Title	Complementary effects of stretch target costs and concurrent processes on cost reduction : a dynamic tension perspective
Sub Title	
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Publisher	Society of Business and Commerce, Keio University
Publication year	2020
Jtitle	Keio business review No.54(2020) ,p.19(1)- 37(19)
JaLC DOI	
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Notes	
Genre	Journal Article
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AA00260481-20200000-0019

KEIO BUSINESS REVIEW
No. 54, 2020
pp.19–38.

Final version received on 12th September, 2020

Complementary Effects of Stretch Target Costs and Concurrent Processes on Cost Reduction: A Dynamic Tension Perspective

By

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Abstract

Recent empirical evidence has not supported anecdotal evidence of the effectiveness of joint use of stretch target costs and concurrent processes. The goal of this research is to examine the joint effects of stretch target costs and concurrent processes on cost reduction. Specifically, this study builds on the dynamic tension perspective to explain how and why joint use of stretch target costs and concurrent processes are associated with superior performance. Applying this perspective, we assume that their joint use is accompanied by dynamic tensions that drive creative generation of cost reduction ideas. Nevertheless, we find no statistically meaningful relationship using multiple regression analysis for a sample of large Japanese manufacturing firms. However, supplementary analysis shows that the joint effects enhance cost reduction for firms in process industries but not those in assembly industries. Moreover, ad hoc analysis shows that concurrent processes enhance cost reduction when target costs are set at stretch levels. These results reflect the characteristics of Japanese process industries that manufacture products of high quality and technology while achieving low cost. This study extends previous research by building on the dynamic tension perspective to explain how and why the joint use of stretch target costs and concurrent processes enhances cost reduction. Moreover, it extends the existing literature by suggesting target cost management is effective in process industries.

Key Words

Target cost management, Dynamic tension perspective, Stretch target costs, Concurrent processes, Cost reduction, Cross-industry analysis

1. Introduction

Japanese manufacturing firms have achieved cost competitiveness by using target cost management (TCM) to manage costs in the product development stage (Ansari *et al*., 2007; Hiromoto, 1988; Kato, 1993b; Tani *et al*., 1994). TCM refers to a system of profit planning and

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cost management in the earliest stages of product development, such as during product planning or design. Given that the market determines product prices and most product costs are determined when product specifications are defined, TCM is used to generate larger profits through effective cost management in these stages (Sakurai, 1989). Since Toyota's development of TCM in the 1960s, it has spread not only to assembly industries, such as transportation equipment and electrical machinery, but also to process-oriented industries (Ansari *et al.*, 2007; Tani *et al.*, 1994).

Target costs are calculated by subtracting target profit from the expected sales price (Kato, 1993b), and when price competition intensifies, the market determines sales prices. In this situation, firms need to effectively manage costs to earn their expected profits. One characteristic of TCM in Japan is that stretch levels of target costs are extremely difficult to achieve; they are virtually unattainable goals that can be achieved only with revolutionary changes in operations. Japanese manufacturing firms, especially those in assembly industries, have attempted to set stretch level target costs to achieve higher profits (Sakurai, 1989; Tani *et al.*, 1994). Furthermore, in Japan, these extremely difficult to achieve target costs contribute to drastic cost reductions (Kato, 1993a; Tani *et al.*, 1993a).

Although setting stretch target costs is an important step in TCM, it is difficult to realize effective cost reduction without support tools. Prior studies indicate concurrent processes play a role (Iwabuchi, 1992; Koga and Davila, 1999). Concurrent processes are overlapping and parallel processes in product development that involve various departmental managers (Carter and Baker, 1992; Takeuchi and Nonaka, 1986). Concurrent processes contribute to effective new product development in Japanese manufacturing firms by significantly shortening time to market and achieving high productivity (Clark and Fujimoto, 1991).

Previous research suggests that joint use of stretch target costs and concurrent processes enhances cost reduction; however, there is little empirical evidence to support this. Specifically, the Japanese TCM literature based on knowledge creation theory or interactive control theory theoretically suggests that their joint use enhances cost reduction (Iwabuchi, 1992; Koga and Davila, 1999). On the contrary, Gopalakrishnan *et al.*'s (2015) experimental study based on Hirst's (1987) theory suggests their joint use is ineffective for cost reduction because overlapping processes result in unexpected changes in product specifications or readjusting designs; as a result, costs might increase. However, there is little empirical evidence of their joint effects, and different theoretical bases predict opposing effects of their joint use.

This study aims to fill this gap. Specifically, to explain how and why their joint effects influence cost reduction, this study relies on the dynamic tension perspective developed in management control research (Chenhall and Morris, 1995; Henri, 2006; Simons, 1995). This perspective was developed to explain why highly innovative firms combine organic processes with formal control systems when prior research based on contingency theory assumes their combined use is inconsistent or paradoxical (Chenhall, 2006). The dynamic tension perspective assumes that formal control systems can support translation of ideas generated from organic processes such as horizonal communication into effective innovations consistent with organizational objectives. Furthermore, new information, ideas, and strategies developed via organic processes can be effectively monitored by formal controls. Joint use of formal control systems and organic processes creates dynamic tensions that enhance performance by acting complementarily (Chenhall and Morris, 1995; Henri, 2006). This perspective is useful for explaining how and why joint use of stretch target costs and concurrent processes are associated with superior performance.

Using ordinary least squares (OLS) and Tobit regression analysis with survey data from large Japanese manufacturing firms, no statistically meaningful relationship between the joint effects and cost reduction is found in the full sample analysis. However, supplementary analysis shows the joint effects enhance cost reduction for firms in process industries but not those in assembly industries. Furthermore, the results indicate that concurrent processes enhance cost reduction in process industries when target costs are set at high stretch levels.

This study makes several contributions to the TCM literature. First, it theoretically explains how and why joint use of stretch target costs and concurrent processes enhances cost reduction. The dynamics of TCM activities are associated with superior product development performance is not well understood (Ansari *et al*., 2007). The dynamic tension perspective is useful for explaining how the dynamic nature of TCM activities that accompany tensions or conflicts affect performance. This study explains the mechanism by relying on the dynamic tension perspective developed in management control research.

Second, this study provides empirical evidence of the effect of joint use of stretch target costs and concurrent processes on cost reduction. There is much anecdotal evidence about their interaction effects, and some studies indicate their joint use is effective. Contrary to these findings, this study's empirical evidence suggests their joint use is not always effective. This result is important for future research as it highlights the need to explore contextual variables that determine the effectiveness of their joint use.

