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PROFIT OPPORTUNITY, STRATEGIC INNOVATIONS, AND MANAGEMENT ACCOUNTING

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Abstract

This paper reexamines the concept of profit in management accounting from the viewpoints of opportunity, profit opportunity, and strategic (feed forward) innovation. The information required today for strategic management and performance evaluation has become distinct from accounting profit information required for traditional management, given the current transitory and uncertain business environment. However, management accounting cannot exist without profit. Therefore, this paper seeks to examine the source of profit and clarify the profit opportunity-based aspects of contemporary management accounting through the analysis of opportunity, profit opportunity, and strategic innovations. For this purpose, the paper first addresses the relationship between opportunity and profit opportunity. Second, in association with management accounting, it seeks to understand current innovations intended to enhance profit opportunity. Thirdly, effects of innovations and profit opportunity on target costing in Japan are discussed. Lastly, this paper develops profit opportunity-based variance analysis that is useful in feed forward planning and feedback control processes. Increased use of strategic innovation management is found to yield more useful variance analysis and strengthen the strategic feature of management accounting, which can contribute to future innovation in management and help objectively recognize and reduce opportunity costs.

Keywords: Uncertainty; profit opportunity; strategic innovation; profit opportunity-based variance analysis

Introduction

This paper aims to reexamine the meanings of accounting profit as management information and its use in feed forward management, which is a critical subject in contemporary management accounting. Therefore, the paper investigates the source and process of profit creation retroactive to opportunity, rather than the measurement and usage of accounting profit, in order to adequately address contemporary problems of management accounting.

Management accounting is a cognitive and control activity that uses accounting concepts and calculation methods (Nishimura, 2003). It uses feedback information such as accounting profit, assets, liabilities, revenues, expenses, costs, and capital in order to plan for and control the long-term future of businesses. Although accounting information is truly objective and reflects past economic phenomena through accounting methods, it is irrelevant to decision-making and performance evaluation given that the present economic and political situations completely differ from those in the past, and the business environment is characterized by strong uncertainty, complexity, and unknown/uncontrollable situations. Feedback accounting information must also join hands with feed forward information on future changes in the business environment to be useful for proactive management in which an enterprise tries to cope with a changeable and uncertain future business environment. In the current environment, in which management accounting must integrate feedback information with feed forward information, we are confronted with several new issues that businesses must address.

These problems cannot simply be resolved by adding supplementary physical or economic information to accounting information. The value of such information is not disputed, but the source and process of creating profit information have remained controversial in contemporary management accounting, since management accounting cannot fulfill its function independently from the concept of profit. Management accounting cannot be separated from accounting profit, and cannot depend upon only its own data and its value. Therefore, the paper seeks to examine the sources and processes of profit creation and develop a scheme of management accounting in which feed forward information is combined with financial accounting

or feedback information. Thus, the paper makes an attempt to address key issues in the future of management accounting.

A previous paper (Nishimura, 2011) clarified the relationships between uncertainty and profit, entrepreneurship activities involving profit creation, and the efforts in management and financial accounting to control uncertainty in the business environment. The importance of understanding the profit management cycle, from opportunity through profit opportunity to accounting profit, was also pointed out in the prior paper. Consequently, in this paper we will explore *how* it is that *entrepreneurs* can recognize and exploit opportunity in an uncertain environment where there are unknown and uncontrollable factors, known but uncontrollable factors, or controllable but unknown factors, and *how* to transform such an opportunity under uncertainty into a profit opportunity with some degree of probability. Thus, the paper first classifies opportunity and profit opportunity into clear categories; second, it investigates practical innovations to exploit profit opportunity; and lastly it presents a vision of contemporary management accounting that makes use of profit opportunity-based variance analysis.

Opportunity and Profit Opportunity

Opportunity is slippery and vague because it exists in uncertainty and is unlimited in space-time. In reality, opportunity lies in chaos (Hopkins, 2011). Thus, enterprises do their best to discover and exploit opportunity in chaos. However, opportunity, in the general and ambiguous sense, is meaningless for businesses and it must take a definite form with some degree of probability because an enterprise has definite expectations of profit creation or enhanced business value. Opportunity does not take a deliberate form until such an enterprise's expectations are closely combined with some objective conditions and its organizational structure (resources, technology, and human power). Such a combination can be conducted in a completely unknown and uncontrollable situation, in an unknown but a controllable situation, or in a known but uncontrollable situation. The difference between opportunity and profit opportunity is quite similar to the difference between 'exploration and exploitation' that March (1991) discusses: "compared to returns from exploitation, returns from exploration are systematically less certain, more remote in time, and organizationally more distant from the locus of action and adaption" (p. 73).

Opportunity must emerge in a special form in space and time for an individual enterprise, even though its actualization cannot be confirmed (Grègoire, et al., 2010). Under this situation, the enterprises assess not only the business environment (e.g., competitive markets), but also their own technology, resources, organizational competence, and development potential (hereinafter, collectively referred to as *organizational structure*) to discover, affirm, and exploit the opportunity. Such space-time limitations on opportunity are so difficult that the activity of addressing these factors is regarded as a special attribute of the *entrepreneur* (Shene, 2000; Nishimura, 2011), since it depends on prior experience, knowledge, and special intelligence in terms of the ability to foresee the opportunity and provide leadership in exploiting it. Shane (2000) thinks of opportunity from the two perspectives of discovery and exploitation, and attaches importance to the former. Because of discovery, an enterprise can connect new technology with the creation of new processes, new products, new markets, and new strategies. It is the *entrepreneur* who has sufficient useful knowledge and experience to discover and exploit opportunities. However, even if such is the case in theory, how can opportunities be searched for, discovered and exploited? In regards to this question, the theories of Simons and Haynie provide valuable insight.

Simons' concept of 'opportunity space'

Simons (1995) may be the first scholar to systematically analyze the relationship between opportunity and strategic management from an integrated viewpoint of strategy and the subsequent initiative of an organization. According to him, *opportunity space* is "the unique set of opportunities that [an] organization can potentially identify or create at a point in time given its competences and resources" (p. 16). Opportunity does not have any meaning for Organisations until it is transformed into special business value. Simons also refers to *organizational attention* as "the allocation of information processing capacity within the organization to a defined issues or agenda," which leads to the optimum distribution of attention in the organization. As a result of this allocation, an organization can maximize, not return on investment, but "return-on-management" (ROM). In other words, ROM represents the advantageous opportunity that is produced by combining organizational attention with the most critical opportunities.

