Effects of External Environment on the Nature of Performance Measures' Use

Farhana Zaman • Daeyoung Yoon

『経営情報イノベーション研究』
静岡県立大学・経営情報イノベーション研究科
第 6 巻（2017 年10月）
（抜刷）

査読論文

Effects of External Environment on the Nature of Performance Measures' Use

Farhana Zaman*
Daeyoung Yoon**

Abstract
The objective of this study is to examine, from a contingency perspective, the relationship between the external environmental factors of an organization and nature of multi-perspective performance measures' use. To conduct this study, we followed a cross-sectional research design and used a structured written questionnaire survey to collect data from the SMEs in Japan. Regression Models are used to test the hypothesis of the study. From the results of this study, we find that interactive use of performance measures' is positively affected by environmental dynamism and negatively affected by hostility. However, diagnostic use is affected by environmental dynamism only. The result of this study will be beneficial for the managers and owners of start-up SMEs to use the performance measures efficiently to survive in a dynamic and competitive business environment.

Key Words: Diagnostic use, interactive use, multi-perspective performance measures, contingency framework, small and medium enterprises

1. Introduction

In a dynamic and competitive business environment, management accounting and control systems are gaining importance (Hofmann, Wald, & Gleich, 2012).Organisations use various management accounting and control systems such as budgets, performance measures, etc for planning, coordinating, controlling and decision making purposes. The various management accounting and control systems could be used either diagnostically or interactively (Simon, 1995; 2000). Simons (2000) suggests that whether to use a management accounting and control systems diagnostically or interactively should depend on the level of uncertainty faced by an organization.

In recent years, there has been an increasing attention on the use of multi-perspective performance measures to evaluate organizational performance. Performance measures help managers to manage organizational performance effectively and efficiently (Melnyk, Bititci, Platts, Tobias, & Andersen, 2013). Performance measurement as an area of management accounting and control systems deals with different indicators of performance to evaluate a business performance. According to Neely, Gregory and Platts (1995) "performance measurement is the process of quantifying action" (p.1228). Furthermore, academics and practitioners are interested to know about the external environmental factors that affect the nature of performance measures' use by managers. External organizational forces require a balance between different

* Graduate School of Management & Information of Innovation, University of Shizuoka, j15502@u-shizuoka-ken.ac.jp
** Graduate School of Management & Information of Innovation, University of Shizuoka, yoon@u-shizuoka-ken.ac.jp

deployments of management accounting and control systems information (Hofmann, Wald, & Gleich, 2012).

Therefore, this study aims to investigate the effect of external environmental factors on the nature of multi-perspective performance measures' use. To do so, we use a contingency-based research framework. Two mostly investigated environmental factors in contingency-based research are environmental dynamism and hostility faced by an organization (Chenhall, 2003). In this paper, we try to investigate the effect of these two factors on the nature of performance measures' use. We select Japanese Small and Medium Enterprises (SMEs)[1] as our experimental setting. We choose Japanese SMEs as our experimental setting because of its social and economic importance. SMEs account for 99.7% of all businesses and 33.61 million people are employed by SMEs in Japan (Small and Medium Enterprise Agency, 2016). So the efficient management of SMEs is important for the overall economic development of Japan.

To conduct this study, we use Simon's (1995) distinction between diagnostic and interactive use of management accounting and control systems. However, we adopt this distinction to examine the use of one particular component of management accounting and control systems named "multi-perspective performance measurement practice". In this study, multi- perspective performance measures replicate the decision by a firm to use a combination of financial and nonfinancial performance indicators to evaluate organizational performance. We use regression models to investigate the affect of environmental dynamism and hostility on the use of multi-perspective performance measures. The findings of the study revealed that the diagnostic and interactive use of multi-perspective performance measures is affected by environmental dynamism.

Nonetheless, this paper has several significances in management accounting practice and literature. First, depending on the external environmental factors faced by an organization the nature of performance measures' use will be different and this study will shed light on those factors which have an influence on different use of performance measures. Second, the academics and practitioners who are supporting the SMEs will get an idea about the impact of environmental uncertainty and hostility on the nature of performance measures' use and hence, they could assist SMEs appropriately. Moreover, in a dynamic and competitive business environment, it is indeed very important for the owners, managers and advisors of start-up SMEs to know about the appropriate style of performance measure' use. The result of this study will be beneficial for the managers and owners of start-up SMEs to use the performance measures efficiently to survive in a dynamic and competitive business environment. Moreover, what factors affect the style/nature of performance measures' use in Japanese SMEs is not well investigated. So this paper will fill that gap in the management accounting literature.

