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清水, 信匡 / 田村, 晶子 / TAMURA, Akiko / SHIMIZU, Nobumasa

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The Consistency Between Investment Management Process and Business Strategy¹

Nobumasa Shimizu and Akiko Tamura

《Abstract》

This paper examines the management process for each strategic type of firm (namely, Defenders, Prospectors, Analyzers, and Reactors) as a new way of analyzing capital budgeting from a managerial accounting perspective. Using a 2009 survey of Japanese manufacturing firms, we reveal the following. To start with, Defenders seldom search for new investment projects because they establish a stable status in a limited operation domain. Therefore, the principal purpose of capital investment in this strategic type is to improve cost competitiveness. As a result, Defenders develop the investment project in their own way, and then evaluate profitability thoroughly following implementation. In contrast, Prospectors continuously search for market opportunities, and evaluate and select projects in order to pioneer new product markets and profit opportunities. Thus, the main purpose of capital investment in this strategic type is to produce new products. Consequently, Prospectors emphasize profitability and timing in the development phase, and then carefully compare the alternative projects available. Finally, Analyzers carefully deliberate and decide upon the optimum timing of investment in

1) We would like to thank the participants of the Global Conference on Business and Finance in Hawaii, January 2012 for their useful comments. The short/previous version of this paper appeared in *Proceedings of the Global Conference on Business and Finance*, The Institute of Business and Finance Research, 2011.

order to seize upon market opportunities using their existing technology. As a result, this strategic type does not aggressively pursue capital investment.

1. Introduction

Capital budgeting is a critical problem for firms in terms of restraining organizational activity and retaining a large amount of capital over the long term. The theoretical research on the capital budgeting decision began after World War II and has had a great influence on managerial accounting (Hiromoto [1993]). As a result, managerial accounting research on capital budgeting has been strongly influenced by finance theory, and so most discussion has concerned the use of common economic evaluation techniques, including the payback method, simple rates of return, net present value, the internal rate of return, and real options (Sugiyama [2002]). This tendency is especially clear in managerial accounting research on capital budgeting (also known as capital investment budgeting or the capital budgeting decision) in Japan (Shimizu [2004]).

Unfortunately, where economic evaluation techniques have been the focus of capital budgeting decisions, there has been a corresponding neglect of managerial accounting (Northcott [1992]). The mail survey employed in this current research uncovered the following key features of capital budgeting management in Japanese firms (Shimizu et al. [2007]). First, economic evaluation techniques feature in most phases of capital budgeting, including development, proposal, deliberation, authorization, and postinvestment evaluation. Second, there is a ranking of the various capital budgeting projects available to the firm. Finally, economic evaluation techniques help to set capital budgeting targets in the firm and the limits to

capital spending. Although these are only some of the many interesting details revealed in the survey, they do suggest that capital budgeting management in managerial accounting (that is to say, capital budgeting) includes many more factors than described in either the previous research or texts.

Therefore, in order fully to explain capital budgeting as managerial accounting, we need to know not only about the investment decision but also about the series of management processes involved; that is, how capital budgeting projects in actual firms are developed, authorized, and implemented (Haka [2007], Maccarrone [1996], Toribe [1997], Yamamoto [1998], and Shimizu [2006]). Accordingly, the principal aim of this paper is to consider the management process fitted to each strategic type as a new way of clarifying capital budgeting as managerial accounting, and to describe the reality of capital budgeting in Japanese firms. Our chief motivations for the analysis are: first, that the firm's strategy must affect capital budgeting management, and second, that capital budgeting should fit with each firm's chosen strategy in order to improve business results.

The remainder of the paper is organized as follows. In Section 2, we introduce the theory of Miles and Snow [1978] and describe the method used to group firms into strategic types. In Sections 3, 4 and 5, we analyze the stance and purpose of capital investment, capital budgeting management, and capital budgeting in the planning system for each strategic type using the results of our mail survey. We then extract the distinctive characteristics of capital budgeting as fitted to each strategic type. Finally, in Section 6, we present the implications of our work and suggest some possible future research directions.

2. Miles and Snow theory and the typology of firms

2.1. Miles and Snow theory

In brief, and following Tsuchiya [1983], the theoretical framework of strategic types that Miles and Snow [1978] proposed is as follows. First, the organization develops a strategy in order to adapt to its environment and to choose and create an adaptive environment. Second, in order to implement the strategy effectively, an organizational structure adapted to this strategy is required. Third, the organization needs management processes adapted to the strategy to employ efficient behavior. Fourth, the structure and processes that the organization already has are conditions for the strategy developed next. Fifth, therefore, the subject of the dominant coalition of the organization is to adapt strategy, structure and process interactively for the organization to be effective and to behave efficiently. Finally, there are four forms of possible adaptive behavior for the organization: the Defender, the Prospector, the Analyzer, and the Reactor.