As he describes, "effective managers use control systems effectively to balance the inherent tensions between (1) unlimited opportunity and limited attention, (2) intended and emergent strategy, and (3) self-interest and the desire to contribute" (p. 28). Then, he gives a detailed account of "the four levers of the control," which he examines on the basis of opportunity and in reference to organizational attention and value creation (ROM). Therefore, his analysis of control can be seen as wide-ranging and up-to-date, and provides clarification to the relationship between opportunity and control in business management. The features of "opportunity space" have a close relationship with the resulting types of innovation (Kornish and Ulrich, 2011).

Haynie's concept of evaluation

Haynie et al., (2009) inquire more deeply into the discovery and exploitation of opportunity from the viewpoint of intelligence, and highlight the importance of "evaluation" in recognizing "valuable economic opportunity" (Haynie et al., 2009). In their paper, Haynie et al. summarize the relation between opportunity and resources as follows:

We are not suggesting that opportunities *are* resources, but instead we suggest that for entrepreneurs engaged in opportunity evaluations, it is likely that the content of opportunity evaluation decision schemas is focused on both the resources at hand and the resources that must be marshaled (not currently under the firm's control) in order to exploit the opportunity under evaluation. Such resources can be intangible - such as new knowledge or organizational routines- or tangible outcomes that may generate the promising new goods and services that can be sold at greater than cost of production. (p. 341)

In order to convert opportunity into valuable economic opportunity, entrepreneurs must first recognize it in a tangible and visible form and specifically note how the opportunity relates to current and future resources.

According to their analysis, business management should deal with opportunity from the viewpoint of a cause-and-effect relationship, in which the cause is the situation of an opportunity and the effect is "the future-oriented outcome envisioned by the decision maker" (p. 340). Thus,

evaluation is a useful means to match a valuable economic opportunity with current and future resources.

Condensation

From the two theories discussed above, we can see the importance of "opportunity space," where opportunity is combined with resources and competences, "organizational attention" and the four levers of control in maximizing the creation of ROM. Further, it is evaluation of valuable economic opportunity that makes the combination of opportunity and current and future resources possible. Valuable economic opportunities are future-oriented, resources-related, and value (or ROM)-creating. To achieve value for organization, opportunities cannot exist as general and abstract concepts, but instead must be synthesized for business outcomes with some degree of probability. It is appropriate to name such opportunities as "profit opportunities."

Opportunity space and valuable economic opportunity transform unclear and vague opportunities into comprehensive, fully formed opportunities in business management. Moreover, attention and evaluation take opportunities closer to being profit opportunity. In actuality, entrepreneurs may tacitly imagine profit opportunity at this stage, and most researchers have also studied methods to transfer opportunity into profit opportunity from various angles, even though they may not have consciously sought to do so (Gruber et al., 2008; Shane, 2000). Profit opportunity is limited in time-space and should be considered opportunity with a certain probability (Morris, 2005), which requires synthesis and systematic evaluation in relation to the business environment and *organizational structure* (technology, human and organizational strengths, resources, competencies, etc.). At the same time, it is clear that profit opportunity is closely related to strategic innovation based on current and future resources. In particular, innovation for exploitation converts opportunity from a general and vague form to a concrete and profitable one, although it should be noted that innovation is closely related to both the discovery and exploitation of opportunities.

As examined above, opportunity has been examined from the viewpoints of discovery and exploitation, and the importance of its identification to creating profit opportunity has also been discussed (see also, Reuer and Tong, 2010; Gruber et al., 2008; Shane, 2000). It may be better for enterprises

to identify the optimal opportunity from a set of diverse opportunities, rather than to pursue several opportunities early on, since pursing a single opportunity more easily leads to exploitation (Grégoire, 2010). However, an enterprise must dedicate much time and resources for the investigation of opportunities to discover the single optimal opportunity, even though their prior experience and knowledge certainly play an important role in the discovery process. Moreover, profit opportunity is synthetic in terms of profitability and the results from synthesizing diverse opportunities depend on organizational structure, since opportunities such as potential revenue, technology development, and cost reduction are not connected directly with profit opportunity (Nagaike, 2010). The concept of profit opportunity becomes clear in contrast to risk in terms of probability by virtue of 'opportunity space' concept and in its relationship with organizational structure. It, with risk concept, enables entrepreneurs to evaluate and manage future innovations by combining them with management accounting.

Opportunity is a fundamental key to grope about in the dark for a new innovation and is transformed into profit opportunity, when opportunity is concretely combined with information system and organizational structure under the specified environment from the angle of profitability. On the basis of this profit opportunity, senior managers decide on a profit plan (planned profit) for business directions, which presents a feasible and periodical business value. Moreover, when the innovation process actually starts, the planned profit becomes control indicators to actualize the process and standards for evaluating performance. Figure 1 reveals the relationship between innovation, profit opportunity, and accounting planned profit on the basis of what we have described.

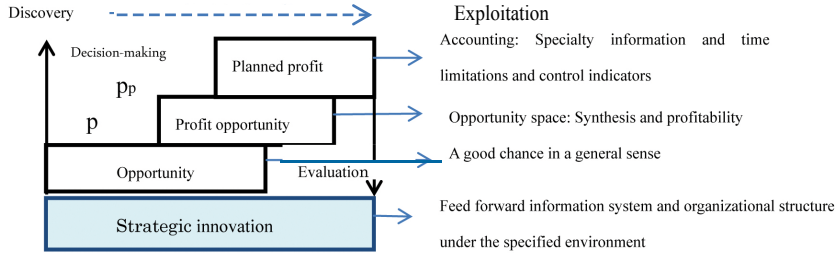


Figure 1: Relationship between Innovation and Opportunity

With regard to practical development of feed forward innovation or strategic innovation, the next section of the paper will more deeply pursue this process and the contents of innovations that increase the probability of success in the uncertainty of the real business world, in other words, the practical transformation process of opportunity into profit opportunity.

