Melco Foundation
Management Accounting Research
Discussion Paper Series

The Melco Foundation

Melco Management Accounting Research Discussion Paper Series

No.MDP2019-007

Multidimensional Performance Evaluation Styles: Budget Rigidity and Discretionary Adjustments

December 2019

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Abstract

In management accounting research, there is no consensus on which styles of performance evaluation lead to superior (inferior) performance. This study addresses this issue by providing a new conceptual framework that classifies the styles of performance evaluation and revealing the styles that lead to superior (inferior) performance. Based on a detailed literature review, this study categorizes the styles of performance evaluation by two dimensions: the importance of budgetary targets and the manner of using accounting information. Two concepts that explain these two dimensions, budget rigidity and discretionary adjustments, are specified. A congruent combination of budget rigidity and discretionary adjustments is predicted in the case of environmental uncertainty. Empirical analysis is undertaken using survey data from Japanese firms. The results indicate that a suitable combination of budget rigidity and discretionary adjustments differs by situation. As expected, a combination of lower budget rigidity and higher discretionary adjustments is optimal in an uncertain environment. Contrary to expectations, a combination of higher budget rigidity and higher discretionary adjustments is optimal in a stable environment. This study empirically demonstrates the importance of discretionary adjustments for performance evaluation regardless of environmental uncertainty.

Keywords
Budgets, Performance evaluation style, Multidimensionality, Budget rigidity, Discretionary adjustments, Environmental uncertainty

1. Introduction

The relationship between styles of performance evaluation and their effects on managers' attitudes, behaviors, and performance is a central theme of management accounting research (Luft and Shields, 2003). This area aims to reveal the situations in which managers' dysfunctional behaviors arise. These studies assume that the use of accounting information by supervisors to evaluate managers' performance causes such behaviors. Since the seminal works of Hopwood (1972) and Otley (1978) produced opposite results, several studies attempted to reveal the effects of performance evaluation styles on managers' attitudes, behaviors, and performance (Brownell, 1982; Brownell and Hirst, 1986; Hartmann, 2000; Hirst, 1981) by specifying variables that moderate this relationship (Brownell and Hirst, 1986; Hartmann, 2000; Hirst, 1983). In addition, many studies focused on measuring variables and analytical techniques (Brownell, 1982, 1985; Derfuss, 2009; Otley and Fakiolas, 2000). Nevertheless, there is no consensus on which performance evaluation style leads to superior (or inferior) performance.

One serious problem of prior studies is that they do not reconsider concept of performance evaluation styles theoretically. They treat the concept is treated vaguely, which hinders the accrual of systematic knowledge. Performance evaluation style is a constructive concept with several dimensions (Briers and Hirst, 1990; Hartmann et al., 2010; Hopwood, 1972). Hence, it is necessary to clarify the dimensions of performance evaluation styles. Nevertheless, several studies focused on only one dimension, because they do not recognize their multidimensionality. In addition, many studies label the concept of performance evaluation styles the same way, even though the meaning differs across studies.

This study aims to investigate the performance evaluation styles that lead to superior (inferior) performance. Hence, this study first seeks to clarify the concept of performance evaluation styles, specifically by assuming that they consist of two dimensions: the priority of budgetary targets among the performance criteria and how supervisors use accounting information in managerial performance evaluation. The first dimension explains the factor measured as a performance criterion at the stage of setting performance criteria and the second dimension indicates whether supervisors

use accounting information strictly or leniently ex post. In addition, this study assumes that two concepts underpin these two dimensions: budget rigidity and discretionary adjustments.

Then, this study assumes that congruence between the degree of budget rigidity and discretionary adjustments is determined by contextual variables. In particular, the present study focuses on environmental uncertainty, which is one of the most important issues of interest to researchers (Hartmann, 2000; Merchant, 1990; Ross, 1995). This study assumes that environmental uncertainty determines congruence between the degree of budget rigidity and discretionary adjustments.

This relationship is tested empirically using survey data collected from Japanese firms. The results indicate that a suitable combination of budget rigidity and discretionary adjustments differs according to environmental uncertainty. Specifically, the combination of lower budget rigidity and higher discretionary adjustments enhances organizational performance under a highly uncertain environment. This study also posits that a combination of higher budget rigidity and lower discretionary adjustments is suitable in a stable environment, though the results show that a combination of higher budget rigidity and higher discretionary adjustments improves organizational performance in a stable environment. These results indicate that the active use of discretionary adjustments complements the effects of budget rigidity on organizational performance, regardless of environmental uncertainty.

This study offers several contributions to the literature on performance evaluation. First, it provides a new conceptual framework that classifies performance evaluation styles. While performance evaluation styles are a composite concept with several dimensions, prior studies treated these dimensions vaguely (Briers and Hirst, 1990; Hartmann et al., 2010). The present study addresses this problem by reconsidering the concepts and specifies two dimensions for performance evaluation. Moreover, this study specifies two concepts, budget rigidity and discretionary adjustments, underpinning the two dimensions. This reconsideration of the theory is important for providing guidelines for the development of research on performance evaluation styles.

