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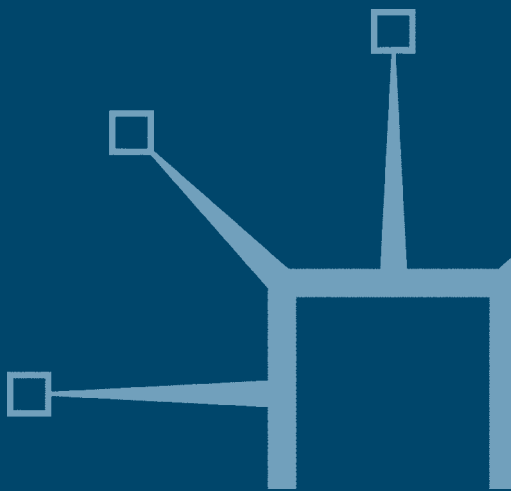
# Management Accounting

## Feed Forward and Asian Perspectives

Akira Nishimura



Management Accounting

*Also by Akira Nishimura*

ACCOUNTING IN THE ASIA-PACIFIC REGION (*co-editor with N. Baydoun and R. Willett*)

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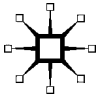



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# Preface and Acknowledgements

Management accounting was born early in the twentieth century, ramifying from financial accounting. Management accounting, and so too does financial accounting, embodies accounting eyes, or control function, and the former takes the social shape of controllability in contrast to that of disclosure in the latter. In our society, both are originally one and undivided, since disclosure would not realize accountability without controllability. Disclosure without controllability is only an empty ceremony. As the separation of ownership and management increases according to the development of joint-stock companies, disclosure gradually established itself relatively independently of controllability. In the case of fraudulent accounts, both completely confronted each other. However, because both must be connected, auditing was given birth to as a neutralizing measure.

Managers who assume controllability must be socially responsible for business risk, even if their responsibility can be discharged by disclosure. When risk can be dissolved by a feedback system, disclosure and controllability work well and stakeholders may continue to expect future recovery. At present, as experienced in Enron's failure, not only Enron but also the accounting firm, Arthur Anderson, fell into such a dangerous situation as to tear their international networks and branches to shreds, and caused widespread redundancies and insolvencies. In Japan, we have also seen some cases in which, for example, a big business fell into bankruptcy in a single night as a result of selling detrimental foods to health shops. Feedback control can no longer function in these firms because social costs are so great and there is not enough time to rectify errors. There is a complete failure of separation of disclosure and controllability.

We therefore should go forward into the twenty-first century with the integration of financial and management accounting. At the same time, this integration should be strongly based upon feed forward management. As a result of the socialization and globalization of big business, feed forward management assumes more and more importance, because failed controllability brings such serious 'irrecoverable losses' on societies that feedback control cannot solve. The proactive countermeasures to prevent us from this calamity should not be carried out by a few excellent managers, but should be the responsibility of every member of an organization. Feed forward management is not implemented until strategic management is organically united with cooperative management in a company.

This book has been stimulated by the feed forward management practised by Japanese management accounting, particularly *Cost Design*, and tries to further advance this idea. However, the object of this book is not to

introduce the structures and contents of Japanese management accounting, but to consider what is the true nature of management accounting and how should it be studied, through the study of Japanese management accounting. This book grapples with these problems from the angle of feed forward management and an Asian viewpoint in order to make clear some perspectives of management accounting science and its global development. Accounting science is a social science, which scientifically studies methods to systematically and synthetically measure, recognize, and control economic phenomena related to business management. Accounting is the control calculation, which systematically and synthetically measures and recognizes economic phenomena by means of accounting methods (T form, double-entry, credit and debit accounts, and others) and supports business management, or decision-making and performance evaluation. Management accounting also depends upon this function of control: accountability.

Here is a brief summary of the main contents of the various chapters. Chapter 2 addresses the fundamental content and structure of accounting and their relationship to management accounting, after giving an overview of the existing literature in terms of Japanese management accounting, feed forward control, and the comparative study of Asian management accounting. They are deeply based on some concepts such as accountability, controllability, disclosure, and feed forward and feedback management. The chapter also lays a foundation for the analysis in subsequent chapters that are always related to the development of formal accounting systems.

Chapter 3 explains how Japan learnt advanced management accounting from North America after the Second World War before developing its own model from the 1970s. Inner-cooperative management orientation and qualitative, structural context in Japan is contrasted with decision-making orientation and quantitative management in the USA. Chapter 4 introduces the Japanese management system, focusing mainly on the reciprocal relationship between effectiveness and efficiency, and the bilateral organization of managers and workers in Japan. It analyses the structures and features of Japanese management accounting, in particular target costing, in detail and its social and organizational backgrounds, and inquires into the effects of Japanese management on British and New Zealand companies.

Until now research on Japanese accounting has only tackled some general aspects of the Japanese management accounting system. The detailed aspects of this system and its basic framework have not yet been examined. The Japanese system is a horizontal two-way management system as opposed to the vertical one-way system generally practiced in the West. The Japanese two-way management system influenced the practice in some Western countries such as the UK and New Zealand in the 1980 and 1990s. British firms such as Rists and Nissan New Zealand applied the Japanese system to their management: just-in-time (JIT), QC circle, cooperative

organization, and *Kaizen* (cost improvement). The 'Japanization' of management systems in New Zealand and the UK in particular is also examined. This influence led these countries to develop the integrated two-way management system, in which high profitability was connected with a democratic organization.

The study in Chapter 5 appraises, within an international context, the transplantation to other countries of Japanese management (including management accounting). The cultural characteristics of Japanese management (collectivism and non-separation of the relationship between family and company) are clarified, utilizing Hofstede's model of value dimensions. The successful transplanting into Asia in terms of transferring cost is contrasted with the relatively unsatisfactory results in the West. The high transfer costs reflect the strong cultural nature of Japanese management (teamwork and loyalty to a company) and its alien nature within the transferee countries. Transplanting is also analyzed using the cost-benefit to the transferees.

Chapters 6 and 7 investigate Asian management accounting practices in relation to economic growth from the viewpoint of feedback and feed forward control. In order to clarify the features of management accounting practices in Asian countries, the development of management accounting is divided into four stages and distinguished by the process from 'drifting' to integrated management accounting through traditional, and quantitative management accounting systems. In particular, management accounting systems in Japan, NIEs, and ASEAN are viewed in the light of the four stages. It is also emphasized that the steady establishment of financial accounting, particularly the disclosure system, played an important role in the progress of management accounting, with reference to lessons from Japan.

Chapter 8 aims at conceptually examining target costing, which Japanese enterprises developed in the 1970s, and clarifying some problems in transferring it overseas. Although some investigations in Japan testify to its popularity in Japanese industries and emphasize the possibility of its transfer, it is important to examine whether there is a conceptual confusion about target costing, when investigators regard all of its types as having been 'made in Japan'. This analysis seeks to clarify the fundamental characteristics of Japanese-type target costing. On the basis of this study, we analyse recent developments in target costing in Taiwan and Mainland China and compare them with their Japanese counterpart.

Management accounting today is powerfully prescribed by the complicated diversification and internationalization of business administration. Therefore, management accountants must grapple with the new concerns of business strategy and the problem of the allocation of fixed overheads, which is still unsettled. Chapter 9 describes subjects that today's management accounting should tackle and proposes a new management costing and the analysis of cost variance. Therefore, activity-based costing and cost design (target costing), which have popularly been discussed until now, are

appraised in terms of their successful results and unsettled problems. In addition, the chapter looks back at the evolutionary process of management accounting to clarify different conceptual frameworks used in today's management accounting from traditional management accounting systems. Lastly, an integrated cost accounting system in which cost design and ABC are connected with contribution margin, and the analysis of cost reduction to be valuable for fixing strategy in and absorption from organizations are concretely explained.

Chapter 10 pioneers an examination of the accounting function of management accounting from the viewpoint of feed forward and corporate strategy. It focuses on some functions inherent in accounting and their roles in efficiently implementing strategic management. In particular, discussion is concentrated on accounting visibility and its control function. At the same time, feed forward cost bookkeeping is advanced in the light of the fruitful outcomes of Anthony's and Demski's theories as well as of the Japanese management practice of cost design.

In the Conclusion, Chapter 11, the basic concept of feed forward management and its relation to management accounting is summarized as a result of the analysis in the preceding chapters, since this concept seems to be increasingly important for the future of the social science.

It took two decades to complete this book. Therefore, the book might seem to have some out-of-date information and contradictory contents in the contexts of earlier and later chapters. However, the book is the fruit of my long-term thoughts about management accounting. This is surely the treasure, which I cannot substitute with anything valuable. This is also a crystal of friendship without which this book would not be born.

Among other things, I wish to express my gratitude to Professor Ali M. El-Agraa, a specialist on International Economics and European Economic Integration, for looking over and correcting this book, and giving me many valuable suggestions. The long friendship with him has given my life a strong energy and light, and urged me to write papers. In particular I remember the days when we drank and talked over teaching and research in Nakasu, Fukuoka in Japan. The manuscript of the book would have stayed in a filing cabinet without his cordial help. I am also indebted to Professor Roger Willett and Nabil Baydoun for having given me a big incentive to set about the study involving this book, when we stayed in Otago University, New Zealand. I take this opportunity to thank Roger for contributing to the commemoration number of the journal in celebrating my 61st birthday: *Journal of Political Economy* in Kyushu University, Japan.

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In particular, I wish to express my gratitude to Professor Trevor Hopper of Manchester University, a prominent authority on the scientific research method of management accounting, for reading the entire text in its original form and making some helpful and valuable suggestions, which not only encouraged me to publish it, but also offered useful advice on how to get it published.

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AKIRA NISHIMURA

# 1
# Introduction

## 1.1 Introduction

This book historically and synthetically analyses management accounting, particularly Japanese management accounting, from the viewpoint of feed forward management and the Asian perspective, and elucidates the contemporary characteristics of management accounting. Its standpoint may be in contrast to the conventional wisdom, which has concentrated upon feedback control and the Western rationalization based on specialization and the division of labour, although it does pay some attention to these aspects of management accounting. However, this book has as its central focus feed forward management and the Asian perspective. This approach is also adopted in order to help in building a global and scientific viewpoint in the study of management accounting.

The research for this book has relied heavily on the existing literature. To clarify the relationship between my approach and that literature and its differences from it, it would be useful for the reader to understand the fundamental standpoint of the book. This book will elucidate the contents and features of Japanese management accounting and compare it with its Western counterpart in the 1970s, leading to the present with an analysis of feed forward management as a result of *genka kikaku*, or cost design – which is usually translated as 'target costing' in English, although this phrase does not seem to capture its essential meaning (see Chapter 7). Concerning the comparative nature of the study, while this book sets inner-cooperative and qualitative management in Japan against decision-making orientation and quantitative management in the USA in the 1970s, in the 1980 and 1990s, as Japanese products penetrated the international markets and drew international attention, it began to be recognized that feed forward control and market strategic management as practised in Japan was diverging from the North American model. It is likely that this divergence will diminish in the future as Western countries also pay more attention to feed forward control and market strategy.

In the light of the collapse of Japan's bubble economy and the continuing strength of the US economy, Japanese management accounting techniques have attracted less interest and it has lost out to techniques such as activity-based costing and balanced scorecard. Do these developments mean that Japanese management accounting contributed nothing to the world of management accounting? At the same time, some have advocated the separation of theory and practice in management accounting, and switched their attention to an empirical study, based on field study. As a result of field study, how could the problem be solved? We must clarify whether or not such analysis has resolved the problem. In particular, the author's interest is to see to what extent these analyses have advanced the scientific research and practices of management accounting.

We should tackle the above subject to gain an overall picture of the theoretical and practical outcomes of management accounting in the twentieth century and define a new direction for research in the twenty-first century. Although this book cannot offer a total solution, it contributes to the development of the research in this field. From this perspective, this chapter reviews the existing English-language literature on the relationship between Japanese management accounting and feed forward control and between feed forward control and management accounting in general, and also discusses the present condition of Asian management accounting research.

With regard to the literature on Japanese management accounting, a comprehensive picture can be seen in the paper by McMann and Nanni (1995). They dealt with the vast English-language literature in five contextual themes: (1) those works using the 'eyes' of the market; (2) those focusing on the quality of work; (3) those employing 'waste' as the measure of cost; (4) those securing continual improvements in the way work is done; and (5) those sharing knowledge through vertical and horizontal communication. In their book, Yoshikawa et al. (1994) also discuss the literature on Japanese management accounting. This chapter deals with only the English-language literature on Japanese management accounting as it relates to the main subjects of this book – that is to say feed forward management and Asian management accounting – and explains their relationship to the subjects (Japanese readers interested in the literature can read the author's Japanese-language book, *Control Function of Accounting and Management Accounting*, Doubunkan, 2000).

## 1.2 Japanese management accounting and feed forward control

As Japanese products penetrated international markets in the 1980–90s, Japanese management accounting as well as new production and business management systems, which produced highly competitive firms through the integration of low price and high quality, received worldwide attention. Advocates of 'the Japanization of industry' became increasingly vocal in

Britain, as the UK tried to learn something from management techniques such as just-in-time (JIT) production, total quality control, and cost management (Oliver and Wilkinson, 1992).

Concerning Japanese management accounting, with an article by Hiromoto (1988) in the *Harvard Business Review* being a turning point, Western researchers began to think that its methods had also contributed to the miracle of Japanese economic growth, and they were eager to understand its characteristics and differences from the Western method. Even before the Hiromoto article, Monden et al. (1986) had paid attention to the management system and cost management of the Toyota Motor Corporation and vigorously introduced, as its peculiar characteristics, target costing, the allocation system of target costs to each organization, cost reduction at the development and design stage of a new model, and value engineering. They focused on the market orientation and cost reduction of Japanese management accounting instead of the concentration of production efficiency and cost control based on standard costing as had been the case in traditional management accounting.

Hiromoto took into account Monden et al.'s achievement and his own empirical research, and encapsulated the characteristics of Japanese management accounting in three points. First, using direct labour hours/cost as a standard of overhead allocation, although it generally became null and void in face of high mechanization, was still effective in Japanese enterprises, since this, as an incentive system of cooperation, mobilized the whole of the workforce towards achieving a long-term goal. That is, because there was a greater emphasis upon motivation in Japan than upon the correct measurement of cost. Second, target costing oriented to market-driven management. Last, Japanese enterprises attached more importance to cost reduction than they did to cost control. Thus, his phrase 'Good-bye to standard costs' encapsulates the nature of Japanese management accounting. After that time, the international interest in the Hiromoto article induced many Japanese accounting researchers to write and publish English-language papers about Japanese management accounting. As a result, Japanese management accounting practices became increasingly familiar in international accounting circles.

Most of these articles, sharing a common recognition of the market orientation in Japanese management accounting, emphasized either its functional aspect or the cost reduction of Japanese-style management accounting, which made the integration of high quality and low cost possible. As a result of empirical research based on questionnaires sent to Japanese companies or field studies, some put importance on the former, while other stressed the aspect of cost reduction. Monden and Sakurai (1989), in common with many other scholars, published an extensive account of management accounting practices of some Japanese companies such as the Toyota Motor Corporation, the Daihatsu Motor Company, and

the Matsushita Electric Industrial Corporation. In particular, Monden (1994) concretely introduced the procedures and contents of target costing at the development and design stages of a new model, and a detailed discussion of cost reduction management related to the just-in-time production systems.

Tanaka (1991) depicted the general state of target costing and pointed out that it established a well-matched relationship between cost and quality on the basis of comparison of target cost and estimated cost. At the same time, another Tanaka (1993) examined the relation between cost design and cost improvement in the Toyota Motor Company. Kato (1993), referring to the market orientation and cost reduction of target costing, also highlighted its social context and the fact that this could hinder its introduction in foreign countries.

In contrast to these descriptions, Tani (1995) wisely not only clarified that there was no system to calculate target cost or cost accounting in Japanese *target costing*, but also, from a target *cost management* perspective, referred to the horizontal and simultaneous engineering that characterized this management: the mutual and continuous cooperation of engineers. This indication led Adler (1999) to question the conclusions of the Hiromoto article since although Hiromoto had emphasized target *costing*, he had actually explained nothing with regard to costing. In a development, Adler tried to unite target cost with activity-based costing (ABC) from the viewpoint of a world-class management: target costing activity-based management.

Yoshikawa et al. (1989), in conducting a comparative study of Scottish and Japanese management accounting, clarified that Japanese employees cooperated with each other voluntarily regardless of the regulation of a specific budget or standard. In another paper in 1995, they took notice of functional cost analysis – a cost management technique derived from value analysis – in Japanese management accounting. Yoshikawa (1996) pointed out that Japanese management accounting improved the visibility of employees; his approach was based on the same analysis as Hiromoto.

## 1.3 A comparative study of Japanese and Western management accounting

Bromwich and Bhimani (1994) reached the conclusion that it would be difficult to transfer multi-skilled working, cost reduction connected with a subcontracting system, and other aspects of Japanese management to the UK situation. Their conclusion was based on a wide-ranging comparison of Japanese management accounting with its North American counterpart, an investigation of their social, economic backgrounds and an examination of the ease of transferability. In another article, Yoshikawa et al. (1993) tried to construct a system of strategic management accounting, in which target costing, ABC, cost table, and function analysis were unified.

A few words should be added here about the comparative study of budget between Japan and other countries from a cultural viewpoint. Concerning the relation between culture and management accounting, collectivism in Japan confronted individualism in the West (Ueno and Wu, 1993). Can the national culture of collectivism really distinguish the Japanese style of management accounting from that adopted in the West? This question is raised because business culture, or accounting culture, is more complicated and a common characteristic in all enterprises, and accounting culture can also influence national culture. For instance, although collectivism is observed in China, Korea, and Japan, as opposed to North America, these three nations have a completely different style of collectivism, yet they share a common accounting culture. Chapter 4, on the basis of our joint research (Baydoun et al., 1997), discusses Japanese management accounting from the point of view of Hofstede's four value dimensions of power distance, uncertainty avoidance, individualism and masculinity and refers to its cultural and economical backgrounds. It summarizes the difficulty of transferring Japanese management accounting to other countries because of the high transfer costs. Bailes and Assada (1991) also made a comparative study of budget goals for division managers in Japan and the USA by conducting company questionnaires in the two countries. They found that Japanese companies attached importance to sales volume in contrast to the high ranking of return on investment in the USA.

Ruling the cultural viewpoint out of consideration, we can confirm that most researchers have characterized Japanese management accounting as a market-oriented and cooperative system, which enhanced the integration of high quality and low cost. However, Japanese and Western management accounting systems more or less share this characteristic, and the difference between both is ultimately only quantitative, rather than qualitative. When Hariman (1990), after referring to the Hiromoto article, analysed the differences between Western and Japanese management accounting, he reached the conclusion that Japanese companies were anything but full practitioners of the market-oriented principle. We should modestly heed the words of McMann and Nanni:

> At this point in the development of the English language literature on Japanese management accounting, few uniquely Japanese *cost accounting* methods have been uncovered. Most evidence shows that Japanese and Western management accounting techniques and methodology are quite similar.

This is because nobody has clarified whether Japanese management accounting could have the possibility for additional ways in which the accounting system can be of service to management (Hartley, 1984). For example, it results from the fact that we have yet to define not only the

difference between target and standard costs, but also the essential definition of target cost.