Strategic Innovation and Profit Opportunity

Profit opportunity-oriented management and accounting is a new phenomenon in the contemporary business environment with strong uncertainty and diversity. Traditional management and accounting could surely forecast future business opportunity assuming the continuation of the present situation. Generally, in relatively stable markets, enterprises mainly adopted mass production or cost control techniques to implement effective and efficient management. Such traditional innovation as the conveyor system and standard cost management was based on feedback information and control methods. However, new concepts and management innovation began to emerge in the 1970s. These were completely different from the traditional methods following the oil crisis that pushed many countries into a full-fledged recession and the spread of financial liberalization throughout the world economy.

In particular, Japanese manufacturers who had previously received strong government protection in trade and finance had to establish their international competitive advantage by implementing new innovations. They broke free from the trade-off thought of cost and quality assumed in traditional management processes to create an integrated approach that achieved high quality, low cost, and timely delivery, which allowed for the discovery and exploitation of profit opportunity, and the successful combination of opportunity with current and future resources. This shift began the use of strategic innovation with the aim of discovering and exploiting profit opportunity by preventively and proactively using forward-looking information and developing production and management systems such as closely united supply chain and subcontracting systems differently than under the traditional methods of innovation. The international business society has developed new types of strategic innovation with the Japanese methods of production and management representing a turning point in the formation of agile supply chain management (external innovation) and rise

in global innovation (open external innovation) (Nishimura, 1997; 2003; 2005; 2007).

Japanese production and management systems: lean production

Toyota Motor Company, representative of the Japanese type of management, opened a new path of strategic innovation that has been pursued since the 1960s: innovation to create and serve new markets without excess capacity or supply. This production and management system is characterized by the creation of demand in markets though the original development of new technology, and by closely united supply chain (subcontracting system), total quality control, and visible management in the internal Organisations of the company. This system is also distinguished from the traditional systems of innovation by the use of preventive and proactive feed forward information (target cost) and control systems (continual cost improvement). The traditional system started to reveal its brittleness under the severe uncertainty and complexity of global markets in the 1970s. Toyota adopted strict methods such as just-in-time (JIT) and made-to-order production to eliminate the risks of excess capacity and inventory, which contrasts with the mass production and optimal buffer stock systems in the traditional methods of innovation (Nishimura, 2003).

Many Japanese companies have adopted this system as a model and globally expanded into new markets. Foreign companies have also introduced these systems to strengthen their competitive advantages. The Toyota system has come to be known as "lean production." Considered from the perspective of uncertainty, this system aims to exploit profit opportunity and control uncertainty by developing unique technology and management systems and promoting self-reliance on an internal supply chain (subcontractors or *Keiretsu*) within the company. Many firms who introduced lean production could enjoy their competitive advantage for a while because of the closed and feed forward attributes of its management and production system.

However, the benefits vanish and the system becomes a hindrance when the aspirations of executives to expand globally to new markets go ahead of new innovations. As a result of such decision-making, excess investment and inventory in the supply chain can result before the creation of the new markets themselves. Over-investment and over-supply break down the

fundamental structure of this innovation, particularly when orders become stagnant and market demand shifts, since lean production always relies on made-to-order systems and tight methods and is only effective when there is growing demand in global markets. The enterprises that adopt lean production often puzzle over the high costs that result from over-investment and excess inventory in the supply chain. If their subjective and immoderate expectations of demand in new markets and goal of being the worldwide sales leader are disjointed from reality, the benefits of closed self-reliance of innovation and the supply chain cannot be achieved (Nishimura, 2011).

Recently, many Japanese manufacturers have again been hindered by uncertainty in the marketplace. The self-reliant innovation does not fulfill its function when the market suddenly changes and demand decreases, particularly when executives cling to subjective and immoderate goals that disregard the changing situation in the global markets and their limited innovative ability. Lean production can have a strong advantage in global markets, as long as an enterprise can continue to develop their own technology and production and management systems that reflect how markets respond to their products. However, in global markets a wide variety of demands can be found, with some markets fond of standardized articles with low quality and low price, whereas other markets are lean toward environmentally friendly or charitable goods even at higher prices. Moreover, the diversity and complexity of global markets change every day. In such a global market and strong uncertainty, self-reliant innovation has its limit to discover and exploit profit opportunity globally. Under such conditions, self-reliance must shift to external innovation.

External innovation: agile supply chain systems

In contrast with self-reliant innovation and the internal-company supply chains (internal innovation), agile supply chain systems tend to absorb changing demand in global markets through the use of flexible networks of supply chains and site-based communication. Such a system can be seen as external reliance of supply. An agile supply chain consists of many independent suppliers who share common information and goals and participate in a common networked system (2). The manufacturers of finished goods can flexibly respond to rapid changes in demands by introducing such flexible supply chains and modular production systems to quickly and

flexibly produce goods tailored to meet the needs of customers. Thus, the flexible response of open supply chains in changing markets and site-based communication play an important role in agile supply management. Actual customer requirements are captured by "direct feed-forward methods" and "virtual supply chains" that are composed of "geographic capacity allocation" and globally concentrated capacity based on "collaborative demand planning" with customers, rather than feedback methods such as production orders based on market forecast information (Collin, 2006).

According to Rimienè (2011), supply chain networks must become more global and intricate in the contemporary business environment, as the level of market uncertainty increases. Specifically, uncertainty is driven by the increasing occurrence in the market of intense competition, short life cycles of goods, ever-changing demand, and unreliable suppliers. Consequently, changes in markets are too complicated to easily plan for and control risks and uncertainty. Thus, "enterprises no longer control all resources, necessary for full satisfaction of market demand. The companies noticed that agility is the essential condition for their survival and competition" (Rimienè, 2011). Rimienè insists that agile manufacturing is required to effectively respond to unexpected rapid changes and uncertainty in the market through a combination of flexible innovation with lean production systems.

