Latent Function of Management Accounting:
Target Costing in the Automobile Industry

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Contents

1. Introduction

The functional analysis theory is an important area of sociology[1], which was proposed by the American sociologist Merton (1949). According to the functional analysis theory, the purpose and function of an action are separately recognized. On the one hand, the purpose of an action is the subjective intention of the actor; on the other hand, its function is the objective result of the action. When the result of the action matches the intention of the actor, it is called a manifest function. However, if the result of the action does not match the intention of the actor, it is called a latent function.

Traditionally, management accounting has been identified as the accounting information used by business managers to reasonably achieve their economic objectives (American Accounting Association (AAA), 1958), with a large number of the traditional management accounting methods being developed such as the standard cost accounting, break-even point analysis, direct costing, divisional accounting, and capital budgeting. Since the release of A Statement of Basic Accounting Theory (ASOBAT) by the AAA in 1966, financial and management accounting have been integrated into a single accounting information system, and the company-wide profit and comprehensive budget management systems have been developed. In addition, since Johnson and Kaplan (1987) criticized the management accounting research, new management accounting theories and practices have been studied such as the economic value added (EVA) (Stewart,

[1] The functional analysis theory recognizes the effect that a certain social phenomenon has on the whole society. There are four functional concepts, the manifest function, the latent function, the eufunction (function to promote the adaptation and adjustment throughout the social system), and the dysfunction (function to reduce the adaptation and adjustment throughout the social system).

1991), target costing (Kato, 1993; Tanaka, 1995; Japan Accounting Association, 1996), balanced scorecard (BSC) (Kaplan and Norton, 1996), activity-based costing (ABC) (Kaplan and Cooper, 1998), Ameba management (Miya, Tani, and Kagono, 1999), and beyond budgeting (Hope and Fraser, 2003). Using these decision-making and performance management accounting approaches, the results of business managers reasonably achieving their economic objectives using accounting information were intended in advance. In other words, they were all manifest functions.

However, in current management accounting practices, results unintended may occur in advance, namely, latent functions can occur in management accounting. This study examines the latent function of the target costing approach in the automobile industry, where the business became globalized, based on Toyota's public information[2].

2. Business Overview: Case of Toyota

Toyota is the leading automobile manufacturer in Japan being listed on the securities markets in Japan and foreign countries. It celebrated its 80th anniversary in 2017, as it was founded in 1937. In fiscal year (FY) 2016, its consolidated employee number was about 350,000 people, with its regional composition ratio being about 57% in Japan, about 13% in North America, about 5% in Europe, about 18% in Asia, and about 7% in other areas. In the same year, its number of the affiliated companies was about 600 companies, with many of these companies being located outside of Japan.

Toyota's history manifests the globalization of the business. It started researching small gasoline engines in 1930, announced the first passenger car (AA model) in 1936, and started the operations of its first factory (Koromo Factory) in 1938. It announced the passenger car Crown in 1955 after the management crisis in 1950, exporting it to the United States for the first time in 1957 and establishing the distributor in the United States in the same year. It introduced the passenger car Corolla in 1966 and led the motorization in the developed countries thereafter. In the latter half of the 1980s, it began the local production of the automobiles worldwide. It started the local production in the United States in 1988, in the United Kingdom in 1992, in India in 1999, in China in 2000, and in France in 2001, accelerating the globalization of business to this day.

After rapidly expanding its scale in the mid-2000s, it temporarily lost its momentum due to the Lehman shock in 2008. However, it recovered quickly. In FY 2010, its consolidated sales were about 19 trillion yen, with its consolidated operating income being about 148 billion yen. However, in FY 2016, its consolidated sales reached about 28 trillion yen, with its consolidated operating income recovering to about 2,854 billion yen. Its composition of consolidated sales (FY 2016)

[2] "Toyota" in this paper is not a name of an individual company but a term referring to the general Toyota group. Therefore, the case in this paper is not an example of an individual company.

by location was about 15 trillion yen in Japan, about 11 trillion yen in North America, about 3 trillion yen in Europe, about 5 trillion yen in Asia, and about 2 trillion yen in other regions. In addition, its composition of consolidated total assets (FY 2016) by location was about 14 trillion yen in Japan, about 17 trillion yen in North America, about 3 trillion yen in Europe, about 4 trillion yen in Asia, and about 3 trillion yen in other regions. In addition to Japan and North America, it also has the solid financial and business bases in Europe, Asia, and other regions.