Challenging these opinions, Chapters 3 and 4 in this book dare to compare management accounting practices in Japan and North America, the UK, and New Zealand. In addition, Chapter 7 makes a comparative study of Japanese and Chinese target costing systems. The concept of feed forward control, which this book strongly emphasizes, may hold the solution to this question.

Morgan and Weerakoon (1989), again referring to the Hiromoto article, extracted the feed forward concept from the Japanese cooperative management related to zero inventory control and cost reduction management through a comparison of target and estimated costs. Morgan (1992) further analysed the essence of the concept in detail and tried to generalize it. He regards feed forward as a way 'to use information available at the input stage to narrow the gap between expected and actual results'. According to him, feed forward control allows the retirement of a planned value by gathering beforehand business environment information in order to minimize the variance between planned and actual costs. Therefore, he focuses on 'the idea of anticipating' and stresses that feed forward control is 'preventive rather than remedial'.

Cooper (1996), in conducting research on the actual practices of many Japanese companies, made it clear that many characteristics of Japanese costing techniques connected with 'lean production' and focused on the consumer. These techniques consisted of the integration of high quality and low price, just-in-time production, economical batch production, and the horizontal integration of the organization. Furthermore, he moulded them into a unique shape: three feed forwards, composed of target costing, value engineering, and inter-organizational cost management system, combined with three feedbacks – product costing, operational control, and *Kaizen* costing. The former is related to the cost management of a future products, while the latter is concerned with existing products. In other words, cost reduction and the improvement of quality at the design stage of a new model in *feed forward techniques* is contrasted with the traditional cost reduction at the production stage in the *feedback methods*. According to Cooper's thought, these six techniques were tied to each other, and resulted in a synthetic cost management programme by which Japanese companies were enabled to reduce costs through the lifecycle of a product.

Chapters, 4, 7, 8 and 9 pay attention to the concept of *feed forward* control and consider it to be the most basic characteristic in which Japanese management accounting can be distinguished from the Western. The analysis in Chapters 4 and 8 depict Japanese management accounting a synthesis of inner-cooperative management and feed forward control, while the West's is characterized as a system of decision-making management and feedback control.

## 1.4 Feed forward control and management accounting in general

Although feed forward control has until now been discussed in relation to Japanese management accounting, it has for a longtime been studied in the realms not only of control engineering and medical science, but also of management accounting in general. This book deals with studies on feed forward control in relation to the mathematical and quantitative analysis of management accounting in North America (see Chapters 8 and 9). Demski (1969) described feed forward control when developing the ex post system which became an epoch-making advance in the study of management accounting science in the previous century. He used linear programming methods to analyse profit variance and recognize opportunity cost variance. He described its formula as follows:

Profit variance = forecast variance + opportunity cost
Forecast variance = ex ante profit − ex post profit
Opportunity cost variance = ex post profit − observed profit

These formulae compare ex ante profit with ex post profit, or *the two planned values*, and elucidate forecast variance by integrating changing business environment information into the model so that it can evaluate the decision-making ability of senior managers. This is completely different from the traditional variance analysis, which directly compares *planned value* with *observed value*. Here is to be found the same idea as target costing, which calculates two planned values: target costs and estimated costs. Demski's aim is to subtly plan value through comparing the two planned values according to business environment information originating from feed forward philosophy, which led managers to the improvement of the decision-making process.

However, because an emphasis was placed on the measurement of opportunity cost in his ex post model, the planned value must be optimum under the same business-environmental condition as that observed. After that, an opportunity cost variance can be recognized. Therefore, judging from the whole of his model, it basically embodies feedback control thought despite including some feed forward control. This is because, just after the observed profit is calculated, the optimum ex post profit is measured, all variances are possible to be analyzed, and control activity begins (see Chapter 9).

Following such a pioneering work, Ishikawa and Smith (1972) took this analysis a step further in an interesting paper, which brought a planning process into focus and offered a detailed analysis of its relationship to feed forward control. They absorbed results from natural science and did not simply pay attention to the relation between feed forward control and the planning processes, but also considered its relation to planning and *control* processes. Examining the influence of changes in the business environment on future decision-making, they considered feed forward control to be a

preventive and anticipatory act that was to be implemented for control before the variance between planned and actual performances had occurred.

Therefore, they pointed out a planning and control system, namely an integration of part of the control function with the planning system instead of the traditional idea of a planning system and a control system. According to them, corresponding to dynamic changes of business environment, the design and construction of planning system assumes more and more importance. Ishikawa (1975) then developed the concept of feed forward to a definite shape in business planning and strategic plan.

Furthermore, Ishikawa (1985) analysed the Japanese budget system from the viewpoint of feed forward and clarified some different aspects between the Japanese and American planning and control systems. For example, he considered the planning and budgeting system in Cannon Company and pointed out that the company was shifting to feed forward control for solving actual problems that cannot be settled by feedback control.

Koontz and Bradspies (1972) discussed a further limit to the present application of feedback control. According to them, by the time accountants analyse results from plan and actual performances are received as information, it is usually too late for managers to revise their actions, and even if they could do so any action would require too much time and money. Such a feedback system is as meaningless as the control analysis after death. From this viewpoint, Koontz and Bradspies started to argue persuasively the necessity for feed forward control, using PERT/CPM as an example. In their opinion, 'the achievement of more effective control is to reduce the magnitude of the error by using prompt information'. This is related to 'future-directed control', or 'feed forward control to correct system disturbances on the basis of detecting and meaning these before the system output change occurs'. Koontz and Bradspies stress the importance of regularly monitoring input variables.

As stated above, studies of feed forward control began in order to make planned value precise and were then extended to applying the feed forward process to the planning and budgeting process. We can see that such an approach has a common base with Japanese cost design. At the same time there has been much impressive literature, establishing feed forward control as a fundamental concept in management accounting or cost management. In Chapter 8, this book also classifies the development process of management accounting into three stages from the viewpoint of feedback and feed forward control, and market strategy: traditional, quantitative, and integrated management accounting.

Belkoui (1983) dealt with the concepts of feedback and feed forward controls in his book *Cost Accounting*, in which he defined feed forward control as a compensatory activity intended to anticipate errors in advance. But, according to him, feed forward control is the general control process of usual events in contrast to feedback control as the control process for the

unusual events. However, at present the more unusual events are, the more the demand for feed forward control increases.

In a later work, Wilson and Chua (1993) define feed forward control as a predictable relationship between inputs and outputs and argue that feed forward should operate at both the input and output stages as opposed to the traditional viewpoint that has focused on the input stage. They advance three purposes of feed forward control: to predict and control the future by making appropriate decisions in the present; to provide decision-makers with a means of comparing actual and expected performance; and to highlight processes that are or may be out of control. Therefore management accounting is intended to provide the decision-maker with information that is future-oriented, predictive and performance-oriented. In particular, it must be noted that Maruta (1998a, 1998b, 1998c, 2001, 2002) has devoted himself to the study of feed forward management accounting. His study is a unique and creative addition to the literature.

On the basis of the above studies, this book examines the concept of feed forward control, extending it to feed forward management, from the two aspects of Japanese management accounting and management accounting in general. Feed forward management consists of a feed forward planning process and a feed forward control process in a narrow sense. Moreover, this book dares to challenge traditional orthodoxy by trying to deal with a formal accounting system at the feed forward level and also to establish a feed forward management accounting system, although most accountants consider the accounting system to be a feedback system (see Chapter 8). As a result of these analyses, this book will be able to elucidate the characteristics of Japanese management accounting and will provide a comparison with the Western model. It will also examine the differences between target and standard costs (especially, see Chapters 8 and 9).

## 1.5 The comparative study of Asian management accounting and the impact of target costing on Asian management accounting

Only a small number of papers deal with the comparative study of Asian management accounting. Chow et al. (1991) compared Singapore's manufacturing performance with that of the USA from the viewpoint of the management control system and national culture. Chang et al. (1995) also analysed budget control in Japan and Taiwan from the cultural viewpoint. Although they concluded that Japanese companies used broader time horizons, built bigger slack into the planning process, and had shorter-term performance evaluation than the Taiwanese from individualism-collectivism and uncertainty avoidance of Hofstede's four value dimensions, their conclusion has yet to be examined, when business organizational culture and the Western countries are included as factors for comparison in their model. Baydoun et al. (1997) first gave fundamentals to the comparative study,

since in their book they dealt with the management accounting practices as well as the financial accounting systems of many Asian countries. Chapter 6 uses these data to make a comparison of management accounting practices in Japan, NIEs, and ASEAN and make each characteristic clear from the angles of feed forward management and market strategy. In particular, the development level of Asian management accounting in comparison with that of the Western is examined.

The reader will recognize from Chapters 5–7 that the adoption of feedback or feed forward systems in Asian business management also mainly depends upon its cost–benefit measurements. However, we should also note that this measurement should be decided not only by monetary standards, but also by natural and biological environment standards.

# 2

# The Control Functions of Accounting and Management Accounting

## 2.1 Accounting and the control function

Accounting is a human act to recognize and control economic activities by means of accounting concepts (such as capital, assets, liabilities, profit, expenses, and revenues) and accounting methods (such as double entry, T form-account, and accounts system). It has a strong relation to the social structure, because these concepts and methods are not merely mathematical – they also rely heavily on historic, economic and political contexts. Consequently, there has been some debate as to whether accounting is fundamentally a mathematical method, an economic behaviour, or a political activity, but this question is yet to be settled.[1] It may appear to be an easy solution to consider accounting as a boundary science in which the above three aspects interact with each other,[2] but such a conclusion cannot clarify the fundamental nature of accounting, because it assumes an ambiguity as to which of the three aspects fundamentally regulates the essence of accounting, and what relationship exists between them. Therefore, the first question that we must consider is: what is the fundamental nature of accounting and how does it relate to management accounting? Such an elucidation may offer the key to an understanding of the features and structures of today's management accounting.

All human beings should record and compute their economic activities in books for the purposeful accomplishment of a complicated labour process. Their purposeful and rational labours fundamentally distinguish them from other animals that only act according to instinct: animals that make elaborate nests instinctively cannot hold an advantage over humans, who can purposefully create the same beautiful result as they plan in advance. This results from a peculiar human characteristic of purposeful and rational labour. In the labour process, humans have tried progressively to use less labour to achieve the greatest outcomes – that is why they have been able to exist and breed up to the present. This concept of economic calculation is inherent in a labour process and has something to do with accounting.

Bookkeeping is different from statistics, which observes a large quantity of economic data in a limited place and a point of time and clarifies their fundamental characteristics. This is because the peculiar nature of bookkeeping relates to daily and systematical registering, classifying, and synthesizing individual economic activities in books by using accounting concepts and methods. Through these concepts and methods, one can calculate the profit (difference between the inflow and outflow of property) and net assets (net increase in stocks) of an enterprise. Simply stated, it represents a calculation system by ledger books linking journals with closing accounts. Therefore, through this bookkeeping system, one can recognize how the expected goal is actualized during, and after a production process. Bookkeeping has a self-checking function to confirm and control individual transactions in books, indicating their relationship to profit, and giving an, overall economic picture of an enterprise. Thus, comparative and checking functions play a central role in the bookkeeping system.

As for accounting measurement, working time is the best yardstick in measuring the value of the labour process that all economic goods as accounting objects generally embody at all historical stages. However, in practice, money, which reflects the value of working time, is used as a proper standard of measurement. Thus, bookkeeping individually and synthetically recognizes and controls the stocks and flows of daily economic activities by means of money. One can realize profits as a result of deducting the credit side from the debit in stock balances and the debit side from the credit in flow differences.

At the stage of simplest production, humans keep accounts in their heads, not in books. For example, peasants did not systematically register their activities in books. As a result of long experience with commercial and manufacturing transactions and the development of the division of labour and cooperative works, accountants, or bookkeepers emerged as a professional class. Therefore, it is evident that accounting is a social product that has resulted from the prolonged development of social production. As a professional method, it assumed a universal form in the West, working in isolation from the accountant's personality and it was systematized in a general form: law and regulation. Conversely, it always belonged to an individual talent in China because of its strong connection to personality. The popularization of bookkeeping was socially limited in China. Accounting (*Kuaiji*) also represented an accountant in the old China (Guo, 1984). Thus, the social accumulation of accounting practices urges its rational and universal development. The formation of debit–credit and double entry bookkeeping is the result of fruitful accumulation by Western civilization.

In this sense, accounting is a science of experience that slaveholders, churches, merchants, or manufactures have had. It is a creature that they have created over a long time in order to manage economic activities.

It is also important to ascertain that a bookkeeping activity does not produce any physical value, even if it, as a professional work, can contribute to the rational implementation and support of the value-added from production. It is not itself a value-adding creative activity, although the creative production could not be carried out without bookkeeping – the unproductive labour of bookkeeping is indispensable in making a production process more efficient. Once it links with management activity, it can fulfill its function as a supporter of rational and purposive production. Thus, humans need bookkeeping in order to organize and control social resources according to a rational and efficient rule of production. Humans cannot carry out continuously effective and efficient management over a long period of time unless they apply accounting visibility to its practical control function. The feedback and feed forward functions of the 'accounting eye'[3] contribute to clarifying the relationship between management actions and corporate profits and the implementation of synthetic management control.

As the socialized division of labour and the separation between ownership and management increase, accountants also become independent of managers in terms of their professional functions. Managers should report the managerial results of the property entrusted to owners and at the same time, accountants should also prepare financial accounts for managers. This report system also regulates the contents and forms of bookkeeping. There occurs in these circumstances a reverse phenomenon where the communication function regulates measurement, when generally it is the other way round. This is a typical phenomenon in the joint-stock company. Accounting for a corporation, in contrast to the mechanics of bookkeeping, begins to perform its own function as a report-initiative.

## 2.2 The control functions of accounting and accountability

Accounting cannot exist independently of social relations and management organizations. In the slavery society, a slaveholder owned not only slaves but also the accounting information they prepared. In 1912 Woolf wrote:

> having regard to the multifarious business carried on by bankers, it was essential for them to have their accounts carefully kept by themselves and a staff of clerks, chiefly freedmen and slaves; the details would be copied down from memoranda (*grammateidia*) into Day Books (*ephemerides*) and Ledgers (*biblidia, grammateia*), in which credit and debit accounts were shown on separate pages.

He pointed out two important issues: slaves' work to keep accounts in cooperation with freedmen, and the book system that Day books were linked on the basis of memoranda with Ledgers. Concerning the latter, an old Chinese bookkeeping, or *Liumen* bookkeeping, also adopted the same

system (Nishimura, 1991). The slaveholder could purposively manage the slavery production system by using accounting information (Gilman, 1939). Gilman also discussed this: 'it is convenient to think that the slave had no power of initiative, no opportunity to exercise independent business judgement; that he merely followed directors. – Because he was a slave, he was merely an extension of his master's personality.' The same situation can be found in the feudal society. Chatfield (1977) writes:

> day-to-day management was normally left to a hierarchy of officials and department heads. The lord's incentive for keeping accounts arose from his need to check on the integrity and reliability of these stewards, to prevent loss and theft, and generally to encourage efficiency. From the steward's viewpoint, accounting records provided evidence that he had discharged his duties honestly and well.

As the production process became increasingly complex, accounting became relatively independent of the management function, but had to have a closer relationship to management organizations. Accountants should prepare and submit financial accounts of property to managers as well as owners. Factory accounting played an important role in controlling working time and other production factors, and checking workers' dishonest behaviours (Garcke and Fells, 1887).

Under the French Commercial Ordinance of 1673, a merchant who fell into bankruptcy without preparing and maintaining accounting books was executed as a fraudulent bankrupt (Howard, 1932). Similarly, the Japanese Bankruptcy Act inflicts a corporal punishment instead of a fine on such a person. This is a significant condition for the modern and systematic development of accounting. In such systems bookkeeping appeared as a social, rather than a private behaviour. Moreover, the development of the joint-stock company system powerfully influenced the formation of modern accounting (Yamey, 1978).

## 2.3 Accountability and disclosure

The joint-stock company provided an impetus to the advancement of the capitalist production system, which is based on machinery industry in compliance with the enhancement of the division of labour and cooperative works. Consequently, managers began to take a relatively independent and distinct position from owners. Their main mission is to adjust, command, and supervise production organizations. Here there is no problem if a manager is independent of an owner in terms of personality, or if he concurrently holds the position of owner. What is important in the context of the Joint-stock company is his function of rationally managing the owner's capital. In the capitalist world, factory accounts and cost accounting came to

the force to support the managers who should reasonably plan and control socialized labour forces and other production factors. Consequently, the control function of accounting evolved into the modern style, where the control by personal account disappeared, and all things, personal and impersonal, were calculated and controlled as factors of capital in general ledgers, and individually checked as physical factors in subsidiary ledgers, cards and lists (Garcke and Fells, 1887).

The expenditure on workers, which personal accounts had treated, was also recognized as one element of capital – that is, as wages in the general ledger of impersonal account. Simultaneously, each worker was concretely managed in subsidiary books, cards, and lists. The personality of the worker was buried in the profit calculation of accounts. The wage account symbolizes the formation of industrial accounting and modern bookkeeping. As a result, all of the production factors were dealt with as the cost of capital, which was calculated in terms of capital stocks and flow connected to profit. The 'accounting eye' was completed as a modern system and started its contribution to modern business management.

In the joint-stock company, in which individual capitals are combined as a social capital, the social capital owns and manages the production processes. Every stockholder, as a constituent of the social capital, has the right to voluntarily acquire accounting information from his company and to manage its production. The stockholder democracy, in which the number of stockholders was decisive in decision-making, was predominant during the formative period of the joint-stock company system. Every stockholder could freely inspect the financial accounts of the company irrespective of the number of stockholdings, and had a voting right on important business matters such as capital increase, borrowing, takeovers and mergers, the employment of new staffs, and dividends (Scott, 1911). The communication function in the accounting system served all stockholders without contradicting the measurement function. Management and ownership prescribed the accounting system as a body.

As the joint-stock company system developed, the stockholder democracy was converted into the stock democracy, in which some stockholders began to control business according to the strength of their capital power. As a result, some big shareholders, or ruling parties, took charge of business management and got accounting information for themselves only. They used accounting information at their discretion to manage business by themselves or through their agents. On the other hand, many minor stockholders were denied free access to accounting information. However, the ruling parties could not refuse them the public disclosure of accounting, so long as they were also owners of a company. In this case, the substantial right to freely inspect financial accounts was changed to the formal one of hearing accounting reports from the ruling stockholders in a general meeting of stockholders.

Concerning accounting information, the person who prepared, reported and used it for management was completely separated from those people who received and used it for investment. The directors' duty to report accounting information to every stockholder had an institutional meaning in company law. They could not be exempted from this duty. The disclosure of accounting information was a countermeasure to the social recognition of a joint-stock company system, since every stockholder could check the arbitrary, fraudulent activities of directors by using the accounting report system (Horrwitz, 1946). It could preserve minor stockholders from speculation, which was stimulated by the limited liability and normative systems, under which any person can establish a company as of right, not by charter, according to a regulated rule (Murphy, 1940).

The disclosure aspect in the joint-stock company system socially assured minor stockholders of their ability to extract accounting information from ruling stockholders or directors as against the substantial right to inspect financial accounts. It follows, however, that minor stockholders should also take full responsibility for their own investments, though they could demand accounting responsibility, or accountability about business administration from the directors. As a result, the idea of auditing was created and further specialized, and developed in the form of chartered public accountants. In this case, accountability means to keep accounts and be responsible for their results according to social rules (Hunt, 1936).