In agile supply chain management, the close relationship between the assembler and constituent members of the supply chain is very important to flexibly respond to the short-term change in demand in markets. The assembler should equip itself with singular designs, technological capabilities, sales strategies, and a large network of suppliers, whereas the supplier should always produce "standard parts and components" or "standard semi-finished products awaiting final assembly or localization" for the assembler. Suppliers must also always share common goals and information in the network. For this purpose, the assembler should give "the necessary technological, financial, logistical support required to achieve stringent time and quality targets" in order to flexibly cope with sudden changes in demand, "although production is always kept at a level slightly below expected sales to keep the stock moving." (p. 41)

Agile supply chain management adopts closed but broad supply chain networks and modular production to flexibly respond to changing markets and to control for uncertainty, which allows opportunity to be transformed into profit opportunity. As Christopher and Towill (2000) point out, "it has also become apparent that markets today are increasingly volatile and hence less predictable and so the need for a more agile response has grown." Therefore, speed and flexible response to volatile markets, modular production, and shared global information and goals play an important part in agile supply chain management. Naylor et al. (1999) define "agile" as follows: in contrast to "lean" production, agile production aims to develop a value stream by eliminating all waste, including time, and to ensure a *level* schedule; "agility means using market knowledge and a virtual corporation to exploit profitable opportunities in a *volatile* market place." Christopher focuses on the flexibility of agile supply chains more than their speed. Therefore, this production system is favorable for low volume production of diverse products, because it relies upon "multiple levels of inventory between the parts of production and final market place, and its high variability and low volume against low variability and high volume in lean production." Certainly, "agility is a business-wide capability that embraces organizational structures, information systems, logistics processes, and in particular, mind-sets" (Christopher, 2000, p.37).

Agile management made the increasingly global discovery and exploitation of profit opportunity possible by using external supply chains (external innovation) and site-based networks rather than the Japanese type of production and management. The "opportunity space" of global, agile management systems is wider than that of the relatively more closed Japanese systems. Thus, agile supply chain management seems to overcome the problems of lean production and to build upon its strong points. However, implementing total inventory management and ensuring the mutual benefit of both assembler and suppliers remain key issues to be resolved in the case of external innovation. Even though there are advantages for the assembler, suppliers in an agile production system may suddenly face excess inventory when their parts and components are not useful to meet changing demand in the market.

Finding the balance between the optimization of the whole system and the benefits to individual members is the crux of the problem in agile supply

management. Thus, innovation shifts from external to global innovation in order to actualize profit opportunity more globally in terms of individual and social optimization. However, the boundary between external and global innovations is so ambiguous that some companies that introduce agile supply management are also considered as examples of companies implementing global innovation. For example, Nokia, a leading mobile phone supplier in Finland, and Dell, an American multinational computer technology company, have been viewed as representing agile supply management and global innovation. At the same time, lean production and agile supply chain management are not mutually exclusive and can be complementary (Christopher and Towill, 2001; Naylor et al., 1999). However, it is more critical in this paper to define the conceptual difference of the three innovation types than to classify companies as practicing one of the three types.

Global innovation

Social upheaval and financial crises are consistently present, and yet their impacts have become more severe and their reach more global. Consequently, the fundamental contradiction between production and consumption, discussed in the previous paper (Nishimura, 2011), touches upon the fact that uncertainty in the market is world-wide and is intensified by the global synergism of financial manipulation and universal information network. Uncertainty becomes stronger and more severe in individual enterprise. Although the increase and diversification of consumption are accelerated by the globalization of consumer financing and information networks, manufacturers are also unsettled by the short life cycle of goods, sudden changes in demand preferences, and changing purchasing power. Under these conditions, lean production and agile supply management are insufficient for the global discovery and exploitation of profit opportunity. Some enterprises have started to adopt global strategic innovation that relies upon open innovation and an open business model (Chesbrough, 2003; 2007).

Global companies have globally and socially introduced innovation and business models that other companies and individuals developed and are developing and also leave their own innovation and models open to global society. As a result, the companies can develop global innovation to discover and exploit global profit opportunity and transform them into marketable

products by using unlimited supply chains and global information networks. The openness and socialization of this innovation differ from the limited and closed features in lean production and agile supply chain management.

Global innovation, which is also called "open innovation," "structural innovation," or "strategic innovation" (Chesbrough, 2003; 2007; Govindarajan and Trimble, 2004), is characterized as the usage of "crowd wisdom," "social embedded innovation," or "global network" (Simanis and Hart, 2009). The Nintendo Wii platform resulted from people and third-party companies that were interested in "acquiring certain skills" for developing software "by participating in the innovation process" or by the "desire to advance a technology" (Boudreau and Lakhani, 2011). In recent times, the exchange of innovation among rival companies has become a daily occurrence internationally, as these companies seek to increase profit opportunity compared with their common rivals. For example, NTT Docomo, Fujitsu, and other Japanese electronics companies cooperate with Korean Samsung, a strong rival to them, to establish a new company that develops, designs, and promotes the sale of core semiconductors for next-generation smartphones. However, within this consortium, the manufacturing of products is outsourced (Nikkei, 2011).

Dell has become one of the most successful personnel computer manufacturers, "not through P&D investment, but by making PCs easier to use, bringing products to market more quickly and innovating on process like supply-chain management, manufacturing and direct selling" (Sawhney et al., 2011, p. 29). The main point of global innovation is to find and exploit profit opportunity worldwide and give priority to the latent profit opportunity that exists in an unknown and uncontrollable environment. Therefore, many enterprises have recently shifted from lean production through agile management to a global innovation model or have developed their own hybrid systems. Global innovation also relates to embedded innovation of Organisations, such as charitable or environmental activities, in which global knowledge, resources and competence are used in relationship with wide stakeholders outside of companies from the perspective of long-term growth (Simians and Hart, 2009).

The fundamental difference between lean production and agile management is to set up "open space for global innovation" inside and outside a company,

particularly through the Internet, in order to socially exchange various ideas, technologies, and designs. Such global innovation is also a "space of global profit opportunity" that is fundamentally consumer-oriented, and has attributes such as speed, variation, diversity, and flexibility. Enterprises organize supply chains, manufacturing processes, resource and technology arrangements, and logistics on the basis of what was discussed and decided through debate in the open space. An example of the use of the online space is IBM arranging a 72-hour "innovation Jam" on its corporate Internet where its employees, clients, and partners could debate about "new business opportunities" (Birkinshaw et al., 2011, p. 4). At the same time, the company donated "500 of its software patents to the open source community" (Chesbrough, 2011, p. 72). Another example is Grameen Bank in Bangladesh, which successfully introduced the "village banking model" to combine villagers' unique knowledge, insights, and perspectives with profit opportunities through micro credit (Simanis and Hart, 2009, pp. 9-10).

