is never provided. The calculation for Optimism is [Praise + Satisfaction + Inspiration] – [Blame + Hardship + Denial]. The calculation for Certainty is [Tenacity + Levelling + Collectives + Insistence] – [Numerical Terms + Ambivalence + Self Reference + Variety]. For each of the definitions in DICTION word lists–for example, Praise–the first element in the Optimism calculation is defined by succeeding text. Refer to Hart and Carroll (2013, pp. 12–16) for each of the 31 definitions.

[ix] The relationship among ESG performances in CEO statements, the relationship among environmental performances in environmental report narratives, and the relationship among social performances in social information narratives were verified. The expression 'performance' was standardised as performance to avoid confusion, because different types of performance are used in each of the three parts.

[x] In this paper, environmental performance is assumed to correspond with environmental report narratives, and social performance is assumed to correspond with social information narratives. The content required in a CEO statement, according to GRI (2013), should include short-term, medium-term, and long-term overall vision and strategy. In particular, the organisation should give a positive or negative indicator of significant economic, environmental, and social influences. GRI (2013) also states that the overarching activities of governance (ESG) are required, and that the sustainability report should disclose the relationship between environment and social information and capture the integrated governance of ESG performance.

[xi] Processing and assembly was set as the standard industry because it includes companies that must balance suppliers and consumers when considering the influence of stakeholders.

[xii] $p = 0.060$.

[xiii] $p = 0.062$.

[xiv] Public relations (PR) was defined in 1987 by the Public Relations Society of America (http://www.prsa.org/) as 'a strategic communication process that builds mutually beneficial relationships between organizations and their public'. In terms of the relationship between companies and sustainability, Clark (2000) pointed out in an analysis of the relationship between CSR and PR that, while these both aim to strengthen the relationship between an organisation and its critical stakeholders, CSR lacks an 'effective method of communication'.

Abbreviations

BCI: Bullfighter Composite Index.

CATA: computer-aided text analysis.

CEO: chief executive officer.

CSR: corporate social responsibility.

DVFA: Deutsche Vereinigung für Finanzanalyse und Asset Management.

EFFAS: European Federation of Financial Analysts Societies.

EPA: Environmental Protection Agency.

ESG: environmental, social, and governance.

GPS: green policy score.

GRI: Global Reporting Initiative.

KPI: key performance indicator.

MHPR: modelled hazard population results.

NGO: non-governmental organisation.

OLS: ordinary least squares.

PR: public relations.

ROA: return on assets.

RSS: reputation survey score.

SRI: socially responsible investment.

References

Aerts, W. (2005). Picking up the pieces: impression management in the retrospective attributional framing of accounting outcomes. *Accounting, Organizations and Society,* 30, 493–517.

Arena, C., Bozzolan, S., & Michelon, G. (2014). Environmental reporting: Transparency to stakeholders or stakeholder manipulation? An analysis of disclosure tone and the role of the board of directors. *Corporate Social Responsibility and Environmental Management,* 22, 346-361. DOI: 10.1002/csr.1350.

Bakar, A., Sheikh, A., & Ameer, R. (2011). Readability of corporate social responsibility communication in Malaysia. *Corporate Social Responsibility and Environmental Management,* 18(1), 50–60.

Barkemeyer, R., Comyns, B., Figge, F., & Napolitano, G. (2014). CEO statements in sustainability reports: Substantive information or background noise? *Accounting Forum,* 38(4), 241–257.

Beattie, V. (2014). Accounting narratives and the narrative turn in accounting research: Issues, theory, methodology, methods and a research framework. *The British Accounting Review,* 46(2), 111–134.

Belkaoui, A., & Karpik, P. G., (1989). Determinants of the corporate decision to disclose social information. *Accounting, Auditing & Accountability Journal* 2(1). http://dx.doi.org/10.1108/09513578910132240（Accessed 4 February 2016).

Brennan, N. M., & Merkl-Davies, D. M. (2013). Accounting narratives and impression management. In L. Jack, J. Davison, & R. Craig (Eds.), *The Routledge companion to*

accounting communication, (pp. 103–132). New York: Routledge.

Castelló, I.,&d Lozano, J. M. (2011). Searching for new forms of legitimacy through corporate responsibility rhetoric. *Journal of Business Ethics*, 100 (1), 11–29.