We organize the rest of the paper as follows. We discuss the definition of constructs in Section 2; in Section 3 and 4 we present the hypotheses and research method respectively; we discuss the results and analysis in Section 5 and in Section 6 we present conclusion and summary of the study.

---

1 The classification of "Small and Medium Enterprises" and "Small Enterprises" used in this study are from the Small and Medium-sized Enterprise Basic Act of Japan. According to the Article 2, Paragraph 1 to 4, of the said act "Small and Medium Enterprises" is referred to "(1) For manufacturing, mining and transport industries- any company with a maximum capital of 300 million yen, or a company or individual with regular employees of 300 or less ; (2) For wholesale industry, any company with a maximum capital of 30 million yen, or a company or individual with regular employees of 100 or less; (3) For retail and service industries - any company with a maximum capital of 10 million yen, or a company or individual with regular employees of 50 or less; Similarly, "Small Enterprises" is referred as (1) For manufacturing, mining and transport industries- companies with no more than 20 regular employees; and (2) For wholesale, retail and service industries, companies with no more than 5 regular employees. In this study, we used the number of regular employees as a measure to classify a firm as SME.

2. Definition of Constructs

2.1. Diagnostic use

According to Henri(2006) "the diagnostic use comprises the review of critical performance variables (i.e., factors enabling the achievement of intended strategy) to monitor and coordinate the implementation of intended strategies." Furthermore, Diagnostic use comprises a mechanistic control used to track, review and support the achievement of predictable goals (Henri, 2006, p.533).

2.2. Interactive Use

On the other hand, according to Henri (2006),

> "the interactive use focuses attention and forces dialogue throughout the organization"….When Management Control Systems are used interactively, (i) the information generated is a recurrent and important agenda for top managers; (ii) frequent and regular attention is fostered throughout the organization; (iii) data are discussed and interpreted among organizational members of different hierarchical levels; and (iv) continual challenge and debate occur concerning data, assumptions and action plans (p.533)."

Therefore, interactive use is an organic control system that support the communication processes and the mutual adjustment of organizational actors.(Henri, 2006)

2.3. External Environment

According to Chenhall (2003), "the external environment is a powerful contextual variable that is at the foundation of contingency-based research (p.137)." The most extensively researched feature of external environment is dynamism and hostility. Hostility refers to the intensity of market competition faced by a firm (Otley, 2016). In this study, we analyze the degree of market dynamism and intensity of market competition as the primary elements of external environment.

3. Hypothesis Development

Dynamism refers to the changes of market related factors over the course of time (Duncan 1972). Particularly, market dynamism represents strategic uncertainties. Managers make different choices regarding the nature of management accounting and control systems use to manage uncertainties (Hofmann, Wald, & Gleich, 2012).

High environmental uncertainty is connected with an explanation of variances from predetermined goals and, a high involvement and interpersonal interactions between superiors and subordinates (Ezzamel, 1990). Merchant (1990) found that uncertainty was associated with pressure to meet financial targets. On the other hand, environmental hostility has been related to a strong emphasis on meeting budgetary targets (Otley, 1978). According to Chenhall (2003) "a consistent steam of research over the past 20 years has confirmed that uncertainty has been associated with a need for more open, externally focused, nonfinancial styles of management control systems. However, hostile and turbulent conditions appear, in the main, to be best served by a reliance on formal controls (p.138)."

Moreover, in a dynamic business environment planning becomes more difficult because probabilities

cannot be easily attached to future events. Therefore, greater informal communication is needed for effective decision making (Chapman, 1997). However, "hostility has been shown to be associated with a greater reliance on accounting controls (especially budgets)"(Otley, 2016, p.50).

Accounting controls are formal control mechanisms which mostly resembles to the diagnostic use and flexible style of control resembles to the interactive use. Therefore, from the above discussion, it can be inferred that environmental dynamism has a positive effect on both diagnostic and interactive use. On the other hand, environmental hostility has a positive effect on diagnostic use. Therefore, we restricted the hypotheses formulation for the impact of dynamism and hostility on interactive use and hostility on diagnostic use. While the impact of hostility on
interactive use remains as a question to be examined.

H1: Environmental dynamism is positively associated the interactive and diagnostic use of multi-perspective performance measures.