The accountability of directors relates to the social responsibility of a corporation. This is because dividend distribution is strongly regulated by the way and method to calculate profit, which should comply with the rule that its distribution must not be organized at the expense of capital. Thus, accountability also meant strict self-responsibility by directors. However, in reality the directors who controlled accounting information would embellish accounts in various forms in order to strengthen their administrative fundamentals and manipulate dividends (Dicksee, 1927). Hence, the measurement function began to conflict with that of communication between directors and minor shareholders.

The legal regulation of accounting through company law should be provided and carried out in detail, as soon as opposition among interested parties becomes impossible to solve within a range of self-responsibility based on disclosure. As a result, the measurement and communication methods of accounting were socially approved and institutionalized.

Before the twentieth century, the disclosure system predominantly prevailed in the adjustment of interested parties and the role of accounting regulation was secondary. In those days, the accounting requirements did not have to be as complicated and detailed as now. Under that situation, stockholders were required to utilize accounting information at their own

responsibility to take decisions on investment. In this sense, disclosure was a device to release controlling stockholders and directors from accountability, even if the published information was simple.

In the twentieth century, when the monopolistic business was organized and the production by a corporation was extensively socialized, all interested parties were diversified and magnified around the corporation: stockholders, creditors, workers, consumers, governments, and commonality. The disclosure system was not merely related to the joint-stock company system, but also to a country's social order (Manne and Wallich, 1972). Accordingly, accountability, as a self-responsibility of a director, also assumes the character of social responsibility. This development was most typically shown in the American railroad companies and Securities Exchange Laws in the 1930s (May, 1936). Accounting requirements on the basis of disclosure have been institutionalized in the process in which big businesses have conflicted with anti-trust movements.

At present, because accountability based on the disclosure system is concerned with the social existence of a corporation, it is an important countermeasure against the undue influences of large corporations. Therefore, accountability becomes part of the social responsibility of big enterprises. Disclosure, in the sense of making accounting information public, is changed to disclosure in the sense of protecting the public from harmful influences due to secrecy, fraud and window dressing of accounting information in North America. As a result, accounting is not only supported by the disclosure system, but is also sublimated to a social regulation that consists of various provisions for measurement and communication. Disclosure and accountability are quite inseparable in financial accounting. They are the required conditions for big business to assert themselves as legitimate in societies.

An accounting system manifests its individuality in the accounting rules of commercial law, company law and tax law, and business accounting principles, which relate to the regulation of capital and profit calculation. This is relatively independent of the disclosure system, which relates to disclosing information and the coordinating interested parties based on public responsibility. Directors should observe these accounting requirements in order to be accountable. Accountability should be discharged not only by disclosure, but also by the observation of accounting rules. However, as controversial confrontations increase between big business and the mass of the people, the former must confront the optional problem whether it shields itself from social criticism and restrictive legal regulations for its business by the reluctant acceptance of disclosure and accounting requirements, or positively strengthens the voluntary disclosure in order to avoid the government regulation of accounting and get a freehand in accounting: whether of the overall, or partial acceptance of accountability (Nishimura, 1977).

## 2.4 Controllability and accountability

At the beginning of the twentieth century, many big businesses, operating with a pyramid style of organization, were established under the leadership of financial capitalists. In the system, every corporation was laid in a stratified structure of business. The management organization of corporation was also socially stratified as a result of the social development of the pyramid company structure, and of the division of management labour. Management becomes an independent social stratum. A function of this stratified management is to systematically adjust, direct, and command socialized business organizations under a plan and control system.

At the beginning of the 1920s, standard cost accounting and budgetary control came to the fore in the accounting area to support this stratified management. 'Management through accounting', based on financial accounting, was systematized as 'management accounting', which took the form of forecast accounting, not a score of past economic transactions, for the planning and control of stratified management. When the managerial thought of planning and control were put together with accounting, management behaviour, whose point of time and space were limited, was systematically and totally grasped daily, and was positioned in the periodical profit calculation of a corporation.

At the height of the period of scientific management proposed by F. Taylor, it was important to the advancement of management accounting that efficiency management was tied to standard costing and cost variance accounts. This is because management accounting contributed to management control and had an opportunity to build its individuality in the accounting area. Each aspect of management behaviour was systematically and totally (periodically) recorded and calculated in standard cost accounting and, through recapitulation, analysis and reporting, business behaviours were planned and controlled from the viewpoint of profit calculation. The feedback system of management and accounting was established. We call this accounting system 'traditional management accounting'. In the 1920s, management accounting made feedback control possible through the comparison of planned values with the actual ones: cost variance accounts. Here, efficiency control, or production strategy, joined hands with feedback control.

In the 1970s, enterprises were more diversified and multinational, and corporations began to be internationally stratified. Strategic planning, involving the optimum allocation of resources, played an important role in worldwide business management. For example, concerning capacity utilization, it was insignificant to increase only its utilization ratio; rather, it was more important to consider what allocation and utilization of capacity contributed to the general profit formation of the whole business in the international scale. If a section maximized its use of facilities at the expense of the optimal use of resources in other sections, it would be evaluated as

having disadvantageous behaviour, being detrimental to the general profit of the entire corporation.

Therefore, the planning and evaluation of strategic resource arrangement is most important in today's management. In order to evaluate the utility of resources from the international and global viewpoint, the strategic planning and control system, which leads to the optimal utilization of resources, becomes more significant than standard costing, which individually pursues maximum efficiency. When the optimization concept is established in accounting, we can compare the actual utilization of resources with their optimal use, and recognize the opportunity cost of resource utilization. Demski (1967) completed an epoch-making work in this area: ex post programming system, in which he made forecast variance of profit and opportunity cost variance clear in the accounting system.

A large multinational enterprise searches for an opportunity to make profit and optimal resource utilization in the international markets, whereas at the same time it puts itself in the danger of strong uncertainty. In the 1970s, management accounting bypassed the traditional accounting of budget control and standard costing, and took the new form that linked with management science, information theory, and behavioural science. In cost accounting, opportunity costing appeared on the front to premise the optimum solution of management. Although before the 1970s, management accounting had as its central aim to efficiently plan and control production processes, it turned to a method of controlling its decision-making process itself. Traditional management accounting, which controlled the production processes by using the feedback system, was shifting to feed forward management accounting, which controlled decision-making processes from the viewpoint of business strategy. The informative and mathematical management accounting appeared in the 1970s.

The informative and mathematical management accounting aimed to achieve high productivity and low cost through the avoidance of uncertainty and the optimal distribution of resources. However, at present, the integration of high quality and low cost is extremely important in international economic conditions of severe competition and production diversification. This concept of management is not about cost minimization, or profit maximization, or the feedback control system, but represents proactive and preventive cost management: feed forward management accounting in which the accounting system is integrated with the management system from the perspective of marketing strategy.

This concept of integrating market strategy with feed forward not only does not permit any small defect, but also asks all employees to actualize zero inventory and high quality under their cooperative works. Most activities of cost management being at the planning and design stage – that is, in advance of production. This is possible when marketing strategy is integrated with feed forward control. Cost design truly embodies this idea.

Concerning cost design, which Japanese motor companies created and developed in the 1970s and 1980s, it has been discussed in detail in other papers (Nishimura, 1995, 2000a, 2000b, 2001).

Today, when a corporation relates not only to the magnified scale and size of production and market, but also its products are closely connected to environmental issues and life problems, it is hard to recover from failure by feedback control. Recently, we observed some serious accidents, which could not be restored by feedback control; today, failure results in disaster of being a stepping-stone to success. Future management accounting must intensify the feed forward concept. Feed forward management is a superior and wider category than risk management.

When we consider the past of management accounting, we can see that its development process has been from the minimization of costs to the maximization of quality through the optimization of profit, a process that has been coincident with the shift from feedback control and accounting information orientation to feed forward control and non-financial information orientation through mathematical and logical control. While the minimization of costs was realized in the traditional management accounting system as a result of efficiency control, the optimization of profit was closely related to the optimum distribution of economic resources among organizations in a corporation: the partial optimization in each organization for the overall maximization of corporate profit. Moreover, the maximization of quality and function was grounded on customer-oriented management and the effective use of natural resources. At present, we are confronted by a difficult problem: how to integrate the three aspects of minimization, optimization, and maximization into a new type of management accounting.

## 2.5 Conclusion

The relation explored here between the control function of accounting and financial and management accounting is shown as Figure 2.1. The control function of accounting, which is immanent in all accounting systems, takes the form of accountability in a social relationship: entrepreneur and accountant, and director and stockholder. When accountability was tied to disclosure, financial accounting was established.

As financial accounting is systematized, a ruling party and managers of a corporation must fulfill their controllability in order to let the accountability be substantial: responsibility for the value preservation and increase of a socially entrusted property. Accountability, without controllability, would lead to the collapse of a civil society based on the disclosure system. Thus, as a matter of course, irresponsibility here should be subject to social sanctions.

At present, management accounting is established as a result of integrating controllability with accountability in the same way that financial

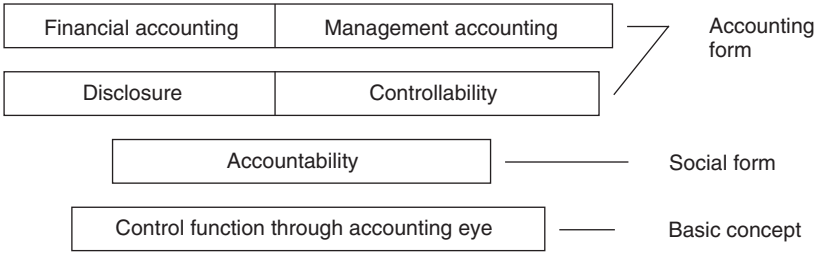



*Figure 2.1* Financial and management accounting

accounting came about by putting together accountability and the disclosure system. Therefore, management accounting was born in a world where accountability linked up with the disclosure system. Thus, the West precedes Asian countries in the formation of management accounting.

Various forms of management accounting appear when controllability is tied to production and marketing strategies, and feedback and feed forward control systems: traditional (production strategic and feedback control); informative and mathematical (productive strategic and feed forward control); and present (market strategic and feed forward control) management accounting systems (see Figure 2.2).

In spite of its external development, management accounting depends on the control function of accounting with which it can exist as an accounting

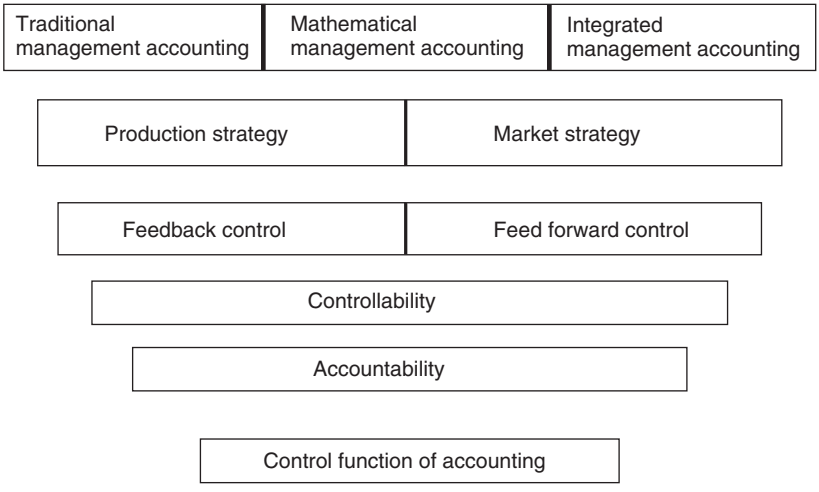



*Figure 2.2* Development forms of management accounting

system. Any management accounting system would not display its accounting function of recognition and control without accounting concepts and methods. No other information system can replace the control function of accounting.

No calculation method can take the place of control functions of accounting, which are shown to be a synthetic calculation system based on daily minute calculation: historical, periodical score based on space and a point of time; recognition of economic activities by money based on physical amounts; and flow recognition based on stock of property. Accounting has the important functions in our economic organization. Naturally, this does not lead to the conclusion that accounting does need other information systems and calculation methods; rather that presently they are more necessary in a society for the development of management accounting than before. However, it is most important for researchers of management accounting to recognize that no business management would do well, if it ignored the control function of accounting, or failed to function through the 'accounting eye'.

# 3

# The Development and Future of Management Accounting in Japan and the USA: A Comparison of Management Philosophies

## 3.1 The development of Japanese management accounting up to the 1970s

Management accounting in Japan went through two main stages of development after the Second World War. In the first period the Japanese government gave an impetus to the import of advanced management and accounting from the West and it took root in private enterprises. Later many large Japanese companies, freed from government constraints, positively created and established a new Japanese-style management accounting: *Genka kikaku* (cost design) and *Kaizen* (continuous cost improvement). In order to review the past it is important to understand the present nature of Japanese management accounting.

As pointed out above, the period from the 1950s to the 1970s was a time of government leadership in Japanese management accounting. It witnessed the establishment of modern management organization and accounting control involving the formation of modern stock companies after the dissolution of the pre-war financial cliques (*Zaibatu*). These new companies organized their management and control systems according to the separation of ownership and management. The formation of internal control system and management organization, and profit planning and budgetary control were concrete examples of this development. Japanese companies first put an internal check system on a firm basis for modernization. At the same time, they adopted profit planning and budgetary control from the 1950s to the 1960s, because foreign governments, investors and banks required them to bring forward their plans for fund usage. Large Japanese companies made good use of these foreign funds to reconstruct facilities damaged by the war. Strong companies' reliance on banks also characterized the nature of Japan's management accounting after the Second World War. They tended to establish favourable relationships between managers and

workers under a stable financial condition established by the main banks. Thus, it is a characteristic of Japan's management accounting that budgetary control and profit planning were adopted more extensively and earlier than standard costing or direct costing (see Table 3.1).

In response to these demands, Japanese government leadership established modern management accounting in Japan by introducing advanced accounting systems from the USA after the Second World War. The Ministry of International Trade and Industry (MITI)'s Industrial Rationalization Council played a critical role in promoting the spread of modern management accounting techniques. From July 1951 to the 1970s MITI published many reports on modernization. It promulgated General Principles of Internal Control in Business Enterprises in July 1951 and Outlines of Procedures related to Execution of Internal Control in February 1953. These were related to fundamental systems to modernize daily operational activities. Profit Planning for Implementation of Business Policy, published in July 1956, also urged companies to prepare business plans, or to budget on the basis of profit planning and to strengthen efficient control in all production processes. Continuously this thought was connected to divisional management that came into wide use as decentralized management. MITI advised 'Profit Planning in Division System of Business Enterprises' in August 1960. 'Cost Management' in November 1966 and 'The Coming Policy of Business Finance' in 1972 were recommended to

*Table 3.1* Popularization of planning in Japanese companies

| *Research Institute* | *Society for the Study of Business Accounting* | *Yoshio Aida* |
|---|---|---|
| *Year of the questionnaire* | *October 1975*[1] (%) | *September 1964*[2] (%) |
| Fund plan | 95.4 | 83 |
| Profit plan | 93.4 | 81 |
| Budgetary control | 92.7 | 83 |
| Plan for investment in plant | 92.7 | 79 |
| Monthly profit and loss statement | 91.4 | 86 |
| Long-range plan | 87.4 | 75 |
| Financial statement analysis | 85.4 | 91 |
| Internal audit | 74.8 | 57 |
| Break-even point analysis | 70.2 | 75–80 |
| Standard costing | 47.7 | 41 |
| Direct costing | 40.4 | 43 |

[1] 151 of 522 companies which were sent the questionnaire returned it (28.9 per cent); [2] 354 of 1100 companies did it (32.2 per cent).

*Source*: Research on New Commercial Law and Accounting, *Bulletin of Cultural Science Institute at Ritsumeikan University*, no. 22 (April 1976); Yoshio Aida, Actual Situations of Companies, *Management Accounting* (March 1966), 39, 81–9.

tackle capital liberalization in the international markets. After 1966 when the Industrial Rationalization Council drafted the former four reports, it assumed a new name: 'the Industrial Structure Council'. The change from 'Rationalization' to 'Structure' likewise meant a change in the character of Japanese management accounting to a structural approach, the implications of which will be examined further below.

While developments were ongoing in technical matters, a sea change in consciousness was also occurring: the movement to raise national productivity and to rationalize industry. The two movements – of the productivity drive and rationalization – had far-reaching implications for rebuilding a national consciousness that would reorganize the domestic economy (which was in a state of disorder due to the war) and revive private companies. The general pre-war and wartime irrational and wasteful militaristic consciousness shifted towards a policy of economic rationalization with the concepts of profit and cost being implanted in the minds of managers and workers. This development also promoted the spread of accounting control and the application of modern management accounting to changing environments. However, it must be noted that in this case, modern management accounting does not mean the recent quantitative model analysis or cost design, or target costing, but the traditional budget control or standard costing method. Since the national movement's goals were reorganization and the revival of the economy, themselves popular goals, new scientific management methods were easily promoted on the back of this popularity.

Turning now to the concrete characteristics of post-war Japanese accounting methods, we should note first that Japanese management accounting made much more use of the total control system than it did of strategic decision-making. This was primarily as a result of the demands of foreign loans and the 'triangle' system of governments, main banks and companies. Second, Japanese companies made better use of human factors related to productivity than the dependency on professional strategic managers. When the two characteristics were combined, the control function collectively acted to plan and control production and sales efficiently and to coordinate actual processes with plans under a regime that sought the total management of employees in comparison with the strong orientation of top managers' management in the USA. But as a result of the national movement to increase productivity, the division between management and employee blurred, resulting in management planning incorporating a strong human factor.

## 3.2 The development of management accounting in the USA

In contrast to Japan, American management accounting from the 1950s had been geared towards planning or strategy. In the second half of the

1960s, a decision-making style of accounting came to dominate. In the USA, information theory played a more important role in all fields of accounting than it did in Japan, because information was thought to be indispensable to decision-making in management. Not only financial information, but also other information related to the business environment was collected for the purpose of planning and controlling management activities. As the economic picture changes more rapidly, senior managers should have directed their attention increasingly to complex decisions. Managers expected to make the best decision by using this information in models. Scholars, together with accountants and managers, developed concrete profit maximum or cost minimum models for decision-making. At this point, it must be noticed beforehand that although accounting information as well as other information is useful for forming decision-making models, we must make an exact distinction between accounting and other information from the viewpoint of accounting theory. In this case, we have to bear in mind that profit (or cost) plays the decisive part as accounting information in the management accounting model.

As stated above, American accountants developed profit maximum or cost minimum models and adapted them to changing environments through the alteration of existing models or by creating new models. To cite the example of cost–volume–profit (CVP) analysis, they invented a linear programming model under the condition of multi-product production. They also created a non-linear C–V–P analysis model, which supposed that unit price of materials or parts, or the sale price changed. When they could not estimate sales with certainty, they devised a C–V–P model that incorporated probability. This is true of the inventory quantitative control model (see Table 3.2).

We should keep in mind that in the case of model analysis, accounting was dealt with as information or an information system to support decision-making for management. It is certain that putting accounting information in the same file as other economic and non-financial information enlarged the sphere of adaptation and made it easy to construct models for decision-making. However, such a theory of information made the special function of accounting vague and resulted in the reduction of accounting to the level of general information. Not all was lost, however, and in this regard, we need to pay intention to the works by Demski in the USA and Samuels in the UK, who argue for the special function of accounting (particularly, profit variance analysis). Nobody can deny that, in any case, American accountants have developed a succession of creative models, which have contributed much to the development of management accounting. Table 3.3 gives a general overview of American researchers' contribution to developments in management accounting, focusing particularly on the 1960s and 1970s.