Third, this study empirically demonstrates the possibility that the cost reduction effects of TCM activities depend on the adopting firm's industry. The study's results indicate joint use of stretch target costs and concurrent processes enhances cost reduction for firms in process industries but not for firms in assembly industries. This result is important because prior studies have concentrated on TCM practices in assembly industries, leaving a lack of evidence regarding how TCM practices work for firms in process industries.

The remainder of this paper is structured as follows. Section 2 provides a theoretical model of dynamic tensions for TCM and introduces the hypotheses. Section 3 describes the data collection and variable measurement. Section 4 presents the analyses and results, which are interpreted in Section 5. Finally, Section 6 provides the conclusions, limitations, and implications for future research.

2. Theory and hypotheses

2.1 Dynamic tension perspective

The dynamic tension perspective is useful for explaining the joint effects of stretch target costs and concurrent processes on cost reduction. This perspective has been developed as disproof of the perceived inconsistency between formal control systems and innovation.

Traditionally, formal control systems are characterized as mechanistic because they aim to measure deviations, focus on unfavorable variances, and implement corrective actions to achieve preset performance targets (Anthony, 1965). Behavior that pursues innovation is accompanied by uncertainty about the causal relationship between managers' efforts and performance. In this situation, formal control systems inhibit innovation because they force managers to focus excessively on short-term performance targets, which may prevent new idea generation that would contribute to future performance. Hence, it has been considered that formal control systems are inconsistent with innovation (Abernethy and Brownell, 1997; Lövstal and Jontoft, 2017; Rockness and Shields, 1984).

Contrary to traditional theory, Simons (1987) empirically finds that highly innovative firms use formal control systems more than conservative firms. Although this result seems inconsistent with prior studies, he interprets it from the viewpoint of types of controls. Later, he classifies controls using two types: diagnostic and interactive (Simons, 1995). Diagnostic controls are similar to traditional mechanistic types of controls that aim to measure deviations and implement corrective actions to achieve preset performance targets. By contrast, interactive controls are organic types of controls that enable employees to search for new opportunities, stimulate dialogue, and generate ideas to enhance organizational learning or the emergence of new strategies (Simons, 1995). Interactive controls are characterized as positive control levers and are useful in highly uncertain environments where strategic change and innovation are greatly needed (Abernethy and Brownell, 1999 ; Bisbe and Otley, 2004).

Since types of control systems were classified, empirical research has examined the performance effects of the tensions created by joint use of opposing types of controls (Chenhall and Morris, 1995; Henri, 2006; Tessier and Otley, 2012; Widener, 2007). From a traditional viewpoint, the combined use of formal control systems and organic processes that pursue organizational learning or innovation seems to be inconsistent or paradoxical. The dynamic tension perspective assumes their joint use offers benefits rather than disadvantages. Specifically, this perspective assumes that formal control systems can support the translation of ideas generated by organic processes into effective innovations that are consistent with organizational objectives (Chenhall and Morris, 1995). Furthermore, new information, ideas, and strategies developed by organic processes can be effectively monitored by formal (diagnostic) controls (Henri, 2006). The relationship between formal controls and organic processes is not substitutionary but complementary (Heinicke *et al*., 2016; Widener, 2007). Hence, joint use of formal control systems and organic processes stimulates dynamic /creative tensions that enhance innovation, organizational learning, and ultimately, organizational performance (Chenhall and Morris, 1995; Henri, 2006; Widener, 2007). Later studies support the certainty of this perspective by confirming the positive effects of joint use of opposing types of controls on product development or project performance (Bedford, 2015; Ylinen and Gullkvist, 2014). This perspective suggests joint use of opposing types of controls enhances performance by creating dynamic tensions (Henri, 2006).[1,2]

2.2 Stretch target costs

Stretch target costs are virtually unattainable goals that can be achieved only through revolutionary operational changes. Target cost is calculated as "target cost = expected sales

[1] Henri (2006, p. 533) explains the notion that "dynamic tensions denote contradictory but interrelated elements" (Lewis, 2000). In addition, Henri (2006, p. 534) points out that "the notion of dynamic tension is not necessarily new in the academic literature, and is related to other terms such as conflict, paradox, dilemma, and contrast" (English, 2001).

[2] Although previous empirical research has focused not only on diagnostic and interactive use but also the belief or boundary systems of Simons' (1995) framework (Bedford, 2015; Heinicke *et al*., 2016; Widener, 2007), this study focuses only on diagnostic and interactive controls because the interest is in how a specific management accounting system, TCM, enhances cost reduction by creating dynamic tensions, and beliefs and boundary systems are not the central concern. Grafton *et al*. (2010) and Ylinen and Gullkvist (2014) are relevant studies that focus only on the diagnostic and interactive use of control systems.

price – target profit" (Kato, 1993b). Theoretically, the expected sales price is driven by the marketplace and target profit is determined through medium or long-term organizational profit planning (Kato, 1993b; Sakurai, 1989).

In the target cost calculation using the expected sales price, one aspect of the equation reflects a customer orientation (Cooper and Slagmulder, 1997). As the market environment becomes more competitive, the market determines product prices, forcing firms to set almost the same price as their competitors. In this situation, Japanese manufacturing firms use a pricing method called "pricing by functions" (Kato, 1993b, p. 38). Creating products requires many functions, and the total value of each function is combined to determine the sales price (Kato, 1993b). To manage costs effectively, firms need to completely exclude functions that are unnecessary from the viewpoint of customer needs (Kato, 1993b; Sakurai, 1989).

The other aspect of the equation is the strong linkage between profit planning and target costs. Because of this, target costs come to mean a commitment agreed upon by every person who participates in TCM activities (Kato, 1993b). In the early phase of TCM practices, before they mature, specific products are linked to profit planning. Later, as more TCM activities mature, profit planning becomes linked not just to specific products but to all products. In other words, target costs are calculated based on how much each product contributes to the organization's overall profit (Kato, 1993b).

In Japan, the level of target costs calculated using these processes tends to be extremely difficult to achieve (Hiromoto, 1988; Kato, 1993b; Tani *et al.*, 1994). According to Thomas *et al.* (1997), stretch targets are virtually unattainable goals that force organizations to significantly alter their processes in a way that often involves an entirely new operational paradigm. Without such revolutionary change, stretch targets cannot be achieved. An extremely difficult to achieve target is not supported by goal-setting theory (Thomas *et al.*, 1997), which suggests challenging but achievable goals are desirable for enhancing goal commitment, in turn contributing to desirable performance (Locke and Latham, 1990). There are enormous gaps to close between target costs and drifting costs, which cannot be achieved with the current way of thinking; capabilities and substantial effort are required for a new way of thinking. Prior studies suggest stretch target costs contribute to drastic cost reduction in Japan (Kato, 1993b).[3] For example, Tani *et al.* (1993a) find that the tightness of target costs is positively correlated with their achievement. Similarly, Koga and Davila (1999) find that the more difficult stretch target costs are to achieve, the greater the reduction in actual costs. This discussion leads to the following preliminary hypothesis:

Hypothesis 1. Stretch target costs enhance cost reduction.