Second, this study enhances the literature on effective (ineffective) performance evaluation. The results of the empirical analysis suggest that it is difficult to understand the performance implications of performance evaluation styles without recognizing their multidimensionality. In addition, the appropriate combination of budget rigidity and discretionary adjustments differs according to environmental uncertainty. These results are important because most prior studies examined the

contingency relationship between only one dimension of performance evaluation and specific contextual variables (Brownell, 1982; Hartmann, 2000; Hirst, 1983).

Third, the results indicate the importance of discretionary adjustments in budget-based performance evaluations. Specifically, discretionary adjustments complement the effects of budget rigidity, regardless of environmental uncertainty. Prior studies suggest that whether managers adopt dysfunctional behaviors depends not on budget-based performance evaluation per se, but on how supervisors use accounting information to evaluate managerial performance (Derfuss, 2009; Hopwood, 1972; Sponem and Lambert, 2016). Moreover, some studies demonstrated that including subjectivity in budget-based performance evaluations is an effective way to improve future performance (Aranda et al., 2019). Considering the results of this and prior studies, discretionary adjustments complement the motivational effects of performance targets. From this perspective, the results demonstrate that the use of discretionary adjustments to evaluate budget-based performance seems to be rational in practice.

This study has several important implications for managerial practice. The results show that practitioners should recognize the importance of budgetary targets and the use using accounting information in performance evaluation as two performance evaluation dimensions. Supervisors must address both dimensions to enhance desirable behaviors and improve performance. In addition, the use of discretionary adjustments in performance evaluation is important for organizational success. Supervisors should not evaluate managers' performance mechanically and systematically based on achieving targets. Instead, supervisors should consider why managers cannot achieve targets, how they behave in the budgeting period, and their actions, among other factors. Such evaluation efforts can direct managers to adopt behaviors desirable for the organization, which ultimately leads to organizational success.

The remainder of this paper proceeds as follows. Section 2 reviews the literature on performance evaluation styles and introduces the new conceptual framework that classifies the performance evaluation styles on two dimensions and explains them with two concepts: budget rigidity and discretionary adjustments. Section 3 develops the research hypotheses by building on complementary theory. Section 4 explains the data collection and variable measurements. Section 5 presents the results of the empirical analysis. Finally, Section 6 summarizes the study, its limitations, and directions for future research.

2. Theory

2.1 Prior studies

The relationship between budget-based performance evaluation and managers' behaviors first received attention about 60 years ago. Descriptive field studies focused on how factory managers or budget staff use budgetary control systems, and highlighted the interpersonal problems caused by their use (Argyris, 1952; Hofstede, 1967). These studies described serious problems arising from the use of budgets as pressure devices, such as hostility toward top management or deteriorating relations among supervisors, subordinates, and colleagues.

Hopwood (1972) advanced the initial studies dramatically by classifying performance evaluation styles and testing their effects empirically. Specifically, Hopwood (1972) proposed three performance evaluation styles—budget-constrained, profit-conscious, and non-accounting. Hopwood (1972) found that a budget-constrained style, which refers to the strict use of budgetary information to evaluate performance, causes the most serious problems.

However, subsequent studies do not replicate Hopwood's (1972) results. Otley's (1978) study was the first to produce contrary results, and numerous studies since then attempted to understand why (Brownell, 1982; Brownell and Hirst, 1986; Hartmann, 2000; Hirst, 1981). Studies following Hopwood (1972) and Otley (1978) developed in two directions. The first is toward the contingency relationship, or the conditions under which performance evaluation styles cause (reduce) dysfunctional behaviors (Brownell and Hirst, 1986; Hirst, 1981, 1983) with contextual variables including environmental uncertainty, task complexity, and budgetary participation. The other direction addresses variable measurement and analytical techniques (Brownell, 1982, 1985; Derfuss, 2009; Otley and Fakiolas, 2000). Nevertheless, there have been no advances in understanding the situations in which managers' dysfunctional behaviors are enhanced (reduced).

2.2 Multidimensional nature of performance evaluation styles

Despite the substantial body of work, few studies reconsidered the conceptual framework or concepts of the styles of performance evaluation. In particular, prior studies did not sufficiently recognize the multidimensional nature of performance evaluation styles. This is a serious problem, as prior studies focused on only one dimension or labeled multiple dimensions in the same way, even though these studies

apply different definitions. These problems inhibit the accrual of systematic knowledge on the performance effects of performance evaluation styles.

A few studies offered a theoretical consideration of the concept of performance evaluation styles. Briers and Hirst (1990) suggested that they consist of at least three dimensions: the range of criteria used to evaluate performance, the flexibility with which variances from the standard are interpreted, and the manner in which managers handle short- and long-term concerns. Similarly, Hartmann et al. (2010) posit two dimensions. The first is the measurement dimension to explain the range of performance criteria for performance evaluation. The range includes quantitative and qualitative performance measures. The second is the style dimension, which explains the manner (e.g., rigid or lenient) in which supervisors use these performance measures ex-post. Hartmann et al. (2010) invoked the concept of leadership style to explain this dimension. Using these two concepts, they examine empirically the effects on managers' work-related attitudes.