*Table 3.2* Comparison of the USA and Japan on quantitative analysis

| *Area method* | *US companies* | | | *Japanese companies* | | |
|---|---|---|---|---|---|---|
| | *1* | *2* | *3* | *1* | *2* | *3* |
| Cost analysis | | | | | | |
| Regression analysis | 91 | 21 | 23.1 | 108 | 5 | 4.6 |
| Multiple regression analysis | 91 | 14 | 15.4 | 108 | 5 | 4.6 |
| C–V–P analysis | | | | | | |
| Probability/decision theory | 68 | 27 | 39.7 | 28 | 5 | 17.9 |
| Mathematical programming | 68 | 17 | 25.0 | 28 | 6 | 21.4 |
| Allocation of service dept. charges | | | | | | |
| Matrix algebra | 102 | 8 | 7.8 | 168 | 6 | 3.7 |
| Distribution of joint cost | | | | | | |
| Mathematical programming | 46 | 1 | 2.2 | 69 | 0 | 0 |
| Game theory | 46 | 0 | 0 | 69 | 0 | 0 |
| Allocation of overhead cost | | | | | | |
| Mathematical programming | 102 | 1 | 1 | 168 | 2 | 1.2 |
| Investigation of variance | | | | | | |
| Bayes' statistics | 101 | 2 | 2 | 167 | 0 | 0 |
| Decision-making | | | | | | |
| Regression analysis | 101 | 2 | 2 | 167 | 0[b] | 0 |
| | | | | 129 | 3[s] | 2.3 |
| Control chart | 101 | 16 | 15.8 | 167 | 3[b] | 1.8 |
| | | | | 129 | 7[s] | 5.4 |
| Cash flow | | | | | | |
| Probability | 57 | 23 | 40.4 | 32 | 4 | 12.5 |
| Analysis | | | | | | |
| Simulation | 57 | 6 | 10.5 | 32 | 19 | 59.4 |
| Capital budget | | | | | | |
| Mathematical programming | 100 | 18 | 18 | 161 | 6 | 3.7 |

*Notes*: (1), (2), and (3) in each column represent the number of respondents, the number of adopters, and the ratio of adopters to the respondents. The 'b' and 's' refer to budget and standard.

*Source*: Yutaka Kato (1989), *Development of Management Accounting Studies* (Tokyo: Zeimukeirikyoukai), 121.

## 3.3 Characteristics of contemporary Japanese management accounting: cost and the just-in-time (JIT) system

Recent rapid progress in high technology (the automation of production processes and the computerization of office services) and increasingly competitive international markets led to changes in management accounting systems in the USA and Japan. Recently, companies have moved towards the production of small quantities of multiple products rather than the mass production of the same product. At the same time, all companies focus on market strategy as a result of acute competition in the international markets. Today companies must ceaselessly research and develop new products that

*Table 3.3* Aspects of management accounting

| *Recognition* / *State* | *One-dimensional* | *Multidimensional* |
|---|---|---|
| *Certainty* | Traditional management accounting<br>(Standard cost variance analysis)<br>(Profit variance analysis by budget)<br>(CVP analysis)<br>(Optimal inventory model) etc. | Profit variance analysis by using linear programming model (Demski, 1967)<br>Departmental performance-evaluation by using shadow price (Samuels, 1965)<br>Allocation of overhead by using shadow price (Kaplan, 1971)<br>Variance analysis by using Lagrange's multiple (Kaplan, 1982) |
| *Uncertainty* | CVP analysis including demand forecast (random variable) (Jaedick, 1964) Statistical cost variance analysis (Bierman, 1961)<br>Inventory model including random variable (Kaplan, 1962) | Decision-making model by using marginal value based on probability-assessed valuation (Demski, 1980)<br>Decision model by using Lagrange's model (Sato, 1984) |

*Sources*:

Bierman, H., Fouraker, L E., and Jaedicke, R. K. (1961), A Use of Probability and Statistics in Performance Evaluation, *The Accounting Review*, 409; Luh, F. (1968), Controlled Cost, *The Accounting Review*, January, l23–32; Concerning quality control and control chart, see Horngren, C. T. (1962), *Cost Accounting: a Managerial Emphasis*, 746ff.

Demski, J. S. (1967), An Accounting System Structured on Linear Programming Model, *The Accounting Review*, October, 702ff; Dopuch, N., Birnberg, J. G., and Demski, J. S. (1967), An Extension of Standard Cost Variance Analysis, *The Accounting Review*, July, 526ff.

Demski, J. S. (1980), *Information Analysis*, second edition, 50–1.

Jaedcke, R. K. and Alexander, A. R. (1964), Cost–Volume–Profit Analysis under Conditions of Uncertainty, *The Accounting Review*, October, 917–26.

Kaplan, R. S. (1982), *Advanced Management Accounting*, 1982, 269ff; Izuka, I. (1985), Roles of Opportunity Loss in Cost Variance Analysis of Inventory Decision, *Costing* (*Japanese*), no. 279, 49.

Kaplan, R. S. and Thompson, U. L. (1971), Overhead Allocation via Mathematical Programming Models, *The Accounting Review*, April, 352ff.

Samuels, J. M. (1965), Opportunity Costing: An Application of Mathematical Programming, *Journal of Accounting Research*, Autumn 1965, 352ff.

Sato, H. (1984), Analysis of Management Accounting Information by Using Agency Model, *Accounting* (*Japanese*), vol. 125 no. 2, 212ff.

anticipate trends, and these products must be cheap and of high quality. All present management accounting in advanced nations therefore put importance on how to calculate and control profitability and cost related to such kinds of market-strategic products.

Japanese companies have striven to research and develop the strategic product more strongly than American companies, because they have aimed at international competitive power since the end of the Second World War. Particularly in the 1970s, Japanese enterprises that encountered heavy shocks from the formation of OPEC and the subsequent rise in oil prices responded by reducing their management costs. They made every effort to improve business structure and rationalize production to strengthen their flexibility and competitive power in the international markets.

By the 1970s, through learning from the West, Japanese enterprises had established modern management accounting: budgetary control and standard costing. They also applied these methods to actual situations from a Japanese standpoint. After the end of the 1970s, a new stage of management accounting commenced on the basis of these past practices. From the 1970s to the present day private enterprises have led the way in creating a new style of management accounting. During the same period, American management accountants incessantly tried to develop the quantitative model: Economic Optimum Quantity, profit maximum model, and so on in the 1970s and 1980s. On the other hand, large Japanese companies devoted themselves to creating and perfecting the just-in-time system, in response to the oil shocks of the 1970s that involved zero inventory to settle problems of fund shortages caused by excess inventory. The result was a tailoring of production to exactly fit variable demand, thereby ensuring optimum liquidity from moment to moment to cope with sudden and unexpected price rises in basic supplies such as energy.

Though the just-in-time production system became popular in the 1970s, private enterprises had long been developing it in cooperation with the government. At the same time, enterprises also established other control systems – for example, a physical distribution management system or a control system over the subcontractor for a total quality control system that supports the just-in-time system. The subcontractor system purchases needed amounts of materials and parts, and produces the exact required amount of finished products, whenever they are ordered. It is a principle of the system that an enterprise only starts to produce whenever a customer issues an order. Thus, it is a global management system involving production management, quality control, inventory management, personnel management, and so on. The global management system is based on feed forward control in which managers cooperate with all employees to realize zero inventory and defects by means of proactive and preventive management.

Because traditional cost management of efficiency orientation was not suited to this system, it was necessary to construct a new cost management

regime beginning from production and looking forward to the market and the customer. The critical activity for enterprises is to create cheap and high quality products, with consideration given to shorter and shorter product life-cycles. Therefore, research and development played the most important role in improving the technology and quality of production. Cost management, cost design, or cost target, and *genka kaizen* (continuous cost improvement) all took an active part in such a global management as the just-in-time system. Japanese enterprises exerted themselves to calculate and control the cost and quality of products at the design stage of a new product model. Cost design, which plans market-competitive cost and actualizes its plan at the stage of development and design by using preventive and proactive activities for cost reduction, was completely different from traditional costing, which controls cost by feedback control, or cost variance analysis. Cost design also embodied feed forward control. Consequently large Japanese companies were able to get a bigger market through incremental improvements of production engineering, parts, and production methods.

Since the war, Japanese enterprises have pursued improvement and effectiveness across the whole of the industrial structure, business organization, and production process, but MITI clearly presented a new idea in its 'Cost Management' report of 1966, as mentioned above. MITI's 'Cost Management' focused on cost planning and control involving structural improvement in the fields of national economy, industries, and enterprises. Acting on its recommendations, every company tried to secure cost reductions and improvements in product quality from the angle of profit management. The yardstick of cost management shifted from efficiency management to cost reduction – that is, from standard costing to a rearrangement of enterprise ownership and structural changes in business organization. Standard costing had a tendency to associate more strongly with target cost induced from the market than cost efficiency induced from changes in the production process. Cost reduction rather than standard costing carried out a daily cost assessment accompanying operational cost improvement (*Genka kaizen*).

In conclusion, after the war, Japanese enterprises actively applied the traditional budget control and standard costing to changing business environments in order to strengthen their international competitive power. But since the 1970s, they have tried to establish a management system and management accounting according to the just-in-time system, simultaneously and positively adopting computers to business management. The main fruit of the new management accounting is target costing or cost design based on market strategy and feed forward control. This, combined with the *Kanban* (just-in-time) production system, brought about the present, successful Japanese business management style. Management accountants in the USA have developed many advanced theories and models of management accounting more successfully and creatively than has been the case in Japan.

However, in international business competition, American enterprises lagged behind Japanese enterprises in the 1980s. American accountants at first thought that the deficit might have been caused by the fact that the management accounting data they generated was only partially relevant to actual business organization and production process. As a result, they not only eagerly learnt Japanese management systems and accounting systems, but also began work on creating new systems. This resulted in the development of the activity-based costing (ABC) system. The ABC system focuses on human activities and the movement of resources in the allocation of product costs. According to this system, production factors (input) do not simply relate to finished products (output); rather, their cost is distributed among products through the activities of personnel and physical movement. Even if every product uses the same quantity of production elements, the distributed cost of the product is not the same since there are different activities involved in the production of the same type of product. The reason is that each activity differs in the employment of resources. Therefore, similar finished products also have different costs because of their different cost drivers. We can definitely recognize the difference of product cost between strategic products and non-strategic products by using this method: profitability of product. It is certain that although the ABC system shifted the viewpoint of analysis from a quantitative to a qualitative or structural concern, it remains feedback control thought.

## 3.4 Comparison of US and Japanese management accounting practices

The analysis given above can be summarized in Figure 3.1. This figure represents the general trend in recent management accounting of the 1980s. This trend was widespread until Kaplan and Johnson criticized the traditional average cost accounting and the quantitative model analysis from the viewpoint of their relevance to actual organization (Johnson and Kaplan, 1987). First, concerning the horizontal line, a structural recognition method or a qualitative analysis lies on the right side. Under the qualitative and structural recognition method, every person is assumed to have different and heterogeneous characters. This method also puts importance on the effects of their personality on productivity. On the other hand, the left side reflects a quantitative and model analysis. This viewpoint considers human beings as a product factor that moves the same way all the time, and summarizes heterogeneous factors of human beings into a set of identical behaviours.

Second, we divide the vertical line into two parts: strategic decision-making orientation in the upper part and total control orientation in the lower part. In this case, the strategic decision-making orientation places absolute trust in planning or strategy, while inner-cooperative management orientation relies entirely on an incremental control process. In the former, if a manager chooses a wrong plan or policy, everything turns out badly,

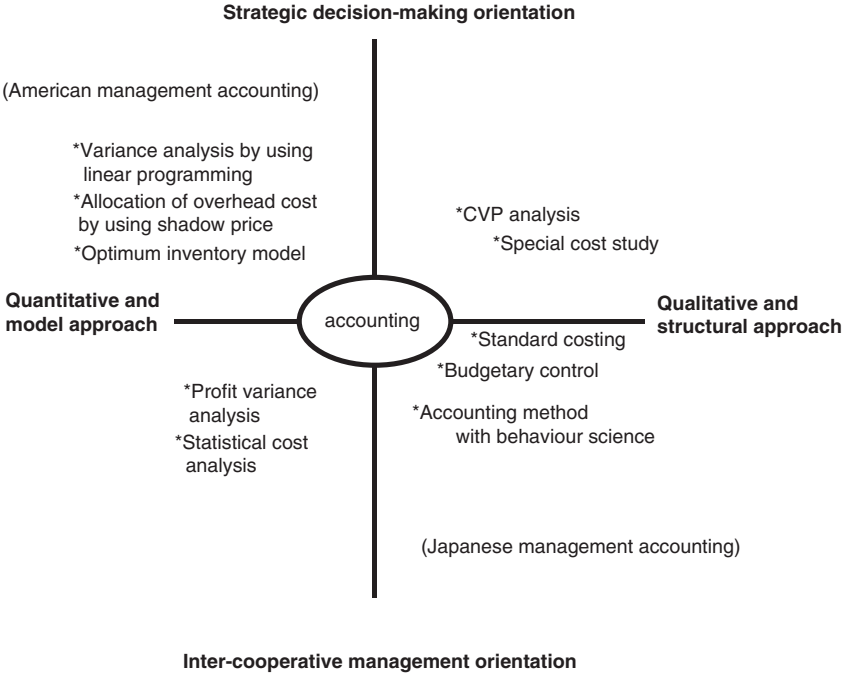



*Figure 3.1* Framework of management accounting

even if he does his best to control the production process in cooperation with other managers and workers. On the other hand, the latter assumes an attitude of trust towards a human control function. According to this attitude, wrong plans or strategies can be amended, if every manager unites with the workers to control the entire process: for example, total quality control, quality circle, or suggestion system.

The circle in the centre represents accounting. This is a recognition and control system to record and calculate daily economic transactions in a time series, to classify and summarize them, and to report their results (economic surplus) in the form of a balance sheet and profit and loss statement. However, accounting assumes different forms under different conditions. The quantitative model analysis considers accounting in the same way as other economic or social information; accounting is information. This makes it easy for us to devise decision-making models. On the other hand, the structural analysis method recognizes accounting as an independent calculation system or a specific information process system, which is closely connected to profit calculation system and double entry bookkeeping.

When we summarize the thoughts and methods of management accounting in the figure, traditional management accounting such as budgetary control and standard costing are to be placed in the right quadrant of the lower part and near the circle, as they have an inner-cooperative management orientation, and a structural and qualitative approach. We also put the behaviour approach of management accounting here away from the circle. A linear programming approach in production planning, cost allocation by using shadow price, or economic optimum quantity model of materials and parts occupy the left quadrant of the upper part, away from the circle. This is because they are stronger in terms of decision-making and quantitative analysis orientation than the other, above-mentioned methods. Demski's ex-post programming model, i.e. profit variance analysis of the ex-post system, is put in the left quadrant of the lower part, since it has a strong control orientation and quantitative approach. Samuels's variance analysis is also set in the same quadrant as Demski's model, because Samuels tries to establish a new double bookkeeping connected with linear programming method for business management. Special cost studies and cost–volume–profit analysis belong to the upper right quadrant because of their strong decision-making orientation and qualitative character. From Figure 3.2, we can easily understand the development tendency of management accounting until the 1970s in the USA and Japan. Simultaneously we can extract the differences in management accounting between the USA and Japan from these quadrants. The upper left quadrant represents the characteristics of management accounting as practised in the USA. The lower right quadrant does the same for Japan. Generally, Japanese management accounting is distinguished by total control orientation and structural analysis in contrast to the American model, which is characterized by the strong strategic decision-making and

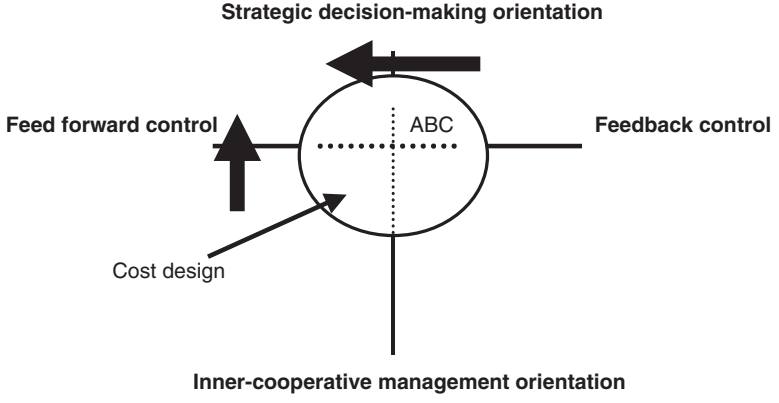



*Figure 3.2* Recent development of management accounting

quantitative analysis, although, as shown in Table 3.2, quantitative analysis seems not to have been thoroughly developed even in the USA.

Although both countries have developed in opposite directions, recently they are converging on the structural and qualitative analysis style. This is owing to the sharp competition of product-strategy and the rapid development of high technology. Another characteristic is that the management accounting methods are entering into the circle. They show the special function of accounting. Particularly, American management accounting is shifting from the quantitative and model analysis to the structural analysis. For instance, activity-based costing (ABC) is the most remarkable example of this new direction. Kaplan (1984, 1990) has made a very significant contribution to establishing a new form of management accounting by adopting field study. Kaplan thinks that researchers have to begin entering business organizations themselves to discover first hand advanced experiences in management accounting. This seems to be a trial of structural and qualitative approach. However, although the quantitative analysis gives way to a structural approach in the USA and becomes a common base of management accounting in both countries, we find out their different features, when we oppose target cost against ABC. Cost design based on feed forward control and inner-cooperative management orientation in cost design is in strong contrast to the American ABC which is related to feedback control and strategic decision-making orientation.

## 3.5 Future aspects of management accounting development

The immediate future of management accounting lies in the expert system in the USA and the New Accounting Information System (NAIS) in Japan. The US expert system integrates quantitative and qualitative analysis methods and differs from the above quantitative systems, which only acquire quantitative output or judgments through the input of various data. The expert system can extract experts' judgment and cope with changing situations by relying on the analysis of computer data. The expert system acts as a substitute for many excellent professional accountants. Accountants already apply it to the areas of auditing, financial accounting, and management accounting. But accounting will soon have to operate reciprocally with computers on a new level. However, we have to remember that the expert system has no common sense; it cannot swim alone in a changing business environment. We have to make the meaning of accounting as a particular type of information quite clear before we can arrive at a new reciprocal level of operation between computers and accounting.

The Japanese NAIS is a new system, which links accounting and computers by using a database and giving relevant information to managers (Kono, 1990). However, even today managers in Japan put more importance on the ability of human experts than is the case in the USA. Japanese managers

always put their ultimate trust in human judgment, even if they make considerable use of computer data. Any computer decision is only considered as a framework for judgment. The human factor will continue to play an important role in the Japanese NAIS indefinitely into the future. The main benefit of these computer systems is to free accountants from the drudgery of number-crunching. We can only hope they will use the saved time and energy to support managers and create newer accounting information systems.

Under this development of computer-aided accounting, some differences remain in management accounting between the USA and Japan. However, we are conscious of a trend in which both differences are close together toward strategic decision orientation and feed forward control in future. As shown in Figure 3.2, large Japanese companies try to adopt professional strategic managers – a typical example being seen in the tie-up between the French Renault and the Japanese Nissan motor companies: the integration of Western strong strategic decision-making and Japanese cooperative management. By contrast, American researchers also begin to pay attention to feed forward control, although this study has not yet resulted in any great insights (Kaplan and Cooper, 1998).