H2: Environmental hostility is positively associated with diagnostic use of multi-perspective performance measures.

Q1: What is the impact of environmental hostility on interactive use of multi-perspective performance measures?

4. Research Method

4.1. Sample and Data

We followed a cross-sectional research design and employed a structured written questionnaire survey to collect data from the SMEs in Japan. In order to collect necessary data for this study, we took assistance from a professional firm named Neo Marketing Inc. Neo Marketing Inc. is a management consultancy firm who helps researchers and academics to collect survey data. The initial questionnaire was written in English and was developed from the existing literature. The original questionnaire was translated to Japanese language as most of our target respondents might not understand the English questionnaire. To translate the questionnaire, we employed the translation procedures as suggested by Hofstede (1980) and subsequently used by Lau and Sholihin (2005). This procedure includes three different steps. First, the second author of the paper, who knows English and Japanese language, translated the questionnaire from English into Japanese. Second, a research student, who also knows English and Japanese language, translated back the Japanese version of the questionnaire to English. Finally, we crossed checked the translated English version of the questionnaire with the original English version to ensure that the translation had been perfectly carried out.

The Japanese version of the questionnaire was then pilot tested on one academic, one manager of a small business and one member of a management consultancy firm who advises SMEs. After receiving recommendation from them, the wording and layout of the questionnaire were changed to improve understandability by the respondents. Our survey questionnaire was then sent to Neo Marketing Inc. for further screening and pilot testing. Neo Marketing Inc. also made necessary correction and sent us the questionnaire for final approval. We then asked the Neo Marketing Inc. to start the questionnaire survey.

We instructed Neo Marketing Inc. to send questionnaire only to those firms who have regular employees 10 or more and 300 or less. Neo Marketing contacted with 577 SMEs in Japan to participate

in the survey. So our target population for this survey was 577 SMEs. After initial contact, it took almost one month for Neo Marketing Inc. to conduct a web based survey. The survey link was sent to the top management team of the respondent firm. The top management team of the firms includes; general manager/ member of management team, company executive and manager of other departments. Neo Marketing provided us data of 500 firms. Out of those 500 firms, 121 firms did not give any opinion regarding an explicit question on whether their firms use financial and nonfinancial performance indicators to evaluate organizational performance or not. So, we got response from 379 firms to conduct our statistical analysis.

After excluding extreme outliers[2], incomplete responses and firms that have regular employees less than 10 or more than 300, we were able to use 320 responses. Out of these 320 firms, 155 firms confirm that they use multi-perspective performance measures to evaluate organizational performance. We use the data of those 155 sample firms to conduct this study.

To scrutinize non-response bias, we compared (by using one sample t-test), the mean firm size (measured in terms of regular employees) of respondent firm with non-respondentfirm[3]. We did not find any statistically significant mean difference (t=1.062, p=.289) between respondent firms and non-respondent firms.

Requested demographic data showed that the respondents have on average 17.57 years of experience in their current organization and are 53 years old on average. The mean number of regular employees of the firms is 51.

4.2. Empirical Model

We apply the following empirical models to examine a firm's nature of performance measures' use.

$$dia\_use = \beta 0 + \beta 1 en\_dyn + \beta 2\ mkt\_comp + ei \quad (1)$$

$$int\_use = \beta 0 + \beta 1 en\_dyn + \beta 2\ mkt\_comp + ei \quad (2)$$

Based on H1 and H2, wepredicted $\beta 1$ and $\beta 2$ to be positive in equation 1. For the interactive use, we predicted $\beta 1$ to be positive and we do not have any prediction for $\beta 2$ in equation 2.

4.3. Variable Measurement

4.3.1. Nature of use

We measured the diagnostic and interactive use of performance measures by using an adapted version of the Vandenbosch's (1999) instrument which is also used by Henri (2006). We asked respondents to answer four questions on diagnostic use and six questions on interactive use. An exploratory common factor analysis reveals only one factor for diagnostic use and one factor for interactive use. The eigenvalue of diagnostic use is 3.22, explaining 80.51 % of variance and the eigenvalue of interactive use is 4.61, explaining 76.90% of variance. So, the dia_use and int_use is calculated as the average summated score of the four items of diagnostic use and six items of interactive use respectively. The Cronbach alpha of the

2 Extreme Outliers are checked by box plots.

3 Respondent firms are those 320 firms who answer an explicit question regarding the use of multi-perspective performance measures to evaluate firm performance and non respondent firm are those 121 firms who do not give any opinion. Out of those 121 firms we exclude the response of 16 firms. Those 16 firms have employees less than 10.

two constructs are .918 (diagnostic use) and .940 (interactive use) respectively.