2.3 Concurrent processes

Sequential engineering is the traditional approach to new product development; known as "throwing it over the wall," it focuses on developing a structured process with clearly defined and sequential phases (Takeuchi and Nonaka, 1986). The job classification of each department that participates in product development, such as product planning,

[3] According to goal-setting theory, which focuses on individual recognition, the specificity and difficulty of goals enhance performance by directing attention to goals and motivating greater efforts (Locke and Latham, 1990). The dynamic tension perspective focuses on organizational states or processes and indicates that tensions or conflicts are beneficial to organizational performance but avoiding or suppressing them leads to undesirable consequences (Henri, 2006; Lewis, 2000).

development, design, production preparation, and manufacturing, is rigorous, and each one acts independently. Sequential processes take a long time to develop and carry the risk of creating problems on cost or quality for the later stages of product development (Takeuchi and Nonaka, 1986).

Concurrent processes are completely unlike the traditional approach. Concurrent processes refer to overlapped activities among the department managers in the product development process (Carter and Baker, 1992). They are also called "rugby-style product development" or "simultaneous engineering." For example, detailed design engineers communicate with basic design engineers before the basic design is determined. Furthermore, production engineering managers interact with basic design engineers before the basic design is determined to infuse ideas about the new product's manufacturability to secure considerable cost savings in the manufacturing stage (Tani, 1995). Overlapping these processes earlier prevents problems that might occur in later product development stages and contributes significantly to high productivity and performance in Japanese manufacturing firms (Clark and Fujimoto, 1991; Takeuchi and Nonaka, 1986).

Previous research indicates concurrent processes are a key component of TCM activities (Tani, 1996; Tani *et al.*, 1993b). Tani *et al.* (1993b) provide two features of concurrent processes for TCM. The first is that drastic cost reduction cannot be realized without cooperation among cross-functional engineers. The second is that collaboration among cross-functional managers brings more creative ideas into product development than interaction solely among members belonging to the same department. The cooperation of various managers before a blueprint is prepared triggers more creative ideas because many options for cost reduction exist. Furthermore, sharing thoughts and ideas triggers new idea generation, contributing to cost reduction. Yoshida (2003) empirically finds that interaction among managers from different departments is more effective for cost reduction than the individual performance effects of each TCM tool, supporting these suggestions.

Hypothesis 2. Concurrent processes enhance cost reduction.

2.4 Joint effects of stretch target costs and concurrent processes on cost reduction

Some studies attempt to explain the cost-reduction effects of the joint use of stretch target costs and concurrent processes. Based on knowledge-creation theory (Nonaka, 1990), Shimizu (1992a) theoretically explains how tight target costs encourage or discourage individual knowledge-creation activities. Shimizu (1992a) states that as long as target cost tightness is well-managed, participants can understand which existing solutions or previous experiences contribute little to meeting the target and then begin to seek new solutions. Subsequently, Shimizu (1992b) extends his discussion about the role of target cost information at the individual level to the group level, identifying target cost information's role as a catalyst for transmitting knowledge and information. That is, because target cost information acts as a commonly shared objective for each individual or team, it becomes easier to drive team efforts, horizontal and vertical interaction, and cross-functional activities. Consequently, existing solutions or previous experiences are rejected, and new solutions are developed. Similarly, Iwabuchi (1992) focuses on the role of sharing information among departments using a case study. He explains that shared information leads to cooperative efforts among functions, and the collection of expertise, professional experience, and knowledge then turns into unique solutions. Furthermore, Koga and Davila (1999) suggest that stretch target costs initiate intense interactions between product and process engineers, as well as frequent monitoring of the gap between the target cost and cost estimate. Thus, target costs act as a catalyst for organizational learning among managers and contribute to good actual performance.

Contrary to these studies, Gopalakrishnan *et al.*'s (2015) experimental study based on Hirst's (1987) theory explains that using specific goals for cost reduction under concurrent processes is less effective than under sequential processes. Based on Hirst's theory, Gopalakrishnan *et al.* (2015) assume the effects of specific target costs decrease under concurrent processes because they enhance task uncertainty. Because of this, changes in or readjustment of designs increase, ultimately increasing costs. However, their study ignores the dynamics in concurrent processes that create new and useful ideas, which contribute to product development performance by jointly using specific target costs.

The dynamic tension perspective is useful for explaining how the dynamics of TCM activities such as joint use of stretch target costs and concurrent processes is associated with superior performance. Building on this perspective, these two notions—stretch target costs and concurrent processes—can be regarded as formal control systems and organic processes, respectively. Concurrent processes can be assumed to enhance cost reduction through stretch target costs, which act as a shared objective (Chenhall and Morris, 1995; Henri, 2006; Shimizu, 1992b; Widener, 2007). Setting stretch target costs not only triggers new knowledge by creating a chaotic environment at the individual level but also enhances new idea generation at the group level through cooperation among individuals with different viewpoints (Iwabuchi, 1992; Koga and Davila, 1999; Shimizu, 1992b). Joint use creates dynamic tensions that enhance performance (Henri, 2006). This leads to the following hypothesis:

Hypothesis 3. The dynamic tension resulting from joint use of stretch target costs and concurrent processes enhances cost reduction.

3. Method

3.1 Data collection

A cross-sectional questionnaire survey was administered among large Japanese manufacturing firms. Japanese manufacturing firms are appropriate as respondents because the study's hypotheses are developed based on Japanese TCM practices and literature. Questionnaires were mailed to executive officers or directors of firms' accounting departments. Because accounting managers are assumed to be quite familiar with TCM practices, they are appropriate respondents. Specifically, previous research indicates that accounting managers in Japan frequently participate in cost meetings (Tani, 1995; Tani *et al.*, 1994). Furthermore, the TCM office is often located within the accounting department (Kato, 1993a; Okano and Suzuki, 2007). The questionnaire, in Japanese, was pre-tested among more than 30 academics and controllers in several companies.

The questionnaire was sent by mail on January 14, 2014 to 847 manufacturing firms listed on the First Section of the Tokyo Stock Exchange, with January 31, 2014 the deadline for response. It instructed respondents to answer all questions regarding their core business unit's practices. To improve the response rate, postcard reminders were sent to those who had not responded.

