



Melco Foundation  
Management Accounting Research  
Discussion Paper Series



The Melco Foundation

# Melco Management Accounting Research Discussion Paper Series

No.MDP2016-002

How does a company prevent sticky costs?  
Strategic capacity cost management: A case study of Komatsu

April 2016

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## The Melco Foundation

Nagoya, Japan

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## How does a company prevent sticky costs? Strategic capacity cost management: A case study of Komatsu

<Abstract>

This study highlights the case of strategic capacity management in the sticky cost literature, according to which the absolute change in costs associated with decreased sales activity is systematically less than that associated with increased sales activity (Anderson, Banker and Janakiraman, 2003). By analyzing the case of Komatsu, we demonstrate that a direct costing system contributes to business performance improvement. In particular, top management can prioritize the use of resources depending on strategy, and the company can maintain the current capacity cost level by offsetting costs for growth and the effects of structural reforms, known as “decoupling costs from growth.” The way to achieve cost improvement is based on total quality management (TQM) practice, and direct costing works when it is related to TQM activities. We conclude that direct costing with improvement knowledge, such as TQM, can prevent sticky cost issues.

<Keywords>

Sticky cost, Strategic capacity cost management, Total quality management, Cost improvement

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## 1 Introduction

The purpose of this study is to examine how to manage sticky cost issues by using a case study of Komatsu, which is one of the largest manufacturers of major construction and mining equipment. Traditional cost management literature classifies costs into variable costs and fixed costs. Variable costs change depending on activities and fixed costs do not vary with activities in a certain period. However, many researchers have argued that this characterization of cost behavior is inconsistent with the way that managers actually manage costs (Cooper and Kaplan, 1998). Johnson and Kaplan (1987) pointed out the limitation of traditional cost accounting, which loses relevance in the management accounting system through “relevance lost.” They criticized total cost accounting because the inaccurate allocation of overheads which are not related directly to labor hours, misleads and results in incorrect decision making. Johnson and Kaplan (1987) also criticized direct costing that focuses on short-term variable costs and pays little attention to long-term cost variation.

Anderson, Banker, and Janakiraman (2003) provided the first large-sample evidence in which cost changes depend not only on capacity usage, but also on the direction of the change in activity. They find that on average, selling, general, and administrative (SG&A) costs fall less in response to a given decline in sales revenue in the previous year than they increase in response to an equivalent increase in revenue. This is called “sticky cost.”

The reason why cost stickiness occurs is asymmetric adjustment that favors upward versus downward activity change. Traditional management accounting literature ignores adjustment costs, such as search, recruitment, and training, in increasing labor input and severance payments in decreasing labor input. When adjustment costs are present, managers weigh the costs of releasing (adding) resources when activity decreases (increases) against the alternative of not adjusting. Anderson, Banker, and Janakiraman (2003) assumed that much lower downward revisions are systematically more costly than upward revisions.

Activity based costing (ABC), activity based management (ABM) are assumed to help organizations to make cost improvements (Kaplan & Cooper, 1998; Noreen, 1991). However, cost behaviors differ from their assumptions in which costs change

depending on cost drivers companies use (Noreen and Sodrrsorm, 1994; Anderson et al., 2003).

On the contrary to the situations in the U.S and European countries, the rate of usage of ABC and BSC is absolutely low in Japan (Yoshida et al., 2012), and competitive power in Japanese manufacturing companies has not yet dropped off (e.g., Fujimoto, 2013). The reason Japanese companies do not introduce ABC is explained as follows. Overhead costs that are fixed costs in European countries and the US are regarded as direct costs (Sakurai, 1995; Kobayashi, 1992), and setting the cost pools for cost allocation might be more costly. Nonetheless, ABM might be useful for cost improvement in Japan (Sakurai, 1995). This suggests that traditional costing is still problematic.

How have Japanese enterprises implemented cost improvement without ABC/ABM? Furthermore, how has management accounting played a role in cost improvement? In Toyota's production system, target costing, cost improvement, and cost maintenance are well known, and the development of strategic frequent new products (Kazusa, 2014), strategic planning (Kato, 1993) with target costing, and kaizen budgeting (Tanaka, 1990; Monden, 1988; Maruta, 2005) are pointed out as the roles of accounting.