4.3.2. Environmental Dynamism

We measure environmental dynamism by the changing nature of the external environment. We asked respondents to assess the changes of their external environment through six items of the questionnaire. The six items of the questionnaire were originally developed by Gordon and Narayanan (1984), and Govindarajan (1984). This instrument is further modified and used by (Hoque, 2004). A modified version of Hoque (2004) is used in this study to capture the dynamic business environment in Japan. An exploratory common factor analysis reveals one factor with an eigenvalue 3.77, explaining 62.18% of variance. The Cronbach alpha of the scale is .881.

4.3.3. Environmental Hostility

Environmental Hostility resembles intensity of market competition faced by a business. We captured market competition by focusing on two items, which assess the dimensions of competition faced by a business firm. We derived these two items of the scale from the discussion of environmental munificence by Castrogiovanni (1991) and the instruments of Tan and Litschert (1994); and Miller and Friesen (1983) which is also used by Bedford and Malmi (2015). An exploratory common factor analysis reveals only one factor. The Cronbach alpha of this construct is .752.

5. Results and analysis

5.1. Descriptive Statistics and Correlation matrix

In Table 1, we show the descriptive statistics and factor loadings of the scale items used in this study. We presented descriptive statistics for the overall sample of 155 firms. Table 2 presents the Pearson correlation matrix for the regression model variable of the 155 sample firms. The correlation matrix shows that the diagnostic use and interactive use are positively and significantly correlated with environmental dynamism and hostility. Nonetheless, the pair wise correlations among the independent variables do not exceed 0.60, suggesting that threat of multicollinearity is limited.

Table 1
Descriptive Statistics and Factor Loadings of Constructs and Measurement Items

Measurement Items and Constructs	Descriptive Statistics		Factor Loadings	Cronbach Alpha
	Mean	Standard Deviation		
Variables:				
Nature of Use:				
To what extent your company uses performance measures for the following purposes (7 point scale: 1=not at all; 7= to an extremely high extent)				
Diagnostic use(dia_use)				
1. Track progress towards goals	5.19	1.39	.898	
2. Monitor results	4.88	1.36	.860	.918
3.Compare outcomes to expectations	5.30	1.35	.933	
4. Review key measures of firms	5.19	1.26	.896	
Eigenvalue: 3.22				
% of variance explained: 80.51				
Interactive use(int_use)				
1. Enable discussion in meetings of superiors, subordinates and peers	5.10	1.27	.859	
2. Enable continual challenge and debate underlying data, assumptions and action plans	5.00	1.27	.886	.940
3. Provide a common view of the company	5.17	1.24	.870	
4. Tie the organization together	5.10	1.34	.894	
5. Enable the organization to focus on common issues	4.88	1.39	.907	
6. Enable the organization to focus on critical success factors	4.94	1.31	.846	
Eigenvalue: 4.61				
% of variance explained: 76.90%				
Environmental Dynamism (en_dyn)				
Indicate to what extent the following aspect of your company's business environment have changed during the last three years.(7 point scale: 1=not at all; 7= to an extremely high extent)				
1.Suppliers' actions	4.25	1.43	.747	
2.Customer demands, tastes and				

preferences	4.57	1.44	.826	
3. Distributors' action	4.28	1.39	.718	
4.Government regulation and policies	4.33	1.54	.754	
5.Economic environment and globalization	4.62	1.53	.841	.881
6.Social Environment	4.65	1.48	.858	
Eigenvalue: 3.77 *% of variance explained:62.81%*				
Market Competition (mkt_comp) Please rate below the following issues of your business				
1. Intensity of competition for main products/services? (l1=not intense at all, 7= extremely intense)	4.53	1.62	.896	.752
2. Difficulty to obtain the necessary inputs (1= not difficult at all, 7=extremely difficult)	3.93	1.43	.896	
Eigenvalue: 1.61 *% of variance explained: 80.34%*				

[a] The exploratory factor analysis was done on the 155 sample firms that use Multi-Perspective Performance Measures.
[b] Extraction method : Principal Component Analysis with Varimax Orthogonal Rotation.