In total, 130 firms responded, an overall response rate of 15.3%. After removing firms that did not use TCM (23) and questionnaires with missing data (9), the final sample for

Table 1. Sample characteristics

Industry	Sent	Valid responses/rate (%)		Sample
Assembly industry				52
Machinery	120	12	10.0	10
Electrical/electronics	154	27	17.5	25
Transportation equipment	62	16	25.8	15
Precision equipment	28	2	7.1	2
Process industry				46
Food	69	13	18.8	10
Textile mill	41	4	9.8	4
Pulp/paper	11	2	18.2	2
Chemical	128	18	14.1	13
Pharmaceuticals	38	5	13.2	4
Oil/coal	11	1	9.1	0
Rubber	11	2	18.2	1
Glass/clay	33	4	12.1	3
Steel	32	4	12.5	3
Non-ferrous/non-fabricated metal	24	4	16.7	2
Fabricated metal	37	8	21.6	4
Other manufacturing	48	8	16.7	0
Total	847	130	15.3	98

analysis includes 98 firms. Table 1 shows the details of the response rate.

3.2 Variable measurement

3.2.1 TCM usage, stretch target costs, concurrent processes, and cost reduction

Respondents were first asked whether their business unit uses TCM. Since firms or business units may use techniques similar to TCM without realizing they are TCM techniques, a general description of TCM was provided (Dekker and Smidt, 2003). Specifically, respondents were asked whether their business units set or manage target costs at the product planning, development, and design stages of new product development (yes or no). Respondents who answered “yes” were asked to answer other questions regarding TCM practices.

The survey constructs of stretch target costs and concurrent processes were composed of one instrument each, as follows. The stretch target cost question (*STC*) relates to the difficulty of achieving target costs: “Are target costs set at a challenging level that cannot be achieved easily at the starting point of product development processes?” The concurrent processes (*CP*) question is: “Are design engineers as well as many related cross-functional members involved in product development processes?” These two items were measured on Likert scales of 1–7, where 1 indicates “not at all” and 7 indicates “absolutely correct.”

The joint use of stretch target costs and concurrent processes was measured by their product term. Prior to forming the product term, the two independent variables were mean-centered because the product term is strongly correlated with each independent variable.

The dependent variable, cost reduction, was measured by how effective TCM activities are in cost reduction. Respondents were asked to rate the effectiveness of TCM activities in cost reduction using a scale of 1–7, where 1 indicates "not effective" and 7 indicates "very effective."[4]

3.2.2 Control variables

Environmental complexity and uncertainty moderate the relationship between TCM elements and performance (Yoshida, 2001). The effects of these environmental factors should be controlled to measure the potential impact of TCM elements on cost reduction. Tani's (1995) items are used because they are suitable for examining business environments in Japan. The items for environmental complexity are the degree of product market diversity (*Diversity*), community of technology with competitors (*Community*), and variety of sales promotions (*Variety*). The items for environmental uncertainty are the degree of product market competitiveness (*Competitiveness*), frequency of developing new products and technology (*Frequency*), and inaccuracy in estimating customer demand (*Inaccuracy*). Respondents were asked to rate their perceived environmental complexity and uncertainty on a scale of 1–7.

Organizational size (*Size*) is also included, measured by the natural logarithm of sales.[5]

4. Results

4.1 Descriptive statistics and variable correlations

The descriptive statistics of the survey constructs are presented in Table 2, and the correlation matrix is presented in Table 3. Table 3 shows statistically significant positive correlation coefficients for *STC* and *CP* (r = .257, p = .011). This result demonstrates they are used complementarily.

4.2 Hypotheses tests

Multiple regression analysis is performed to examine the joint effects of stretch target costs and concurrent processes on cost reduction. Two models are used; model 1 examines the main effects of *STC* and *CP* and includes control variables. Model 2 includes the joint effect term of *STC* and *CP*. Equation (1) is estimated to test the hypotheses.

$$Cost\ reduction = \alpha + \beta_1 STC + \beta_2 CP + \beta_3 STC{*}CP + \Sigma Controls + \varepsilon \tag{1}$$

Table 4 summarizes the estimation results of the OLS regression. The results of model 1 show positive coefficients of *STC* and *CP* on cost reduction (β = .313, p = .011 and β = .273, p = .025, respectively). Hence, hypotheses 1 and 2 are both preliminarily supported. The positive effects of *STC* on cost reduction are consistent with Tani *et al.*'s (1993a) results, which indicate a correlation between tightness and achieving target costs. In addition, the positive association between *CP* and cost reduction is consistent with previous literature suggesting or confirming that interaction among functional managers effectively reduces cost (Tani *et al.*, 1993b; Yoshida, 2003).

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[4]The key variables of stretch target costs, concurrent processes, and cost reduction are measured using one item because the questionnaire survey's purpose is to investigate current Japanese management accounting practices. The questionnaire includes 138 items, such as items about budgets and performance measurement. Because of this study's exploratory nature, its key variables are measured using one item.

[5]Harman's single factor test is used to examine common method bias (Podsakoff *et al.*, 2003). Confirmatory factor analysis with no rotation performed on nine questionnaire items reveals four factors. As the contribution ratio of factor 1 is sufficiently low (16.84%), common method bias might not be a serious problem.

Table 2. Variable descriptive statistics

		Mean	SD	Min	Max
1.	Stretch target costs (*STC*)	3.73	1.36	1.00	7.00
2.	Concurrent processes (*CP*)	5.23	1.28	2.00	7.00
3.	Diversity of product market (*Diversity*)	3.77	1.57	1.00	7.00
4.	Community of technology with competitors (*Community*)	3.51	1.22	1.00	6.00
5.	Variety of sales promotions (*Variety*)	3.85	1.41	1.00	7.00
6.	Competitiveness of product market (*Competitiveness*)	5.17	.91	2.00	7.00
7.	Frequency of developing new products and technology (*Frequency*)	4.69	1.33	2.00	7.00
8.	Inaccuracy in estimating customer demand (*Inaccuracy*)	3.86	1.14	2.00	6.00
9.	Organizational size (*Size*)	5.27	.63	3.93	6.99
10.	Cost reduction	5.17	1.18	2.00	7.00

Notes: Sample size is 98.

Table 3. Variable correlation

		1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	*STC*									
2.	*CP*	.257*								
3.	*Diversity*	–.049	–.044							
4.	*Community*	–.036	–.058	.294**						
5.	*Variety*	.183†	–.037	.351***	.142					
6.	*Competitiveness*	.013	.134	.130	–.053	.069				
7.	*Frequency*	.006	.195†	.232*	.307**	.283**	.318**			
8.	*Inaccuracy*	–.011	–.048	.160	.016	.083	.203*	–.036		
9.	*Size*	.224*	.261**	.087	.030	.123	.226*	.391***	–.191†	
10.	*Cost reduction*	.352***	.344***	–.011	–.070	.091	.000	.173†	–.066	.246*

Notes: $^{\dagger}p$<.1, *p<.05, **p<.01, ***p<.001 (two-sided tests).