The standardization and simplification of parts and components are also common features of external and global innovations, in spite of different conceptions of the opportunity space. Nissan Motor Co. in Japan adopted a policy to "develop a line of cars and sport utility vehicles with markedly different styles, performance and market positioning" based on a common set of components (Sawhney, 2006, pp. 30-31). The apparel retailer Zara in Spain made "counterintuitive choices in sourcing, design, manufacturing and logistics" and created "a fast and flexible supply chain." Zara did not adopt the full outsourcing of production, but rather retains half in-house in order to "locate its manufacturing facilities closer to its markets to cut product lead time." The company favors "small lot" production and "a plethora of designs" to economies of scale, allowing it to "refresh its design almost weekly" (Sawhney, 2006, p. 32).

Finally, open external innovation tends to strengthen durable business growth by distributing the outcomes of innovation to the stakeholders involved in the discovery and exploitation of new profit opportunities. Komatsu Co. in Japan, a manufacturer of machine tools, developed "a machine tracking system" that can remotely control information on the operating situation and hours of Komatsu-made construction machinery, and monitor the amount of fuel remaining through the Internet by using GPS satellites and mobile communication. The company can use the information from

one-hundred thousand machines input into this system to forecast future demand and production and to plan future inventories. Further, Komatsu gives their customers this information to promote new profit opportunities by providing opportunities for fuel savings and cost reductions to them. The company also holds a "Technical Skill Competition" every year, in which 200 individuals participated, including more than 46 foreigners representing nine countries (Nikkei, 2011).

As the space of global innovation expands and the opportunity space enters into unknown and uncontrollable areas, the feed forward capabilities in facilities and organization and the corresponding costs must also be large. Therefore, the evaluation of profit opportunity plays an important role in global innovation.

Strategic Innovations and Target Costing

The three innovations and the creation of profit opportunity

As stated above, enterprises have continually exerted themselves to discover and exploit greater profit opportunity in order to cope with the strong uncertainty and complexity in the world economy. With regard to this issue, we have clarified the development process for innovations involving opportunity, including internal innovation, external innovation, and global innovation. However, this is also a process in which global companies compete to discover and exploit profit opportunities and, for this purpose, have established feed forward, or strategic mechanisms of innovations including global information and networks, as well as new production, supply chain, and management systems.

Table 1: The Feed forward Systems of the Three Types of Innovation

Type	Production/ management system	Information/ network system	Features	Opportunity pivot
Internal innovation (Toyota system / Lean production)	Just in time (zero inventory); made to order; total quality management; continuous improvement; cost design; closed subcontractor system	Visible management (Kanban); shared goals and norms of all members in organization	Market creation through integrated products of low-cost and high-quality	Internal development of technology and organizational structure

External Innovation	Agile supply chain; integration of modular production and flexible supply chain to respond to changing market conditions	Site-based shared information, goals, and networks among suppliers; concentrated design and strategy by the manufacturer of finished products	Mobility and flexibility of market-oriented supply chain and site-based information systems	Market-oriented supply chain and the production of standardized parts
Global innovation	Social and open innovation including embedded innovation; open modular system; relations with external stakeholders (shared development and usage of technologies and resources);	Globally and socially shared information and outcomes shared by participant	Global creation of profit opportunities; latent potential profit opportunity is defined and resources allocated prior to the opportunity	Global development ability; simultaneous dispersion and concentration of profit opportunity

Uncertainty and probability in the real world can be schematized in a matrix of known, unknown, controllable, and uncontrollable factors. Perfect uncertainty fundamentally exists where one cannot know and control at all, whereas some degree of probability is possible through the use of knowledge and information or the development of control methods and technologies. The shift from internal to external innovation is to search for the latent opportunity potential that is hidden by uncertainty. In lean production and management, a car company could gain market share by developing a new production and control system, including target costing, where low costs are integrated with high quality, because no other firms would be privy to this information and would be left with the existing trade-off between cost and quality. Agile supply chain systems aim to promote flexible and speed responses to unknown future market changes by the reorganization and cooperation of a known supply chain.

In practice, the three innovations become intertwined with one another, and no one can decide the best of the three with certainty because of the difficulty in measuring the true cost of strategic innovation and the amount of profit opportunity. However, every enterprise should reexamine and reform their existing framework of management accounting and researchers should also thoroughly probe the relationship between accounting profit and uncertainty.

Transfiguration of target costing in Japan

Now that we inquired into the three strategic innovations in connection with the creation and exploitation of profit opportunity, the next step is to examine how they have impacted on management accounting and its changes. Unfortunately, a new model of management accounting based on profit opportunity and risk management was not yet established. However, it will go to the core of the above problem to investigate how target costing (cost design: *Genka Kikaku*) in which target profit and target cost take a leading role in cost management has transfigured in Japan according to the development of the innovations, because this costing was established as 'a feed forward mechanism' (Cooper and Slagmulder, 2004) and 'a proactive cost reduction tool' (Shank and Fisher, 1999) in company with the internal strategic innovation. Some transfigurations of target costing in global innovation will be clarified through analyzing present target costing practices, although the costing have not assumed a new form appropriate to the global innovation in spite of efforts such as 'J cost theory' (Tanaka, 2008; 2009) and life cycle cash flow accounting based on time (Kawada, 2009). Our recent research suggests some different aspects from what it used to be in Japan, which have resulted from the internal to the global innovation.

A questionnaire was administered to 850 Japanese listed companies in Tokyo Stock Exchange in November in order to investigate 'target costing in the era of global management'. Although 12 replies were returned and were not many enough to define the whole characteristics of Japanese companies, we can throw some light on the content and meaning of present target costing by analyzing them as case studies with reference to more detailed data of Annual Securities Reports. The list of their employee number, sales and industrial sector is shown in Note (3) at the end of the paper.