Hartmann et al.'s (2010) classification has two problems. First, it cannot explain the strict use of accounting information. Specifically, they classified the style dimension by whether a performance measure is quantitative or qualitative. Quantitative performance measures include both financial and non-financial measures. Their classification cannot recognize the differences between these two attributes; that is, their classification cannot explain the use of "accounting" information strictly. The second problem is that their concept of leadership style, such as initiating structure, cannot explain the manner in which managers use accounting information strictly. Specifically, the concept of leadership style is too general to explain how supervisors use accounting information. Therefore, there is scope to make the concepts more sophisticated.

2.3 Conceptual framework

Based on the abovementioned studies, the authors assume that the concept of performance evaluation styles consists of two dimensions. The first is the priority of budgetary targets, which explain the positioning of budgetary targets as evaluation criteria. Specifically, this dimension focuses on whether budgetary targets are of high or low priority at the stage of setting performance criteria. Prior studies discussed this dimension as a range of measures to evaluate performance (Briers and Hirst, 1990; Hartmann et al., 2010).

The other dimension is how supervisors use accounting information. This dimension explains whether supervisors evaluate managers' performance strictly or

flexibly based on performance measures ex post. In other words, this dimension explains the degree of subjective adjustments at the ex-post stage of performance evaluation. Previous studies discussed this dimension as the flexibility with which supervisors interpret variances from the standard or how they handle short- and long-term concerns (Briers and Hirst, 1990; Hartmann et al., 2010; Hopwood, 1972).

The distinction between these two dimensions is important because no significant understanding of the effects of performance evaluation styles is possible without considering both. Recognizing performance evaluation styles by only one dimension leads to several problems. Focusing only on the priority of budgetary targets ignores how supervisors use accounting information ex post. One can assume that managers are less likely to adopt dysfunctional behaviors to achieve budgetary targets if supervisors evaluate managers' performance flexibly ex post. Hence, ignoring this dimension erodes the understanding of the effects of performance evaluation styles.

Similarly, focusing on only how supervisors use accounting information ex post (the use dimension) ignores the priority of budgetary targets. Performance measures and targets themselves direct managers' attention toward them, regardless of whether supervisors use accounting information strictly or leniently for ex-post performance evaluation (Flamholtz, 1983; Marginson and Ogden, 2005; Sprinkle, 2003). Attention-directing effects become significant as the priority of budgetary targets increases, and thus, focusing on only the use dimension ignores the serious effects of budgetary targets. In this way, the relationship of the two dimensions of performance evaluation styles is not unidirectional but reciprocal.

It is important to specify the concepts suited to explain these two dimensions. Otherwise, this theoretical reconsideration would not produce an empirical analysis. This study posits several concepts that explain these two dimensions. *Budget rigidity* explains the priority of budgetary targets. Budget rigidity increases if supervisors emphasize budgetary targets as comprehensive measures that reflect managers' efforts and behaviors. On the contrary, budget rigidity decreases as the priority of performance targets besides budgetary targets increases.

Discretionary adjustments are the concept that explains the use dimension. This concept explains the degree to which supervisors evaluate managers' performance subjectively ex post. Prior studies showed the effectiveness of discretionary adjustments as a means of improving goal congruence and risk reduction (Bol, 2008; Gibbs et al., 2004; Hoppe and Moers, 2011). Research on budgeting also demonstrated the wide diffusion of discretionary adjustments in budget-based performance

evaluation (Libby and Lindsay, 2010). Discretionary adjustments increase as supervisors evaluate managers' performance flexibly in consideration of the environment or managers' explanations. On the contrary, discretionary adjustments decrease as supervisors evaluate managers' performance based on ex-ante performance criteria strictly.

As Fig. 1 shows, performance evaluation styles are classified by combining the degree of budget rigidity and discretionary adjustments, thus yielding four performance evaluation styles. First, the *non-accounting style* places a lower priority on budgetary targets and supervisors hardly judge subordinates' performance subjectively. Supervisors set performance targets based on quantitative non-financial measures and evaluate them. Second, the *flexible evaluation style* is a performance evaluation that does not emphasize budgetary targets and supervisors often judge subordinates' performance subjectively. In this style, supervisors emphasize quantitative and/or qualitative non-financial performance targets and evaluate the achievement of budgetary targets flexibly. Third, the *budget emphasis style* makes budgetary targets the primary priority and supervisors evaluate managers' target achievements objectively. Achievement of budgetary targets is primary. Finally, the *budget emphasis and flexible evaluation style*, requires that subordinates achieve budgetary targets, but with a subjective performance assessment.

Budget rigidity	Low	High
Low	Non-accounting style	Flexible style
High	Budget emphasis style	Budget emphasis and flexible style

Fig. 1 Classification of styles of performance evaluation

3. Hypothesis

Many prior studies in this area adopted contingency theory (Hartmann, 2000), which is useful to examine control practices that match contextual variables, but is limited in that it cannot explain interdependence (internal consistency) among control practices (Grabner and Moers, 2013). This study adopts complementary theory to examine the interdependence of budget rigidity and discretionary adjustments while considering the effects of a contextual variable (environmental uncertainty). This theory is useful for predicting how each dimension of performance evaluation style fits together (Grabner and Moers, 2013). In other words, it is suitable for explaining and

examining the interdependence of budget rigidity and discretionary adjustments in specific contexts (uncertain vs. stable external environments).