In model 2, the coefficient of the joint effects term of *STC* and *CP* is not statistically significant (β = –.087, p = .487). Furthermore, the change in the coefficient of determination (R^2) is not statistically significant (ΔR^2 = .004, ΔF^2 = .488, p = .487). This result indicates that the change in explanatory power might not differ if the joint effects term is included.

A Tobit model is also tested because the range of the dependent variable, cost reduction, is restricted. Table 4 reports the results, which are similar to the OLS results; the cost-reduction effects of *STC*CP* are again not statistically significant (p > .10). Hence, it cannot be said that joint use of *STC* and *CP* enhances cost reduction.

4.3 Supplementary analysis

To examine the effects of firm industry, an industry dummy variable is created. This variable is included because differences in the maturity or sophistication of TCM between assembly and process industries seem to create differences in how TCM elements affect performance.[6] The industry dummy variable equals 1 for firms in assembly industries and 0

Table 4. Estimation results of multiple regression analysis

	OLS		TOBIT
	Model 1	Model 2	
STC	.313*	.339**	.390**
CP	.273*	.252*	.265*
*STC*CP*		–.087	–.094
Controls			
Diversity	.012	.024	.029
Community	–.126	–.145	–.166
Variety	.020	.019	.006
Competitiveness	–.139	–.129	–.130
Frequency	.182	.161	.226
Inaccuracy	–.010	–.023	–.020
Size	.167	.175	.208
Intercept	4.290***	4.268***	4.165***
R^2	.231	.235	
Adj. R^2	.152	.147	
F	2.936**	2.676**	
Pseudo–R^2			.086
Number of censored observations			12
Total number of observations			98
Log likelihood ratio			–145.897

Notes: *P*-values are two-sided tests. Unstandardized. **p*<.05, ***p*<.01, ****p*<.001.

for firms in process industries. Interaction variables, *STC*Industry*, *CP*Industry*, and *STC*CP*Industry*, are also included. Each industry is sorted using the classification table of industries developed by the Securities Identification Code Committee of the Japan Exchange Group.[7]

Multiple regression analysis using Equation (2) is conducted to examine the combined cost-reduction effects of *STC*, *CP*, and *Industry*.

$$Cost\ reduction = \alpha + \beta_1 STC + \beta_2 CP + \beta_3 Industry + \beta_4 STC{*}Industry + \beta_5 CP{*}Industry + \beta_6 STC{*}CP + \beta_7 STC{*}CP{*}Industry + \Sigma Controls + \varepsilon \quad (2)$$

Table 5 presents the OLS regression estimation results. In Model 1, the effects of *Industry* are significantly positive at the 10 percent level (β = .457, p = .073). Although the

[6]TCM was first developed in assembly industries like machinery, electric appliances, transportation equipment, and precision instruments (Monden and Hamada, 1991; Sakurai, 1989; Tanaka, 1995). Beginning in the 1980s, these firms faced diversified customer needs and shorter product life cycles, and thus, had to develop numerous products with unique characteristics (Sakurai, 1989). To simultaneously achieve low-cost, high-quality products introduced timely based on changing customer needs, costs must be managed in the early stages of product development processes. Therefore, TCM is relatively mature in assembly firms but only developing in processing firms (Okano and Suzuki, 2007).

[7]A test is conducted to examine differences in this sample's industry distribution and that of the First Section of the Tokyo Stock Exchange. The results indicate there are no statistically significant differences in industry distribution between respondents and firms belonging to the First Section of the Tokyo Stock Exchange (χ^2 = 11.821, df = 15, p = .693). Hence, this study's sample industry distribution is representative of the First Section of the Tokyo Stock Exchange.

Table 5. Results of multiple regression analysis including industry dummy variable

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	90% CI	Coefficient	90% CI	Coefficient	90% CI	Coefficient	90% CI
STC			.279*	[.078, .481]	.018	[–.317, .353]	–.152	[–.502, .199]
CP			.282*	[.085, .480]	.360*	[.067, .653]	.510**	[.204, .816]
*STC*Industry*					.449†	[.038, .859]	.672*	[.239, 1.105]
*CP*Industry*					–.128	[–.549, .293]	–.262	[–.684, .161]
*STC*CP*					–.024	[–.239, .190]	.269	[–.031, .569]
*STC*CP*Industry*							–.539*	[–.934, –.145]
Diversity	–.015	[–.236, .207]	.030	[–.179, .239]	.068	[–.147, .282]	.055	[–.155, .265]
Community	–.153	[–.369, .063]	–.128	[–.331, .075]	–.113	[–.322, .096]	–.070	[–.276, .136]
Variety	.061	[–.155, .277]	.021	[–.188, .230]	.008	[–.201, .217]	.039	[–.166, .244]
Competitiveness	–.121	[–.358, .116]	–.132	[–.353, .090]	–.142	[–.371, .086]	–.165	[–.388, .059]
Frequency	.154	[–.092, .400]	.150	[–.086, .386]	.139	[–.101, .379]	.125	[–.109, .360]
Inaccuracy	–.031	[–.239, .178]	–.036	[–.231, .159]	–.029	[–.236, .177]	–.037	[–.239, .164]
Size	.274	[–.090, .637]	.087	[–.263, .437]	.083	[–.273, .438]	.073	[–.274, .420]
Industry	.457†	[.038, .875]	.359	[–.040, .758]	.387	[–.014, .788]	.550*	[.140, .959]
Intercept	3.484**		4.525***		4.494***		4.421***	
R^2	.125		.250		.281		.323	
Adj. R^2	.046		.164		.170		.209	
F	1.585		2.903**		2.530**		2.834**	

Notes: Estimated with OLS-regression analysis. CI means confidence interval. *P*-values are two-sided tested. Unstandardized.
†*p*<.1, **p*<.05, ***p*<.01, ****p*<.001, VIF< 4.0.

interaction terms of *Industry* and *STC* or *CP* are not statistically significant in Models 2 and 3, *STC*CP*Industry* is statistically significant in Model 4 (β = –.539, p = .026).

A Tobit regression is also performed, and the results are reported in Table 6. Similar to the OLS regression results, the negative coefficient of *STC*CP*Industry* is statistically significant (β = –.671, p = .007). Moreover, the positive coefficient of *STC*CP* is statistically significant at the 10 percent level if the industry dummy variable is added (β = .320, p = .090). The results from the OLS and Tobit regressions suggest that the cost-reduction effects of joint use of stretch target costs and concurrent processes differ depending on the firm's industry.