## 3.6 Conclusion

The present task of accounting researchers is not only to create new models of accounting, but also to make the essential nature of accounting clear. We now have access to real time information through the use of computer systems. However, we may fail to develop an adequate accounting science and solve present and future problems without a rigorous inquiry as to the essence of accounting: what is the basic characteristic of accounting as a specific type of information? As described in Chapter 1, accounting is a control system which records and classifies daily economic activities in a time series by using certain accounting methods, and then summarizes these economic activities in financial statements. At the same time, accounting calculates and recognizes profit from two angles: stock and flow.

Management activities are independent and discrete events in terms of time and place. If they were not connected by accounting, management activities would fail to function in an integrated fashion, with disastrous implications for profit. Once accounting associates these independent management activities in a time series, we can recognize their profitability and continuity across an entire business enterprise. Only when these activities are connected and quantified by cost variance accounts, can we make their individual profit contributions to a business enterprise clear. Accounting gives management activities a history. Therefore, we have to analyse recent management accounting more concretely from the angle of accounting science, and not only from the point of view of management itself.

Japanese automobile companies have adopted the *Kanban* (just-in-time) production system or cost design. However, Japanese accountants do not understand completely how to characterize cost design from the accounting viewpoint, even less how to describe the relationship between the JIT system and cost accounting and the differences between cost design, and standard costing and budget. Moreover, we must be confronted by difficult problems to clarify the accounting differences between ABC and cost design and to solve how to integrate feed forward control with strategic decision-making in the accounting world. Although there have been a number of recent theoretical developments in accounting – for example JIT, balanced scorecard, value chain, cost design, and so on – much still remains to be studied. Accounting scientists should always reflect how they have advanced accounting science until now.

# 4

# Developments in Japanese Management Accounting and their Impact on British and New Zealand Companies

## 4.1 Introduction

In recent years, there have been many changes in the economies of most industrialized countries resulting mainly from the impact of the oil crisis in the 1970s. In particular, it has led to rapid technological development and increasing competition in international markets. In particular, the Japanese economy has been afflicted with serious defaults and a frightening increase in business bankruptcies for more than ten years since the breakdown of the bubble economy in the latter half of the 1990s. As a result, business organizations have had to adjust and account for the impact of these changes. In such circumstances, every organization has been attempting to reduce costs while producing high-quality goods and services. Horngren (1989) points out that management accounting underwent substantial changes in the 1970s as a result of economic pressures. In the stable and optimistic 1960s, the notions of single person, single period, zero cost of information, easy access to information, certainty, and profit maximization had a dominant position in management accounting. However, by the 1970s, this had been replaced by feelings of uncertainty and pessimism. For the accountancy profession, this decade was characterized by multi-person, multi-period, costly information, asymmetric information across individuals, uncertainty, and utility maximization. Companies in Western countries have developed some control methods based on this idea. Their key objective is to avoid uncertainty and to cope with the shock of change with as little disruption to operations as possible. Enlargement of scale and scope seemed to be an effective method to realize this objective. As an organization becomes bigger and more diversified, it may be able to secure stability and certainty in the purchase of materials and sales of products. However, this traditional view is becoming increasingly unsustainable in the face of rapid economic change.

The traditional view has two defects: asymmetry of information and a lack of harmony. A big organization seems to be able to eliminate the risk of change thanks to increased stability. However, the separation between top

management and workers at the shopfloor level means that top-level information and decision-making becomes detached from the day-to-day operation of the business. Therefore, it is not easy for a company to get goal congruence. In addition to this asymmetry of information, 'a sense of security' of employees depending on a big organization makes the shop-floor both complacent and inflexible. Because of this, many of the world's largest corporations have fragmented their organization into small and flexible units (division or matrix organization or miniprofit centre) in order to achieve effectiveness and efficiency. As a result, in the USA, managers take it for granted that 'size and innovation are inversely correlated'. However, in the 1980–90s, why then were large companies in Japan more innovative than small ones (Kharbanda and Stallworthy, 1991)? Why did Japanese management methods and techniques also have a high degree of flexibility to reduce the risk from sudden and unexpected changes in technology (Seglund and Ibarreche, 1984)? In answering these questions we may uncover a way of getting out of the present business crisis.

The fact that the Japanese management system had been successful in the 1980–90s may well have provided the motivation for the 'Japanization' of management accounting systems in the West. Companies in Western countries showed an interest in embracing with Japanese capital and positively introduced Japanese management (Munday, 1991). However, it is still too early to judge whether this system was a successful in the Western world. Accordingly, this chapter will first examine the main characteristics of Japanese management accounting and its differences from the American system. Next, it will outline a basic philosophy of Japanese management (horizontal two-way management) and compare this with the traditional management philosophy (vertical one-way management). Finally, it will consider some fruitful cases of management accounting transferred from Japan to New Zealand and the UK.

## 4.2 The management accounting system in Japan and its differences from the American type of management accounting

### The general nature of Japanese management accounting

Budgetary control is popular in Japan and has been adopted more expansively than standard costing or direct costing since the end of the Second World War. Although the budgetary systems of large Japanese and American manufacturing companies are similar in some ways (Bailes and Assada, 1991), the development of the budget system in Japan has occurred in a different way from the process in the USA. This development in Japan was closely related to the country's particular circumstances after the end of the war. Japanese companies adopted profit planning and budgetary control extensively from the 1950s to 1960s, because foreign governments, foreign

investors, and banks requested them to bring forward their plans for fund usage. Funds were used to rebuild the economy and to reconstruct facilities damaged by the war and also to introduce advanced technology from foreign countries. Companies' reliance on banks also encouraged them to adopt budgetary control and profit planning more extensively and earlier than standard costing and direct costing (see Table 2.1 in Chapter 2).

Even in the 1970s, companies in Japan focused more on the budget and cost control than on the use of accounting for strategic decision-making, which was very popular among accountants at that time. In doing so, they adhered to the old management accounting established in the 1920s, which focused on the use of budget and cost control. While management accountants in Western countries developed their quantitative models during the 1970s, the Japanese devoted themselves to creating and perfecting just-in-time management. This was especially true following the impact of the oil crisis of the 1970s, which made it difficult for Japanese firms to sell their products owing to the increase in the price of imported products. As a result, the just-in-time (that is, zero inventory) system was adopted to solve the problems of fund shortage and long capital turnover caused by excess inventory. Japanese management accounting had a strong control orientation and did not assign a decisive role to decision-making of senior management as powerfully as the American management accounting system. Development of quantitative analysis in the USA reflected this feature. As illustrated above (Table 2.2 in Chapter 2), quantitative analyses related to decision-making developed more extensively in the USA than it did in Japan through the use of techniques such as control charts, and CVP analysis and cash flow information related to probability. In contrast to this, Japanese companies did not promote quantitative analysis methods in their practice of management apart from some adoption of CVP analysis and simulation.

With regard to cost accounting, according to the NAA's report (1988)[4] there was a strong shift towards standard costing in many American industries (see Table 4.1). On the other hand, Japanese companies used a variety of costing methods, including actual costing, direct costing, and standard costing, the choice of the method generally depending upon the company's scale and its industry type. It seems that Japanese management adopted this flexible and multifaceted attitude in order to cope with the change and diversity of production structure and market. Most management accounting in Japan was originally introduced from Western countries (Hariman, 1990). These methods have subsequently been refined and some new ones that are specific to Japan's culture and environment have also been developed. As a result there are significant differences between the Japanese system and those that prevail in the Western countries. The following section will examine the case of the Nissan Motor company, an exemplar of the Japanese type, but it has recently reached an impasse. This section will provide the background for our later discussion on the special case of Nissan New

*Table 4.1* Usage of costing in Japan and the USA (percentages)

| *Industry* | *Job order costing* | | *Process costing* | | *Standard costing* | | *Actual costing* | | *Full costing* | | *Direct costing* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *(1)* | *(2)* | *(1)* | *(2)* | *(1)* | *(2)* | *(1)* | *(2)* | *(1)* | *(2)* | *(1)* | *(2)* |
| Total | 40 | 34 | 63 | 23 | 53 | 71 | 33 | 26 | 40 | 50 | 28 | 17 |
| Oil, Gas | 25 | 26 | 8 | 41 | 50 | 62 | 75 | 21 | 88 | 41 | 38 | 23 |
| Machine | 80 | 50 | 28 | 15 | 60 | 85 | 40 | 15 | 0 | 50 | 100 | 25 |
| Car and Parts | 50 | 14 | 5 | 0.8 | 50 | 94 | 50 | 17 | 25 | 50 | 75 | 25 |
| Space Development | — | 90 | — | 10 | — | 48 | — | 35 | — | 48 | — | 14 |
| Electronics | 46 | 42 | 69 | 15 | 77 | 65 | 39 | 35 | 85 | 59 | 23 | 21 |
| High tech. | 50 | 66 | 100 | 43 | 50 | 71 | 100 | 43 | 50 | 52 | 0 | 10 |
| Other Industry[1] | 50 | 21 | 0 | 23 | 0 | 74 | 50 | 25 | 50 | 63 | 0 | 8 |
| Consumer Product | 25 | 4 | 50 | 33 | 25 | 75 | 50 | 28 | 75 | 49 | 0 | 20 |
| Miscellaneous Goods[2] | 0 | 81 | 67 | 1 | 67 | 75 | 33 | 38 | 67 | 56 | 33 | 19 |

[1] Other manufacturing industry; [2] Metal chemistry, paper manufacturing, and others are included.

*Source*: Research Report (No. 1) of NAA's Tokyo Division, *Management Accounting in New Production Environment*, 1988.

Zealand in the next section, and will explore the improvements introduced by the corporation through the structural transformation of existing methods and switch of idea.

### Management accounting in Nissan[5]

*(1) Profit planning and development*

One of the most important characteristics of Nissan management was profit planning by product, which related reciprocally with profit planning by functional department. The company prepared profit management on a short-term, medium-term and long-term basis. The long-term (ten-year) profit planning reflected anticipated changes in the business environment, available economic resources, the firm's desired market share, and the firm's ten-year business plan. The long-term plan was considered the most important: from this the medium-term (7–8 year) profit plan and the short-term (3 year) which reflected recent conditions of competition and development of technology were developed. This short-term plan was prepared in a definite quantitative form. The first year of the short-term plan constituted the first budget. The budget was carried out with flexibility and autonomy, because it was related to the daily changes of the environment (Tanaka, 1991).

After the annual budget was prepared, the company broke the profit budget down by department: sales, purchase, personnel, technology, design, production, quality, and general administration departments. More importantly, the company related this profit plan to profit management

by product. The development of new products played a key part in the accomplishment of the profit plan by product. *Shukan*, who is the product development manager responsible for the whole process from design to sale, was given a large amount of discretion to develop a new product model. Target profit and target cost were framed in the fundamental plan of new development, since cost of the product was almost decided at the stage of design. At this stage, *Shukan*, as a leader of the project team, was entirely responsible for the development of new product model, although his or her activity was restricted within the limit of the budget. He or she gave a contract for the realization of the new product model to each department. The target costing was an important goal for each department to accomplish.

*(2) Cost design and cost reduction*

Management of the target cost consisted of a three-stages plan of development, establishment of target cost and its achievement. First, in the fundamental plan, the *shukan* started by analysing problems in the development and production of existing cars and compared their commercial value (specification, performance, cost and quality) with that of cars in other companies. Top management determined the basic policy of cost design and established a framework of target cost. Second, in the establishment of target cost, the target cost took a definite form of *daiatari* target cost (target cost per car) and the cost was distributed into functional departments. Objectives of cost design activity were clearly limited. The distributed cost became the long-term goal with which each department should comply. In particular, the cost reduction of purchased parts was seen as very important, because material cost amounted to about 70 per cent of factory cost and around 90 per cent of the material cost consisted of purchased parts.

Most large motor companies in Japan, including the Nissan Motor Company, used value analysis and price negotiations. After the companies received reports of value analysis related to new parts from employees or subcontractors, management examined them and determined whether to replace the existing parts with new ones. For example, the Daihatsu Motor Company encouraged subcontract companies to propose new cost reduction and connect their proposals to daily factory improvement. Benefits were distributed to the subcontractors (Monden, 1991). Nissan also followed this practice.

Lastly, we must describe activities to accomplish the target cost. At the stage of accomplishment, the design department put together a team from factory, purchase, and other related departments, the responsibility of which was to make a more concrete plan of the accomplishment stage before the trial car design stages. This team was responsible for the target cost during the whole process, from the issuance of the trial car drawing to the estimation of cost in the sales department. This process was carried out

through comparing trial drawing with that of the regular drawing and monitoring them. While the trial drawing was based on materials and parts specification at the stage of design, the regular drawing depended on the specification at the stage of manufacturing. The team compared the result of two monitors with the target cost, clarified the cost problems of each functional department and tackled the problems from the angle of value analysis. The estimated cost resulted from the final summary of cost design activities, which was checked through two monitors, and was an important factor for pricing. Of course, quality control (QC) circles or teamworking activity always strengthened the quality control, motivation, and the firm's continuous quest for improvements in efficiency and effectiveness.

It is also well known that Nissan had developed a system of computer-supported management. The company developed 'Nissan CAD, CAM, and CAB Systems' that contributed to curtailing the development aspect of developing a new car by using a method of 'Simultaneous Engineering'. This method could carry out development and production simultaneously. In the golden age, the company was trying to develop a new computer system, through which sales staff could design the car desired by a customer in the shop and the product department could produce it immediately in the factory (Tanaka, 1991).

*(3) Dual responsibility accounting*

A connection between department responsibility accounting and product responsibility accounting played an important part in target costing. Each department of Nissan's car manufacturing operation was responsible for sales, expenditures and profit and should manage them in harmony with the profit plan and budget related to it. The department subdivided profit into marginal profit, controllable profit, and operating profit. Then cost was divided into controllable and uncontrollable in each department, so that each department, group, and individuals might have distinct cost responsibility. Product responsibility accounting involved responsibility for the profit plan of respective products, which the *shukan* most entirely bore. His or her performance was measured on the marginal profit of the product. The marginal profit of the product was computed as follows:

Sales
– Material expenses

Direct material marginal profit
– Direct manufacturing general expenses
– Direct labor cost
– Depreciation (fixed amount of model cycle)[6]
– Development cost (fixed amount of model cycle)

Marginal profit of product

The *Shukan* was responsible for the model mix, sales, material expenses, direct general expenses, investment in plant and equipment, and development costs. Therefore, he or she must direct and coordinate all of the functions of departments. His or her functions ranged from the design to the sale of the product.

With regard to management accounting in Nissan, we must pay attention to the fact that the company carried out two-way management between long-term profit plan and short-term one, between profit and cost, and between cost and physical activity. Plan and control always resulted in *daiatari* management (management of target profit and target cost per car), although management started with the long-term profit plan. *Daiatari* target cost was usually far below the currently available standard cost (Morgan and Weerekorn, 1989). Accordingly, small groups and individual workers should make all possible efforts for continuous cost reduction and improvement of technology in the process of production. All engineers and workers must cultivate multiple skills and abilities for this purpose. Japanese companies would not succeed in just-in-time production or target costing without this multiple ability among its employees. Thus, the training of the company at various stages had played an important role in the standardization of skill.

All of the departments and project teams also had autonomy to react flexibly to their changing environment, even if they were restricted by the profit plan or budget. However, this autonomy was objective, rather than subjective. Managers, engineers, and labourers should adjust their activities to changes in the business environment rather than on the basis of subjective judgment. It would be an objective comparative analysis of cost and value. As a result, the whole of management was very strict and rigid for employees, although each level of management had flexibility in the face of a rapidly-changing environment. The bilateral relationship between macro- and micro-management represented an important aspect of Nissan's management.

## 4.3 Horizontal organization and two-way management

### Horizontal management organization

In terms of organization theory, practices around specialization and division of labour were completely different between Japan and the Western countries. We have been convinced that as management enlarges specialization and division of work becomes infinitesimal, efficiency rises according to increase of social production power. Therefore, the management function is very important, because it coordinates specialized jobs and harmonizes them towards the realization of high levels of efficiency and fulfilment of the firm's goal. Accordingly, managers and academic circles have developed various

management control systems and management accounting methods in order to secure goal congruence. Agency theory is one of the most significant recent developments in this area.

However, infinitesimal specialization of management seems to separate information and decision-making in top management from the operation of the shopfloor, because management activities are too infinitesimal and divided not only to be integrated, but also to conform immediately with changes on the shopfloor. This traditional model of management can be termed a vertical one-way management.

Specialized differentiation of functional tasks goes through a hierarchical or vertical structure of control (Marinaccio and Morris, 1991). This can be illustrated by means of some examples. The profit budget, as a goal of the company, leads to budgeted costs for the production and service departments. The budgeted cost regulates the consumption standard for materials and labour on the shopfloor. This one-way flow of accounting information also corresponds with the vertical management organization. Top management prepares a profit goal on return on investment (ROI) and then division managers make profit budgets. Foremen and workers plan and do their jobs in compliance with the directions of the division manager. In the whole process, business strategy and management control play a decisive role.

It is a prevailing belief that high levels of efficiency on the shopfloor are worthless if the strategic decision-making of the management is wrong. Therefore, recent management accounting has focused on decision-making in top and division management, with information and decision-making on the shopfloor being seen as secondary. This makes an excellent contrast to the Japanese idea that management can amend wrong plans or strategies, if every manager unites his efforts with workers to control the entire process. The relationship of building-out or horizontal relationship between managers and workers was popular in Japan. On the other hand, in the USA the vertical relationship in management and one-way direction in accounting information was more prevalent. As Kharbanda and Stallworthy et al. (1991) point out, collective decision and responsibility play a key role in the establishment of close and effective teamwork in Japan, while decision-making and responsibilities belong to individuals in Western countries. As to the economic and technological changes and their impact on management decision-making, these changes may be divided into two distinct types: strategic and operational. The strategic changes relate closely to structural changes in economy and technology, which herald a new epoch in business management. The top management should tackle these changes by changing their existing strategy. In this respect Western management is likely to be superior to the Japanese. The operational changes are continual market-oriented changes of cost and quality after the structural changes are all settled. Japanese management contributed to management of certainty and risk derived from these daily changes. Although Japanese management had

little to do with the development of new accounting methods, it reorganized traditional and old management accounting under a new management philosophy. As a result, Japanese companies could move from the risk of change to the pursuit of profit opportunity. This Japanese management is characterized as a horizontal two-way management. The idea of two-way management[7] is so original that to my knowledge it has not been previously referred to in accounts of Japanese management accounting.

The main bases for this system are:

(1) Two-way relationship between accounting information and economic resources (activities), accounting information and time, and an accounting data and another and these are simultaneously managed.
(2) Not only their causality, but also their relationship of action and reaction are reciprocally analyzed, and through preparatory operation, waste or defects are prevented from occurring: proactive and preventive management.
(3) Management circle (from planning to control through coordinating) consists of stratified two-way relationships. Large two-way relationship (between long-range profit and target cost per car) includes many small two-way relationships (target cost and engineers' design, profit and cost, cost and effective labor hour, and so on).
(4) Main emphasis of the two-way management is on the management of human resources. The following discussion examines the 'horizontal two-way management system' in detail.