3.1 Uncertain environments

In an uncertain environment, random noise leads to fluctuations in the achievement of budgetary targets. Financial performance measures, such as budgetary targets, cannot give supervisors accurate information about managers' efforts (Banker and Datar, 1989; Hirst, 1981, 1983; Holmstrom, 1979; Moers, 2006). In this case, prioritizing budgetary targets enhances the risk that managers will have lower performance (Banker and Datar, 1989; Hirst, 1981; Holmstrom, 1979). In addition, managers perceive ambiguity about the causal relationship between their own efforts and consequences. Managers who cannot predict how to achieve targets perceive a higher cost of making efforts, which provides less incentive to achieve targets. Nevertheless, emphasizing budgetary targets raises the risks that managers will legitimize dysfunctional behaviors such as manipulating performance measures (Hopwood, 1972; Merchant, 1990). Such behaviors are problematic because managers' make efforts in the wrong direction. Hence, in a highly uncertain environment, it is suitable to make budgetary targets a lower-priority performance criterion (Holmstrom, 1979).

In addition, it is possible to predict the benefits of lowering budget rigidity. Specifically, it not only reduces the risks that managers bear, but also gives them opportunities to adapt their behaviors to environmental change. Short-term performance pressure decreases as budget rigidity decreases. Consequently, managers' long-term orientation is enhanced (Merchant, 1990; Van der Stede, 2000). In addition, they quickly make adjustments for customer needs and engage in innovative behaviors (Lillis, 2002; Van der Stede, 2000). It can be assumed that lower budget rigidity is suitable in a highly uncertain environment because these orientations and behaviors are more important in this case.

Here, it should be noted that lower budget rigidity is not enough to motivate managers to adapt their behaviors to environmental change. Identical performance evaluation requires not only a reduction in managers' risks, but also a motivation for them to adapt their behaviors to environmental change (Gibbs et al., 2004). Discretionary adjustments enable supervisors to use ex-post information to judge managers' efforts and behaviors flexibly (Bol, 2008; Gibbs et al., 2004; Hoppe and Moers, 2011), which allows managers to predict how new information, such as fluctuations in the external environment, changes supervisors' priorities. Managers

will act autonomously based on their predictions (Bol, 2008). Therefore, discretionary adjustments encourage managers to adapt their behaviors to changes in the external environment (Bol, 2008; Gibbs et al., 2004).

Based on this discussion, this study predicts that a combination of lower budget rigidity and higher discretionary adjustments is suitable in a highly uncertain environment. This combination can reduce the risk that managers' performance will decline. Lower budget rigidity and higher discretionary adjustments reinforce each other, leading to risk reduction and goal congruence. Therefore,

Hypothesis 1: In an uncertain environment, discretionary adjustments moderate the relationship between budget rigidity and performance. The positive effects of lower budget rigidity on performance become significant as discretionary adjustments increase.

3.2 Stable environments

In a stable environment, financial performance measures such as budgetary targets, can are comprehensive measures that reflect managers' behaviors and efforts accurately. In this situation, the higher priority of budgetary targets enhances goal congruence between supervisors and managers. Managers can explicitly understand the causal relationships between their efforts and consequences. Hence, higher budget rigidity motivates managers to achieve budgetary targets (Hirst, 1981; Moers, 2006; Otley, 1978). Furthermore, achieving budgetary targets leads to organizational success.

Regarding the use dimension, active use of discretionary adjustments is not desirable. In a stable environment, it is easier to clarify managers' optimal behavior. In addition, it is not difficult to design desirable formal evaluation rules ex ante to give supervisors information that accurately reflects managers' efforts. Managers can easily estimate the return on their own efforts when supervisors evaluate their performance based on formal rules (Baker et al., 1994; Bol, 2008). This estimation motivates managers to achieve budgetary targets. Prior studies also indicated that objective performance evaluation is suitable when performance measures reflect managers' efforts accurately (Baker et al., 1994; Govindarajan, 1984).

From this discussion, the authors predict that the combination of higher budget rigidity and lower discretionary adjustments is optimal in a stable environment. In other words, managers face fewer risks and goal congruence between supervisors and managers increases as budget rigidity rises and discretionary adjustments decrease. This combination creates the maximum motivation for managers to achieve budgetary

targets. Hence,

Hypothesis 2: In a stable environment, discretionary adjustments moderate the relationship between budget rigidity and performance. The positive effects of higher budget rigidity on performance become significant as discretionary adjustments decrease.

Fig. 2 shows the optimal combinations this study assumes. The cell labeled "Unfit" refers to an ineffective style of performance evaluation. These practices do not suit the situation. In other words, these firms do not attain equilibrium. Therefore, it can be assumed that the performance of these firms is lower than that of other firms whose practices suit the situation.