Meanwhile, Taiichi Ohno who modeled Toyota production system expressed skepticism as full costing was not useful for cost improvement in Toyota (Ohno, 1978), and non-financial indicators, such as shortening of lead time and reduction of stock by Just In Time, are essential at the factory floor level. This suggests a relationship between management accounting and kaizen activities. Without ABC and ABM, how have Japanese companies solved the issue of overhead cost management? In addition, how have they prevented sticky costs if they have problems? Using the case of Komatsu, this study shows that the introduction of direct costing leads to management reforms and strategic management of capacity cost (CC) on condition that the organization is capable of improvement based on total quality management (TQM).

The rest of this paper proceeds as follows. In Section 2, we review arguments about traditional fixed cost management and discuss the research question. In Section 3, we provide the research method. Our fieldwork is shown in Section 4. In addition, we describe Komatsu's standard variable margin (SVM) management and

CC management. Then, the findings are discussed in Section 5 and Section 6 concludes.

## 2 Cost stickiness and capacity cost management

### 2.1 Cost stickiness and cost behavior

Anderson, Banker, and Janakiraman (2003) provide the first large-sample evidence that changes in cost depend not only on the usage of capacity, but also on the direction of the change in activity. They find that on average, SG&A costs fall less in response to given decline in sales revenue in the previous year than they increase in response to equivalent increase in revenue. It is called “Cost sticky”. Since then, several scholars have tried to understand cost behavior (Anderson et al., 2007; Calleja et al., 2006; Balakrishnan and Gruca, 2008).

In addition to research about understanding cost behavior, factors to influence cost stickiness have been recently discussed (Banker et al., 2013, Balakrishnan and Gruca, 2008; Balakrishnan et al., 2004; Balakrishnan et al., 2014; Holzhacker et al., 2015). Banker et al. (2013) hypothesize that cost rigidity increases when demand uncertainty is high and companies choose more fixed cost than variable costs in high demand uncertainty. However, it is generally assumed that less fixed costs and higher variable costs are suitable when demand uncertainty is high. Banker et al. (2013) admit this supposition but suggest congestion cost increases more when demand uncertainty is high. Meanwhile, Holzhacker et al. (2015) show demand uncertainty and financial risk make companies choose more variable cost using outsourcing, leasing and contracting non-regular employees by hospital data. As a result, cost elasticity increase and the cost structure become more flexible.

It is not clear that what kind of factors have influences on decision about cost structures. Most data of this area are collected by quantitative research, and more qualitative research to understand cost management activities is required (Anderson and Lanen 2007; Kajiwara 2014). Anderson and Lanen (2007) concluded there is a need for more investigation through fieldwork about cost management in terms of cost stickiness. Hereafter, we summarize how fixed cost management is understood next.

## 2.2 Capacity cost management and research question

Traditional cost accounting theory assumes that costs consist of variable costs and fixed costs relating to usage of capacity. CCs, which are very similar to fixed costs conceptually, are traditionally classified as committed costs and managed costs (NAA, 1963). In addition, managed costs consist of policy costs and operating costs, summarized in Table 1. In this way, capacity costs are managed based on organizational layers and managerial periods.

Table1: Traditional fixed cost management

		Committed cost	Managed cost	
1	Decision making	Decided	Not decided	
2	Controllability	Uncontrollable in short period	Manageable	
3	Variability	Stable for several years	Variable in 1 year	
4	Accounts	(Fixed assets) Depreciation, Fixed asset tax, Insurance, Rent (Human resources) Fixed salary Management salary	Policy cost	Operating cost
			R&D Marketing Social expense	Energy Manager's salary Quality cost
5	Management way	Middle-range plan → Proper decision making → Usage management after introduction	Allocated budget based on management policy	Variable budget based on activities
6	Management layer	Top management Middle management depending on delegation	Middle management	

However, Borden (1990) stated that costs should be managed by short-term variable costs and long-term variable costs, as he criticized traditional cost classification as being unsuitable for managing indirect costs using ABC. Long-term variable costs do not change quickly while they change depending on the volume of activities. These kinds of fixed costs, such as set-up costs, order costs, and

schedule-planning costs, have increased recently (Borden, 1990). Such costs do not change depending on usage of capacity (Cooper and Kaplan, 1998). For example, if organizations want to reduce set-up costs, they need to reduce support staff or cut hours for setting up. Long-term variable costs are classified as fixed costs traditionally (NAA, 1963).

Organizations have at least two options for management of increasing CCs, including sticky costs: aiming for correct allocation of products, such as ABC/ABM, or giving up overhead cost allocation. In either case, organizations have to reduce idle CCs and utilize them more.