#### Horizontal two-way management

As previously mentioned, generally Japanese management accounting was typified as being concerned with cost design and cost improvement (Yoshikawa et al., 1989). Cost design was based on the pursuit of long-term profit. First, a company prepared its profit goal with its capital investment plan and personnel plan. This profit goal was divided into new product projects. The cost design activity was the first process of cost reduction, and involved two stages: at the first stage, cost managers and design engineers made a design of new products to satisfy the needs of customers and accomplish target cost. At the second stage, they determined estimated cost by analysing the target cost from the viewpoint of value engineering (Monden, 1991).

Second, the company developed a plan for the continuous improvement of cost through the introduction of a proposal and praise system. At the process of cost design, cost managers and design engineers planned and reviewed the new product in terms of cost and physical (functional) factors. As mentioned above, there was a close correspondence between cost and profit or price. Under the Japanese management, accounting methods

assumed a two-way relationship. First, the profit goal was calculated not on ROI, but on a continuous study of the competitive market price and cost. Cost not only reflected physical resources and human activities, but also positively influenced them. Cost reduction was executed through control of physical resources and activities. In this case, the 'cost mind' of all members was premised on this cost reduction. At the stage of *genka kaizen* (continual cost improvement), cost information should create a cost reduction mindset among all employees on the shopfloor. Cost information should reflect the results of decision-making. Thus, the employees were always conscious of profit and cost. 'Cost control is seen to be everyone's job in Japan' (Kharbanda and Stallworthy, 1991).

This two-way relation also characterizes financial and management accounting. Although management accounting seems to be segregated from financial accounting in the Japanese accounting system, both types of accounting continued to have a strong two-way relationship. Management activities were independent and discontinuous in terms of time and place, even if they were controlled from the angle of the two-way management. They would fail to function in an integrated fashion with disastrous results for profit, unless they were connected with and summarized by financial accounting. In the Toyota Motor Corporation, for example, target cost and the result of cost reduction went ahead paralleled to *kijun genka* (allowable base cost) and actual cost and at the final stage, connect with them in financial accounting. Only when managerial activities and management accounting were connected with and embraced by financial accounting could the corporation make their contribution to its goal clear. Financial accounting placed various managerial activities into a history of business enterprise. On the other hand, individual managerial activities reformed reality and created a history. Large Japanese companies adhered to traditional accounting methods more strongly than did those in the USA.

To sum up, Japanese management accounting was based on the two-way management of efficiency and effectiveness (in particular, the integration of cost and quality). Thus, information and control systems also had a two-way system of feedback and feed forward. This two-way management is preventive and relates to 'no defect' management, because it permits corrective action immediately or in advance when error occurs (Morgan, 1992). Cost control connects closely with the control of physical operation and time. This management does not permit the existence of defects, differing completely from standard cost control or mathematical quality control. In addition to the two-way feedback and feed forward system, the two-way relationship between information and decision-making plays an important role in this instantaneous management, since information always functions as a motivation and guide for corrective action. These reciprocal relations play a very important role in the risk management of operational changes. To achieve the two-way management, the Japanese management shifted

from the traditional theory to synthesis theory: from a 'division of labour' theory to one of integrated specialization. In this case, the specialization of labour must be based on the synthetic coordination of labour. The overall coordination precedes 'division of labour'. All members of the company must keep this synthetic concept in mind. Division of labour was established after that synthesis.

The two-way management structure was supported by a horizontal and cooperative relationship between management and workers. Thus, the system of two-way management needed an equal and cooperative organization of management and labour. Senior managers went down to the shopfloor to collaborate with workers in achieving a common goal. In addition, they organized small groups and induced them to close and effective teamwork. Even if the Japanese horizontal relationship might contradict with some aspects of what could be called a 'true' industrial democracy, managers always tried to achieve an equal and horizontal relationship for efficiency and effectiveness. They wore the same uniform as other workers and took lunch in the same canteen. This is likely to reduce the gap between both parties, which in many countries is very significant, possibly resulting in inefficiency and a loss of trust between parties. Members of the team were both collectively and individually responsible for the outcome of that team.

The system of horizontal two-way management had its roots in the principle of harmony and coordination. Thus, Japanese companies considered labour to be a multi-skilled, rather than a single-skilled resource. Most Japanese companies adopted training systems in each stage of management and engineering for this purpose. Every manager and shopfloor worker acquired multiple skills on the shopfloor. Employment under an age-limited system provided security to workers and thus encouraged them to improve their skills within the organization. Every group and every employee could adjust to any operational change or diversification in each stage of management. Is it now time to change the focus and ask why the horizontal two-way management was established in Japan in the first place?

## 4.4 Horizontal two-way management and the Japanese social environment

It is certain that the successful management of large Japanese companies in the 1980–90s relied heavily on the strong support of the Japanese government. We should pay particular attention to a unified power in Japan that linked together individuals in pursuit of a common goal. The unifying power of the group in Japanese companies was a result of the employment system. In Japanese companies, an employee could usually work in the same company until his or her retirement. The companies also adopted the seniority system, in which wage rose according to, and position was dependent upon, the employee's working years and experience rather than his

or her ability. This situation brought about good relations between top management and labour unions. Trade unions helped the employees to secure status until retirement. The policy of age-limited employment fostered employees' loyalty to their company and secured their immobility by assuring job security. Labour's loyalty to the company was very strong in Japan. Subcontractors shared the same systems. At the same time, the subcontracting companies' loyalty to their parent company was stronger than in the Western countries.

In the second half of the 1960s, subcontracting companies were reorganized as part of the parent company's production system. Consequently, they grew out of the twofold structure (their low wage and second-class technology in contrast to high wage and advanced technology in large companies) and had a new social position, in which their specialized technology and facilities were working together with the parent company's production. We cannot make the special characteristics of Japanese management system clear without offering some analysis of the employment and subcontracting systems. Japanese management accounting fulfilled its function through support of these systems. It may be difficult to transplant the Japanese management systems to foreign companies, unless foreign companies provide substitutable systems for the Japanese employment and subcontracting systems.

With regard to horizontal two-way management in Japan, we must also describe the government's influence on the nationwide popularization of the management accounting and productivity movement. The Industrial Rationalization Council of the Ministry of International Trade and Industry (MITI) played a critical role in promoting the spread of management accounting. From July 1951 to the 1970s, MITI published the following reports: *General Principles of Internal Control in Business Enterprises* (July 1951), *Outlines of Procedures Related to Execution of Internal Control* (February 1953), *Profit Planning for Implementation of Business Policy* (July 1956), *Profit Planning in Divisional Organization* (August 1960), *Cost Management* (November 1966), and *The Coming Policy of Business Finance* (May 1972). We must pay attention to the development of management accounting under the leadership of government in the 1950s and 1960s.

After 1966, when the Industrial Rationalization Council drafted the former four reports, it assumed a new name – the 'Industrial Structure Council'. From the second half of the 1960s, when large companies realized the importance of the rationalization of production, the government began to guide companies towards the 'structural' improvement of business management. This was intended to equip Japanese companies to compete in world markets. 'Cost Management' in 1966 definitely reflected this idea. It focused on cost planning and control concerning structural improvement in the fields of national economy, industry, and enterprises. Under the guidance of the recommendation, or 'Cost Management', every enterprise concentrated on cost reduction and the improvement of product quality from the viewpoint

of profit management. The yardstick of cost management shifted from efficiency management to cost reduction. In the latter case, the focus was on the design of product and structural changes in business and production organization, although the former emphasized cost control in the production process. This idea had a tendency to associate more strongly with target cost induced from market strategy (Nishimura, 1992).

Another important issue about two-way management that we cannot overlook is the nationwide Productivity Movement supported by the government. The Japan Productivity Centre that was established in the 1950s contributed not only to the introduction of advanced management systems from the USA, but also to popularization of productivity activity and modernization of labour management (Warner, 1992). The centre also expanded quality-control training education and management training programmes ranging from senior to low-level management. These movements played a role in emphasizing the importance of productivity (or constant awareness of cost and profit) in the minds of managers and workers. A new stage of management accounting commenced on the base of the past government-oriented practices from the end of the 1970s. Since then, private companies have led the way in creating a new style of management accounting by themselves, centred on the just-in-time system and target costing (Nishimura, 1992).

To sum up, by improving quality and reducing costs, the Japanese management system might succeed in helping to promote Japanese products in international markets. This was enhanced by the unique employment system (age-limited employment and seniority systems), the government's support for rationalization in the business environment and productivity movement, and Japan's culture. It may be common knowledge that the focus on group harmony was stronger in Japan than in the Western countries. This group orientation took the concrete shape of the *ringi* system in private companies. Under this system, all relevant parties in a group must consent to a proposal before it is implemented (Black and Mendenhall, 1993). The Japanese managers and labourers lived under structural and cultural constraints that forced them to work well together in small groups and to put their efforts together in order to achieve high profitability for their company. These employment systems and group orientation are not generally found in Western countries. However, some Western companies already adopted Japanese management accounting – for example the target costing and *genka kaizen*, or cost improvement. It is questionable whether management in the Western countries can implement a horizontal two-way system, although the idea of the 'balanced scorecard' seems to encapsulate some aspects of the system.

The US system of activity-based costing is completely different from Japanese target costing. Activity-based costing focuses on cost drivers (physical factors or activities) and the reciprocal relationship between the

cost and cost driver. It is one method through which managers make better decisions and receive timely cost information in order to determine the profitability of products. But this method has originally had nothing to do with the horizontal management of organization. In the vertical one-way management system adopted in the USA, top managers could tackle the strategic changes systematically, because its structure was originally geared towards strategy and innovation, and their performance would be critically evaluated by shareholders. However, the vertical organization was responded deficiently to continuous operational changes because of asymmetry of information and decision-making. By contrast, in Japan, strategic decision-making depended to a large extent on the personality of individual managers and the government's strategic support. Therefore, top managers of strategic ability could lead the horizontal organization and use the two-way management with the powerful support of the government so that Japanese companies could be successful. This is mainly because the horizontal two-way management might fulfill its function well in the face of the operational changes and diversities, after the top managers adopted strategy to make use of structural change towards profit opportunity. However, the horizontal organization in Japan would be ineffective when top managers were incapable of making strategic decisions and when there was no strategic support from government. It also malfunctioned when the triangle system of governments, banks and enterprises was corrupted.

In the USA, the maladjustment of the vertical one-way management to the management of operational changes in the 1980 and 1990s might result in unsuccessful strategic innovation by top management. As a result, American management concentrated its efforts on the possibility of introducing the Japanese management system. Some American companies also tried to connect activity-based costing with the horizontal organization, so that activity-based costing might be of use not only to decision-making, but also to daily cost improvement (Hall et al., 1991). In Japan, it is now very important to establish a systematic organization of strategic decision-making in the face of the rapid changes in the global economic structure.

With regard to the horizontal relationship in Japanese companies, we must also not disregard the following aspect. The horizontal two-way management in Japan did not depend upon a true democratic system, although all members inside a small group were located in equal relationship for two-way management of efficiency and effectiveness. We cannot overlook the fact that middle managers and workers were under severe pressures, notwithstanding the equality to be observed on the shopfloor. This equality did not depend upon individual equality and the power of trade unions, but was rather the result of the firm's management policy. Black and Mendenhall (1993) depict the actual situation of Japanese group orientation as follows:

> For example, in the United States, it would not be considered unusual for a thirty-year old manager to meet her fifty-year old division manager, who is one level above her own manager, regarding company matters. In Japan, such a meeting would rarely take place, due to age, rank, gender, and status differences. In the United States, there is a more general belief that individuals have the right to be treated equally despite differences in status and rank – in Japan, no such expectations exist.

Black and Mendenhall's account is of considerable importance in analyzing the process of 'Japanization' in Western countries. In respect of this development, we can see some interesting cases in New Zealand and the United Kingdom.

## 4.5 Nissan New Zealand and Japanization

Nissan New Zealand invested more than NZ$1 billion and was employing 3,700 workers. It applied three basic management principles in any organization: teamworking, flexibility and continuous quality improvement. First, teamworking as a semi-autonomous self-management was broadly responsible for most matters relating to its area of work – quality, health and safety, skill's development, cost, process, layout, time keeping and recruitment. Group decision-making, information sharing and mutual assistance played an important part in teamworking. Second, employees who were organized into teams could learn an increased number of skills in company training courses and expanded their abilities and skills at work. At the same time, they could get advancement in pay according to an annual merit and appraisal system, which rewarded those employees who had acquired new skills. The increase was among one to five percent of base pay, and it continued annually until the top of the pay scale was reached. Of course, the company guaranteed a single pay scale for all production workers; male and female workers had equal opportunities to increase their pay rates. At the time of the survey, 44 per cent of team leaders were female and so were 40 per cent of forepersons. This reflected flexibility and versatility. Third, the quality circle made efforts to 'result in massive savings in overhead, rework, materials, warranty and consequently greater customer satisfaction and product acceptance in the market.' 'Quality is assured by the process, not by after-the-fact inspection' (Williams et al., 1991).

Nissan New Zealand emphasized the importance of joint consultation and training program (skills training, process training, and leadership training) to implement and maintain change in the shopfloor successfully. The former was closely related to 'industrial democracy'. According to the negotiated consultation provisions of the Nissan–Engineers Union agreement, the union could be involved at 'the earliest stage of planning and implementing significant changes in working practices and technology'. As a result of this agreement, all the employees and their trade union representatives might be

convinced that 'since they were all in the same boat and in rough waters, everyone had better start rowing in the same direction'. More importantly, the individual employee was in a stronger position to make decisions on planning and control as the result of their joint consultation and multiple skills (Williams et al., 1991).

Nissan New Zealand absorbed many lessons from the experience of 'Japanization' of management in the UK (Williams et al., 1991). We can find its original form in Nissan Motors (UK) Ltd. Gleave and Oliver (1990) also explain the differences in human resources management between Japan and the UK by means of a case study of five Japanese manufacturing companies in the UK. Some of these companies in the UK pushed on with the long-term career development of employees within the company and promoted them on merit in contrast to an age-limited employment and seniority system in Japan. This proves that it was not easy to transplant the Japanese employment system directly in the UK, because this system was shaped by the unique characteristics of Japanese society. However, the emphasis on long-term career development and the promotion of employees based on merit, fostered stable employment and a high employee identification with the company. At the same time, teamworking, single-status systems (same company uniform, a single canteen, and morning exercises) and quality circles as well as employment systems were taking root in the companies and tending to reduce the barriers between the management and the employees. Workers in these companies might also possess more discretion for decision-making than their counterparts in Japan.

Furthermore, Marinaccio and Morris (1991) give us an interesting case study of 'Japanization' in Rists in the UK. The company introduced Japanese management techniques (quality circle, training, teamworking, continuous improvement, design organization, single-status systems, and so on) from Sumitomo Wiring systems. In Japan Sumitomo has had a relationship with Rists since 1987. In order to gain access to the European automobile market, Sumitomo owned 30 per cent of shares in Lucas SEL wiring systems, which was a joint venture with Rists. This joint partnership helped Rists to gain access to Sumitomo technology and production organization. It was most important for the trade union to contribute to the reduction of 'demarcation barriers'. Skilled craftsmen acquired multiple skills. They state that

> At a shopfloor level the removal of demarcation barriers has enabled complete flexibility with regards to the movement of operators from one work area to another. This is essential as labour can be redeployed between areas at peak times of production. Historically, workers have always been moved around within a single production area. However, the new agreements allow for labour to be moved anywhere on-site and coupled with these operators now perform such tasks as quality control (Marinaccio et al., 1991).

Workers developed multiple skills, so that they could react flexibly to changes in production requirements. At the same time, they could have a more powerful right to involvement in decision-making and to influencing working conditions.

We can point out here that Nissan New Zealand, as well as the companies listed above, have also tried to reform the organizational pyramid-based division of labour and to build a new worker-management relationship which was based on 'teamwork, trust, and the involvement and contribution of everyone' (Williams et al., 1991). Job satisfaction for employees also connected with increased productivity and profitability for the company. Nissan New Zealand started to take its own distinctive path which was divergent from Japanese management. This closely related to industrial democracy on the company. The formation of equal relationships between managers and labourers in Japanese companies depended strongly upon the employment system, enterprise trade union and cultural environment. These Japanese systems and cultural environment cannot be observed in New Zealand. The trade unions in New Zealand had stronger power than was usual in Japan. However, Nissan New Zealand adopted a 'middle of the road' solution through a mutual compromise between the managers, the trade union, and individual workers. Everyone was satisfied with the result of this compromise, because employee could always improve their skills and abilities along with their pay, and at the same time management could also manage change in today's global economic environment.

This two-way management under industrial democracy was different from the Japanese model of horizontal two-way management. Under industrial democracy, even if there had been a strained condition in the workplace because of the two-way management of efficiency and effectiveness, this stress would be based on the spontaneous behaviour of employees, rather than the firm's compulsory working system. They could have not only high income and opportunity of self-advancement, but also an equal and democratic relationship between 'white collar' and 'blue collar' in their working and personal lives (Williams et al., 1991). Moreover, if the two-way management under industrial democracy was integrated with the systematic strategic organization of top management, it might give full play to its ability in a system completely different from the Japanese management system. This style of management could be described as an integrated two-way management, since it would be a style in which two-way management is aggregated with vertical democratic and strategic organization. However, the rationalization of industry, enterprise, and production, particularly substituting for the subcontract company system and encouraging the broad popularization of management accounting, might be indispensable for the nationwide development of integrated two-way management.

## 4.6 Conclusion

Horizontal two-way management in Japan was a management philosophy that reconstructed traditional management and accounting methods towards a two-way correlation between effectiveness and efficiency. As a result of this reconstruction, Japanese firms were able to construct new management and accounting systems such as the just-in-time system and target costing. Japanese companies could also sell many of their products in international markets because of their high quality, low cost and timely delivery. Two-way management was established with the nationwide cooperation of the people and with the wholehearted support of government.

In the recent serious business recession in Japan, large Japanese companies are now faced by the difficult problem of building systematic organizations geared towards strategic decision-making. This is an urgent question for top managers to address given the present technological and economic changes in the business environment. They should make the widest possible use of horizontal two-way management in shaping long-range strategy. Moreover, Japanese companies have tried to switch from the past lifestyle of 'worker bee' to a new one embodying more free time. The successful establishment of this new lifestyle may also hold the key to the solution of the question of whether or not horizontal two-way management can be transformed into a integrated two-way management in Japan.

What is more important is the possibilities for further developing the integrated two-way management in New Zealand and the United Kingdom. This type of management is growing in the culture of industrial democracy that these countries have cultivated for a long time. However, it is questionable whether the integrated two-way management system in the UK and New Zealand is superior to the Japanese horizontal two-way management system in achieving profitability and effectiveness, because the recent revival of the Nissan Motor Company strongly depended upon the Japanese type of cooperative, collective management.

The recent financial difficulty and reconstruction of the Nissan Motor Company highlights both the weaknesses and the strengths of the Japanese model of management. The critical financial situation in the company did not prove the incompetence of the Japanese style of management and accounting, but it did reveal the harmful effects of bureaucratic top management on bringing the ability of cooperative and preventive management into full play, since the senior manager, Carlos Ghosn, who was in charge of senior management in the French Renault Motor Company, converted the bureaucratic decision-making structure into a cross-functional structure with transparency and prompt decision-making, and resuscitated the Japanese style of management from the crisis. The company realizes the highest profit as a result of the strong leadership by Carlos Ghosn, by which the preventive and proactive behaviour of the

*Table 4.2* Profit appropriation of Japanese affiliates in foreign countries (money amounts in billion yen)

| *Country* | *Total* | *Manufacturing industry* |
|---|---|---|
| USA | −371.4 | −185.3 |
| Latin America | −40.4 | −26.6 |
| Europe | −107.5 | −45.1 |
| Oceania | −33.6 | 1.7 |
| Africa | −4.7 | 0.4 |
| Middle East | 22.1 | 20.1 |
| Asia | 432.6 | 229.6 |
| Total | −93.5 | −5.4 |

*Source*: Death and Revival of Japanese Management, *The Weekly Toyo Economy* (Shukan Toyo Keizai), 1 May 1993, 11.

whole workforce was integrated with Western rational decision-making in top management.