Put another way, and as shown in Figure 1, firms survive in a competitive environment by controlling the following series of processes: first, deciding upon the organizational domain in which they behave (the entrepreneurial problem), second, deciding upon what system they will use to operate the activity (the engineering problem), and third, formulating and implementing the management processes needed to operate these systems successfully (the administrative problem). There are four possible patterns of adaptation. Drawing on Miles and Snow [1978], these four environmental adaptations of organizations (strategic types) have the following characteristics.

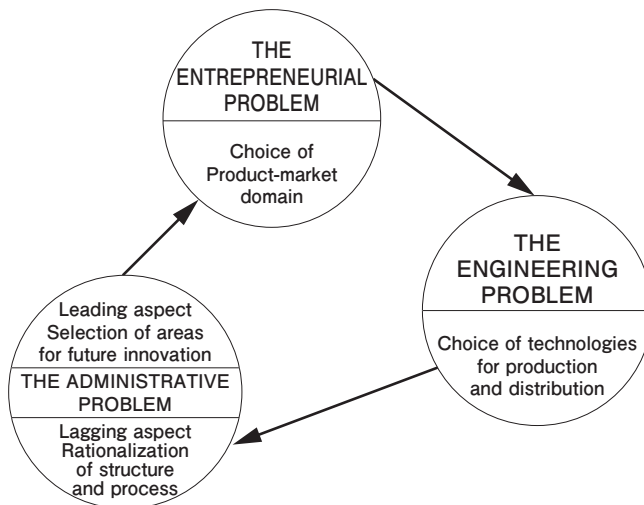
- Defender: This strategic type limits its operational area to a relatively narrow product market where it improves efficiency and cost

competitiveness, and establishes firm status.

- **Prospector:** This strategic type always searches for market opportunities to obtain profits. It aggressively creates change and uncertainty and develops new products and markets.
- **Analyzer:** This strategic type establishes firm status in existing product markets but also searches for market opportunities that it can cope with using its existing technology and rapidly seizes these if they appear promising.
- **Reactor:** The strategy in this strategic type is not functioning properly. It cannot adapt; rather, it merely reacts to environmental change and lacks consistent organizational activity.

The main objective of our 2009 mail survey is to distinguish clearly the characteristics of those strategic types whose strategy is functioning (Defenders, Prospectors, and Analyzers)²⁾.

Figure 1. The adaptive cycle in Miles and Snow ([1978], p. 24³⁾)



2.2. Outline of the mail survey

We sent our mail survey to a sample of Japanese manufacturing firms in March 1, 2009 and received responses by April 30, 2009. We mainly addressed the questionnaires to the management planning sections of 853 Japanese manufacturing firms listed on the Tokyo Stock Exchange First Section, requesting them to respond concerning capital investment for their main product. Unfortunately, the response rate to the survey was only 11.72% (100 of the 853 companies). This response rate was significantly lower than our previous survey in 2005 (Shimizu et al. [2007]), one reason being that our request for a response coincided with an exceptionally busy period in accounting settlements associated with the so-called Lehman Shock. Table 1 provides the number of respondent firms by industry. Using a Chi-squared test, we confirm that the respondent firms' distribution by industry is comparable to all manufacturing firms listed on the First Section of the Tokyo Stock Exchange. We also compare firm scale (total assets and capital stock) across respondent and nonrespondent firms, and find no significant difference.

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- 2) Many researches which are applied Miles and Snow strategic theory to managerial accounting only discuss two types, namely Defenders and Prospectors, instead of four types. See Simons [1987]. Fukuda [2008] discuss Defenders and Prospectors in Japanese firms.
 - 3) The page number we refer here is from a reprint of Miles and Snow [1978] (Miles and Snow [2003]).

Table 1. Respondent firms by industry [number of firms and percentage of total responses]

Foods	Textiles & apparel	Pulp and paper	Chemicals	Pharmaceuticals	Oil and coal products	Rubber commodities	Glass & ceramics products
6 (6%)	2 (2%)	1 (1%)	11 (11%)	1 (1%)	2 (2%)	0 (0%)	3 (3%)
Iron and steel	Nonferrous metals	Metal products	Machinery	Electric appliances	Transportation equipment	Precision instruments	Other Products
7 (7%)	4 (4%)	7 (7%)	13 (13%)	23 (23%)	13 (13%)	2 (2%)	5 (5%)