Budget rigidity	Discretionary adjustments: low	Discretionary adjustments: high
low	unfit	congruent under uncertain environment (hypothesis 1)
high	congruent under stable environment (hypothesis 2)	unfit

Fig.2 Assumed congruent relationships

4. Methods

4.1 Data collection

To test the hypotheses, in 2014, questionnaires were sent to 1,822 firms listed on the First Section of the Tokyo Stock Exchange. The respondents of the mail survey are managers/directors of corporate planning departments, who are appropriate respondents because their main functions in large Japanese firms include exploring appropriate budgeting and performance evaluation systems. To increase the response rate, a once-off follow-up postcard was sent to the managers/directors who did not respond by the due date. These processes resulted in 308 responses (a 16.9% response rate). There were 233 final samples for the analysis after eliminating firms that did not use budgets (2), did not use budgetary targets to evaluate the performance of business unit managers (32), had missing data (22), and for which archival data on organizational performance was unavailable (19).

4.2 Variables

4.2.1 Budget rigidity

Budget rigidity (*BR*) is the priority of budgetary targets among the evaluation criteria. Prior studies often used instruments developed by Hopwood (1972) or Otley (1978) to measure *BR*. However, they may not be appropriate because they were developed to investigate practices at particular research sites (Otley and Fakiolas, 2000). In this study, *BR* is measured following Van der Stede's (2000) seven items developed for a cross-sectional survey. The seven items are measured on Likert scales of 1 to 7, where 1 indicated "not at all" and 7 "absolutely correct." One item was eliminated due to the ceiling effect.

4.2.2 Discretionary adjustments

Discretionary adjustments (*DA*) occur when supervisors evaluate managers' performance flexibly by considering their own judgements and opinions. *DA* is measured as follows. First, items that measure discretionary adjustments based on budgetary targets are adopted from Libby and Lindsay's (2010) questionnaire. Second, respondents are asked to rate objective non-financial measures subjectivity. These two items are measured on Likert scales of 1 to 7, where 1 indicated "not at all" and 7 "absolutely correct."

4.2.3 Environmental uncertainty

Environmental uncertainty (*EU*) is measured by questionnaire items rather than objective archival data. Specifically, *EU* is measured by eight items that reflect three common dimensions in prior studies: internal business processes, competition, and technology (Ekholm and Wallin, 2011). These eight items are measured on Likert scales of 1 to 7, where 1 indicated "very predictable" and 7 "very unpredictable."

Table 1 shows the results of the exploratory factor analysis using all questionnaire items via maximum likelihood extraction and oblique rotation. The loadings of the scale items for each factor vary from .482 to .797 for *BR*, .609 to .999 for *DA*, and .507 to .668 for *EU*. The Cronbach's alphas are .838, .756, and .830 for *BR*, *DA*, and *EU*, respectively. These results support the reliability of the measurement items. In addition, Table 1 supports the convergent and discriminant validity of the measurement items. This study does not use two questionnaire items that do not load on factors for the variable measurement and empirical analysis.

Table 1 Descriptive statistics and the results of exploratory factor analysis

Questionnaire item	Mean	S. D.	Min	Max	Factor loading		
					BR	DA	EU
Not meeting the budget has a strong impact on managers' performance evaluation	4.76	1.169	2	7	**.797**	.074	.287
Promotion prospects depend heavily on ability to meet the budget	4.48	1.153	1	7	**.692**	.140	.271
Meeting the budget is an accurate reflection of whether managers are successful	4.76	1.100	2	7	**.611**	.124	.260
Performance of business unit's managers is assessed predominantly on the basis of attaining budgetary targets	5.46	1.159	1	7	**.590**	-.014	.250
Control over business unit is achieved by monitoring how well the budget targets are on track	5.29	1.107	2	7	**.588**	.045	.232
Not meeting the budget reflects poor performance	4.90	1.188	1	7	**.482**	-.018	.296
Budget target is evaluated subjectively based on change of conditions or explanation by manager	3.96	1.386	1	7	-.001	**.999**	.001
Quantitative non-financial targets are evaluated subjectively based on change of conditions or explanation by manager	4.07	1.313	1	7	.017	**.609**	.037
Production, service, and information technologies	4.17	1.002	1	6	-.260	-.195	**.668**
Diffusion of proprietary knowledge	4.44	.899	1	6	-.412	-.137	**.625**
Emergence of new competitors	3.61	1.302	1	7	-.184	-.092	**.622**
Customer demand, tastes, and preferences	3.97	1.046	1	6	-.280	-.155	**.608**
Suppliers' actions	4.12	.947	2	6	-.318	-.047	**.547**
Market activities of competitors	3.87	1.042	1	6	-.329	-.137	**.507**
Industrial relations	4.82	1.033	2	7	-.184	-.031	.329
Government regulation and policies	3.83	1.109	1	6	-.254	-.029	.296
Cronbach's α					.838	.756	.830

BR = budget rigidity, *DA* = discretionary adjustments, *EU* = environmental uncertainty.

For ease of presentation, loading > .400, which are used in the final measurement of constructs, are highlighted in bold.

4.2.4 Organizational performance

Organizational performance is measured by financial and market performance in line with prior studies (Ittner et al., 2003; Said et al., 2003) in order to determine the effects of performance evaluation styles on multiple facets of performance. First, financial performance is measured by the average ROA of the 3 years between 2011 and 2014. Second, the market performance is the Tobin's Q in 2014, which indicates

the market value of a company divided by the replacement cost of its assets. To control for industry effects on organizational performance, both ROA and Tobin's Q are divided by industry average scores.