The Toyota Way is the set of values (code of conduct) shared within the Toyota organization[3]. The two pillars of Toyota Way are the continuous improvement and respect for people. These two pillars consist of five items, namely, challenge[4], Kaizen, Genchi Genbutsu, respect[5], and teamwork[6]. Among them, the two items of Kaizen and Genchi Genbutsu are unique concepts of Toyota Way, being supported by elements such as organizational learning, effective consensus building, sincere communication, and exercise of a team's comprehensive power. In other words, Toyota has enhanced its competitiveness through the organic cooperation and collaboration (Kaizen by Genchi Genbutsu) between the functional departments and the distinct strengths of each functional department (e.g., the technical, purchasing, production, production technology, and sales departments). Its competitiveness manifests itself in the outstanding product power, advanced quality, and strong price competitiveness. Due to its competitiveness, Toyota has grown through the globalization of business, thus far.

3. Business Globalization: Case of Toyota

We will look further into the details of Toyota's globalization of business. First, we will explore the long-term trends in Toyota's production and unit sales volumes. In 1965, before introducing the main model Corolla, its production and unit sales volumes were about 500,000 units. After that, due to the expansion of the global automobile market and the aggressive business development strategy implemented by Toyota, its production and unit sales volumes have been on the rise. They increased to about 2.3 million units in

[3] In Toyota, as the business rapidly globalized, the management task of sharing the values and the code of conduct globally emerged. To tackle this problem, Toyota Way was established in 2001 to systemize the values that have been inherited through the Toyota production system (TPS).

[4] Challenge is supported by elements such as creating the added value centered on the manufacturing, the spirit of the challenge, the long-term orientation, the consideration and decision-making, the preparation for the risk, the priority orientation, and the overall optimization.

[5] Respect is supported by elements such as the respect for the stakeholders, the mutual trust and responsibility between the company and the employees, the acceptance of heterogeneity, the fair treatment, and the self-realization.

[6] Teamwork is supported by elements such as the emphasis on the human resource development, the leadership, the trust in the human ability, the delegation of authority, and the mutual contribution.

1975, to about 3.8 million units in 1985, to about 4.5 million units in 1995, to about 7.3 million units in 2005, and to about 9 million units in 2015. Meanwhile, its proportion of production volume outside Japan to the total production volume and its proportion of unit sales volume outside Japan to the total unit sales volume continued to rise consistently. In 2015, about 64% of the total production volume and 84% of the total unit sales volume were produced and sold, respectively, outside Japan.

Second, we will look at Toyota's major research and development (R&D) bases. Toyota has established R&D bases in all regions in the world, and has been conducting R&D globally to develop vehicles that meet the market characteristics and the customer needs. In Japan, it has five R&D bases such as the Headquarters Technical Center (responsible for the product planning, design, prototyping, and evaluation), Higashifuji Research Institute (responsible for the prior development), Tokyo Design Research Institute (responsible for the leading design), Shibetsu Testing Site (responsible for the evaluation), and Toyota Central Research Institute (responsible for the basic research). In addition, it has 11 R&D bases outside Japan in charge of the basic research, environmental technology, product planning, design, evaluation, certification, and motorsports vehicle development. Currently, it has 16 R&D bases, with its regional composition being five in Japan, three in North America, three in Europe, four in Asia, and one in other regions.

Third, we will look at Toyota's major production bases. Toyota has 16 production bases in Japan, including the headquarters factory (Komomo factory), Motomachi factory, and Takaoka factory, which started operations in 1938, 1959, and 1966, respectively. In addition, it has 53 production bases in 28 countries outside of Japan, with its regional composition being 11 in North America, 9 in Europe, 24 in Asia, and 9 in other areas.

Fourth, we will look at the sales regions of the major models of Toyota. For example, the main models such as Yaris (Vitz), RAV4, Corolla, Prius, Land Cruiser, Camry, and Lexus GS are sold in all regions of North America, Latin America, Europe, China, Asia, Oceania, and the Middle East in addition to Japan. Hilux and Auris are sold in Latin America, Europe, Asia, Oceania, and the Middle East in addition to Japan, while Highlander is sold in North America, Latin America, Europe, China, and Oceania. Toyota sells about 100 car models in more than 170 countries worldwide, including the Toyota brand (responsible for the cost-leadership strategy) and the Lexus brand (responsible for the differentiation strategy). These sales of Toyota vehicles are supported by the strong and global network of sales bases of about 280 dealers and 5,500 sales stores in Japan, and about 170 distributors and 10,000 dealers outside Japan[7].