A simple slope analysis is performed to examine which industries have statistically significant coefficients of *STC*CP*. Following Aiken and West (1991), the regression line of *CP* is estimated when *STC* takes ±1 standard deviations (SD).

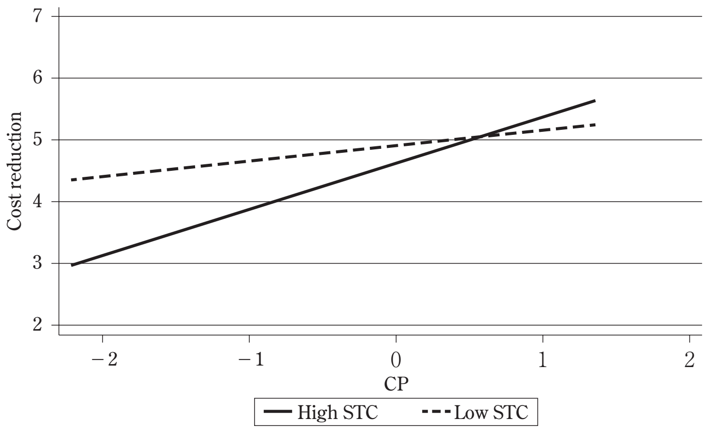
The results shown in Figure 1 indicate that *CP* enhances Cost reduction when *STC* is high (+1SD) in process industries (β = .748, p = .007). The coefficient of *CP* when *STC* is low (–1SD) is not statistically significant (β = .247, p = .247). In contrast, no statistically significant relationship is found for firms in assembly industries (p > .10). Hence, the results suggest that the complementary use of *STC* and *CP* enhances Cost reduction for firms in process industries, thereby partially supporting hypothesis 3.

Table 6. Results of Tobit analysis including the industry dummy variable

	Coefficient	Standard error
STC	–.123	.217
CP	.545**	.191
*STC*Industry*	.714**	.269
*CP*Industry*	–.291	.264
*STC*CP*	.320†	.189
*STC*CP*Industry*	–.671**	.250
Diversity	.057	.133
Community	–.083	.130
Variety	.027	.129
Competitiveness	–.166	.141
Frequency	.188	.146
Inaccuracy	–.041	.125
Size	.101	.218
Industry	.587*	.254
Intercept	4.318***	1.119
Pseudo–R^2	.123	
Number of censored observations	12	
Total number of observations	98	
Log likelihood ratio	–139.974	

Notes: Method is Tobit (lower limit=1, upper limit=7). †p<.1, *p<.05, **p<.01, ***p<.001

Figure 1. Interaction between *STC* and *CP* for firms in process industries



5. Discussion

The estimation results indicate that the joint use of stretch target costs and concurrent processes enhances cost reduction for firms in process industries; however, no statistically meaningful relationship is found for the full sample or assembly firms alone.

A positive main effect of stretch target costs is found in assembly industries; however, no significant effect is found for concurrent processes and the interaction effect. These results may indicate that excessive use of concurrent processes is not effective for cost reduction. Today, firms in assembly industries benefit from TCM support tools, such as TCM case studies or three-dimensional computer-aided design (3D-CAD). These tools are effective for cost reduction because TCM case studies encourage idea generation based on previous TCM product development cases, and 3D-CAD solves component interference problems. Although these tools are useful for engineers in assembly industry firms, more meetings because of concurrent processes might create excess workload and hamper autonomy. Busy engineers do not have enough time to use these support tools (Yoshida, 2003; 2007); thus, effective ideas for cost reduction may not be developed and further cost reduction may not be realized.

The estimation results for the positive performance effects of the joint effect term for firms in process industries reflect the characteristics of Japanese process industries (Fujimoto and Kuwashima, 2009). According to Fujimoto and Kuwashima (2009), previous product development literature indicates that fine-tuning product development between parts and functions is needed in assembly industries, such as automobiles, consumer electronics, and computers. For process industry products, such factors as epoch-making process technology inventions, investment, and R&D expense amounts have been considered extremely important. On the contrary, the authors propose that Japanese firms in process industries, particularly firms that treat industrial materials, also gain capabilities that accurately achieve the required functions for customers with extremely strict constraints on quality and costs. To meet these strict customer needs, firms in these industries must totally optimize operational steps. Specifically, sharing knowledge with customers about product specifications might lead to reduced development costs by avoiding excessive customization. Furthermore, collaboration between sales and development departments might lead to better and more accurate understanding of customer needs and help avoid excessive customization. This study's results indicate that concurrent processes effectively reduce costs for process industry firms. Hence, stretch target costs set to achieve strict customer needs might strengthen the cost-reduction effects of concurrent processes.

6. Conclusion

This study aims to clarify the cost-reduction effects of the joint use of stretch target costs and concurrent processes. To examine their joint effects, the study builds on a dynamic tension perspective. Based on data from a questionnaire survey, no statistically meaningful relationship between the joint effects and cost reduction is found when the full sample is analyzed. However, supplementary analysis using an industry dummy variable shows that the joint effects enhance cost reduction for firms in process industries but not those in assembly industries. Moreover, ad hoc analysis of process industry firms indicates that concurrent processes enhance cost reduction when target costs are set at high stretch levels.

This study contributes to the growing body of TCM literature. The study theoretically explains how and why joint use of stretch target costs and concurrent processes enhances cost reduction. Contrary to Gopalakrishnan *et al.*'s (2015) study based on goal-setting theory, this study assumes stretch target costs and concurrent processes positively affect cost reduction. The study's dynamic tension perspective is useful for explaining how the dynamic nature of TCM activities that accompany tensions or conflicts affect performance, which has not been adequately studied (Ansari *et al.*, 2007).

In addition, this study provides empirical evidence about these interaction effects, which have primarily been suggested theoretically in prior studies. Contrary to expectations, no statistically significant relationship is found when the full sample is analyzed. However, supplementary analysis finds the expected results for firms in process industries. These results imply that different product development processes require different TCM practices, as Messner (2016) indicated theoretically. This study's results are important for developing future research because differences in TCM practices between industries are not well known.

This study also has implications for managerial practices. The results suggest effective tools for cost reduction differ by firm or business unit industry. This is important for practice, especially for firms in process industries, because successful TCM factors for cost reduction in these industries have not been demonstrated before. The study's results suggest concurrent processes among departments are effective for cost reduction at early stages of product development. By contrast, for firms in assembly industries, the results suggest that the effective means of reducing costs might have changed since the 1990s. In other words, firms in assembly industries should avoid excessive use of concurrent processes that erode engineers' autonomy and lead to exhaustion. The results suggest that setting stretch target costs and decomposing target costs by function, part, department, and so on are important cost reduction factors, because decomposing target costs enhances controllability and enables target achievement.