11 companies answered 'effective' in Japanese factories in response to the question that asked whether target costing was even now effective or not. Of the 11, nine companies said it was also effective in Asia, and it was also effective in seven companies in Europe. Companies that did not answer had no factories there. Although target costing seemed to be effective in Japan, ten companies, including one company, which had adopted activity-based standard costing, planned to change it into target costing in future, answered ' newly improve its existing method' in the future. D and I companies whose target costing was 'fully effective' in Japan and Asia affirmed that it was

useful for not only competitive advantage, profit planning, and cost planning, but also the establishment of employees' cooperative relationship. They also intended to consider its improvement in connection to different cultures, environments and customs in foreign countries. I company connected it with product life cycle costing (LCC) at the stage of materials and components purchase and product manufacturing process and at the same time was concerned about 'consumers' needs': reduction of maintenance and repair costs. E company whose target costing was fully effective in Japan and comparatively effective in Asia gave an affirmative answer that it was useful for cost reduction and competitive advantage in Japan and for the establishment of employees' cooperative relationship and competitive advantage in Asia, too. The company planned to further improve it from the viewpoint of LCC.

G company whose local factories in Asia implemented their own local management and which adopted target costing only in Japan for profit planning and cost planning used LCC at the stage of product manufacturing process to make decisions about competitive price, reduce cost, and evaluate the total profit of a product life cycle. Among C, E, G, K, and H, which connected target costing with LCC, E and D also implemented it for competitive advantage. C company made use of LCC not only for competitive price decision and cost reduction but also for environmental consideration and the shortening of product life cycle.

As stated above, the focus of target costing shifts from cost reduction and the shortening of lead time through Kaizen (continuous improvement) which is a distinctive feature in the original mode (Cooper and Slagmulder, 2004; 1999; Shank and Fisher, 1999) to a stronger aspect of strategy in terms of competitive pricing and the profit planning of a new product. The combination of target costing with LCC, whose application extends from internal costs (development/design cost and production cost) to external costs (user's and social costs and disposal/recycle costs), also intends to quickly respond to changing market needs and complexity by shortening product life cycle (Nakajima, 2004; 2011), and to adopt competitive differential pricing policy. Regarding competitively differential pricing, Seiko Epson Corp. which produces ink-jet printers with short life cycle, sells a printer at a low price in price-competitive areas and make up for its low profitability by selling ink-cartridges as consumption articles at a

comparatively high price during its useful life, while it sells a printer with big ink-tank at thrice the price of the above area in developing countries. The analysis and evaluation of product life cycle profit may play an important role in competitively differential pricing. (Nikkei, 4, 12, 2012; Annual Securities Report: Seiko-Epson Company, 2012) We must also pay attention to the connection of target costing with LCC at the level of materials and components purchase and product manufacturing process. The recognition of total profit of product life cycle not only captures 'information on social benefits and external opportunity costs' (Mei Lin, 2011), but also works well to reduce these costs for marketing.

Table 2: Ratio of each cost element in total manufacturing cost (%)

Company	A	B	D	E	H	K	J
Material costs	96.1	37	56.7	72.4	75.5	65.9	59.1
Labor cost	3.5	19.2	19.4	14.1	11.1	22.2	18.8
Other manufacturing costs	0.4	43.8	23.9	13.5	13.4	11.9	22.1
(Expenses arising from outside manufacture)	(32.5)	(16.8)	(1.5)				

Source: *Statements of Manufacturing Cost*s in *Annual Securities Reports of Seven Companies (2011 or 2012)*, Ministry of Finance Japan

As shown in Table 2, the ratio of material cost and expenses arising from outside manufacture amounts to about 60~95 % of total manufacturing cost and global companies should develop global supply chain management and supply chain costing in target costing. These costs must also be taken into consideration beforehand, keeping step with strategic profit planning. In Fuji Zerox Company which has its production base in China, the estimation and portfolio of suppliers' costs are an important part of target costing at the case of developing a new product and also fulfills its function as a benchmark in cost management in overseas factories after going into mass production (Orita, 2012).

We can see from the above that target costing tends to focus on competitive pricing and strategic profit planning more strongly in connection with

LCC and supply chain costing. With respect to our matter, this focus is closely related to the finding and exploitation of profit opportunity. With reference to these target costing practices, the paper can tentatively propose a theoretical model of profit opportunity-based variance analysis from the viewpoint of strategic innovation management. Fundamentally, the closer the planned profit comes to profit opportunity, the more it is of an advantage to strategic innovation. Profit opportunity-based variance analysis also plays an important role in feedback management in order to reduce opportunity costs in the next period. Before turning to a closer examination of profit opportunity-based variance analysis, the two following remarks should be made concerning the relationship with target costing.

First, if target costing is closely connected to the profit opportunity-based variance analysis, it will become more strategic and play an important part as strategic target costing in the process of strategic innovation. Secondly, a product does not have only its inimitable target cost, but has manifold target costs according to different functions and price structures in different areas. The best among these target costs will be decided on the basis of differential profit opportunities in each area from the viewpoint of global innovation. At the same time, based on this target cost, cost management is also implemented in multifarious forms.

Profit Opportunity and Profit Opportunity-based Variance Analysis

Meanings of profit opportunity-based variance analysis

Regarding profit management, accountants have long recognized opportunity cost as a benchmark measurement (Samuels, 1965; Demski, 1967; 1968; 1969). According to Demsk's model (ex post system), forecast profit variance is measured by a comparison of ex ante (forecast profit) and ex post profits (the optimal profit in the current situation), and as a result, the planning ability of a manager can be evaluated. These concepts can be expressed in the following equations:

Ex ante profit – ex post profit = forecast variance
Ex post profit – actual profit = opportunity cost variance

Managers have incentives to precisely forecast profits and risks in future periods through such variance analysis. Next, Organisations attempt to

use opportunity cost variance information by comparing the ex post profit with the observed profits and to generate business value through efficient activities and a high degree of capacity utilization in the next period. As a result of such analyses, they can also foresee the nature of risks and subsequently adopt methods to mitigate them. Currently, such a model as this is usually considered to be mainly of theoretical interest, although many managers probably already informally control opportunity in this manner, even though the analyses may not be conducted in a systematic way.