Thereby, Toyota develops a large number of car models at numerous R&D bases, produces them at many production bases, and sells them at multiple sales bases. In this context, when we want to investigate

[7] Outside Japan, Toyota has established distributors for each country, who sell the cars to the dealers.

the R&D, production, and sales bases of a certain car model, they are not necessarily the same thing, or located in the same area or within the same country. Rather, this model is usually developed at numerous R&D bases, produced at many production bases, and sold at multiple sales bases across the regions and countries[8].

Most work at automobile manufacturers proceed on a car model basis[9]. Therefore, as the business becomes globalized, the supply chain of the automobile manufacturer expands globally across regions and countries unlike the supply chains on site. In addition, the supply chains have complex correspondence relationships like the network eye, which are formed by connecting the numerous R&D, production, and sales bases.

Further, as mentioned above, the sources of competitiveness of Toyota and the automobile industry are the outstanding product power, advanced quality, and strong price competitiveness, which are achieved through the organic cooperation and collaboration between the functional departments and the distinct strengths of each functional department (e.g., the technical, purchasing, production, production technology, and sales departments). As the supply chains at the automobile manufacturers expand globally across regions and countries, and establish complex correspondence relationships like the network eye by connecting the numerous R&D, production, and sales bases, maintaining the organic cooperation and collaboration between the functional departments and improving the sources of competitiveness are the important management issues for Toyota and the automobile industry. Next, we will consider the contribution of the target costing approach to these management issues.

4. Manifest and Latent Functions of Target Costing

Target costing is an approach to manage the cost determination processes of a new product in all activities of the product development starting with the product planning (Tanaka, 1995). In addition, it progresses to the comprehensive profit management of the new product that simultaneously achieves targets such as the quality, price, reliability, and delivery date that meet the customer needs (Japan Accounting Association, 1996).

The target costing method has a long history in the automobile industry, especially in Toyota. In the 1960s, Toyota activated value engineering (VE)[10]. In 1963, it positioned

[8] For example, in the case of model A, the basic research, leading design, prior development, and product planning were conducted in Japan; the design and evaluation were carried out in North America; the production, purchasing, production technology were conducted in Japan, North America, Latin America, Europe, China, and Asia; and the certifications and the sales were carried out worldwide.

[9] The three major processes of the automobile business are product development, supply chain, and sales.

[10] VE and VA are the activities to obtain the necessary functions of the products at the minimum cost by changing the design drawings and the suppliers and streamlining the manufacturing methods. VE is an activity at the product development stage, while VA is an activity at the mass production stage.

cost maintenance, cost improvement, and target costing as the three pillars of its cost management (Tanaka, 1995). In addition, after the oil shock in 1973, it enhanced target costing by establishing the target costing committee in 1974 and the organization specialized in cost in 1975, and emphatically applying the target costing approach to the concept stage of the new product since 1986[11]. It also greatly strengthened the promotion system and the activities of target costing since 1991, triggered by the collapse of Japan's bubble economy. It established the VE center in 1994, created the new basic compact (NBC) committee in 1996, started the excellent quality (EQ) activity in 1998, started the cost competitiveness construction (CCC21) activity in 2000, started the break through TOYOTA (BT2) activity, commenced the awareness reform activity in the technical department in 2002, established the EQ promotion department in 2003, established the new VE center in 2004, started the company-wide value innovation (VI) activity in 2005, started the emergency value analysis (VA) activity in 2008, started the Ryohin-Renka cost innovation (RR-CI) activity in 2009, started the company-wide VA activity in 2010, and established the VA development department in 2011. In addition, it established the promotion system for the global target costing. It established the target costing departments or functions in North America in 1998, in Europe in 2006, and in Asia in 2011. Even today, the target costing plays a central role in Toyota's development of high-quality, low-cost automobiles.

Generally, with respect to automobiles, it is said that 80% or more of the product cost at the mass production stage is already incurred at the product development stage. Therefore, the target costing drastically reduces the product cost by thoroughly analyzing the mechanism of cost generation back to the sources where the cost is generated at the product development stage (Kato, 1993). In other words, the manifest function of target costing is cost reduction (achieving the cost targets) or the comprehensive profit management of the new product linked to the product development.