In this study, we aim to discuss how companies can cope with problematic CCs, which is one of the most important issues in such a competitive environment. Our basic research question is how companies can solve sticky cost problems without using ABC/ABM. We take Komatsu's cost management practice and show a successful case of managing overhead cost issues.

### 3 Research method

#### 3.1 Research site

The case study company is Komatsu Ltd., which is the second-largest company in the global construction and mining equipment industry. Komatsu manufactures and sells construction and mining equipment, utilities, forest machines, and industrial equipment. Komatsu was established in 1921. Currently, it has 47,208 employees in 180 group companies around the world as of March 31, 2015. The company's consolidated sales were 1,978,676 million yen as of March 31, 2015.

Komatsu is well known for its innovative business models. For instance, the Komatsu Machine Tracking System (KOMTRAX) has terminals installed on construction equipment to transmit information concerning the location, cumulative hours of operation, and operating condition of vehicles using global positioning system (GPS). Another example is Komatsu's autonomous haulage system, which is a remote-controlled system to run super-large driverless dump trucks.

Komatsu is an appropriate case study for our research not only because it is of large enough scale to operate a mature management control system but also because it has experienced changes in sales in both upward and downward directions since

2001.

### 3.2 Overview of investigation

To explore the detailed process of cost management, we use the method of a retrospective case study. Before starting our interview research, we investigated the literature concerning management practices at Komatsu. We found dozens of studies concerning TQM practices at Komatsu, and we referred to some books and articles written by past chief executive officers (CEOs). This literature supports the data from our interviews.

In January 2014, we started to visit the case company to perform interviews (see Appendix). Our investigation was conducted by a disinterested observer. In order to avoid respondent bias, we conducted interviews with the chief financial officer, senior managers, managers, and staff in the accounting, information, research and development (R&D), and manufacturing departments. We visited various places, including the head office and some plants, to collect data.

We conducted semi-structured interviews in which we proposed a list of question items in advance of the interviews. Most of the interviews were recorded using a voice recorder and note taking. For the purpose of protecting confidential information and avoiding factual errors, we presented the information to the company before making this study public.

## 4 Management accounting control system at Komatsu: Standard variable margin management and capacity cost management

In this section, we show the management accounting system at Komatsu, that is, SVM management and CC management. First, we explain the middle-term planning and budgeting process. Then, the structure and function of SVM management and CC management are shown. Finally, we explain TQM as a system of supporting cost improvement and budgeting control.

### 4.1 Middle-term management planning and budgeting process

The company develops a basic middle-term management plan for 3 years, and a new plan is developed every 3 years. The management target is to maintain high



profitability in the construction equipment businesses and to control the net debt–equity ratio under 0.3 to improve the financial standing. Although sales targets are estimated, the accounting numbers are flexible because the demand for construction equipment depends on the world economy.

The sales plan in the annual plan is based on forecasts made by each department, taking into account recent economic changes and world economic growth rates. These forecasts are discussed in the management meeting and approved. In addition, annual monthly plans are revised twice a month, while production plans are revised frequently to maintain optimal inventory volumes.

KOMTRAX is indispensable for forecasting the demand for construction equipment at sales and production meetings. Each piece of equipment has a KOMTRAX, including GPS, which enables the company to know how much the equipment works in real time. Initially, KOMTRAX was introduced to detect theft, but now, it is also used to forecast future demand and helps the company support maintenance services.

#### 4.2 Calculation structure of MACS: Standard variable margin management

When Masahiro Sakane became CEO of Komatsu in 2001, the company had made huge losses of about 800 million yen, resulting in a management emergency. Before 2000, the problem was that capacity costs had increased as sales increased, meaning that capacity costs were not fixed. Under full costing, capacity costs are allocated to products, and people used to believe they could cover CCs as long as sales grew. However, this was not true. Therefore, Sakane changed the full-cost accounting system into a direct-cost accounting system as one of his managerial reform policies.

SVM management is based on direct costing, in which costs are divided into variable costs and fixed costs, and the range of responsibility is set very clearly. The operational income is calculated as follows (Table 2).