Table 2. Pearson Correlation Matrix

	dia_use	int_use	en_dyn	mkt_comp
dia_use		.791** (.000)	.534** (.000)	.277** (.000)
int_use			.508** (.000)	.192* (.016)
en_dyn				.565** (.000)

**Correlation is significant at 1% level (2-tailed).
*Correlation is significant at 5% level (2-tailed).
[a]p-values are in parentheses.
[b]Variables: dia_use = diagnostic use; int_use= interactive use;
en_dyn= environmental dynamism; mkt_comp= market competition.

5.2. Regression results -Diagnostic use

Results for the diagnostic use of performance measures are presented in Table 3. The results show that the estimated coefficients on environmental dynamism (β1=0.555, p<0.001, two tailed), is positive and statistically significant. Therefore, the results support H1. Furthermore, the results support the notion that in a dynamic business environment performance measures are used as a diagnostic tool to evaluate organizational performance and make decisions. However, the estimated coefficients on variable mkt_comp(hostility) (β2= -.036, p=.661, two tailed) is negative and statistically insignificant. Thus, H2 is not supported. The regression model explained 28.1% (adjusted R^2) of the variance in the dependent variable.

The results imply that in regard with external environment, the primary determinant of the diagnostic use is environmental dynamism. The results indicate that in a dynamic and changing business environment SMEs need to keep track on their day to day activities and monitor results with predetermined goals. However, environmental hostility has no impact on the diagnostic use of performance measures.

Table 3. OLS regression results for diagnostic use (dia_use) (N=155)

Variables	Predicted sign	Coefficient estimates	t-value	p-value
Intercept		2.722	8.023	<.001
en_dyn(β1)	+	.555**	6.676	<.001
mkt_comp(β2)	+	- .036	-.439	.661
Model Fit R^2 Adjusted R^2		 .286 .277		

** Statistically significant at 1% level (2-tailed).
* Statistically significant at 5% level (2-tailed).
[a] Variables: dia_use = diagnostic use; int_use= interactive use; en_dyn = environmental dynamism; mkt_ comp= market competition.
[b] Coefficients are standardized coefficients.

Table 4 presents the result of the association between interactive use and the environmental variables based on the sample of 155 firms. The analysis reveals that the interactive use is positively and significantly related to environmental dynamism (β1= .587, p= <.001, two tailed) in the predicted direction. Hence, the result supports H1. Conversely, the estimated coefficient on market competition is negative but statistically significant at 10% level. Therefore, market competition has a negative impact on interactive use of performance measures. The regression model explained 26.2% (adjusted R^2) of the variance in the dependent variable.

The regression results suggest that our sample firms use performance measures interactively when the external environment is dynamic. However, they do not prefer to use performance measures interactively when they face intense competition in the market. This is an interesting finding indeed. It may be because, when a firm faces intense competition regarding their main products and services, and face difficulties in acquiring necessary inputs, the top management of the firm become more cautious about the financial performance of their firm and want to use performance measures only as a diagnostic tool to monitor results and keep track on outcome with expectation.

Table 4. OLS regression results for interactive use (int_use) (N=155)

Variables	Predicted sign	Coefficient estimates	t-value	p-value
Intercept		2.962	9.113	<.001
en_dyn(β1)	+	.587**	6.991	<.001
mkt_comp (β2)	Not Predicted	-.139	-1.660	.099
Model Fit R^2 Adjusted R^2		 .271 .262		

** Statistically significant at 1% level (2-tailed).
* Statistically significant at 5% level (2-tailed).
[a] Variables: dia_use = diagnostic use; int_use= interactive use; en_dyn = environmental dynamism; mkt_ comp= market competition.
[b] Coefficients are standardized coefficients.

6. Conclusion

This paper examined the impact of external environment on the nature of performance measures' use. Based on a sample of 155 SMEs, the results of this study revealed that external environmental factors recognized by contingency-based research are important determinant for nature of performance measures' use. In particular, we find that both diagnostic and interactive uses are significantly affected by environmental dynamism. Moreover, the strong correlation between diagnostic and interactive use of performance measures indicates that Japanese SMEs use performance measures as a diagnostic as well as interactive tool. The joint use of management control systems is not new in management accounting literature. Managers use management control systems (for example, performance measures) as diagnostically and interactively to manage inherent organizational tensions (Henri, 2006).