Cho, C. H., Laine, M., Roberts, R. W., & Rodrigue, M. (2015). Organized hypocrisy, organizational façades, and sustainability reporting. *Accounting, Organizations, and Society*, 40, 78–94.

Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society*, 32(7–8), 639–647.

Cho, C. H., Roberts, R. W., & Patten, D. M. (2010). The language of U.S. corporate environmental disclosure. *Accounting, Organizations and Society*, 35(4), 431–443.

Cicero, M. T. (2000). Rhetoric/Cicero anthology, Volume 6, Hideo Katayama Translation, Iwanami Shoten, pp. 162–165.

Clark, C. E. (2000). Differences between public relations and corporate social responsibility: An analysis. *Public Relations Review*, 26(3), 363–380.

Clatworthy, M. A., & Jones, M. J. (2006). Differential patterns of textual characteristics and company performance in the chairman's statement. *Accounting, Auditing & Accountability Journal*, 19(4), 493–511.

Cong, Y., Freedman, M., & Park, J. D. (2014). Tone at the top: CEO environmental rhetoric and environmental performance. *Advances in Accounting*, 30(2), 322–327.

Corminer, D., & Mangan, M. (1999). Corporate environmental disclosure strategies: Determinants, costs and benefits. *Journal of Accounting, Auditing, and Finance*, 14(4), 429–451.

Demers, E. A., & Vega, C. (2010). Soft information in earnings announcements: News or noise? (INSEAD Working Paper No. 2010/33/AC).

Demers, E. A., & Vega, C. (2014). Understanding the role of managerial optimism and uncertainty in the price formation process: Evidence from the textual content of earnings announcements. http://dx.doi.org/10.2139/ssrn.1152326 **(**Accessed 6 May 2015**)**.

Deutsche Vereinigung für Finanzanalyse und Asset Management (DVFA) (2010). KPIs for ESG—key performance indicators for environmental, social and governance issues. DVFA, Frankfurt am Main.

Fernandez-Feijoo, B., Romero, S., & Ruiz, S. (2014a). Effect of stakeholders' pressure on transparency of sustainability reports within the GRI framework. *Journal of Business Ethics*, 122(1), 53–63.

Fernandez-Feijoo, B., Romero, S., & Ruiz, S. (2014b). Commitment to Corporate social responsibility measured through global reporting initiative reporting: factors affecting the behavior of companies. Journal of Cleaner Production 81, 244–254.

Freeman, R. E. (1984). *Strategic management. A stakeholder approach.* Boston: Pitman.

Global Reporting Initiative (GRI). (2013). *G4 sustainability reporting guidelines.*

Haddock-Fraser, J. E., & Tourelle, M. (2010). Corporate motivations for environmental sustainable development: Exploring the role of consumers in stakeholder engagement, *Business Strategy and the Environment,* 19(8), 527–542.

Hahn, R., & Regin, R. (2014). Legitimizing negative aspects in GRI-oriented sustainability reporting: A qualitative analysis of corporate disclosure strategies. *Journal of Business Ethics*, 123(3), 401–420.

Hart, R. P., & Carroll, E. C. (2013). DICTION 7.0: The text analysis program help manual. Digitext, Inc. Available at https://www.jou.ufl.edu/assets/researchlab/dictionmanual.pdf

Higashida, A., Kokubu, K., & Kawahara, C. (2005). Information disclosure and determinants in environmental reports by Japanese companies: Analysis focused mostly on environmental reports issued in 2003. *Corporate Social Accounting and Reporting Research*, 17, 38–3938 (in Japanese).

Highhouse, S., Brooks, M. E., & Gregarus, G. (2009). An organizational impression management perspective on the formation of corporate reputations. *Journal of Management*, 35(6), 1481–1493.

Hopwood, A. G. (2009). Accounting and the environment. *Accounting, Organizations, and Society*, 34(3), 433–439.

Kokubu, K., Nishitani, K., Shinohara, A., & Kitada, H. (2012). Environmental disclosure by Japanese companies: Influence of stakeholders and information needs. *Industrial Accounting*, 71, 51–61 (in Japanese).

Kokubu, K., Noda, A., Onishi, Y., Shinabe, T., & Higashida, A. (2002). Determinants of environmental information disclosure by Japanese companies: Issuance of environmental reports and qualitative analysis. *Accounting*, 54, 74–80 (in Japanese).