Table 2: Operational margin by standard variable margin management

Sales		100
	Purchasing goods	45
	Variable cost	4
	Internal process cost	4
Standard variable cost (SVC)		49
Direct sales cost		5
Standard variable margin (SVM)		46
Other variable cost (OVC)		2
	Maintenance cost · Production	9
	Capacity cost (CC)	
	Other administrative cost	20
Capacity cost		29
Operational margin		15

Source: Compiled by authors based on information from the company

Standard variable cost (SVC) is based on purchasing goods and the internal process cost. Variable costs include SVC and direct sales cost, which consists of packaging, freight, and so on. SVM refers to sales minus variable cost. Cost variance and claim cost are counted as other variable cost (OVC). OVC consists of OVC I, that is, warranty cost, including claim cost; OVC II, which is wage variance, efficiency variance, budget variance, material price variance, cost improvement, and so on; and OVC III, which is closing adjustment, like lowest cost accounting.

The SVC of Komatsu is unchanged annually, and the company focuses on OVC, including the improved cost and reduction of CC to achieve its financial targets. This is seen as the mission in factories.

The departments involved in sales, production, purchasing, and R&D, as well as the head office, have responsibility for such factors as SVM, OVC, and CC, as shown in Table 3. The factories used to be seen as a profit center, but they are now regarded as a cost center. The sales department has the responsibility to achieve SVM by increasing sales volumes and sales prices, while the production and purchase departments are responsible for SVC and OVC. The R&D department has indirect

responsibility for SVM and SVC because it changes designs of models. For example, it adds new functions to raise prices, or helps the production department to reduce costs by reducing parts or sharing parts. Finally, all departments, including the head office, have responsibility for CC.

Table 3: Responsibility accounting

Department	SVM	SVC	Direct Sales Cost	OVC	CC
Sales	○		○		○
Production		○	○	○	○
Purchase		○		○	○
R&D	(○)	(○)			○
Head office					○

Source: Compiled by authors based on information from the company

### 4.3 Fixed cost management: Capacity cost management

#### 4.3.1 Structure of capacity cost management

Table 4 shows the responsibility for CC and the main themes for achieving targets.

Table 4: Capacity cost management

					Department	Topic
CC	Production overhead	Factory management cost	Labor cost		Each company, department (counted by accounting)	No. of people, overtime hours
			Depreciation			
			Other expense			Volume maintenance cost
		Equipment cost	Depreciation	Normal depreciation		Capacity utilization
		Incremental depreciation				
		Other expense		Repair cost		
	SG & A	R&D cost				Research expense
		Sales and product supporting cost				Promotion cost
		Head office cost, Administrative cost				Office other cost

Source: Compiled by authors based on information from the company

Factory management costs consist of indirect labor cost, factory depreciation, volume maintenance cost, and other costs. Volume maintenance cost refers to the development cost for improving present products and production systems. Equipment costs consist of depreciation and other expenses. The initial budget is set by the accounting department, which is based on the plan for recruiting staff and investing in equipment. CC is managed on a monthly basis.

The aim of the introduction of SVM management is to clarify the costs for which each department is responsible. Distributing the responsibilities for CC and setting targets for each department enables the company to clarify the key points of management and assists the organization to achieve its targets. The accounting staff member in a factory had the following to say after the introduction of SVM management in 2002.

“For me, the clarification of the center of responsibility was essential. The factory used to be a profit center that was the key factor in performance measurement, and therefore, the manager had to focus on the operational profit of the factory. After SVM management, the sales department has responsibility for SVM, and the factory can focus on the costs for which it should be responsible” (Accounting staff member).

#### 4.3.2 Decoupling costs from growth

The company tries to keep the rule of “decoupling costs from growth,” which means that it does not increase fixed costs, even if sales grow. However, it has a policy not to decrease R&D expenses, which are met by cutting other costs in the production and administration departments. As a result, as shown as Figure 1, Komatsu succeeded in keeping its fixed costs level in times of sales growth, and in reducing fixed costs in time of sales decline. This suggests that Komatsu prevented the occurrence of sticky costs, given that all SG&A expenditure is considered as fixed costs.