This study has several contributions in management accounting literature and practice. As a contribution to the literature, this study focuses on the nature of performance measures' use in SMEs. To date, the contingency-based research has not focused on the nature of performance measures in SME setting. The result of this study showed the association between external environmental factors and nature of performance measures' use. Therefore, this study will be useful to the owners and managers of new start-up SMEs as well as academics and practitioners as they will get the idea about the appropriate use of performance measures in dynamic and competitive business environment. Furthermore, this study will improve the quality of management consultancy service of practitioners and advisors. Thus, the failure of SMEscould be reduced which is happened by inappropriate use of management accounting and control systems (López&Hiebl, 2015).

There are some limitations of this study. For example the potential threat of internal validity. However, to minimize this treat, we adopted the well established scale to measure the variables. The scales that we used are well developed and used by many researchers in management accounting literature. Moreover, our experimental setting is SMEs; hence caution should be taken to utilize the findings in other experimental setting.

Finally, further research could be conducted by considering more variables and using some new statistical method such as structural equation modeling to show the impact of environmental factors on each other. The reliability and accuracy of this study can be tested by replicating the study in settings apart

from Japanese SMEs.

Acknowledgement

The first author of the paper would like to convey her gratitude to Otsuka Toshimi Scholarship Foundation for their support in her doctoral study.

References

Bedford, D.S., & Malmi, T. (2015). Configurations of control: An exploratory analysis. *Management Accounting Research, 27*, 2-26.

Castrogiovanni, G.J. (1991). Environmental munificence: a theoretical assessment. *Academy of Management Review, 16* (3), 542-565.

Chapman, C.S. (1997). Reflections on a contingent view of accounting. *Accounting, Organizations and Society, 22*, 189- 205.

Chenhall, R.H. (2003). Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Accounting, Organizations and Society, 28*, 127-168.

Duncan, R.B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly, 17*, 313-327.

Ezzamel, M. (1990). The impact of environmental uncertainty, managerial autonomy and size on budget characteristics. *Management Accounting Research, 1*, 181-197.

Henri, J-F. (2006). Management control systems and strategy: A resource-based perspective. *Accounting, Organizations and Society, 31*, 529-558.

Hofmann, S., Wald, A., & Gleich, R. (2012). Determinants and effects of the diagnostic and interactive use of control systems: an empirical analysis on the use of budgets. *Journal of Management Control, 23* (3), 153-182.

Hofstede, G.H. (1980). Culture's consequences: International differences in work-related values. Beverly Hills: Sage Publication Inc.

Hoque, Z. (2004). A contingency model of the association between strategy, environmental uncertainty and performance measurement: impact on organizational performance. *International Business Review, 13*(4), 485-502.

Gordon, L.A. , & Narayanan, V.K. (1984). Management accounting systems, perceived environmental uncertainty and organization structure: An empirical investigation. *Accounting, Organizations and Society, 9*(1), 33-47.

Govindarajan, V. (1984). Appropriateness of accounting data in performance evaluation: an Empirical examination of environmental uncertainty as an intervening variable. *Accounting, Organizations and Society, 9*, 125-135.

Lau, C.M., & Sholihin, M. (2005). Financial and nonfinancial performance measures: How do they affect job satisfaction? *The British Accounting Review, 37*(4), 389-413.

López, O.L., & Hiebl, M.R.W. (2015). Management accounting in Small and Medium-Sized Enterprises: Current knowledge and avenues for further research. *Journal of Management Accounting Research, 27*(1), 81-119.

Melnyk, S.A., Bititci, U., Platts, K., Tobias, J., & Andersen, B. (2013). Is performance measurement and management fit for the future? *Management Accounting Research, 25*(2), 173-186.

Merchant, K. (1990). The effects of financial controls on data manipulation and management myopia. *Accounting, Organizations and Society, 15*, 297-313.

Miller, D.,& Friesen, P.H. (1983). Strategy-making and environment: The third link. *Strategic Management Journal, 4*(3), 221-235.

Neely, A., Gregory, M., & Platts, K. (1995). Performance measurement system design: A literature review and research agenda. *International Journal of Operations & Production Management, 25*(12), 1228-1263.

Otley, D.T. (1978). Budget use and managerial performance. *Journal of Accounting Research, 16*(1), 122-149.

Otley, D. (2016). The contingency theory of management accounting and control: 1980-2014. *Management Accounting Research, 31*, 45-62.