4.2.5 Control variables

To observe the cleanest possible effects of performance evaluation styles, the analysis includes several firm characteristics. The first is organizational size (*SIZE*), which is an important factor influencing the use of budgetary control systems and their effects on performance (Bruns and Waterhouse, 1975; Merchant, 1981). Organizational size is measured by the natural logarithm of total assets.

Second, debt leverage (*Leverage*) and the ratio of free cash flow to total assets (*FCF*) are included. Prior studies indicated that the financial condition of the firm significantly influences its use of budgetary control systems to evaluate performance (Becker et al., 2016).

5. Results

5.1 Descriptive statistics and variable correlation

Table 2 presents the descriptive statistics and variable correlations. Panel B shows that the correlation coefficient of the two dimensions of performance evaluation styles (*BR* and *DA*) and organizational performance (*ROA* and *Tobin's Q*) are not statistically significant ($p > .10$), suggesting that it is not possible to understand the performance effects of performance evaluation styles without considering the multidimensionality of performance evaluation styles.

5.2 Hypothesis tests

The hypotheses were tested using a multiple regression analysis. This method is suitable for examining the interrelationships among control practices (Bedford and Malmi, 2015; Grabner and Moers, 2013). This study also investigates the interaction effects of *BR* and *DA*, which comprise performance evaluation styles. Hence, multiple regression analysis is an appropriate analytical technique.

Three models are estimated to examine the hypotheses. Model 1 contains each main exploratory variable (*BR, DA*, and *EU*) and includes the control variables. Two- and three-way interaction terms are included in Models 2 and 3, respectively. It should be noted that the interaction terms produce a multicollinearity problem, which we avoid by centralizing all independent variables. Subsequently, the interaction terms are formed.

Table 2 Descriptive statistics and variable correlation

	Mean	S. D.	Min	Max
Panel A Descriptive statistics				
1 BR	4.94	.85	2.00	7.00
2 DA	4.02	1.21	1.00	7.00
3 EU	3.97	.77	1.83	6.00
4 ROA	-.43	4.44		
5 Tobin's Q	-.03	.29		
6 SIZE	7.96	1.42		
7 LEVERAGE	49.80	17.82		
8 FCF	1.83	6.29		

	1	2	3	4	5	6	7
Panel B Variable correlation							
1 BR							
2 DA	.082						
3 EU	-.052	-.138**					
4 ROA	-.064	.056	.086				
5 Tobin's Q	-.093	.068	.099	.647***			
6 SIZE	.086	-.006	-.070	.086	.059		
7 LEVERAGE	-.053	.040	-.126*	-.368***	.041	.248***	
8 FCF	.047	.012	.145**	.079	.048	.028	-.205***

Pearson correlations. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively (two-tailed). A blank space is left where we can specify the responding firms.

Variable definition

BR = budget rigidity, *DA* = discretionary adjustments, *EU* = environmental uncertainty, ROA = return on assets, *SIZE* = organizational size, *LEVERAGE* = debt leverage, *FCF* = ratio of free cash flow to total assets

Table 3 reports the multiple regression analysis regression results. Initially, the main effects of *BR* on *ROA* are statistically significant, but only at .10 in Model 1 (β= −.479, p= .076). The main effects of *DA* on *ROA* and *Tobin's Q* are not statistically significant (p> .10). Prior studies on *DA* concur that *DA* is not always effective because it comes with both benefits and costs (Baker et al., 1994; Bol, 2008; Gibbs et al., 2004). The results showing that the main effects of *DA* are not statistically significant are consistent with prior studies.

Model 2 shows negative coefficients of *BR*EU* on *ROA* and *Tobin's Q* (β=

Table 3 Effects on organizational performance of association between budget rigidity, discretionary adjustments, and environmental uncertainty

Dependent	ROA			Tobin's Q		
	Model 1a	Model 2a	Model 3a	Model 1b	Model 2b	Model 3b
SIZE	.642***	.613***	.596***	.013	.012	.010
	(.195)	(.191)	(.189)	(.014)	(.013)	(.013)
LEVERAGE	-.106***	-.107***	-.099***	.001	.001	.001
	(.016)	(.016)	(.016)	(.001)	(.001)	(.001)
FCF	-.013	-.042	-.055	.002	.001	.000
	(.044)	(.044)	(.044)	(.003)	(.003)	(.000)
BR	-.479*	-.455*	-.489*	-.029	-.029	-.032*
	(.269)	(.263)	(.261)	(.019)	(.019)	(.018)
DA	.405	.391	.263	.026	.025	.014
	(.270)	(.264)	(.266)	(.019)	(.019)	(.019)
EU	.253	.245	.245	.032	.029	.029
	(.273)	(.268)	(.265)	(.019)	(.019)	(.019)
BR*DA		.157	.123		-.017	-.020
		(.251)	(.248)		(.018)	(.017)
BR*EU		-.970***	-.930***		-.075***	-.071***
		(.272)	(.269)		(.019)	(.019)
DA*EU		.106	-.051		.014	-.001
		(.231)	(.237)		(.016)	(.017)
BR*DA*EU			-.543**			-.050***
			(.219)			(.015)
Constant	-.235	.031	-.204	-.174	-.162	-.184*
	(1.572)	(1.542)	(1.527)	(.112)	(.109)	(.107)
Δ R²		,047	.021		.069	.041
ΔF		4.578***	6.137**		5.755***	10.580***
R²	.190	.237	.257	.034	.103	.144
Adjusted. R²	.168	.206	.224	.008	.067	.106
F	8.815***	7.681***	7.686***	1.320	2.854***	3.737***

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively (two-tailed). Estimations are with ordinary least squares. We report unstandardized coefficients and standard errors in parentheses. The variance inflation factor is less than 1.5. See Table 2 for definitions of the variables.