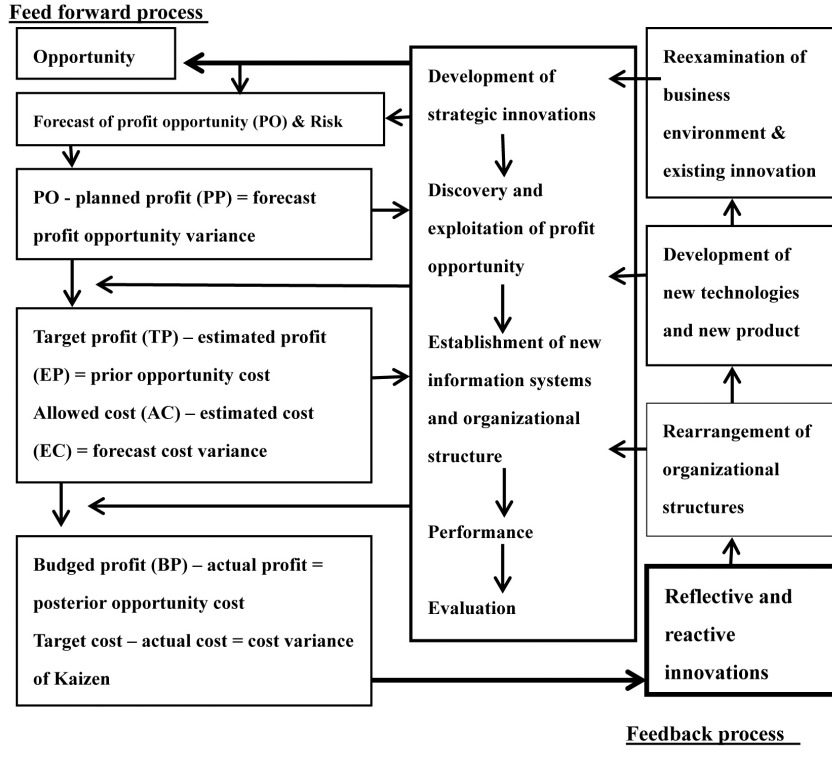
The ex post system described above relies on feedback control. The forecast variances of opportunity cost are recognized after the event. Furthermore, ex post systems advocate a simple feedback model that contrasts with the double-loop feedback of BSC (Kaplan and Norton, 1996). In order to proactively develop profit and risk management as part of a systematic approach to strategic management accounting, it is necessary to adopt an integrated cycle of feed forward and feedback control, because profit opportunity and risk must be preventively and proactively controlled before the event.

The present object is not to pursue this ex post optimum, but to discover and exploit profit opportunity and control risk and opportunity cost beforehand. This integrated cycle in strategic management accounting is necessary for this purpose. However, some elements in the integrated cycle of feed forward and feedback controls are suggested by the approach of the ex post system and Japanese management through *Genka Kikaku* (cost design), which embodies feed forward control and the importance of the planning process during the cost design stage. Such considerations are very important for proactive and preventive project management.

Profit Opportunity-based Variance Analysis in the Integrated Cycle of Feed Forward and Feedback Management

The application of feed forward information to management accounting has been discussed elsewhere (Nishimura, 2003; 2011). This paper therefore focuses on integrated information on target profit and costs and profit opportunity-based variance analysis in a development process of innovation, as embodied in a strategic viewpoint (see Figure 2).

The cost design which Japanese enterprises created in the 1970s made it possible to develop feed forward control in accounting. As shown in Figure 2, which extends this framework, this feed forward approach to control at the cost management stage is not designed to reactively reflect on profit opportunities and risks after they occur, but to accumulate long-and short-run information on innovation related to the business environment and organizational structure and to synthesize this information when possible. Information gathered in such a way is connected to multi-dimensional, planned values (target and budgeted profits, allowed costs and target costs based profit opportunity and expected risks) that reflect long-term strategic and short-term competitive plans, and business can proactively adopt the most suitable methods to realize practical target values. Senior managers can thus compare an annual target profit based on long-run strategy with estimated profit based on actual competition, and through preparatory variance analysis, decide budgeted profit and adopt preventive and proactive methods to better ensure that a satisfactory profit is realized. At the profit forecasting stage, they may also compare the target risk avoidance with the estimated risk avoidance at the same time as the comparison between target profit and estimated profit. In this way, preparatory variance analysis and preventive and proactive methods can be used to mitigate risk and enhance profit opportunity. Additionally, attention should be paid to the fact that all the variances in this model are measured in relation to profit opportunity and risk, and that the model also evaluates and controls methods to improve profit opportunity proactively and preventively. This relationship can be schematized as follows:



*TP is calculated by considering forecast profit opportunity variance and revision of the innovation

*AC (long business planned cost) = target sales –TP; EC (competitive cost) = Estimated sales – estimated profit

*BP is calculated by considering prior opportunity cost and equipping with feed forward Kaizen (improvement)

Figure 2: Integrated Cycle of Profit Opportunity-based Variance Analysis and Innovations

Profit opportunity (PO) – planned profit (PP) = forecast profit opportunity variance
*PO numerically represents long-term (e.g. 5~7 years) value which 'opportunity space' of specific innovations produces in term of profitability, while PP is a long-term forecasted value based on the estimated outcome of preventive and proactive activities in existing organizational structure under the scheduled innovations.

If PO>PP
Target profit (TP) – estimated profit (EP) =prior opportunity cost
Allowed cost (AC) – estimated cost (EC) = forecasted cost variance
AC = target sales – TP; EC = estimated sales - EP

Annual target profit is calculated by dividing PP by the number of years after adding the above variance which may be resolved by supplemental strategic innovation. Estimated profit is deduced from yearly forecasting comprehensive factors related to present business environmental (competitive) and organizational conditions in reference to the annual target profit. Managers decide a definite budgeted profit after implementing feed forward management (changes in materials, production processes, or processing methods) beforehand to actualize the estimated profit. At the same time, it can calculate allowed costs and estimated costs according to profit variance analysis. The allowed cost is based on long-term business policy (investment and dividend policy). On the other hand, the estimated cost is decided by competitive strategy in markets or 'reverse engineering method' (Mcmillan, 1984, p.258). Target cost is decided after compering AC with EC and considering forecasted cost variance and its improvement methods.