However, such target costing constitutes the main part of the product development process of the automobile. Figure 1 illustrates the product development process of automobiles at Toyota. In the product development of an automobile, to realize the customer satisfaction based on the customer's viewpoint, the core chief engineer, the technical department (responsible for the prior development, the design, and the evaluation), the purchasing department, the production department, the production technology department, and the sales department form one unified team beyond the boundaries of functional organizations. After this, the formed cross-functional team incorporates the merchantability of the automobile to meet the customer needs, the high quality, and the factors of cost reduction for achieving the cost targets into the design drawing of the new product. In addition, from the earliest

[11] This is commonly referred to as front-loading. See Imai (2016).

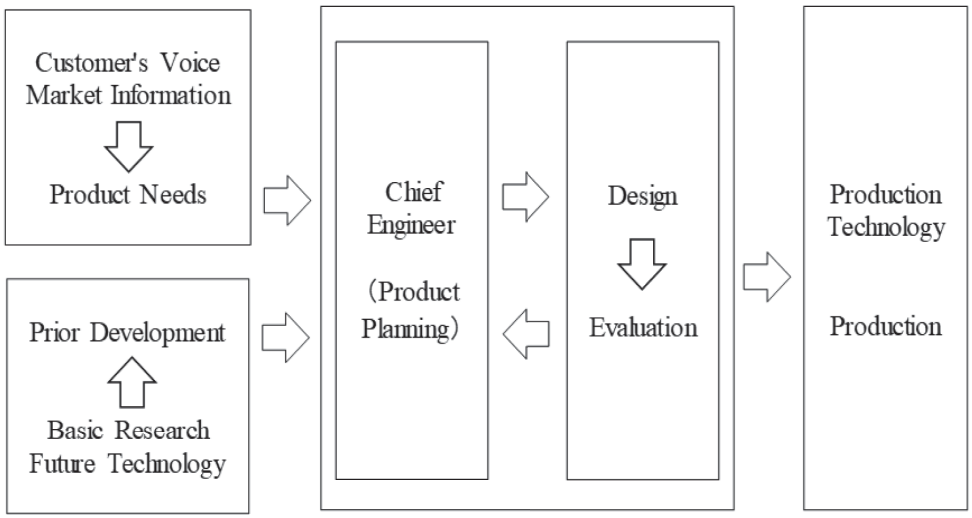

Fig. 1　The product development process of automobiles at Toyota
(Source: the Toyota Motor Corporation corporate official website)

stage of the product development process, the design drawing of the new product and the production are collectively planned at the mass production stage. Therefore, it enables the elimination of waste at the mass production stage of the new product to a certain extent in advance[12].

According to Tanaka (2002), target costing is carried out in principle using concurrent engineering[13], and it cannot be implemented effectively without the active support and cooperation of many related departments. Therefore, the related departments to target costing are mutually connected strongly and organically. In addition, Tanaka (2002) shows the relevance of the related departments in target costing in Figure 2.

As mentioned above, maintaining the organic cooperation and collaboration between the functional departments and improving the sources of competitiveness are the important management issues for Toyota and the automobile industry. As the business becomes globalized, the supply chains expand globally and establish complex correspondence relationships like the network eye, which are formed by connecting the numerous R&D, production, and sales bases. In such circumstances, target costing refines the source of competitiveness such as the strong price competitiveness through the cross-functional cooperation and collaboration between the functional departments (e.g., the technical, purchasing, production, production technology, and sales departments), and contributes as the eufunction to solving the

[12] This is commonly referred to as the pursuit of manufacturability. See Imai (2016).

[13] Concurrent engineering is a method that improves efficiency by shortening the development period and the delivery time by simultaneously carrying out the tasks.