−.970, p= .000, β= −.075, p= .000, respectively). These results reflect the incongruence between higher *BR* and higher *EU*. That is, it is suitable to lower the priority of budgetary targets as a performance criterion in a highly uncertain environment.

Finally, Model 3 shows statistically significant coefficients on *BR*, *DA*, and *EU*, using either *ROA* or *Tobin's Q* (β= −.543, p= .014, β= −.050, p= .001). Moreover, the increase in R^2 is statistically significant (ΔR^2= .021, ΔF = 6.137, p= .014, ΔR^2= .041, ΔF = 10.580, p= .001, respectively). These results indicate that the effects of *BR* on organizational performance depend on both *DA* and *EU*.

Next, a simple slope analysis is performed in each *EU* group to understand the content of the interaction. Following Aiken and West (1991), the regression line of *BR* on organizational performance when *DA* and *EU* take ±1SD is estimated.

Fig. 3 shows the patterns of the *BR* regression line on organizational performance.

Regarding Hypothesis 1, the results indicate that *BR* decreases both *ROA* and *Tobin's Q* when both *DA* and *EU* are higher (β= −2.446, p= .000, β= −.197, p= .000). As in Fig. 3, organizational performance increases as *BR* decreases when both *DA* and *EU* increase. In other words, the positive effects of a lower *BR* on organizational performance are reinforced as both *DA* and *EU* increase. Thus, Hypothesis 1 is supported. These results can be interpreted as follows. It is suitable to reduce the priority of budgetary targets and to evaluate managers' performance flexibly while considering managers' behaviors and efforts in a highly uncertain environment.

Next, regarding Hypothesis 2, the statistical significance of the simple slope of *BR* on organizational performance cannot be confirmed when both *DA* and *EU* decrease (p> .10). Nevertheless, the results indicate that *BR* enhances both *ROA* and *Tobin's Q* when *DA* is higher and *EU* is lower (β= 1.669, p= .005, β= .079, p= .038). These results indicate that organizational performance is enhanced as both *BR* and *DA* increase in a stable environment. Hence, the results do not support Hypothesis 2. The results for Hypothesis 2 suggest that the active use of *DA* reinforces the positive effects of *BR* on organizational performance in a stable environment.

These results can be interpreted from the strength and direction of motivation. From the perspective of motivation strength, Aranda et al. (2019) showed empirically that subjective performance evaluation enables managers to set stretch targets and motivates managers to make efforts to achieve targets. Thus, future performance is enhanced. Considering their results, it is possible that the active use of discretionary adjustments enables firms to set difficult budgetary targets and motivates managers to

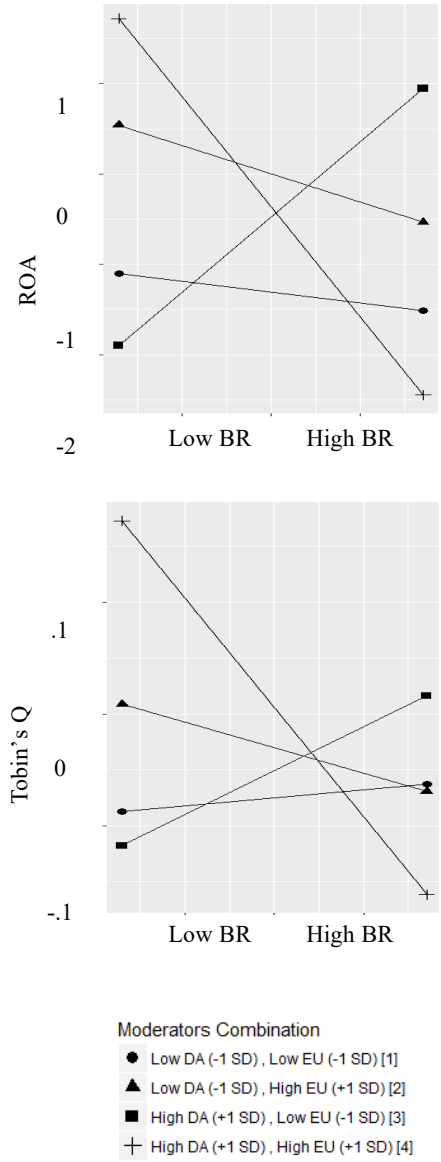

Fig. 3 Results of simple slope analysis

achieve targets, even when the external environment is stable. In other words, higher discretionary adjustments complement the motivational effects of budget rigidity. Therefore, it can be assumed that the combination of high budget rigidity and high discretionary adjustments is congruent in a stable environment.