The slump in business of Japanese subsidiaries in the UK was in total contrast to the excellent results that they were still recording in some Asian countries (see Table 4.2), which suggests that it was very difficult for the Japanese management systems to be transferred directly to Western countries. However, transferring the Japanese management style to Asian countries has been much more successful and has produced good results for Japanese companies, because these countries shared similar environmental and cultural characteristics (Kumon, 1992). In Western countries, the impact of high salaries and industrial democracy, and the merit of strong strategic decision-making must be considered when horizontal two-way management is adopted. If such a new management system as the more completely integrated two-way management is adopted in Western countries, this may cause the management system in these countries to be completely different from the Japanese horizontal two-way management. The more completely integrated form of two-way management should not be considered without the existence of the following factors: the nationwide applicability of the two-way management of efficiency and effectiveness; a powerful organization for strategic decision-making; and the democratic system in both society and the company. The development of integrated two-way management in New Zealand and the UK, and the introduction of industrial democracy and strategic decision-making in Japan, are important aspects for future research.

# 5

# Transplanting Japanese Management Accounting and Cultural Relevance

## 5.1 Introduction

The Japanese business community strongly believes that the successful penetration of Japanese companies into international markets had been as a result of its management system (including its system of management accounting). Consequently, Japanese big businesses had been actively transferring their management systems to their overseas affiliates. In addition, in pursuit of high quality and productivity, non-Japanese managers in other countries have introduced Japanese management methods into their companies. Some have termed this process 'Japanization' (see, for example, Munday, 1991; Oliver et al., 1991; Marinaccio and Morris, 1991).

After a decade of implementation, some analysts have praised the success of Japanization, while others have criticized it for its detrimental impacts, especially the cultural conflicts that have been caused. It is therefore important to discuss the transplanting of Japanese management from a cultural viewpoint; an approach which, so far, has been largely neglected. Thus, the aim of this chapter is to examine the relationship between management accounting and culture[8] and to outline the cultural characteristics of Japanese management.[9] It will also clarify the fundamental structure of Japanese management and its differences from the transplanted form of management. Moreover, an evaluation of transplanting with regard to the transfer cost will be made in a comparative analysis with Western and Asian countries.

## 5.2 Culture and management accounting

The relationship between accounting and culture has received much consideration in recent accounting literature, particularly that in the field of financial accounting. The aim of such research has been either to clarify fundamental aspects of accounting, or to explore the possibility of the international harmonization of financial accounting (see, for example, Cushing, 1987; Gray, 1988). Although the relationship had not yet been clarified,

fortunately Ueno and Wu (1993) have conducted a comparative study on the influence of culture in the budgetary control practices of the USA and Japan. Relying on the cultural dimensions addressed by Hofstede, their study examines the influence of Japanese collectivism on budgetary control as compared with American individualism. Their study is significant because it distinguishes between the features of management accounting methods in both countries, but a more detailed analysis may be required in order to reach a more definitive understanding of Japanese management accounting.[10] This is because they link the cultural idea of collectivism or individualism directly to the evaluation of teamwork or individual performance, when each cultural idea can coexist with the two evaluations (Schein, 1987); the cultural idea must be conceptually distinguished from the performance evaluation methods.

When the broadness of culture is linked directly with the narrow concept of budget control practice, the latter is often unable to reflect the full complexities of culture. This is because a management system in the aggregate embodies the essential features of culture. Hofstede's value patterns should not be separated into parts to recognize the cultural features of accounting: power distance, uncertainty avoidance, individualism and masculinity (Hofstede, 1987). This chapter will consider the dimensions of Hofstede's value patterns in synthesis. At the same time, in order to elucidate the relationship between the transplanting of management and culture, the four value dimensions will be tackled from a more limited (managerial) angle than Hofstede's (national) one.

As Hofstede argues, power distance and uncertainty avoidance are closely related to the functioning of organizations within a nation. In business organizations, be they large or small, the extent of power distance depends ultimately upon the dispersed size of decision-making. This has implications for determining who has the discretion to take decisions at each particular management level. The extent of centralization or decentralization in decision-making corresponds to the development of a modern organization – as it moves from a one-man concern to a modern joint-stock company. Uncertainty avoidance links itself strongly to certain types of organizations: functional department, division, or matrix system. These types of organization provide decision-makers with different relevant information and avoid uncertainty to varying degrees. Some types do not fit happily with the relevant information and are inferior to others in terms of uncertainty avoidance. Others are relevant and flexible for decision-makers.

It is clear, therefore, that power distance is inseparable from uncertainty avoidance. These two dimensions combine to encapsulate an organizational culture. The organizational culture has been strongly influenced by the formation of the modern organization as determined by the development of the market economy: management functions have become more specialized and decentralized as the social division of labour has become extensive;

management must now coordinate the extensively divided jobs effectively and efficiently. The transformation from scientific management to recent excellent management represents this development process. Accordingly, decision-making within an organization has also been decentralized to various levels. Thus, the increased popularity for decentralized organizational units and dispersed decision-making is consistent with business enterprise practices in advanced industrial countries.

By contrast, of the four dimensions addressed by Hofstede, the remaining individualism and masculinity are derived from national culture in a way that is relatively independent of changes in business organizations. However, they do connect with organizational structure, since, as Hofstede (1987) points out, they have an impact on the functioning of individuals within organizations. The durability or universality of national culture in a society contrasts starkly with the short history of organizational culture or its adaptability to environmental changes. The strength or weakness of individualism and collectivism depends upon the social and cultural factors such as climate, religion, language, historical structures (for example, contractual or centralized state), and the state of civil society in each country. For instance, collectivism in Japanese management may be traced to its origins in rice farming and the dominant religions (Confucianism, Buddhism, and *Shinto*), its long warrior-dominated history, a partial bourgeois revolution, and a centralized state (Dunn, 1969).

Masculinity relates to a sense of household entrenched in the above origins. Considering business management, masculinity takes the shape of an undifferentiated situation between family and company, or sexual discrimination in employment and working conditions. Strong masculinity means inequality in employment and working conditions for males and females, with women having little economic power and being subordinated to males. At the same time, a male worker must work hard for the sake of his family. Therefore, in the case of an economy characterized by strong masculinity, it is very difficult for a family to become independent of a company. There is a strong loyalty to the company on the part of employees.

In Asian countries, dominant management organizations are more closed than is the case in the West, and a few top managers have extensive decision-making powers at all levels of management: the family company is an example, since in this case ownership is rarely separated from management. With regard to the national culture, management systems strongly depend upon collectivism and unspecialized situation of family and company. This is in striking contrast to the position in the West, where individualism and the complete separation of family and company are the norm, and where diversified types of organization and decentralized decision-making have developed. We can conclude that the interaction between the organizational and national cultures shapes the cultural aspects of management accounting in each country.

## 5.3 Japanese management accounting and culture

Target costing is typical of Japanese management accounting and closely related to just-in-time (JIT) production techniques. Target costing consists of two processes: *genka kikaku* (cost design) and *genka kaizen* (continuous cost improvement). At the level of cost design, the target cost of a new product is estimated on the basis of a long-range profit plan and market price estimates. First, at the planning stage, the cost accountants and design engineers develop the target cost on the basis of the structure of the new product under the responsibility of a *shukan* (a chief engineer) with the aim of satisfying customers' needs as well as penetrating international markets. Second, at the implementation stage, the expected actual cost is estimated from the viewpoint of value engineering. Production departments and subcontractors try to reach the target cost by improving production methods and adopting new materials and technology. Any variance between the target cost and the expected cost (estimated cost) is thus minimized. At the stage of mass production (*genka kaizen*), the target cost is compared with the standard cost over a certain number of budgeted months (for example, six months in the case of Toyota) during which time improvements in efficiency may be obtained. Workers and managers in all departments at all levels are expected to endeavour to propose new cost and technological improvements on a daily basis in order to bring the standard cost closer and closer to the target cost (Tanaka, 1991).

Target costing plays an important role in JIT. The interaction between cost accountants and engineers, the relationship between 'feedback' and 'feedforward' (Morgan, 1992), and the process of cost reduction in the design stage are unique features of JIT. The JIT system essentially consists of two subsystems: visible management and a new production system. The visible management, often called *kanban* in Japanese, relies partly on aspects of traditional Japanese culture[11] and partly on advanced information systems. The fundamental function of visible management is to discover and remedy problems quickly. The new production system consists of small lots, zero inventory, multi-skilling, short lead times, the pull production method, a suitable arrangement of machines (Robert et al., 1991; Hirano, 1990), and a horizontal relationship between managers and workers. The production system must be so designed as to enable it to solve the problems discovered in the process of visible management. In the implementation of JIT Japanese management exhibits a strong control orientation, seeking collective and cooperative management in contrast to the decisive role which is played by senior management in the USA (for example, total quality control versus the optimum inventory model). The benefit of human resource management in the solution of problems is explicitly recognized. In particular, Japanese middle- and lower-level managers play an important proactive role in anticipating problems before they occur. In this Japanese system much depends

upon the mutual trust between workers and managers, proper training, multi-skilled employees and a firm belief in the ability to amend wrong plans if every one works together to control the operating management process. For this purpose, middle managers come down to the shopfloor, wear the same uniform as other workers, eat in the same canteen, and hold sports meetings or go picnicking with them. The shortage of just such a middle management level is questioned in the operations of Japanese overseas affiliates.

The combination of JIT and target costing results in a Japanese management system based on the concept of zero inventory and zero defects and ultimately an integration of low cost and high quality. However, it should not be overlooked that this integration could not be implemented without longer working hours than those in the West[12] and without a system of cheap parts supplied by subcontracting companies. With regard to working conditions, despite their legal entitlement, workers are unable to enjoy a paid holiday due either to 'much organizational pressure', or to fear of being accused of reneging on their collective responsibility (Cole, 1992; Oliver and Lowe, 1991).

When the impact of culture on management accounting is examined on the basis of Hofstede's value dimensions, it is indisputable that a strong national culture characterizes Japanese management accounting. When we picture a diagram whose horizontal line shows a separated relationship between family and company with its strength from the left to the right side, and whose vertical line shows the strength of individualism from the upper to the lower, Japanese management accounting belongs to the same quadrant (the fourth quadrant) as other Asian countries in contrast to the West (the second quadrant). The fourth quadrant reflects collectivism and the family's strong identification with the company. However, with regard to the organizational culture, Japanese companies use similar types of dispersed decision-making and decentralized organization units as in the West. However, this organizational culture is transformed under the strong influence of the above national culture (Nishimura, 1992, 1994).

In the West, it is believed that as the division of work becomes finer and the management function enhances specialization, efficiency rises. This is called rationalism. Rationalism is based on the notion that individual specialization precedes coordination and integration. In such circumstances management becomes very important for coordinating specialized jobs towards the realization of the corporate goal – especially when business companies have become large. In the whole process of management, strategic decision-making plays a decisive role. It is a prevailing belief that the existence of high levels of efficiency in workshops is no good, if the strategic decision-making is wrong. This makes an excellent contrast to the control-oriented and collective philosophy in Japan. In Japan the integrated and cooperative idea and the stratified relationship of cooperation between

managers and workers lie at the heart of management. According to this idea, the specialization of management function and division of work develop and change their shapes. Therefore, multi-skilling, personal responsibility for plural sections of a production line, the redeployment, and continuous training play an important part in this cooperative management.

## 5.4 Transplanting of Japanese management in the West and in other Asian countries

Surveys carried out by the Japan External Trade Organization (JETRO) provide some interesting data. Figure 5.1 shows the management methods that Japanese overseas affiliates in Europe were adopting in the period September 1991 to January 1992. Of 338 companies that responded to JETRO's questionnaires, more than 30 per cent had transplanted the quality control circle, training, and horizontal organization systems (same canteen, uniform, open staff office, and company social events) from Japanese management to their companies. Some case studies of individual Japanese affiliates confirm this pattern. Although, in

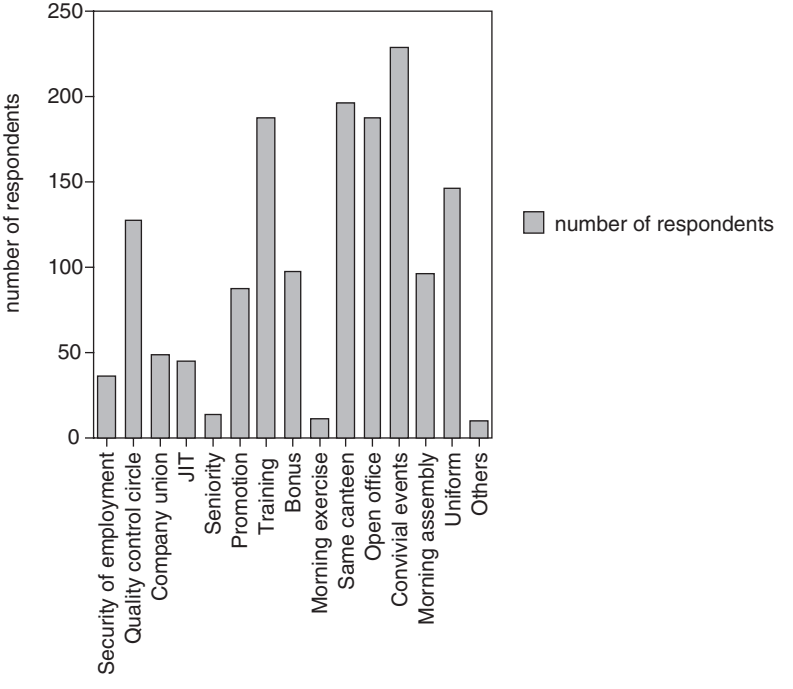



*Figure 5.1* Japanese management in Europe

*Source*: JETRO, *Management of Japanese Manufacturing Companies in Europe 1992* (Tokyo: JETRO, 1992), 46–8.

*Table 5.1* Japanese management in the UK, New Zealand and Taiwan

| *Company* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nissan New Zealand | | yes | agree | | yes | yes | | | | yes | yes | |
| Hoya Lens (UK) | yes | | agree | | yes | yes | yes | yes | | | | a |
| Komatsu (UK) | yes | | agree | | yes | yes | | yes | yes | yes | yes | b |
| Matsushita Elec. (UK) | | | agree | | yes | yes | yes | yes | yes | | | |
| Yamazaki Machine (UK) | yes | | | | yes | yes | | yes | yes | yes | | |
| Takiron (UK) | | | agree | | yes | | yes | | | | | c |
| Lucas wiring (UK) | | yes | agree | | | yes | | | | yes | yes | d |
| A (Taiwan) | con. | yes | yes | | | | | | | yes | yes | |
| B (Taiwan) | con. | yes | yes | yes | yes | yes | | | | yes | | |
| C (Taiwan) | con. | yes | yes | | | yes | yes | | | yes | | |
| D (Taiwan) | con. | yes | yes | yes | yes | | | | | yes | | |
| E (Taiwan) | con. | yes | yes | yes | yes | | | | | | | |

*Notes*: 1 = security of employment, mainly meaning lifetime in Taiwan and long career employment in the UK; Con. means considering; 2 = quality control circle; 3 = company union in Taiwan and agreement with single union in the UK; 4 = seniority system; 5 = promotion; 6 = training; 7 = bonus system; 8 = wearing uniform; 9 = same canteen; 10 = team work; 11 = multi-skilling. a = computer system. b = company slogan, computer system, and morning exercise; c = morning assembly, '*kanban*', and JIT; d = design engineering and CAD system.

*Sources*: Alan Williams, Bruce Owen, and Alan Emerson, *The Nissan Way* (Auckland: William Collins, 1991), 11–37; Simon Gleave and Nick Oliver, Human Resources Management in Japanese Manufacturing Companies in the UK: 5 Case Studies, *Journal of General Management* (Autumn 1990), 54–68; Rocco Marinaccio and Jonathan Morris, Work and Production Reorganization in a 'Japanized' Company, *Journal of General Management* (Autumn 1991), 56–69; Hiroshi Kumon, Japanese Car Manufacturing Companies in Taiwan, *Study of Social Labor*, vol. 39, nos 2–3 (1991), 454–89.

Table 5.1, some UK Japanese affiliates seem not to have adopted the quality control circle, there is no doubt that, judging from the extensive use of teamwork, multi-skilling and human resource management in these firms, they have emphasized quality control and high productivity. Other Japanese affiliates in the West tried to reform the traditional vertical structure of control into a horizontal one (Williams et al., 1991). Table 5.1 shows that the same tendency occurred in Japanese affiliates in Taiwan. Therefore, the Japanese training system, quality control circle, and some horizontal organizations had been mainly transplanted to other countries to improve quality and raise productivity. However, these were confined to the level of *genka kaizen* (cost improvement); it is evident that the total system of Japanese management, which is based on the two-way and horizontal management and consists of visible management (*kanban* system), new production systems and target costing, were not transplanted in full.

This partial transplantation also applied with regard to the delegation of decision-making. In Europe, top managers in Japanese affiliates were only made responsible for decision-making in the area of operating management. This covers the employment of workers and managers, the working system, wages, the procurement of materials, and the planning of production and sales. In contrast, changing capital stock, appointing and dismissing directors, deciding investment and financing, and disposing profits were left to the head offices in Tokyo (JETRO, 1992). Japanese management was split into two parts: long-term strategy being decided at the head offices in Tokyo and product strategy by the Japanese affiliates in Europe. As a result, target costing was also separated: *genka kikaku* in Tokyo and *genka kaizen* in local factories.[13] There were some differences in the transplanting process as it affected the UK and Taiwan. Concerning labour unions, almost all Japanese affiliates in the UK had a single-union agreement. Similarly, following the model of the Nissan–Amalgamated Engineering Union agreement at Nissan UK (Williams et al., 1991), Nissan New Zealand also negotiated an agreement for continuous quality control and a significant role for workers in decision-making. They tried to encourage long-term career employment within the company in order to secure a stable relationship between managers and workers. However, Japanese affiliates in Taiwan placed importance on the direct transfer of the system of lifetime employment and seniority from Japan (Kumon, 1991). Although Chinese managers in Japanese affiliates had far wider decision-making powers in Taiwan than they did in the West, it was also easier to transfer Japanese management systems to Taiwan. This is because management in the East Asian countries shares a common cultural heritage of collectivism (authority, trust and loyalty) and relates to a strong sense of family, patrimonial custom and state-oriented economic control. This common cultural basis is important for the process of transplanting.