Budgeted profit – actual profit = posterior opportunity cost
Target cost – actual cost = cost variance of Kaizen

Enterprises use feed forward information on business performance and financial accounting results to rearrange existing resources and organizational structures and to guide future innovation management. Specifically, the variance between target profit and budgeted profit shows anticipated failure or success to control uncertainty, or indicates prior opportunity cost related to the discovery and exploitation of profit opportunity and risk management. On the other hand, variance between budget profit and actual profit represents posterior opportunity cost related to problems of practical organizational structure or organizational and individual performance. Senior managers use this variance to reexamine and rearrange existing organizational structure and develop more strategic and competitive technology and products in the next period. The cost variance of Kaizen is an indicator to reexamine and improve the existing organizational structure and operating system in the context of the existing innovation in the next period. Profit variance analysis is also connected to cost variance analysis in the integrated cycle of feed forward and feedback management.

If target costing in Japan is incorporated with this profit opportunity-based variance analysis, it will become more strategic and competitive, and be

able to have multiphasic forms which can effectively correspond to global consumers' needs in different prices and functions, since it links directly with the space of profit opportunity and risk.

Conclusion

Businesses operate in unknown and uncontrollable uncertainty every day. As pointed out in the previous paper (Nishimura, 2011), we cannot be confident of the absolute controllability of the uncertainty, because we are surrounded by inexhaustible unknown and uncontrollable phenomena. Therefore, business managers should not be arrogant and unscientific to nature and society. The strategic innovations advocated in the paper are only one attempt to control uncertainties. Management accounting has also to take part in the challenge. As a result, one can be confident of relative truth and controllability.

Regarding profit opportunity and uncertainty, the paper clarifies that in the near future, all chief executives, managers, and other organizational members should be conscious of the implementation and evaluation of strategic innovations and the actual continuous improvements resulting from the analyses of prior and posterior variances involving profit opportunity. Contemporary management and accounting must also have a stronger integration of feed forward (preventive and proactive) and feedback looking (reflective and reactive). For example, when target costing is correctly positioned beneath profit opportunity-based variance analysis from this integrated proactive and reactive perspective, it become more strategic and competitive and can enable the *entrepreneur* to evaluate and exploit profit opportunities and for managers to plan for and control business activities based on strategic innovations.

Although the idea of feed forward looking has been discussed in the fields of business management and management accounting (Ishikawa and Smith, 1975; Belkoui, 1983 Morgan, 1992), it has not yet taken a definite form in accounting systems generally. The traditional management accounting systems have recently begun incorporating feed forward and feedback ideas through target costing and cost improvement techniques established by

Japanese enterprises and through the ABC and BSC approaches developed by innovators in strategic management accounting (Atkinson, et.al, 2001; Kaplan and Norton, 1996). The possibility of applying feed forward and feedback information more widely extends not only to cost management, but also to profit opportunity and risk management, as strategic and strategic innovation is looked upon as important.

This paper gives only a framework for coping with the current issues of uncertainty and opportunity in management accounting. Others, such as Falta et al. (2006) and Kumarasinghe and Willett (2010), have used mathematical, statistical, and empirical approaches to analyze these new contemporary issues in business enterprises. Oshita (2012) also grapples with the difficult task of clarifying contemporary gaps in management accounting. These efforts to illuminate the fundamental problems in contemporary management accounting or to establish proactive and preventive management accounting will unite and open up new ways to establish new strategic management accounting. They will contribute to lessening the gap between practice and theory in contemporary management accounting as for which Scapens (1991) posed a problem for the scientific development of management accounting.

In the strongly uncertain and complicated society at present, the allure of organizational power and the intelligence of scientific-minded leaders make feed forward and strategic innovations feasible and fruitful, and ensure the transformation of opportunity into profit opportunity and profit opportunity into profit, though the fuller study of these critical factors in organizational structure lies outside the scope of this paper. As described in the previous paper (Nishimura, 2011; see Ingrassia, 2010; Collins, 2009), even a little arrogance in top leaders in large car companies has damaged their business performance over the long term and much money and time have been required for their recovery. Management accounting must also be more forward-looking and more deeply and scientifically enter into the unknown and uncontrollable world, although it is very dangerous to unreasonably assume to control what nobody completely knows or can control.

Unfortunately risk management cannot be discussed here for lack of space in spite of a serious question in relation to profit opportunity. This issue,

linking the above activation of organization in corporate governance, will be examined in another paper in order to clarify the role of management accounting in a very uncertain society.

Note:

This paper uses the term "feed forward innovation" more roughly than as used in cybernetic science. In this context the word means proactive and preventive information and management /production system in which global information, knowledge, resources, competence, and technologies are used for self-reliance (internal innovation), agile supply chain management (external innovation), and global innovation. Enterprises have invested large amounts of money and time for establishing this feed forward innovation. Thus, it would better to say '*strategic innovation*' in this paper, because it is strategic and we are not familiar with 'feed forward innovation.'

For example, a leading mobile phone manufacturer, Nokia, adopted integrated project management, which consists of collaborative demand planning with customers, site-based ordering by progress, professional cost management, and performance metrics with an integrated platform. The supply chain is flexibly decentralized according to changing markets on the basis of concentrated demand planning and site-based ordering, whereas parts and components are standardized and modularized for finished products in response to changes in demand in markets. Its goal is "to provide customers with more speed, efficient and cost effective deliveries by better orchestrating the end-to-end supply chain" (Collin and Lorenzin, 2006). In the case of Zara, each of the more than 300 small contractors specializes in one particular part of the production process or one particular garment type. They work exclusively for Zara's parent company, Inditex SA. In return, they receive the necessary technological, financial, and logistical support required to meet the stringent time and quality targets (Christopher, 2000).

Table 3: Employee number (EN), Sales, and Industrial Sector of the Investigated Companies (2011) (Money Amounts in Hundred Millions of Yen)

	EN	Sales	Sector		Employ-ee	Sales	Sector
A	198	798	Electric machinery and tools	G	1,050	1,647	Food processing
B	3,561	4,210	Precision machinery	H	1,542	1,800	Food processing
C	800	448	Transport equipment	I	6,700	4,541	Food processing
D	17,465	2,078	Electric and communication machinery	J	1,468	461	Medicines
E	5,200	4,309	Lighting fixtures for cars	K	1,480	500	Food processing
F	32,595	7,000	Chemistry	L	1,026	876	Food processing

Source: *Annual Securities Reports of the Investigated Companies*, 2012, Ministry of Finance Japan

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