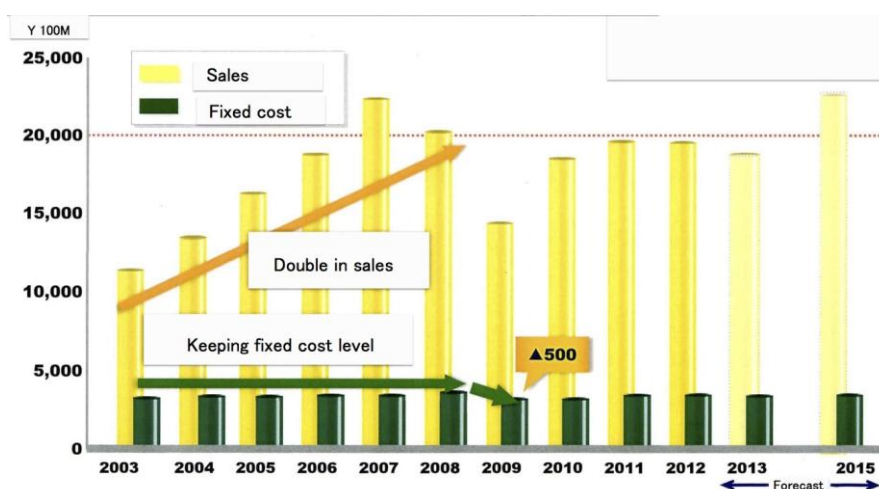


Figure 1: Sales and capacity cost

Source: Provided by the company

#### 4.3.3 Strategic choice of capacity costs

The company's R&D policy is to develop "Dantotsu products" in terms of environment, safety, ICT, and economy. This has involved the decision to sacrifice some functions in order to focus on two or three innovative and superior functions that other competitors take several years to follow, and to set aside more than 10% of product costs as investment to develop the next Dantotsu products. These products have superior functions and quality, which has given the company a top slot in global market share. One of Dantotsu products is KOMTRAX, which has set the standard for all equipment. This policy was initiated by the CEO, Sakane, during the company's management emergency (Sakane, 2009). It reduced half kinds of its R&D products, and focused the R&D resources on high SVM products.

"It was also an important point, and I cut down the fixed costs of non-production departments, as well as added necessary R&D expenditure for our growth strategy. 'Dantotsu' seemed to sound nice, R&D staff worked harder" (Sakane, 2009: 43).

In fact, SG&A expenses were more problematic in terms of CC. The rate of SG&A per unit of sales was approximately 6% higher than Komatsu's competitor because the company owned about 300 subsidiaries and had additional administrative staff. To deal with its financial crisis, it needed to reduce fixed costs by selling non-core businesses, such as electronics, eliminating and consolidating subsidiaries, and offering one-off voluntary retirement. To improve SVM, the company cut down the number of items that were of low profit. Less than 2 years after 2001, the company was able to cut 500 billion yen from fixed costs. Finally, its operational income ratio in 2007 was almost the same as its top competitor.

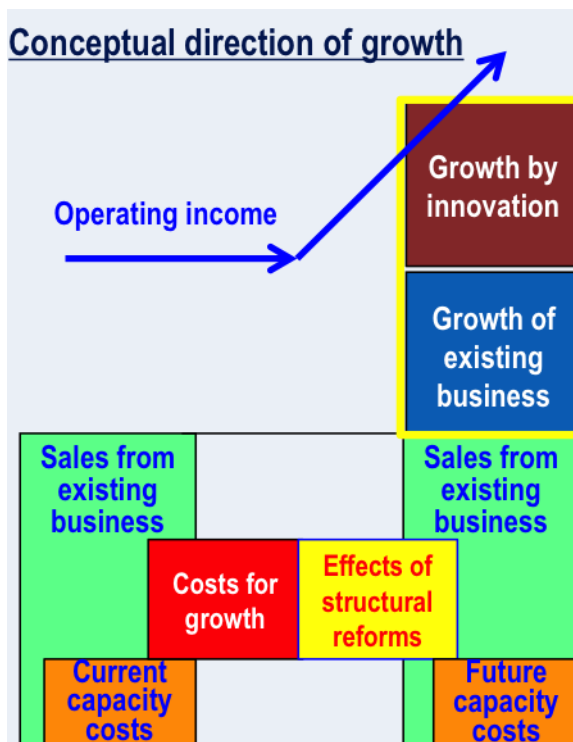


Figure 2: Conceptual direction of growth

Source: Provided by the company

Komatsu's basic management concept is summarized in Figure 2. While it attempts to maintain current CCs, it charges costs for growth. In particular, in the case of the financial crisis, the CEO chose a strategic priority of R&D expenditure to introduce Dantotsu products.

#### 4.4 Total quality management as an action management tool

The significant factors in budgeting are TQM, which is supported in the vision and credo of the "Komatsu way" as well as in Komatsu's budgeting practice.