2.3. The method used to measure strategic typology and the results

In order to classify the respondent firms into four strategic types, we adopted the measurement of strategic types described by Conant et al. [1990]. This method has been successful in many studies as a useful way of grouping firms into Miles–Snow strategic types (DeSalbo et al. [2005]). The classification procedure proposed by Conant et al. [2005] is as follows. To start with, we prepared 11 questions that explicated the three basic problems in Miles and Snow’s [1978] adaptive-cycle model. These comprised four questions regarding the entrepreneurial problem that develop the strategy, three questions concerning the engineering problem that creates the systems to operate the strategy, and four questions about the administrative questions in managing the system. We then constructed four distinct response options characterizing the four possible strategic types (Defender, Prospector, Analyzer, and Reactor) for each of the 11 questions. Next, as a basic rule, the sample firms were classified into one of the four strategic types depending on the response option selected most often. For instance, we classified the firm as a Defender if it most often chose Defender response options. However, if the number of response options tied between Defender, Prospector, and/or Analyzer

response options, the firm was classified as an Analyzer, while if they tied involving Reactor response options, the firm was classified as a Reactor. The appendix includes the 11 questions and the 4 response options.

Table 2 provides the results of the classification of the respondent firms by the procedure described. As shown in Table 2, the largest number of firms are Analyzers, followed by Defenders, and then Prospectors. We were unable to classify one firm because it did not respond to all of the questions in the survey. This reduced our sample size to 99 firms. We also do not examine Reactors in detail because they do not operate consistently, though we do list their responses for reference⁴⁾.

Table 2. Results of classification: Number in each strategic type

Strategic type	Number of firms (%)
Defender	21 (21.0)
Prospector	16 (16.0)
Analyzer	44 (44.0)
Reactor	18 (18.0)
Missing Observations	1 (1.0)
Total	100 (100.0)

3. Stance on capital investment and its purpose

We first examine the firm's stance on capital investment. The scale used for the questions on capital investment stance is a 5-point Likert scale (1 = withhold investment, 3 = neutral stance, 5 = invest aggressively). We questioned firms on their investment stance both at the time of the survey (2009) and three years ago (2006). Table 3 reports the results for this response. As shown, three years ago, more than half of firms responded

4) We plan to examine Reactors as firms whose strategy is not functioning in a future study.

either 4 or 5 on the scale; that is, the majority of firms were investing positively as business conditions were recovering. In contrast, in 2009, more than half of firms chose 1 or 2; that is, the majority of firms had a negative stance on investment going into the recession.

Table 3. The stance on capital investment (percentage number of responses)

Response option	Stance at present (2009)	Stance three years ago (2006)
1 Withhold investment	45 (45.5)	6 (6.1)
2	21 (21.2)	8 (8.1)
3 Neutral stance	10 (10.1)	16 (16.2)
4	17 (17.2)	33 (33.3)
5 Invest aggressively	6 (6.1)	36 (36.4)
Total	99 (100)	99 (100)

We next observe the results by strategic type. Table 4 reports the means and standard deviations of the response to the questions on investment stance on the 5-point Likert scale for each strategic type and all firms. As the differences in responses among the various strategic types are important, we emphasize the difference by halftoning the maximum mean and underlining the minimum mean if the difference between maximum and minimum mean is more than 0.3 (we undertake a similar procedure in the remaining tables).

As shown, Prospectors invested most positively, both three years ago (2006) and at present (2009). This may indicate the Prospector's attitude of taking risks to seek profit. Three years ago, Analyzers took the most negative stance towards investment, while at present, Defenders take the most negative stance. One contemporary argument is that the Japanese economy cannot recover from recession because capital investment is not increasing. Policy makers must then develop policy to stimulate investment

for each strategic type depending on their characteristics, rather than applying the same policy for all firms by assuming that every firm displays identical behavior toward investment.

Table 4. Stance on investment by strategic type

	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)	Total (99 firms)
Stance at present (2009)	<u>1.81</u> (1.078)	<u>2.50</u> (1.673)	<u>2.11</u> (1.298)	2.44 (1.338)	2.17 (1.333)
Stance three years ago (2006)	3.81 (1.250)	4.13 (1.360)	<u>3.75</u> (1.144)	3.94 (1.056)	3.86 (1.178)

Notes: Upper value = mean, lower value = (standard deviation), the highest mean among 3 types is in halftone and the lowest mean among 3 types is underlined.

We also questioned firms on the frequency of capital investment by purpose using 5-point Likert scale (1 = never carry out, 5 = always carry out). Table 5 reports the means and standard deviations of the responses. The most frequent investment purpose was “(3) to improve production lines” (3.76).