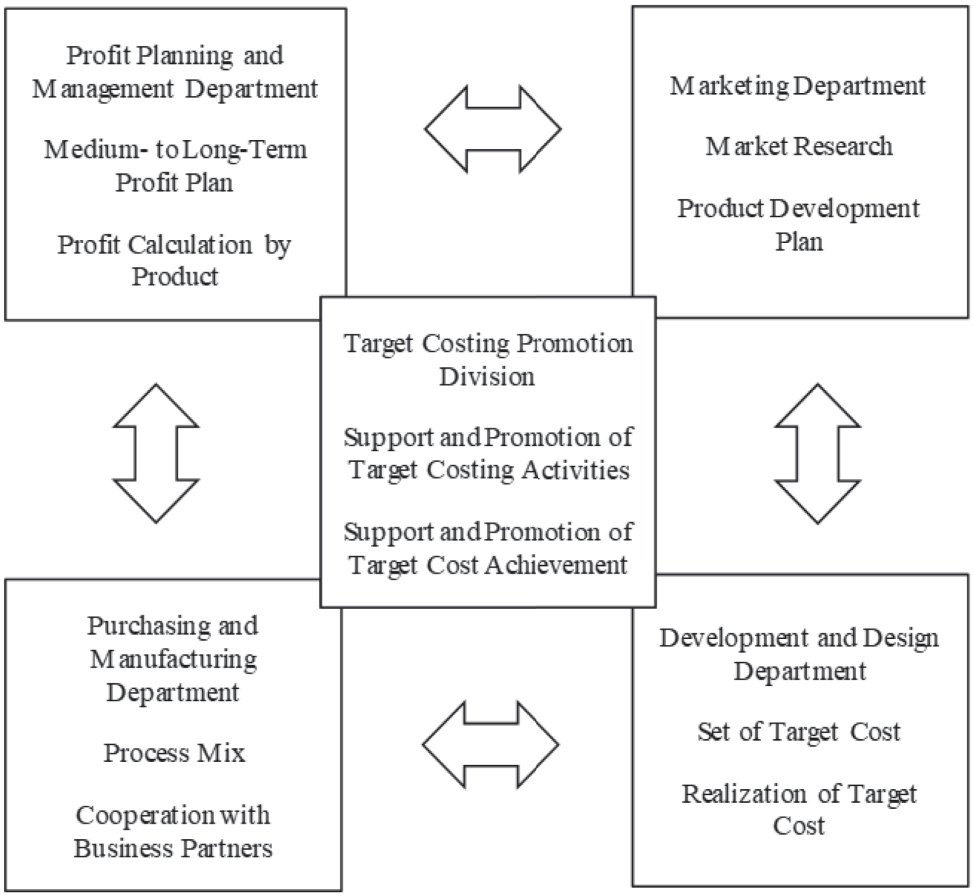

Fig. 2 Relevance of related departments in target costing
(Source: Tanaka, 2002, p. 122, adjusted by author)

aforementioned issues of global management faced by the automobile industry. In other words, target costing has the latent function of promoting the organic cooperation and collaboration between the functional departments and enhancing competitiveness on a global basis regarding the product development.

5. Conclusion

The automobile industry has consistently grown through winning the global competition based on its high competitiveness. Its sources of competitiveness are the outstanding product power, the advanced quality, and the strong price competitiveness that are created through the organic cooperation and collaboration between the functional departments and the distinct strengths of each functional department (e.g., the technical, purchasing, production, production technology, and the sales departments). Moreover, they are closely related to management accounting. Based on this viewpoint, this paper investigates the relationship between the

globalization of business and the management accounting in the automobile industry based on Toyota's public information.

For that purpose, we use the functional analysis sociological theory, in particular the concepts of the manifest and latent functions, finding that target costing has the latent function in the automotive industry where the business became globalized. In other words, the manifest function of target costing is the cost reduction (achieving the cost targets) or the comprehensive profit management of the new product during its development. However, at present, target costing has the latent function of promoting the organic cooperation and collaboration between the functional departments and enhancing the competitiveness on a global basis with regard to the product development.

The management accounting research so far has focused on the results that the management accounting methods intended in advance, namely, the manifest functions. However, in current management accounting practices, there may be cases where results that were not intended in advance (i.e., the latent functions) occur, as well as the eufunctions.

Fujimoto (1997) pointed out that the biological evolution theory assumes only the random mutations (e.g., DNA transcription mistakes); however, in the evolution of social systems, mutations occur in various forms such as the in-advance rational behavior, the selection forced by the environment, the coincidences, and the horse out of gourd. After this, the evolved social system is retained through the organization's routines, the maintenance of its programs, the dissemination of knowledge within the organization and among the organizations, etc. Based on this viewpoint, the latent function of management accounting can be regarded a form of the evolution of the management accounting as a social system.

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