In Komatsu, TQM is understood as a tool for controlling cost by budget, and it is a concrete action management tool for checking the progress of cost improvement. Policy deployment is developed from vision to a strategic plan, top management policy, departmental management policy, middle manager policy, and annual action plan (for middle managers, sectional chiefs, and staff). In addition, an action plan is developed in each section.

Komatsu started TQC activities in 1962 as an improvement initiative by all staff,

known as “Maru A Provision.” By this initiative, the company was awarded the Deming Prize, and its activities were established in the organization. Currently, the company sets a middle-range plan, management policy, and departmental action plans, which are done according to a plan–do–check–act (PDCA) cycle (Arai, 2012).

Policy deployment is a tool for communicating top management policy to all employees and is utilized in dealing with environmental changes and improvement by considering issues deeply. For successful policy deployment, it is necessary for a company to maintain a business culture by which the organization can change its business plan when the environment changes, and middle managers understand top management policy, exercise autonomous PDCA management, and develop the middle up by applying the top management policy.

The Komatsu way, completed in 2006, works to maintain the organizational culture. For example, significant factors for departmental managers and managers in subsidiaries, as per the chapter on management, is that they activate board meetings, do not postpone risk issues, comply with business rules, and always consider successor training. The top management needs to explain the company’s situation and future direction to all employees every 6 months.

Based on the organizational culture, TQM activities, such as meetings of business planning, enterprise project management, autonomous improvement activities to strengthen the factory floor, and small group improvement activities, are implemented in the organization. In terms of the relationship between the improvement activities and accounting numbers, the accountants have calculated the cost improvement amounts and examined how they affect the financial statements. When factories held responsibility for profit, they had to take care of both sales and production. However, after introducing SVM management, they need focus only on OVC, which means there is clarification of managed objects. They feel that they can more easily understand the TQM improvements in terms of accounting numbers.

Even though the factories focus on OVC, the production cost, they do not stop considering sales. Instead, their relationship with the sales department has been deepened. Based on the TQM process, each department aims to move in the same direction and deal with environmental change through regular meetings among sales departments, production departments, and factories in Japan, called “sales–



production meetings.” This is held at the head office every month, and the managers check the sales plans and production plans. In addition, participants revise the plans. KOMTRAX is utilized for gathering information through the whole supply chain, including sales agents. As a result, the production departments not only have cost responsibilities, but also consider sales through these meetings.

TQM activities are developed by departments indirectly related to production, and the reduction of CCs occurs not only for production cost, but also for SG&A costs.

“I believe that the successful managerial reform was based on the improvement initiative developed by TQM. Komatsu introduced QC activities in the 1960s. Based on the field principle, we see the facts in the field and use data to understand status. From this understanding, we develop strategy for issues and check the results again; we develop the PDCA cycle. This improvement knowledge was accumulated not only in production departments, but also in indirect departments as field DNA” (Sakane, 2009: 12).

In Komatsu’s case, relating SVM management and CC management to TQM knowledge supports the company’s improvement activities and achievement of its strategic policy, “decoupling costs from growth.”

## 5 Strategic capacity cost management

This study examines how Komatsu got over the sticky costs problem. The problem in Komatsu was that fixed costs increased when sales increased, which meant capacity costs were not fixed. In addition, factories held responsibility for profit, which made their management range too wide.

In order to solve these issues, the company introduced SVM management and CC management by dividing costs into variable and fixed costs, giving each department responsibility based on the controllability principle. The improvement costs are calculated as OVC, and the company plans favorable variances and revises the plans with great flexibility by updating the forecasts. The indirect costs in ABC are dealt with as variable costs in Komatsu. Under CC management, the fixed costs are managed so that the total cost does not increase when sales grow. When sales decrease, the level of fixed costs is reduced. In particular, the top management did

not decrease R&D expenses to achieve its strategy, while the reduction of administration expenses contributed to the great improvement in earnings.

This study gives an account of how a direct costing system can solve overhead allocation issues and sticky cost problems, which is not ABC in the case of Komatsu. The question then arises: what conditions are suitable for direct costing?

In Komatsu, SG &A was allocated to products, in which the company used total full costing: beyond full costing. The problems therein were that responsibilities become unclear under allocation costs and expenses. Under SVM management and CC management, each responsibility has been clarified. In ABC, the organization develops cost improvement based on activities in which it has a standard while discussing the reason for allocation and waste of resources. By using ABC, the organization focuses on its activities to solve issues in allocating costs, such as unclear responsibilities. It attempts to find the key factors and manage activities. In a sense, corporate staff play an important role in cost improvement. In Komatsu, cost targets are not set based on departments, but people on the factory floors play the main roles in cost improvement initiative, in which the knowledge for cost reduction is based on TQM. Corporate staff give departments the resources for cost improvement and encourage their autonomous activities. This has the advantage of not allocating the costs.