Table 5. Purpose of capital investment by strategic type

Question item	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)	Total (99 firms)
(1) Replace	3.38 (1.117)	<u>3.75</u> (1.183)	<u>3.32</u> (0.934)	3.61 (1.145)	3.45 (1.052)
(2) Increase Production	<u>3.33</u> (0.966)	3.88 (0.957)	3.43 (0.873)	3.78 (0.732)	3.55 (0.895)
(3) Improve production lines	3.81 (0.981)	<u>4.13</u> (0.885)	<u>3.66</u> (0.745)	3.61 (0.979)	3.76 (0.870)
(4) Produce new Products	3.52 (1.078)	<u>4.06</u> (0.854)	<u>3.48</u> (0.952)	3.50 (1.150)	3.59 (1.010)

Notes: Upper value = mean, lower value in row = (standard deviation), the highest mean among 3 types is in halftone and the lowest mean among 3 types is underlined.

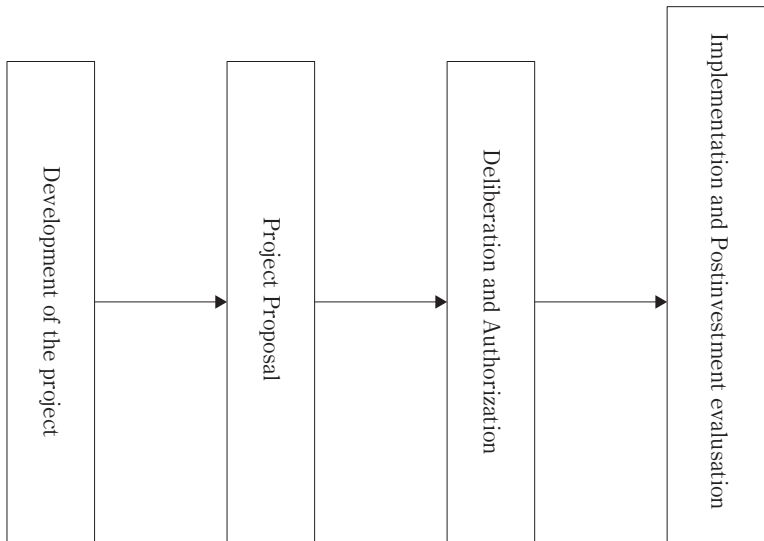
We now examine the purpose and frequency of capital investment by strategic type. As shown in Table 5, Prospectors invest most frequently for every purpose, while Defenders invest least frequently “(2) to increase production” and Analyzers invest least frequently for other purposes. Similarly, Defenders and Analyzers invest less frequently than Prospectors do, and this coincides with their more negative stance on capital investment in Table 4. What do the data suggest? In sum, Prospectors invest more frequently “(3) to improve production lines” and “(4) to produce new products”. Of these, investing relatively more “(4) to produce new products” may indicate the continuous seeking of market opportunities characteristic of Prospectors. Moreover, Prospectors invest more frequently “(1) to replace” and “(2) to increase production” than the other strategic types, and this reflects their attitude to increasing sales after entering the market. In contrast, Defenders and Analyzers invest more frequently “(3) to improve production lines” than for any other purpose. This appears to fit the theory in that Analyzers seek market opportunities that they can handle using existing technology, so they often develop products that they can produce using existing equipment. Likewise, Defenders produce the same kind of product, so they may not require frequent capital investment.

4. Capital budgeting management and strategic type

In order to understand the firm’s actual capital budgeting process, we propose the following model, as shown in Figure 2. This is based on the strategic capital budgeting planning process presented by Maccarrone [1996, p. 44] of Development/evaluation → Selection → Authorization → Implementation and control → Postauditing⁵⁾. Here “Development of the

project” refers to the desirable capital investment being analyzed as a capital budgeting project. “Project proposal” is the project being proposed to headquarters. “Deliberation and authorization” indicates the capital budgeting project proposed from the subordinate section of the organization being discussed and finally approved at the highest level. Finally, “Implementation and postinvestment evaluation” refers to the capital expenditure phase and the ex post monitoring of the project.

Figure 2. Capital investment management process



5) See Shimizu [2006] for identification of the capital budgeting management process. In this study, we include “Deliberation of the project” and “Final authorization of the project” together as “Deliberation and authorization”, and “Implementation of the equipment” and “Postevaluation” together as “Implementation and Postinvestment evaluation”. We also exclude “Disposal and diversion”. Otherwise, we assume exactly the same capital budgeting process as in Shimizu et al. [2007].

We posed questions concerning each of the four phases of the management process described above, numbering 18 question items in total. The scale used for each question item is again on a 5-point Likert scale (1 = do not agree at all, 5 = strongly agree).

4.1. Development of the project phase

We included four questions concerning the “Development of the project” phase. Table 6 describes the content of the question items and reports the means and standard deviations of the responses to these question items for the full sample. As shown, it is clear that fewer firms “(1) organize team” at the “Development” phase (2.93).