This study has several limitations. First, the sample size and number of survey instruments are small. Specifically, only one questionnaire item is used for the survey constructs. Although each survey item captures the construct's content, supporting content validity, using more items helps ensure the reliability and validity of the survey constructs. Second, endogeneity concerns cannot be eliminated because of the cross-sectional survey. Several factors related to TCM cannot be controlled, such as how target costs are decomposed and certain tools such as cost tables and VE (Tani *et al.*, 1994). These uncontrolled omitted variables may lead to bias. Third, the study results are limited to explaining cross-industry influences. Thus, intra-industry differences in cost-reduction processes cannot be explained. The effects of the joint use of stretch target costs and concurrent processes on cost reduction might vary with more micro factors, such as product architecture or project team capabilities. These overlooked factors might lower the validity of the findings, although some level of homogeneity in TCM practices within industries can be assumed, as Messner (2016) explains. Finally, Japanese characteristics might influence the study's results. The relative maturity of TCM practices in Japan compared to other countries (Ansari *et al.*, 2007) might influence the cost-reduction effects of stretch target costs and concurrent processes; results in other countries where TCM maturity is low might differ from these results.

Despite these limitations, this study provides insights into the effectiveness of the joint use of stretch target costs and concurrent processes and establishes the basis for several directions in future research. First, research should consider context variables that moderate the cost-reduction effects of joint use. Yoshida (2001) empirically finds that elements such as stretch target costs and concurrent processes do not always enhance cost reduction, and their effect is different for businesses such as computers and air conditioning. This is because different business environments, such as those with novel technology and market dynamism, require different approaches to cost reduction. Hence, it seems that the effectiveness of joint use of stretch target costs and concurrent processes is determined by these contextual factors. Future research should explore and examine their effects. Second, future research should consider the stage at which target costs are identified. As Shimizu (1992a) and Yoshida (2003) show, stretch target costs act either as a facilitator for or constraint to knowledge creation, depending on when target costs are identified. It is possible that statistically meaningful effects of joint use of stretch target costs and concurrent processes on cost reduction will be found by considering different stages. Third, accurately interpreting the result that using stretch target costs and concurrent processes enhances cost reduction for firms in process industries requires field investigation of TCM practices in these industries. Unfortunately, there are few such investigations. Clarification of TCM activities in these industries might enhance knowledge about the current state of Japanese manufacturing industries and enable an understanding of the cost reduction generated by joint use in process industries.

References

Abernethy, M. A., and P. Brownell (1997). "Management Control Systems in Research and Development Organizations: The Role of Accounting, Behavior and Personnel Controls", *Accounting, Organizations and Society,* 22(3/4), 233–248.

Abernethy, M. A., and P. Brownell (1999). "The Role of Budgets in Organizations Facing Strategic Change: An Exploratory Study", *Accounting, Organizations and Society,* 24, 189–204.

Aiken, L. S., and S. G. West (1991). *Multiple Regression: Testing and Interpreting Interactions.* London: Sage.

Ansari, S. L., J. Bell, and H. Okano (2007). "Target Costing: Uncharted Research Territory", in *Handbook of Management Accounting Research (Vol. 2)*, ed. by C. S. Chapman, A. G. Hopwood, and M. D. Shields. Oxford: Elsevier, 507–530.

Anthony, R. N. (1965). *Planning and Control Systems: A Framework for Analysis.* Boston, MA: Harvard University.

Bedford, D. S. (2015). "Management Control Systems Across Different Modes of Innovation: Implications for Firm Performance", *Management Accounting Research,* 28, 12–30.

Bisbe, J., and D. Otley (2004). "The Effects of Interactive Use of Management Control Systems on Product Innovation", *Accounting, Organizations and Society,* 29, 709–737.

Carter, D. E., and B. S. Baker (1992). *Concurrent Engineering: The Product Development Environment for the 1990s.* Boston, MA: Addison-Wesley.

Chenhall, R. H. (2006). "Theorizing Contingencies in Management Control Systems Research", in *Handbook of Management Accounting Research (Vol. 1),* ed. by C. S. Chapman, A. G. Hopwood, and M. D. Shields. Oxford: Elsevier, 163–205.

Chenhall, R. H., and D. Morris (1995). "Organic Decision and Communication Processes and Management Accounting Systems in Entrepreneurial and Conservative Business

Organizations", *Omega, International Journal of Management Science,* 23(5), 485–497.

Clark, K., and T. Fujimoto (1991). *Product Development Performance: Strategy, Organization and Management in the World Auto Industry.* Boston, MA: Harvard Business School.

Cooper, R., and R. Slagmulder (1997). *Target Costing and Value Engineering.* Portland, OR: Productivity Press.

Dekker, H., and P. Smidt (2003). "A Survey of the Adoption and Use of Target Costing in Dutch Firms", *International Journal of Production Economics,* 84, 293–305.

English, T. (2001). "Tension Analysis in International Organizations: A Tool for Breaking Down Communication Barriers", *The International Journal of Organizational Analysis,* 9(1), 58–83.

Fujimoto, T., and K. Kuwashima (2009). *Nihongata Purosesu Sangyo: Monozukuri Keieigaku ni yoru Kyosoryoku Bunseki [Japanese Process Industries: A Competitive Analysis of Their Manufacturing Systems].* Tokyo: Yuhikaku.

Gopalakrishnan, M., T. Libby, J. A. Samuels, and D. Swenson (2015). "The Effect of Cost Goal Specificity and New Product Development Process on Cost Reduction Performance", *Accounting, Organizations and Society,* 42, 1–11.

Grafton, J., A. M. Lillis, and S. K. Widener (2010). "The Role of Performance Measurement and Evaluation in Building Organizational Capabilities and Performance", *Accounting, Organizations and Society,* 35, 689–706.

Heinicke, A., T. W. Guenther, and S. K. Widener (2016). "An Examination of the Relationship Between the Extent of a Flexible Culture and the Levers of Control System: The Key Role of Beliefs Control", *Management Accounting Research,* 33, 25–41.

Henri, J. F. (2006). "Management Control Systems and Strategy: A Resource-based Perspective", *Accounting, Organizations and Society,* 31, 529–558.

Hiromoto, T. (1988). "Another Hidden Edge: Japanese Management Accounting", *Harvard Business Review,* 66(4), 22–26.

Hirst, M. K. (1987). "The Effects of Setting Budget Goals and Task Uncertainty on Performance: A Theoretical Analysis", *The Accounting Review*, 774–784.