Small and Medium Enterprise Agency. (2016). *White Paper on Small and Medium Enterprises in Japan, 2016*. Retrieved from http://www.chusho.meti.go.jp/sme_english/

Simons, R. (1995). *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal*. Boston: Harvard Business School Press.

Simons, R. (2000). *Performance Measurement and Control Systems for Implementing Strategy*. Upper Saddle River: Prentice Hall.

Tan, J.J., & Litschert, R.J.(1994). Environment-strategy relationship and its performance implications: an empirical study of the Chinese electronics industry, *Strategic Management Journal, 15*, 1-20.

Vandenbosch, B. (1999). An empirical analysis of the association between the use of executive support systems and perceived organizational competitiveness. *Accounting, Organizations and Society, 24*, 77-92.

Appendix A
Questionnaire in Japanese

本調査は、業績測定の実施とその範囲、実施スタイルを決定づける要因（例えば、組織規模、事業構造、事業環境、情報システムの機能）の効果を明らかにするために行われるものです。

あなたが経営する企業(以降、貴社）について、理想ではなく、貴社の現実を踏まえてご回答いただきます。

あなたがお勤めの企業(以降、貴社）について、理想ではなく、貴社の現実を踏まえてご回答いただきます。

本調査はにご協力いただけますか。
（お答えは 1 つ）

○1	調査に協力する
○2	調査に協力できない

Q1. 貴社では、下記の各事項の管理にあたり、どの程度まで業績指標を使用していますか。

「1=全く使用していない」～「7=非常によく使用している」として、最もあてはまる数字を 1 つお答えください。
（お答えはそれぞれ 1 つずつ）

		1（全く使用していない）	2	3	4（どちらとも言えない）	5	6	7（非常によく使用している）
Q1-1	目標に向けた進捗状況	○1	○2	○3	○4	○5	○6	○7
Q1-2	業務遂行結果のモニタリング	○1	○2	○3	○4	○5	○6	○7
Q1-3	計画と成果の比較	○1	○2	○3	○4	○5	○6	○7
Q1-4	主要業績数値の検討	○1	○2	○3	○4	○5	○6	○7

Q1-5	会議での上司や部下、同僚との議論の活発化	○1	○2	○3	○4	○5	○6	○7
Q1-6	業務関連データや予測、行動計画に沿った持続的な挑戦と対話の活発化	○1	○2	○3	○4	○5	○6	○7
Q1-7	経営現状に関する情報の提供	○1	○2	○3	○4	○5	○6	○7
Q1-8	組織の結束	○1	○2	○3	○4	○5	○6	○7
Q1-9	諸経営事項への集中	○1	○2	○3	○4	○5	○6	○7
Q1-10	事業を成功に導く主要要因への集中	○1	○2	○3	○4	○5	○6	○7

Q2. 過去 3 年間において貴社の事業環境はどの程度大きく変化しましたか。

「1=全く変化していない」~「7=大きく変化した」として、最もあてはまる数字を 1 つお答えください。
（お答えはそれぞれ 1 つずつ）

		1（全く変化していない）	2	3	4（どちらとも言えない）	5	6	7（大きく変化した）
Q2-1	供給業者の動き	○1	○2	○3	○4	○5	○6	○7
Q2-2	顧客の嗜好、ニーズ、好み	○1	○2	○3	○4	○5	○6	○7
Q2-3	流通業者の動き	○1	○2	○3	○4	○5	○6	○7
Q2-4	政府の規制や政策	○1	○2	○3	○4	○5	○6	○7
Q2-5	経済環境やグローバリゼーション	○1	○2	○3	○4	○5	○6	○7
Q2-6	社会環境	○1	○2	○3	○4	○5	○6	○7

Q-3 下記の事業イシュー(課題・問題)について、最も当てはまる数字１つをお答えください。
（お答えはそれぞれ１つずつ）

		1（全くない）	
		2	
		3	
		4（どちらとも言えない）	
		5	
		6	
		7（非常に激しい）	
Q3-1	主要製品・サービス分野における競争圧力 ※「1=全くない」～「7=非常に激しい」	○1	○2	○3	○4	○5	○6	○7

		1（全く困難ではない）	
		2	
		3	
		4（どちらとも言えない）	
		5	
		6	
		7（非常に困難である）	
Q3-2	事業展開に必要なインプット（資本など）獲得 ※「1=全く困難ではない」～「7=非常に困難である」	○1	○2	○3	○4	○5	○6	○7