Table 6. Management processes in the “Development of the project” phase (all firms)

#	Content of question item	Mean (Standard deviation)
(1)	When the development of the investment project begins, the project team is organized.	2.93 (0.972)
(2)	The developer of the investment project compares two or more ideas.	4.03 (0.749)
(3)	The developer of the investment project is recognizing the level of profitability that should be achieved.	4.35 (0.787)
(4)	The developer of the investment project is recognizing the appropriate timing of investment.	4.24 (0.797)

Next, we use Table 7 to analyze management in the “Development” phase. As shown, Defenders “(1) organize team” relatively less than Prospectors and Analyzers, while a smaller number of firms organize teams at the “Development” phase overall. This is because Defenders operate continuously in an existing organizational domain; thus, they can cope with

project development using existing technology. This is generally a standing system, such as a department of production management. In contrast, Prospectors continually enter new organizational domains. As a result, Prospectors form new project teams consisting of members with detailed knowledge of the new technology to handle the new domain. In addition, Analyzers enter a new domain by combining existing technologies. To handle this, Analyzers form project teams consisting of members with different technology. Whether or not “(2) the developer of the investment project compares two or more ideas”, Prospectors are most likely to carry it out, followed by Analyzers, while Defenders are least likely to carry it out. As Prospectors invest to enter new product market domains, they more carefully develop their investment plans. Similarly, more Prospectors indicates that “(3) the developer of the investment project is recognizing the level of profitability that should be achieved”. Interestingly, more Analyzers, as well as Prospectors, respond that “(4) the developer of the investment project is recognizing the appropriate timing of investment”. This may be because investing with appropriate timing in response to demand is very important for both Analyzers and Prospectors.

Table 7. Management processes in the “Development” phase by strategic type

Question item	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)
(1) Team organization	2.62 (1.024)	3.00 (0.966)	3.05 (0.939)	2.94 (0.998)
(2) Comparison of multiple projects	3.86 (0.727)	4.19 (0.911)	4.02 (0.832)	4.11 (0.832)
(3) Profitability check	4.14 (0.854)	4.50 (0.816)	4.30 (0.701)	4.61 (0.850)
(4) Appropriate timing	3.76 (0.889)	4.31 (0.873)	4.36 (0.685)	4.44 (0.705)

Notes: Upper value = mean, lower value in row = (standard deviation), the highest mean among 3 types is in half-tone and the lowest mean among 3 types is underlined.

4.2. Proposal phase

We now use Table 8 to examine the overall tendency of management in the “Proposal” phase. As shown, we can see that firms carry out the content implied in every question very well, as the responses for each question item average more than four. Next, we employ Table 9 to observe the management in the “Proposal” phase by strategic type. As detailed, Analyzers respond more often that “(5) when the investment project is proposed, the item that should be deliberated upon is decided”. Because Analyzers may face some difficulty in adjusting deliberated items, they decide capital investment at the final deliberation. Conversely, Prospectors and Analyzers respond more than Defenders that they “(8) propose in exact timing with investment”. This is because Prospectors and Analyzers run a greater risk of losing from the incorrect timing of investment, while Defenders perform in a more stable domain.

Table 8. Management processes in the “Proposal” phase (all firms)

#	Content of question item	Mean (Standard deviation)
(5)	When the investment project is proposed, the item that should be deliberated upon is decided.	4.14 (0.821)
(6)	The priority is ranked for the proposed project.	4.14 (0.821)
(7)	The profitability of the investment project is evaluated from the financial standard that should be achieved.	4.02 (0.937)
(8)	Propose in exact timing with investment	4.22 (0.790)

Table 9. Management processes in the “Proposal” phase by strategic type

Question item	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)
(5) Formalization of deliberation item	<u>3.86</u> (0.910)	4.13 (1.088)	<u>4.32</u> (0.639)	4.06 (8.02)
(6) Ranking of priority	3.90 (0.768)	4.00 (0.816)	4.14 (0.639)	4.06 (0.802)
(7) Profitability check	4.00 (0.949)	3.88 (1.147)	4.09 (0.772)	4.00 (1.138)
(8) Exact timing	<u>4.00</u> (0.775)	<u>4.44</u> (0.814)	4.32 (0.708)	4.06 (0.938)

Note: Upper value = mean, lower value = (Standard deviation), the highest mean among 3 types is in half-tone and the lowest mean among 3 types is underlined, (if the difference between the highest and the lowest mean is more than 0.3).

4.3. Deliberation and authorization phase

Table 10 provides the overall tendencies of management in the “Deliberation and authorization” phase. As shown, firms do not always “(11) compare two or more implement plans” in “Deliberation and Authorization” phase; “Comparison of implementation plans” at “Deliberation and Authorization” phase, 3.61 on average, is less than “Comparison of multiple projects” at “Development” phase, 4.03 on average (in Table 6). In many firms, the only subject of Deliberation is

whether they authorize the proposed plan rather than make a selection from the proposed plans.