Mallin, C., Michelon, G., & Raggi, D. (2012). Monitoring intensity and stakeholders' orientation: How does governance affect social and environmental disclosure? *Journal of Business Ethics,* 114(1), 29–43.

Marais, M. (2012). CEO rhetorical strategies for corporate social responsibility (CSR). *Society and Business Review,* 7(3), 223–243.

Merkl-Davies, D. M., & Brennan, N. M. (2007). Discretionary disclosure strategies in corporate narratives: Incremental information or impression management? *Journal of Accounting Literature*, 27, 116–196.

Merkl-Davies, D. M., Brennan, N. M., & McLeay, S. J. (2011a). Impression management and retrospective sense-making in corporate narratives: A social psychology perspective. *Accounting, Auditing & Accountability Journal*, 23(3), 315–344.

Merkl-Davies, D. M., Brennan, N. M., & Vourvachis, P. (2011b). Text analysis methodologies in corporate narrative reporting research. Conceptual paper, available at: https://www.academia.edu/2173695/Text_Analysis_Methodologies_in_Corporate_Narrative_Reporting_Research (Accessed 8 September 2014).

Ministry of the Environment. (2012). *Environmental reporting guidelines 2012* (in Japanese).

Neu, D., Warsame, H., & Pedwell, K. (1998). Managing public impressions: Environmental disclosures in annual reports. *Accounting, Organizations and Society,* 23(3), 265–282.

Nishitani, K. (2014). Corporate environmental initiatives and information disclosure are influence on shareholder. *Environmental Economics and Policy Studies*, 7(1), 10.

Parsa, S., & Kouhy, R. (2008). Social reporting by companies listed on the alternative investment market. *Journal of Business Ethics,* 79, 345–360.

Patelli, L., & Pedrini, M. (2015). Is tone at the top associated with financial reporting aggressiveness? *Journal of Business Ethics,* 126(1), 3–19.

Patten, D. M. (1992). Intra-industry environmental disclosures in response to the Alaskan oil spill: A note on legitimacy theory. *Accounting, Organizations and Society,* 17(5), 471–475.

Roberts, R. W. (1992). Determinants of corporate social responsibility disclosure: An application of stakeholder theory. *Accounting, Organizations and Society,* 17(6), 595–612.

Short, J. C., & Palmer, T. B. (2008). The application of DICTION to content analysis research in strategic management. *Organizational Research Methods,* 11(4), 727–752.

Sotorrío, L.L., & Sánchez, J.L.F., (2010). Corporate social reporting for different audiences: the case of multinational corporations in Spain. *Corporate Social Responsibility and Environmental Management*, 17, 272-283.

Sydserff, R., & Weetman, P. (2002). Developments in content analysis: A transitivity index and scores. *Accounting, Auditing & Accountability Journal*, 15, 523–545.

Ullmann, A. A. (1985). Data in search of a theory: a critical examination of the relationships among social performance, social disclosure, and economic performance of US firms. *The Academy of Management Review*, 10(3), 540–557.

Table 1. Analysis of correlation (CEO statements)

		Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	CEO Statements Optimism	1.722	0.025	1														
2	CEO Statements Certainty	1.706	0.074	-0.174 *	1													
3	ESG Performance	2.202	0.122	-0.026	0.054	1												
4	Advertisement Expenses to Net Sales	1.624	0.040	0.134	-0.263 **	-0.210 **	1											
5	Foreign Investor Shareholding Ratio	0.320	1.416	0.142	-0.019	0.024	0.018	1										
6	GRI	0.200	0.401	0.103	-0.253 **	0.030	-0.021	0.081	1									
7	Size of Firm	6.100	0.490	0.049	0.016	0.202 **	-0.294 **	0.171 *	0.070	1								
8	ROA	5.930	3.699	0.024	0.028	-0.027	0.299 **	-0.047	0.240 **	-0.360 **	1							
9	Leverage	0.544	0.181	-0.005	-0.100	0.050	-0.162 **	-0.202 *	0.060	0.437 **	-0.488 **	1						
10	Raw Materials	0.200	0.401	-0.038	-0.130	0.079	0.012	-0.074	-0.172 *	-0.127	-0.026	0.054	1					
11	Other Manufacturing	0.150	0.358	-0.073	0.104	-0.066	0.279 **	-0.060	-0.079	-0.255 **	0.134	-0.263 **	-0.2100* **	1				
12	Infrastructure	0.063	0.243	-0.038	0.047	0.020	-0.152	-0.044	0.000	0.126	-0.156 *	0.121	-0.129	-0.109	1			
13	Non-manufacturing	0.175	0.381	0.203 *	0.085	-0.029	-0.101	0.247 *	0.016	0.271 *	0.088	0.165 *	-0.230 *	-0.194 *	-0.119	1		
14	Processing and Assembly	0.413	0.494	-0.054	-0.058	-0.004	-0.059	-0.066	0.184 *	0.017	-0.068	-0.040	-0.419 **	-0.352 **	-0.216 **	-0.386 **	1	
15	Yearly Dummy (FY2011)	0.500	0.502	-0.470 **	0.342 **	-0.081	0.000	0.001	-0.250 *	-0.013	0.130	-0.029	0.000	0.000	0.000	0.000	0.000	1