Komatsu's case shows that direct costing contributes to cost improvement by providing cost information to support existing capabilities for improvement, such as TQM.

The extant literature discusses that the variable cost ratio decreases while the fixed cost ratio increases under the contemporary business environment, and as a result, the relevance of direct cost decreases (Dilts and Russel, 1985; Sakurai, 1992; Johnson and Kaplan, 1987). In Komatsu, internal processing costs are managed as variable costs, and the ratio is somewhat significant. Under direct costing, another issue is that direct cost information makes it difficult to recover full costs by setting price. Komatsu avoids this issue by setting price to make marginal profits to cover the total fixed costs. Some scholars indicate that direct cost accounting suits mature and declining markets, and is not suitable for the high-tech industry because the nature of the decline phase is relatively short. The construction machine market is still developing, although it is a high-tech industry in a sense, and yet, direct costing

contributed to solving Komatsu's organizational crisis. In addition, the fixed cost ratio at Komatsu was relatively higher than at its competitor, and the company was able to solve this issue by guaranteeing R&D spending and reducing total fixed cost by strategic CC management. This does not conform to issues addressed in the literature.

## 6 Conclusion

This study examines whether ABC/ABM using exhaustive cost allocation is the only solution under competitive circumstances with increasing capacity costs. Our case study shows that direct costing after quitting full costing contributes to an improvement in business performance. Without ABC/ABM, direct costing is related to cost improvement activities with TQM. We call Komatsu's cost management practices strategic capacity cost management. Its characteristics are strategic priority principles for capacity resource allocation, decoupling costs from growth, and cost improvement knowledge, such as TQM. We contribute to the extent literature by adding ideas about how to manage capacity costs from a strategic viewpoint.

In this study, we show the results of offsetting increasing costs for growth and decreasing improvement costs, but we do not show what Komatsu has done in reality and how it has achieved this. We need more research about Komatsu's case. In addition, future research is needed to investigate whether cost management in Komatsu is applicable to other industries or companies in similar industries, and how other enterprises deal with the issues of traditional cost accounting.

## Appendix

	Date	Location	Interviewee	Duration
1	1/22/2014	Head Office (Tokyo)	Executive Officer, Information Strategy Division; General Manager, Controlling Department, etc.	1.5 hours
2	5/26/2014	Head Office (Tokyo)	Executive Officer, Information Strategy Division; General Manager, Controlling Department	1 hour
3	7/7/2014	Head Office (Tokyo)	Chief Financial Officer; Director; Senior Executive Officer; Executive Officer, Information Strategy Division; General Manager, Controlling Department	3 hours
4	8/27/2014	Oyama Plant	General Manager, Administration Department; Senior Manager, Accounting Section, Administration Department; Manager, Accounting Section, Administration Department; Manager, Accounting Section, Administration Department; Manager, Quality Control Department	4 hours (incl. 1 hour observation)
5	8/28/2014	Research Division	Group Leader, Accounting Section, Administration Department; Staff, Administration Department	2 hours
6	10/27/2014	Osaka Plant	General Manager, Administration Department; Deputy General Manager, Accounting Section, Administration Department; Senior Manager, Manufacturing Department; Manager, Manufacturing Department; Manager, Administration Department; Manager, Quality Control Department	4 hours (incl. 1 hour observation)
7	12/17/2014	Osaka Plant	General Manager, Administration Department; Deputy General Manager, Accounting section, Administration Department; Manager, Administration	2.5 hours

			Department	
8	2/23/2015	Thailand Plant	Vice President, Accounting Manager	4 hours  (incl. 40 minutes observation)
9	9/17/2015	Head Office (Tokyo)	General Manager, Controlling Department Staff, Controlling Department	2 hours
10	11/9/2015	Head Office (Tokyo)	Accounting Manager, Accounting Manager	2 hours
11	12/3/2015	Head Office (Tokyo)	Executive Officer, Information Strategy Division	2 hours
12	12/24/2015	Head Office (Tokyo)	Executive Adviser (former CEO) Executive Officer, Information Strategy Division	1 hour

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