Table 10. Management processes in the “Deliberation and authorization” phase (99 firms)

#	Content of question item	Mean (Standard deviation)
(9)	The deliberation on the investment project is advanced according to a prescribed procedure.	4.79 (0.558)
(10)	The deliberation committee considers each project separately.	4.47 (0.733)
(11)	While deliberating on an individual investment project, two or more implementation plans are compared.	3.61 (0.901)
(12)	While deliberating on the investment project, the profitability level that should be achieved is checked.	4.29 (0.836)
(13)	While deliberating on the investment project, the timing of investment is checked.	4.33 (0.769)

Next, we examine the management of “Deliberation and authorization” by strategic type using Table 11. As shown, more Prospectors and Analyzers on average follow “(9) observance of deliberation procedure”; that is, Prospectors and Analyzers seldom allow exceptions. In addition, Prospectors and Analyzers tend to undertake the “(11) comparison of implemented plans” in the “Deliberation and authorization” phase. This may be because the right or wrong investment directly leads to business success or failure in Prospectors and Analyzers. As also shown, Analyzers most value timing, while Defenders act in a more stable domain. This table also reveals the Analyzers’ strategy of seizing on promising market opportunities. In contrast, Prospectors have shorter deliberation periods, as they may essentially make almost all investment decisions before the “Deliberation and authorization” phase.

Table 11. Management processes in the “Deliberation and authorization” phase by strategic type

Question item	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)
(9) Observance of deliberation procedure	4.57 (0.746)	<u>5.00</u> (0.000)	4.89 (0.321)	4.61 (0.850)
(10) Deliberation on each project	4.38 (0.669)	4.63 (0.500)	4.59 (0.757)	4.17 (0.857)
(11) Comparison of implementation plans	<u>3.29</u> (1.007)	<u>3.81</u> (0.834)	3.61 (0.784)	3.78 (1.060)
(12) Profitability check	4.19 (0.750)	4.19 (0.629)	4.27 (0.899)	4.33 (0.970)
(13) Timing check	<u>4.05</u> (0.805)	4.06 (0.929)	<u>4.52</u> (0.590)	4.44 (0.856)

Note: Upper value = mean, lower value = (Standard deviation), the highest mean among 3 types is in half-tone and the lowest mean among 3 types is underlined, (if the difference between the highest and the lowest mean is more than 0.3).

4.4. Implementation and postinvestment evaluation phase

Finally, we examine management behavior in the “Implementation and postinvestment evaluation” phase. We examine the overall tendencies from Table 12 and find that the responses for all question items average less than four. Thus, firms appear to perform less management in this phase than in the previous phase. We interviewed several firms and found that few firms manage carefully in the “Implementation and postinvestment evaluation” phase.

Table 12. Management processes in the “Implementation and postinvestment evaluation” phase (all firms)

#	Content of question item	Mean (Standard deviation)
(14)	The implementation of investment in equipment is continuously monitored.	3.69 (0.986)
(15)	After the equipment by investment is operating, postinvestment evaluation is conducted continuously.	3.62 (1.057)
(16)	After the equipment by investment is operating, the profitability of the investment project is evaluated.	3.67 (1.050)
(17)	Analyze the cause of failure of an investment project to reach expected profitability.	3.51 (0.919)
(18)	Right or wrong of investment after implementation directly is related to performance evaluation.	3.10 (1.045)

Next, we analyze management in the “Implementation and postinvestment evaluation” phase by strategic type. As shown, Analyzers most often undertake “(15) evaluation continuously”, unlike Prospectors. In addition, Defenders most often undertake “(16) a profitability check” after investment, unlike Prospectors. One characteristic of the Prospector’s planning sequence is that they evaluate investment projects in the development, proposal and deliberation phases, then move to develop a detailed operating plan; that is, Evaluate → Act → Plan (Males and Snow [1987], p. 62). Therefore, a characteristic of Prospectors is that they do not evaluate carefully after investment. As an alternative, Defenders continuously repeat the planning sequence of Plan → Act → Evaluate, then carefully evaluate following investment. This leads to continuity and thoroughness in evaluation and the postinvestment profitability check.

Table 13. Management process in the “Implementation and postinvestment evaluation” phase by strategic type

Question item	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)
(14) Monitoring of implementation	3.43 (1.028)	3.69 (1.014)	3.66 (0.939)	4.06 (0.998)
(15) Continuity of evaluation	3.57 (1.207)	<u>3.38</u> (1.147)	<u>3.73</u> (1.020)	3.61 (0.916)
(16) Profitability check	<u>3.81</u> (1.078)	<u>3.38</u> (1.147)	3.73 (1.042)	3.61 (0.979)
(17) Analysis of failed projects	<u>3.24</u> (0.889)	3.44 (1.094)	<u>3.59</u> (0.923)	3.67 (0.767)
(18) Relation with performance evaluation	<u>2.86</u> (1.195)	<u>3.50</u> (0.966)	3.00 (0.940)	3.28 (1.127)

Note: Upper value = mean, lower value = (Standard deviation), the highest mean among 3 types is in halftone and the lowest mean among 3 types is underlined, (if the difference between the highest and the lowest mean is more than 0.3).