*p<0.05;**p<0.01
N=160

Table 2. Analysis of correlation (environmental information)

		Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Environmental Information Optimism	1.711	0.016	1															
2	Environmental Information Certainty	1.714	0.047	0.114	1														
3	Environmental Performance	1.827	0.144	0.039	-0.032	1													
4	Governance Performance	1.592	0.327	0.051	-0.065	0.050	1												
5	Advertisement expenses to net sales	1.677	1.877	-0.003	-0.190 **	0.217 **	0.147 *	1											
6	Foreign investor shareholding ratio	0.814	4.501	0.050	-0.006	0.083	-0.049	-0.020	1										
7	GRI	0.179	0.384	0.126 *	-0.146 *	-0.038	0.005	-0.089	0.024	1									
8	Size of Firm	6.109	0.469	-0.067	-0.029	0.185 **	0.190 **	-0.166 **	0.142 *	0.095	1								
9	ROA	6.006	3.982	0.131 *	0.058	0.025	-0.061	0.218 *	0.446 **	-0.090	-0.308 **	1							
10	Leverage	0.540	0.176	-0.145 *	-0.060	-0.143 *	0.136 *	-0.225 **	-0.198 **	0.119	0.454 *	-0.591 **	1						
11	Raw Materials	0.222	0.417	-0.151 *	-0.065	-0.026	-0.230 **	-0.096	0.090	-0.175 *	-0.127 *	0.103	-0.028	1					
12	Other Manufacturing	0.159	0.366	0.028	0.004	0.165 *	-0.017	0.394 **	-0.061	-0.118	-0.206 **	0.157 **	-0.344 **	-0.232 **	1				
13	Infrastructure	0.063	0.244	0.022	0.003	-0.210 **	0.200 **	-0.158 *	-0.043	0.006	0.100	-0.175 *	0.199 **	-0.139	-0.113	1			
14	Nonmanufacturing	0.190	0.393	-0.020	0.018	-0.298 **	0.100	-0.143 *	0.115	0.011	0.191 *	0.074	0.155 *	-0.259 **	-0.211 **	-0.126 *	1		
15	Processing and Assembly	0.365	0.482	0.114	0.037	0.247 **	0.029	-0.020	-0.103	0.228 **	0.060	-0.180 *	0.059	-0.405 **	-0.329 **	-0.197 *	-0.368 **	1	
16	Yearly Dummy (FY2011)	0.500	0.502	0.198 **	0.1650* *	0.057	0.025	0.000	0.000	-0.176	-0.015	0.113	-0.023	0.000	0.000	0.000	0.000	0.000	1

＊p＜0.05;＊＊p＜0.01
N=252

Table 3. Analysis of correlation (social information)

		Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Social Information Optimism	1.729	0.020	1															
2	Social Information Certainty	1.714	0.035	0.279 **	1														
3	Social Performance	1.543	0.412	-0.073	0.080	1													
4	Governance Performance	1.602	0.321	-0.071	0.106	-0.003	1												
5	Advertisement Expenses to Net Sales	1.695	1.916	-0.040	-0.103	-0.012	0.140 *	1											
6	Foreign Investor Shareholding Ratio	1.068	5.188	-0.044	-0.032	-0.002	-0.078	-0.017	1										
7	GRI	0.175	0.381	-0.113	-0.197 **	0.091	0.049	-0.078	0.004	1									
8	Size of Firm	6.143	0.466	-0.056	0.033	-0.074	0.167 *	-0.193 **	0.159 *	0.042	1								
9	ROA	5.911	4.005	-0.001	0.044	0.064	-0.069	0.225 **	0.433 **	-0.057	-0.285 **	1							
10	Leverage	0.548	0.180	0.015	0.035	0.052	0.093	-0.255 **	-0.184 **	0.093	0.444 **	-0.607 **	1						
11	Raw Materials	0.208	0.407	-0.004	0.000	0.187 **	-0.220 **	-0.078	0.067	-0.155 *	-0.152 *	0.125	-0.047	1					
12	Other Manufacturing	0.150	0.358	-0.053	-0.133 *	-0.245 **	-0.002	0.394 **	0.049	-0.101	-0.154 *	0.116	-0.329 **	-0.216 **	1				
13	Infrastructure	0.067	0.250	0.137 *	-0.002	-0.134 *	0.201 **	-0.161 *	-0.051	0.009	0.084	-0.172 *	0.188	-0.137 *	-0.112	1			
14	Non-manufacturing	0.217	0.413	0.017	0.082	0.038	0.077	-0.177 *	0.069	-0.003	0.189 **	0.044	0.193 **	-0.270 **	-0.221 **	-0.141	1		
15	Processing and Assembly	0.358	0.481	-0.044	0.029	0.062	0.017	0.008	-0.125	0.205 **	0.037	-0.141 *	0.022	-0.383 **	-0.314 **	-0.200 **	-0.393 **	1	
16	Yearly Dummy (FY2011)	0.500	0.501	0.242 **	0.327 **	-0.006	0.017	0.000	0.000	-0.197 **	-0.017	0.108	-0.032	0.000	0.000	0.000	0.000	0.000	1

*p<0.05; **p<0.01
N=240

Table 4 Estimation results

	Explained Variable											
	CEO Statements Optimism		CEO Statements Certainty		Environmental Information Optimism		Environmental Information Certainty		Social Information Optimism		Social Information Certainty	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
ESG Performance	−0.028	0.015 *	0.009	0.047								
Environmental Performance					0.002	0.008	−0.008	0.024				
Social Performance					0.002	0.003	−0.006	0.010	−0.003	0.003	0.006	0.005
Governance Performance									−0.006	0.004	0.013	0.007 *
Advertisement Expenses to Net Sales	0.001	0.001	−0.010	0.004 **	0.000	0.001	−0.006	0.002 ***	0.000	0.001	−0.002	0.001
Foreign Investor Shareholding Ratio	0.001	0.001	−0.002	0.004	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
GRI	−0.002	0.005	−0.034	0.014 **	0.006	0.003 **	−0.020	0.008 **	−0.003	0.003	−0.016	0.006 **
Size of Firm	0.002	0.005	0.001	0.014	−0.002	0.003	0.000	0.008	−0.003	0.003	0.001	0.005
ROA	0.000	0.001	0.000	0.002	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.001
Leverage	−0.004	0.012	−0.050	0.038	−0.011	0.008	−0.008	0.023	0.001	0.010	0.006	0.017
Raw Materials	0.000	0.005	−0.019	0.015	−0.006	0.003 **	−0.017	0.008 **	0.000	0.004	−0.005	0.006
Other Manufacturing	−0.005	0.005	0.025	0.017	−0.002	0.003	0.001	0.010	−0.003	0.004	−0.010	0.007
Infrastructure	0.000	0.007	0.011	0.023	0.001	0.005	−0.008	0.014	0.012	0.006 **	−0.007	0.009
Non-manufacturing	0.011	0.005 **	0.020	0.017	−0.002	0.003	−0.007	0.009	0.002	0.004	0.000	0.006
Dummy (FY2011)	−0.024	0.004 ***	0.044	0.011 ***	0.007	0.002 ***	0.012	0.006 **	0.009	0.003 ***	0.019	0.004 ***
Constant term	1.780	0.037 ***	1.710	0.118 ***	1.715	0.019 ***	1.748	0.055 ***	1.757	0.021 ***	1.673	0.035 ***
Number of Observations	160		160		252		252		240		240	
AdjR^2	0.237		0.172		0.071		0.064		0.053		0.131	
Model F-statistic (p-value)	5.120 ***		3.750 ***		2.480 ***		2.320 **		2.030 **		3.770 ***	

*p<0.10; **p<0.05; ***p<0.01

[2019.1.9 1274]