Iwabuchi, Y. (1992). "Genka Kikaku no Kino: Jyoho-kyoyu-ka to Chishiki Sozo no Kanten kara [Functions of Target Costing: Information Sharing and Knowledge Creation]", *Kigyo Kaikei,* 4(8), 41–47.

Kato, Y. (1993a). *Genka Kikaku: Senryakuteki Kosuto Manejimento [Target Costing: Strategic Cost Management].* Tokyo: Nihon Keizai Shimbun.

Kato, Y. (1993b). "Target Costing Support Systems: Lessons from Leading Japanese Companies", *Management Accounting Research,* 4(1), 33–47.

Koga, K., and A. Davila (1999). "What is the Role of Performance Goals in Product Development? A Study of Japanese Camera Manufacturers", in *Dynamic Strategy Resources: Development, Diffusion and Integration,* ed. by H. A. Hitt, P. G. Clifford, R. D. Nizon, and K. P. Coyte. London: John Wiley & Sons, 407–431.

Lewis, M. W. (2000). "Exploring Paradox: Toward a More Comprehensive Guide", *Academy of Management Review,* 25(4), 760–776.

Locke, E. A., and G. P. Latham (1990). *A Theory of Goal Setting and Task Performance.* Englewood Cliffs, NJ: Prentice Hall.

Lövstal, E., and A. M. Jontoft (2017). "Tensions at the Intersection of Management Control and Innovation: A Literature Review", *Journal of Management Control,* 28, 41–79.

Messner, M. (2016). "Does Industry Matter? How Industry Context Shapes Management Accounting Practices", *Management Accounting Research,* 31, 103–111.

Monden, Y., and K. Hamada (1991). "Target Costing and Kaizen Costing in Japanese Automobile

Companies", *Journal of Management Accounting Research,* 3, 16–34.

Nonaka, I. (1990). *Chishiki-Sozo no Keiei [A Theory of Organizational Knowledge Creation].* Tokyo: Nihon Keizai Shinbun.

Okano, H., and T. Suzuki (2007). "A History of Japanese Management Accounting", in *Handbook of Management Accounting Research (Vol. 2)* ed. by C. S. Chapman, A. G. Hopwood, and M. D. Shields. Oxford: Elsevier, 1119–1137.

Podsakoff, P. M., S. B. MacKenzie, J. Y. Lee, and N. P. Podsakoff (2003). "Common Method Bias in Behavioral Research: A Critical Review of the Literature and Recommended Remedies", *Journal of Applied Psychology,* 88, 879–903.

Rockness, H. O., and M. D. Shields (1984). "Organizational Control Systems in Research and Development", *Accounting, Organizations and Society,* 9(2), 165–177.

Sakurai, M. (1989). "Target Costing and How to Use It", *Journal of Cost Management,* 3(2), 39–50.

Shimizu, N. (1992a). "Genka Kikaku Katsudo ni okeru Mokuhyo Genka Jyoho to Chishiki-Sozo Katsudo no Kankei [The Relationship Between Target Costing Information and Knowledge Creation Activities]", *Sangyo Keiri,* 51(4), 132–139.

Shimizu, N. (1992b). "Syudanteki Chishiki-Sozo Katsudo ni okeru Mokuhyo Genka Jyoho no Yakuwari [The Role of Target Costing Information in Target Costing as Knowledge Creating Activities]", *Kigyo Kaikei,* 44(10), 91–96.

Simons, R. (1987). "Accounting Control and Business Strategy: An Empirical Analysis", *Accounting, Organizations and Society,* 12(4), 357–374.

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

Takeuchi, H., and I. Nonaka (1986). "The New Product Development Game", *Harvard Business Review,* 64(1), 137–146.

Tanaka, M. (1995). *Genka Kikaku no Riron to Jissen [Target Cost Management and Profit Engineering].* Tokyo: Chuo Keizai.

Tani, T. (1995). "Interactive Control in Target Cost Management", *Management Accounting Research,* 6, 399–414.

Tani, T. (1996). "Genka Kikaku no Eremento: Niti-Doku Hikaku [Elements of Target Cost Management: A Japanese-German Comparison]", *Kokumin Keizai Zasshi,* 173(3), 35–49.

Tani, T., H. Okano, N. Shimizu, Y. Iwabuchi, J. Fukuda, and S. Cooray (1993a). Genka Kikaku no Jittutai Chosa: Genka Kikaku no Kontinjenshi Riron [Contingency Theory of Target Costing]", *Kigyo Kaikei,* 45(6), 797–804.

Tani, T., H. Okano, N. Shimizu, Y. Iwabuchi, J. Fukuda, and S. Cooray (1994). Target Cost Management in Japanese Companies: Current State of the Art", *Management Accounting Research,* 5, 67–81.

Tani, T., N. Shimizu, Y. Iwabuchi, and J. Fukuda (1993b). "Genka Kikaku to Kaigitai deno Sogo-Sayo [Target Cost Management and Interaction among Managers in Meetings]", *Kaikei,* 144(3), 80–92.

Tessier, S., and D. Otley (2012). "A Conceptual Development of Simons' Levers of Control Framework", *Management Accounting Research,* 23, 171–185.

Thomas, K. R., W. A. Hochwarter, and N. J. Mathys (1997). "Stretch Targets: What Makes Them Effective?", *Academy of Management Executive,* 11(3), 48–60.

Widener, S. K. (2007). "An Empirical Analysis of the Levers of Control Framework", *Accounting, Organizations and Society*, 32, 757–788.

Ylinen, M., and B. Gullkvist (2014). "The Effects of Organic and Mechanistic Control in Exploratory and Exploitative Innovations", *Management Accounting Research,* 25, 93–112.

Yoshida, E. (2001). “Genka Kikaku Katsudo wo Shien Suru Soshikinoryoku to Pafuomansu to no Kankei: Bo Denki Meka ni okeru Jigyo kan Hikaku [Empirical Study About the Relationship Between Organizational Capabilities for Target Cost Management and Performance: Comparison among Three Divisions at a Japanese Electric Company]”, *Cost Accounting Research,* 25(2), 1–9.

Yoshida, E. (2003). *Genka Kikaku Noryoku [Organizational Capabilities for Target Costing].* Tokyo: Chuo Keizai.

Yoshida, E. (2007). “Ko Hinshitsu to Tei Kosuto no Jirenma: Jidosha Rikoru Genin Bunseki ni yoru Kosatsu [Dilemmas Between High Quality and Low Cost: An Analysis of Japanese Automobile Recall Data]”, *Mita Business Review,* 49(7), 47–61.