5. Capital budgeting in planning system and strategic type

It is impossible for firms to implement all available investment projects, even if they recognize the necessity of investment. Firms are then subject to a budget constraint and have a limited ability to manage investment projects. Therefore, they need to coordinate investment projects by collecting and selecting information on each. In this mail survey, we asked how each investment project is coordinated across four stages. These are medium-/long-term budget plans, annual budget (plan), between medium-/long-term and annual budget, and deliberation just before implementing investment. The scale used for each question item is a 5-point Likert scale (1 = do not agree at all, 5 = strongly agree).

Table 14. Capital budgeting in the planning system (all firms)

#	Content of question item	Mean (Standard deviation)
(1)	Register investment project in medium-/long-term plan.	3.87 (1.027)
(2)	Timing of investment is written clearly in medium-/long-term plan.	3.79 (1.013)
(3)	Priority for investment project is ranked in medium-/long-term plan.	3.43 (1.012)
(4)	Register investment project in annual budget.	4.55 (0.659)
(5)	Timing of investment is written clearly in annual budget.	4.39 (0.780)
(6)	Priority for investment project is ranked in annual budget.	3.86 (0.958)
(7)	Investment project that is registered in annual budget is selected from the projects that are registered in medium-/long-term plan.	3.71 (0.860)
(8)	New capital investment project that is not in medium-/long-term plan can be added in annual budget.	3.75 (0.800)
(9)	Detailed deliberation and authorization of investment plan takes place before implementation aside from annual budget.	4.09 (1.135)
(10)	The deliberation of each project takes place separately.	4.18 (1.014)
(11)	Budget limit for investment is set in annual budget.	4.49 (0.813)
(12)	Capital investment is implemented within the annual budget limit.	4.20 (0.700)

First, we examine the overall tendency of respondent firms using Table 14. Comparing registration, timing, and the priority of investment project across the medium-/long-term plan ((1), (2), (3)) and the annual budget ((4),(5),(6)), the mean values for each question are higher for the annual budget than for the medium-/long-term plan. For example, the mean value of registration of the project is 3.87 in the medium/long term and 4.55 in the annual budget, so it is clear that most firms register investment

projects in the annual budget. Therefore, the investment project is recognized by the organization in the annual budget rather than in the medium-/long-term plan. In addition, firms consider investment timing and rank investment priority in the annual budget rather than in the medium-/long-term plan. In other words, there is every possibility that the coordination for investment projects is secured in the annual budget.

From (7) and (8), the selection and addition of investment projects are incurred to some degree in the medium-/long-term plan and the annual budget. As the mean values of the responses for (9), (10), (11) and (12) are greater than four, it is clear that most Japanese firms perform deliberation on each project apart from the annual budget, and set budget limits and implement investment within the budget limits.

Table 15. Capital budgeting in the planning system by strategic type

Question item	Defender (21 firms)	Prospector (16 firms)	Analyzer (44 firms)	Reactor (18 firms)
(1) Registration in medium-/long-term plan	3.57 (1.121)	<u>4.13</u> (0.885)	3.89 (1.039)	3.94 (0.998)
(2) Timing written in medium-/long-term plan	3.48 (1.078)	4.00 (0.894)	3.84 (1.077)	3.83 (0.857)
(3) Priority rank in medium-/long-term plan	3.33 (1.111)	3.56 (0.892)	3.39 (1.061)	3.56 (0.922)
(4) Registration in annual budget	<u>4.43</u> (0.676)	4.94 (0.250)	<u>4.43</u> (0.728)	4.61 (0.608)
(5) Timing written in annual budget	4.19 (0.928)	4.88 (0.342)	4.34 (0.745)	4.33 (0.840)
(6) Priority rank in annual budget	3.76 (0.944)	<u>4.31</u> (0.946)	3.75 (0.866)	3.83 (1.150)
(7) Selection of the projects	3.52 (0.928)	<u>4.31</u> (0.602)	3.64 (0.780)	3.56 (0.984)
(8) Addition of the projects	<u>3.43</u> (0.870)	4.00 (0.966)	3.73 (0.624)	3.94 (0.873)
(9) Authorization just before implementation	3.71 (1.309)	3.75 (1.390)	<u>4.32</u> (0.857)	4.28 (1.179)
(10) Deliberation on each project	<u>3.67</u> (1.317)	4.25 (1.238)	<u>4.34</u> (0.776)	4.33 (0.767)
(11) Setting budget limit	4.29 (1.007)	<u>4.81</u> (0.403)	4.45 (0.848)	4.56 (0.705)
(12) Keeping budget limit	4.43 (0.598)	<u>4.44</u> (0.629)	<u>4.05</u> (0.680)	4.11 (0.832)

Note: Upper value = mean, lower value = (Standard deviation), the highest mean among 3 types is in half-tone and the lowest mean among 3 types is underlined, (if the difference between the highest and the lowest mean is more than 0.3).