In terms of motivation direction, the results suggest the importance of discretionary adjustments as a means of managing the process of achieving budgetary targets. Specifically, a low degree of discretionary adjustments means that supervisors evaluate managers' performance mechanically or systematically based on whether they reach budgetary targets. This type of performance evaluation only emphasizes performance outcomes and does not consider the process of achieving targets. It raises

the risk that managers adopt dysfunctional behaviors such as manipulating performance measures that inhibit business improvement. Therefore, the active use of discretionary adjustments is possibly effective for managing the processes of achieving targets, even when the external environment is stable.

The results also suggest the importance of discretionary adjustments. That is, discretionary adjustments complement the effects of budget rigidity on organizational performance regardless of environmental uncertainty. Prior studies noted that whether managers adopt dysfunctional behaviors depends not on budget-based performance evaluations per se, but on the manner in which supervisors use accounting information to evaluate performance (Derfuss, 2009; Hopwood, 1972; Sponem and Lambert, 2016). Furthermore, previous studies showed that performance evaluation practices that include subjectivity are widespread (Libby and Lindsay, 2010). The results here indicate the rationality of such practices; specifically, that it is important to not evaluate managers' performance based on accounting information mechanically or systematically, but rather to evaluate performance flexibly while considering managers' actual efforts to achieve targets. In this sense, the *budget emphasis and flexible evaluation style* can be referred to as a *reciprocal style* in a stable environment. This style requires subordinates to achieve budgetary targets that embody organizational goals while adjusting their performance subjectively. Both organizational goals and the context that subordinates face are considered. Hence, this style develops a reciprocal relationship between supervisors and subordinates in a stable environment.

Fig. 4 shows the congruent combinations of the empirical analysis.

		Discretionary adjustments: Low	Discretionary adjustments: High
Budget rigidity	Low	Unfit	Congruent under uncertain environment
	High	Unfit	Congruent under stable environment

Fig. 4 Empirically supported congruent relationships

6. Conclusion

This study aimed to determine the performance evaluation styles that lead to superior (inferior) performance. The many studies in this area did not reach a consensus on this relationship. Contrary to prior studies, the present study provides a theoretical reconsideration of the concepts of performance evaluation styles. This study categorizes performance evaluation styles by two dimensions: the priority of budgetary targets among the performance criteria at the stage of setting performance criteria and the manner of using accounting information ex post. It also specifies two concepts to explain these dimensions, namely budget rigidity and discretionary adjustments, under the assumption that environmental uncertainty determines the optimal degree of each. The empirical results support this assumption; that is, the combination of lower budget rigidity and higher discretionary adjustments is optimal in a highly uncertain environment, while higher budget rigidity and higher discretionary adjustments is optimal in a stable environment. Furthermore, the results demonstrate that the active use of discretionary adjustments complements the positive effects of budget rigidity, regardless of environmental uncertainty.

However, the present study has limitations. First, the conceptual framework is not completely original as it based on prior studies. Nevertheless, it helps to identify the crucial dimensions to distinguish the performance evaluation styles.

The second limitation relates to the problems of variable measurement and empirical analysis. Endogeneity concerns cannot be eliminated because the study uses a cross-sectional survey and cannot control several factors related to performance evaluation styles, such as target difficulty and budget revisions. Because of these overlooked control variables, it is possible that omitted variable bias exists.

The third limitation is in the interpretation of the results of the empirical analysis. The results demonstrate that the combination of lower budget rigidity and higher discretionary adjustments is suitable in a highly uncertain environment. Lower budget rigidity demonstrates the importance of emphasizing performance criteria besides budgetary targets, but this study does not indicate what measure firms should emphasize in practice. Furthermore, the results cannot explain what information supervisors use in their discretionary adjustments and how they evaluate managers' performance. Future studies should investigate the concrete practices of performance evaluation, which currently exist in a black box. In particular, qualitative research methods are important to uncovering the practice of performance evaluation accurately because research on performance evaluation styles overemphasized quantitative analyses.

Appendix

Survey instrument

Budget Rigidity

How do you implement budgetary control for the following? (1= not at all; 7= absolutely correct)

1. The business unit's managers are constantly conscious of meeting budgetary targets.
2. Performance of business unit's managers is assessed predominantly on the basis of attaining budgetary targets.
3. Control over business unit is achieved by monitoring how well the budget's targets are on track.
4. Meeting the budget is an accurate reflection of whether managers are successful.
5. Not meeting the budget has a strong impact on managers' performance evaluation.
6. Promotion prospects depend heavily on ability to meet the budget.
7. Not meeting the budget reflects poor performance.

Discretionary Adjustments

How does your company evaluate business unit managers? (1= not at all; 7= absolutely correct)

1. Budget target is evaluated subjectively based on change of conditions or explanation by manager.
2. Quantitative non-financial targets are evaluated subjectively based on change of conditions or explanation by manager.

Environmental Uncertainty

How accurately does your company predict the business environment 3 years ahead? (1= very predictable; 7= very unpredictable)

1. Production, service, and information technologies
2. Diffusion of proprietary knowledge
3. Customer demand, tastes and preferences
4. Market activities of competitors
5. Emergence of new competitors
6. Suppliers' actions
7. Industrial relations
8. Government regulation and policies

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