Next, we examine capital budgeting by strategic type. In the medium-/long-term plan, Prospectors most respond “(1) register investment project” and “(2) write investment timing” and “(3) rank investment priority”, while Analyzers closely follow the practice of Prospectors, unlike Defenders. In the annual budget, although Prospectors similarly obtain higher mean values for these question items, Analyzers have as low a mean value as

Defenders. Between the medium-/long-term plan and the annual budget, Prospectors most often “(7) select investment project” and “(8) add new investment project”, while Defenders do so least often, and Analyzers are similar to Defenders. On this basis, it is clear that Defenders tend not to seek new investment projects, while Prospectors collect information and select projects well.

Analyzers most often “(9) authorize the project just before implementation aside from annual budget”, unlike Defenders and Prospectors. Analyzers need to evaluate and select the project just before implementation to seize market opportunities. However, Defenders and Prospectors complete project evaluation before deliberation, so authorization tends to be just a formality. Analyzers and Prospectors similarly place emphasis on “(10) deliberation on each project separately”, unlike Defenders. This means that Analyzers and Prospectors deliberate carefully on each project in order to enter new product market domains, while Defenders seldom do so because they operate in an existing product market domain. Finally, Prospectors most often “(11) set budget limit”, followed by Analyzers, and less like Defenders. Put differently, Prospectors and Defenders keep to a budget limit, unlike Analyzers. This is because Analyzers have to use their budget flexibly because they evaluate and select projects in the short term, while Prospectors actively manage investment projects.

6. Conclusion

Our principal motivations in this paper are that capital budgeting management must be affected by firm strategy and that capital budgeting should therefore be adapted to each firm’s strategy to improve business

results. In the analysis, we describe the capital budgeting appropriate for each strategic type by illustrating the differences in stance and purpose, management process and budgeting for the three strategic types in Miles and Snow [1978]. The major capital budgeting characteristics of these three strategic types are as follows. First, Defenders seldom search for new investment projects because they establish a stable status in a limited operational domain. Therefore, their main purpose of capital investment is to improve cost competitiveness. They then develop investment projects in their own way, and then thoroughly evaluate profitability following implementation.

Second, Prospectors continuously search for market opportunities, and evaluate and select projects in order to pioneer and to profit from new product markets. Thus, the main purpose of capital investment for these firms is to produce new products. In doing so, they address profitability and timing in the “Development” phase and carefully compare the alternative projects available. Finally, Analyzers deliberate carefully and optimally time investment to seize market opportunities using their existing technology. They are not aggressive in capital investment. We thus provide clear evidence that firm strategy affects capital budgeting management. Therefore, one potential future research topic is whether capital budgeting as fitted to strategic type leads to improvements in business performance. Although we leave this for future research, we briefly outline and discuss the return on assets for each strategic type.

Table 16. Average return on assets by strategic type

Return on capital	Defender	Prospector	Analyzer	Reactor	Total
4-year average (2005–08)	4.96% (3.97) 21	7.43% (5.03) 16	7.12% (4.51) 44	7.87% (4.93) 18	6.85% (4.61) 99
5-year average (2005–09)	4.16% (3.50) 21	7.20% (4.09) 15	6.22 (4.17) 43	6.81% (4.52) 18	6.03 (4.17) 97

Note: Upper value in row = mean, middle value in row = (standard deviation), lower value in row = number of sample firms.

Source: NEEDS Financial QUEST

As shown in Table 16, by comparing the 4- and 5-year average returns on assets, we can see that the Japanese economy moved into recession from 2008 to 2009 because return on assets was worsening, both across all firms and for every strategic type. However, for both sample periods, return was highest for Prospectors, followed by Analyzers, and then Defenders. We therefore must take some care because a difference in return does not necessarily imply some relative superiority or inferiority in strategic type. Instead, we assume that return would improve only if each firm were to undertake capital budget management in line with its strategic type. Furthermore, although we only emphasize the capital budgeting management matched with strategic type, there will be necessary capital budgeting management for every strategic type. For instance, Shimizu et al. [2008] have extracted the appropriate capital budgeting management that has led to improvement in firm performance. These considerations remain an important subject for us to explore.

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