## 5.5 Transplanting of the management system and transfer cost

The recent conclusions of an investigation by the Japanese Ministry of International Trade and Industry (MITI) into the overseas activities of Japanese affiliates shows that their slump in the UK and the USA is in complete contrast to their outstanding successes in some Asian countries (see Tables 5.2 and 5.3). This relates closely to the environment and culture in the countries into which Japanese management has been transferred. With regard to the environment, Japanese affiliates in the West worked under conditions of short working hours, high salaries, and an insufficient supply system of parts relative to their parent companies in Japan. These circumstances prevented the transplanted management from linking high quality with low cost. The Japanese affiliates must allocate considerable resources to establish an efficient and effective subcontracting system in the

*Table 5.2* Profit on investment in Japanese overseas affiliated companies in foreign countries (percentages)

| *Country* | *General machinery* | | | *Electronic Machinery* | | | *Transport equipment* | | | *Precision machines* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1989* | *1991* | *1992* | *1989* | *1991* | *1992* | *1989* | *1991* | *1992* | *1989* | *1991* | *1992* |
| USA | 4.3 | 0.9 | −0.7 | −3.2 | −6.7 | −4.0 | −5.0 | −10.0 | −2.9 | −1.4 | −11.5 | −7.01 |
| Asia | 30.5 | 28.8 | 23.4 | 13.7 | 12.3 | 14.1 | 11.3 | 32.9 | 23.5 | 18 | 13.4 | 11.3 |
| Europe | −8.4 | 21.7 | −11.9 | 8.2 | 7.0 | −10.8 | 5.8 | 3.8 | −1.7 | 4.3 | −14.2 | −6.9 |
| Oceania | | −28.2 | 14.7 | 12.5 | −0.02 | 12.5 | 11.3 | 9.4 | −4.0 | 2 | −5.8 | −3 |

*Source*: International Business Section of Industrial Policy Department in MITI, *Business Activities of Japanese Companies in Foreign Countries*, nos 18–19, 21, and 22 (Tokyo: Ministry of Finance, 1990, 1992, and 1993), 3–172, 37–156, and 39–131.

*Table 5.3* Sales profit rate in Japanese overseas affiliated companies (percentages)

| *Country* | *General machinery* | | | *Electronic machinery* | | | *Transport equipment* | | | *Precision machines* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1989* | *1991* | *1992* | *1989* | *1991* | *1992* | *1989* | *1991* | *1992* | *1989* | *1991* | *1992* |
| USA | 1.6 | 0.7 | 05 | 0.1 | −1.1 | −0.03 | −1.4 | −1.3 | 0.6 | −0.04 | −3.8 | −6.4 |
| Asia | 7.5 | 5.8 | 5.1 | 3 | 3.1 | 3.5 | 3.1 | 7 | 4.8 | 2.2 | 2.3 | 16.7 |
| Europe | −0.6 | 3.5 | −1.4 | 1.3 | 2 | −1.3 | 2.8 | 2.8 | −0.1 | 0.5 | −1.4 | 0.7 |
| Oceania | 5.3 | 5.3 | 1.5 | 1.4 | 0.1 | 0.3 | 2.6 | 2.6 | −1.0 | 0.3 | 1 | 1.7 |

*Source*: International Business Section of Industrial Policy Department in MITI, *Business Activities of Japanese Companies in Foreign Countries*, nos 18–19, 21, and 22 (Tokyo: Ministry of Finance, 1990, 1992, and 1993), 3–172, 37–156, and 39–131.

West, particularly in North America, because there was not as yet a regional supply system for parts and materials.

By contrast, Japan and the other Asian countries had reasonable supply networks for cheaper parts and materials, which ensured that these countries trade mutually in the same area; hence they enjoyed the merits of an international division of labour in this area. The ratio of imported electrical appliances and transport components from Japan was higher in Europe than in Asia: in electronics and transport equipment industries, the figures were 65 per cent and 41.5 per cent in North America and 45.6 per cent and 57.9 per cent in Europe in contrast to 39.8 per cent and 50.2 per cent in Asia (see Table 5.4). According to JETRO's survey, of 163 Japanese affiliates that had strong relations with European manufacturing makers of parts, 96 (59 per cent) complain about bad quality, high prices, and late delivery (JETRO, 1992). Generally, it would be very costly to improve the quality of highly exclusive parts in the West by using Japanese management

*Table 5.4* Ratio of local procurement of parts by Japanese overseas affiliates in each area, 1992 (percentages)

| *Area and industry* | *(1) from local* | *(2) from others* | *(3) from the same area within 2* | *(4) from Japan* |
|---|---|---|---|---|
| USA (Total) | (52.7) | (10.1) | (11.1) | (37.2) |
| 1 General machines | 33 | 8.2 | 24.9 | 58.8 |
| 2 Electronics | 26 | 9 | 25.5 | 65 |
| 3 Transport equipment | 56 | 2.5 | 74.6 | 41.5 |
| 4 Precision machines | 36.4 | 0.8 | 7.4 | 62.8 |
| Asia (Total) | (33.7) | (26.7) | (76.1) | (39.6) |
| 1 General machines | 44.1 | 7.2 | 90 | 48.7 |
| 2 Electronics | 43.8 | 16.3 | 34.6 | 39.8 |
| 3 Transport equipment | 45.3 | 4.5 | 99.4 | 50.2 |
| 4 Precision machines | 27.5 | 4.4 | 92 | 68.1 |
| Europe (Total) | (15.6) | (35.1) | (11.4) | (49.3) |
| 1 General machines | 52.4 | 8.8 | 92.8 | 38.8 |
| 2 Electronics | 19 | 35.4 | 83.9 | 45.6 |
| 3 Transport equipment | 35.3 | 6.6 | 91.3 | 57.9 |
| 4 Precision machines | 22.3 | 9 | 99.1 | 68.7 |
| Oceania (Total) | (40.9) | (4.8) | (59.1) | (54.3) |
| 1 General machines | 18.1 | 0.2 | 100* | 81.7 |
| 2 Electronics | 15.9 | 8.4 | 84.9* | 75.7 |
| 3 Transport equipment | 49.2 | 2.9 | 8.7* | 47.9 |
| 4 Precision machines | 8.6 | 22.1 | 100* | 69.3 |

*Note*: * means the ratio of procurement from the Asian area.

*Source*: International Business Section of Industrial Policy Department in MITI, *Business Activities of Japanese Companies in Foreign Countries*, no. 22 (Tokyo: the Ministry of Finance, 1993), 90–101.

and establishing subcontracting systems. As a result, the local procurement of electrical appliances was limited to electric wires, packaging, and resinous moulds (Maruyama and Fujii, 1991).

The reason that transplanting is very costly in the West is that it takes a long time for the benefits of high quality and productivity to exceed the high transfer costs. The transfer costs refer to those expenses that a company has to pay in order to transfer its management systems to other countries. Japanese companies should pay a huge amount of money for training and establishing 'the team system to rouse workers', since collective and cooperative activity is central to the Japanese management system (Maruyama and Fujii, 1991). It may take much longer for Japanese management to put down deep roots in the West than in other Asian countries, because the culture in the West is so different from that of Japan. Even if Japanese management succeeds in transplantation for a short period by becoming fashionable, there is no guarantee of durable success because of the above-mentioned high transfer costs.[14]

In contrast to their performance in the West, Japanese affiliates in Asian countries continued to record high profit rates (see Tables 5.2 and 5.3). This is largely because they have been able to employ cheap labour. In Singapore, highly skilled technicians received only one-third of the starting salary for Japanese college-educated office workers. In addition, they were even prepared to work on Saturdays (Nakamura, 1992; Marinaccio and Morris, 1991). Japanese affiliates can also establish an international procurement system for parts in Asia. Table 5.4 shows that the ratio of local procurement was not only high, but also that parts and materials were procured at a high rate inside the Asian countries. In the transport equipment industry, 99.4 per cent of overseas procurement depended upon supply from the other Asian countries.

It is easier and less costly to send Japanese managers to Asia to transfer the benefits of Japanese management than it is to send them to the West. First, transportation costs and living expenses in Asia are lower. Second, and even more importantly, fewer managers are required to stay at the Japanese affiliates in Asia to transfer Japanese management; managers in Asia can easily assimilate Japanese cultural practices, whether or not they approve of them – their attitude to management is similar to that of Japanese managers. Third, the training costs are lower in Asia than they are in the West. The cost of training Asian Managers in Japanese management techniques is also not so high in Asian countries, due to their shared common culture. Table 5.5

*Table 5.5* Number of seconded managers and ROI in electronics and transport equipment industry

| *Area and industry* | *1989* | | | *1991* | | | *1992* | | |
|---|---|---|---|---|---|---|---|---|---|
| | *(1)* | *(2)* | *ROI* | *(1)* | *(2)* | *ROI* | *(1)* | *(2)* | *ROI* |
| Electronic machines | | | | | | | | | |
| North America | 3.0 | 12 | −3.2 | 2.84 | 12 | 6.7 | 3.02 | 12 | 4.0 |
| Asia | 1.05 | 6 | 13.7 | 1.06 | 6 | 12.3 | 1.06 | 6 | 14.1 |
| Europe | 2.95 | 5 | 8.2 | 1.50 | 5 | 7.0 | 1.43 | 6 | −10.8 |
| Oceania | 2.4 | 8 | 12.5 | 2.65 | 6 | −0.02 | 2.37 | 6 | −3.3 |
| Transport equipment | | | | | | | | | |
| North America | 4.53 | 14 | −2.9 | 3.66 | 17 | −1.1 | 3.50 | 17 | −2.9 |
| Asia | 0.81 | 3 | 23.5 | 0.86 | 4 | 3.1 | 0.75 | 4 | 23.5 |
| Europe | 0.89 | 7 | −1.7 | 1.15 | 7 | 2.0 | 1.29 | 9 | −1.7 |
| Oceania | 0.59 | 6 | −4.0 | 0.52 | 7 | 0.1 | 0.62 | 7 | −4.0 |

*Notes*: (1) means the ratio of seconded Japanese managers to the total number of employees in Japanese affiliates; (2) means the average number of Japanese managers per Japanese affiliate.

*Source*: International Business Section of Industrial Policy Department in MITI, *Business Activities of Japanese Companies in Foreign Countries*, nos 18–19, 21, and 22 (Tokyo: the Ministry of Finance, 1990, 1992, and 1993), 33–172, 37–156, and 39–131.

shows that the return on investment (ROI) has some relationship to the number of seconded Japanese managers and their ratio to the total number of employees in Japanese affiliates. With regard to ROI, North America was the lowest of the four areas. This may be due to the fact that it has the largest number of seconded Japanese managers and the highest ratio of managers total employees in the four areas. In Asia the contrary situation is observed. Because human resource management performed an important part in Japanese management, the cost of seconding Japanese managers to other countries for training programmes was particularly expensive. This strongly influenced ROI for Japanese affiliates.

Although Japanese management has succeeded in penetrating international markets with its products, it does not follow that the transplantation of Japanese management will be beneficial to other countries. Furthermore, although Japanese affiliates have continued to achieve good business results in Asia, it is too early to conclude from this that the process of 'Japanization' has been beneficial for Japan and other Asian countries. The merits and demerits of transferring Japanese management to other countries must be appraised not only from the viewpoint of transfer cost, but also from the angle of the costs and benefits in the countries that are 'Japanized'. Its strong friction with the native cultures of other countries should be further considered: hard work, high speed of assembly, no overtime pay, illness, stress and isolation of workers, and discrimination (Special Report, 1986). JETRO's survey (1992) also finds that European managers and workers in Japanese affiliates were annoyed about many Japanese management practices. Concerning teamwork, one should pay attention to the different attitudes observed in Japan and the USA. In the USA, the promotion of teamwork or consensus per se did not make sense. It was more important for individuals to be informed and given the necessary skills to solve problems efficiently (Schein, 1987).

It is most important to clarify the fundamental features of excellent management at present, including Japanese management, as well as cultural conflicts. An understanding of these features will enable every country to establish the management accounting framework suitable for its particular culture. Japanese management has also aimed at integrating high quality and low cost, although traditional management ideas have usually considered that there is a trade-off between the two (Daniel et al., 1991). This shift in ideas must be analysed theoretically. The combination of specialities (for example, multi-skilling) and horizontal organization (for example, teamwork) enables the integration of low cost and high quality.

The US approach of activity-based costing is completely different from the Japanese method of target costing. Activity-based costing focuses on the reciprocal relationship between cost and cost driver (physical factors or activities). It is a method through which the manager makes better decisions and receives timely cost information about the profitability of products.

Originally, this method had nothing to do with the horizontal management of organization. However, some American companies have tried to connect these two, so that activity-based costing may be of use not only for decision-making, but also for daily cost improvements (Johnson, 1991; Johnson et al., 1992). Activity-based costing and target costing are special types of excellent management accounting.

Of course, it would be worthwhile to ascertain and analyse the general characteristics of the modern management accounting that have been adopted by companies in many countries. However, such a task lies beyond the scope of this chapter, and will be addressed in future work.

## 5.6 Conclusion

This chapter has shown that Japanese management is strongly influenced by the Japanese national culture of collectivism. This is linked to the organizational culture of rationalism introduced from the West. The cultural characteristics of the Japanese management style can be summarized as horizontal and control-oriented organizations, characterized by collective effort, and a lack of distinction in loyalties to family and company (a strong culture of 'masculinity').

Japanese management consists of visible management, the new production system, and target costing. However, the aspects of management transplanted into other countries constituted only one part of Japanese management. Teamwork and total quality control have mainly been transplanted to other countries while control over long-range strategy and investment policy has been retained in Japan. These management methods link closely with Japanese culture and it is clear that this transfer of national culture to other countries caused more serious problems than the transfer of the organizational culture.

Judging from transfer costs, the process of 'Japanization' is very costly. If there are not enough conditions for benefit from transfer cost, Japanese companies will not achieve profit by transplanting their system of management. For example, the high salaries, short working hours, and insufficient supply systems for cheap parts in the West are in marked contrast to the beneficial conditions in these areas in the Asian countries. Because the training and seconding costs of Japanese managers are the main factors in transfer costs, these influence the profitability of Japanese affiliates in the West and in Asian countries. The level of transfer costs indicates the difficulty of transplanting management accounting into other countries and also its impact on the profitability of Japanese affiliates. Therefore, transfer cost is also an important criterion of successful transplanting of management.

Furthermore, transplanting must be evaluated with regard to the costs and benefits to be earned in the countries to which Japanese management is transferred. When transplanted management produces cultural conflicts in

the host countries, it should be moulded into a management system suitable for the cultures of the transferees. One must consider the optimum condition for achieving low transfer costs in order to maximize the benefit for the transferee countries. Therefore, both the quality and quantity of transfer costs should be examined in depth. It is very important to make the general characteristics of the best current management accounting techniques clear and to develop and advanced management accounting suitable for the national culture of each country.

# 6

# Asian Economic Growth and Management Accounting

## 6.1 Introduction

In the middle of the 1980s, Japanese management accounting attracted worldwide attention, as did the phenomenon of Japan's bubble economy. Japanese management accounting was considered to have contributed to the high growth rates of the Japanese economy. As a result, corporations in foreign countries began to introduce the Japanese model of management accounting in order to bring about the integration of low cost and high quality. At the same time, Japanese corporations started to transfer the management accounting system as well as production plant and technology to foreign countries in order to counteract the losses in exports which had resulted from the appreciation of the yen.

Some Western scholars commented on some aspects of Japanese style management and regarded them as a 'threatening form of social control' or 'organizational presser' (see Note 10). Black and Mendenhall (1993) pointed out, from the viewpoint of different national traits, that 'to Americans, Japanese may seem like chameleons because their behavior changes so much more radically in response to context'. However, in Europe some paid attention to the accounting system connected with the cooperation type of organizational management and were willing to accept the 'Japanization' of their management accounting systems in order to gain an edge in cost and quality in world markets (Oliver and Lowe, 1992). Taking this movement into consideration, Japanese corporations believed that the Asian economy would continue to grow with the support of their management accounting systems, when they were transferred to other Asian countries. Unfortunately, following the devaluation of the Thai baht, enthusiasm for the Japanese management accounting system has waned, resulting in a reduction in its transfer overseas. The Asian economic recession has now turned into a world economic problem. Therefore, some may conclude that any consideration of the overseas transfer of the Japanese management accounting method is no longer meaningful.

Before accepting this conclusion, we need to clarify the actual situation with regard to management accounting in Asia and to conduct a serious examination of the problems involved in its transfer. Moreover, we should analyse the Asian economy from both a long-term and a short-term perspective as well as considering the differences in characteristics between the ideas and methods of the Japanese management accounting and traditional methods. We may then be able to show that the transfer of the accounting system is not a thing of the past, but is, in fact, an important issue to be connected with Asian economic growth in the future, when the new ideas and methods are applied in a suitable fashion to Asian management control. Thus, the aim of this study is to examine the actual situation of Asian management accounting in a context of internationally developed stages of management accounting and to consider the implications of the transfer of Japanese management accounting for various Asian countries.

## 6.2 Development of management accounting and Japanese management accounting

The development of management accounting is generally divided into four stages, as shown in Table 6.1. In the first stage, an independent calculation system of management accounting was not established, and financial accounting data were used for business management. During this stage, management through accounting had a strong character of 'drifting' (*nariyuki*) management, since business was managed according to the development of the situation and by using past financial accounts. At this time the financial ratio analysis or comparative business analysis was principally adopted as a method of controlling production and business management.

At the beginning of the twentieth century scientific management was advocated by F. Taylor. This philosophy, as well as the idea of government budget, influenced the formation of the second stage of management accounting. To be exact, this stage is the formative period of management accounting. The methods in this stage were mainly budget control, standard costing, and break-even point analysis. In particular, budget control was used to control corporation production and business wholly, and the standard costing to control jobs partially. The standard cost or the planned profit was thought to be a criterion or a standard that should be realized. Efficiency was measured by the standard value or the criterion. Thus, if the actual cost was at variance from the standard or the plan, it should be revised towards the standard. Cost variance should be eliminated in the following step. In this case, the standard was true, and variance between the standard and the actual costs was abnormal. Thus, variance analysis and control played an important role in this stage of management accounting. This stage may be named 'traditional management accounting' since its fundamental contents still exercise

*Table 6.1* The development stages of management accounting

| *Stage* | *Management accounting* | *Features* | *Methods* |
|---|---|---|---|
| First | 'Drifting' management accounting | Application of financial accounts to management control | Financial ratio analysis, Business comparative study |
| Second | Traditional management accounting | Efficiency management based on scientific management (control through plan) | Budgetary control, Standard costing, Break-even point analysis, Cost variance analysis |
| Third | Quantitative information management accounting | Optimum profit management based on management science (control decision-making process) | Inventory management, LP, Information analysis, Behaviour science, Profit prediction, Opportunity cost analysis |
| Fourth | Integrated management accounting | Integration of accounting management and organizational management, strategic and feed forward management (proactive and preventive management) | Cost design, Continuous cost improvement, Target costing, Activity-based management, Balanced scorecard |

considerable influence on today's management accounting systems, even if their forms have changed over time.

Quantitative and information theory gained more innovative power than traditional management accounting during the 1970s. In this third stage, the management accounting system rested on the philosophy of management science. The optimum profit was pursued in profit management instead of the break-even point, or profitability in traditional management accounting. Probability, linear programming, economic optimum stock model, and information theory were used broadly for profit management. At the same time, behaviour science and agency theory, relating to this idea, became conspicuous during this stage. The fundamental point at this stage was to control planning process itself and to forecast the future of business precisely according to corporation environments and conditions. That is to say, to control the abilities and process of managers' planning and to make the evaluation of their performance more reliable.

It is further ascertained that the third stage of management accounting depended basically upon two fundamental ideas of control concept: feedback and feed forward. In the process of shifting from the drifting management to the traditional management accounting, the feedback control exerted a strong influence on the accounting system. This control philosophy took a completed form through development from traditional management accounting to quantitative and information management accounting. At the same time, feed forward control thinking was beginning to develop. In particular, Demski (1967, 1969) used the idea to develop a new theory to control the decision-making process consistently.

According to feedback control thinking, actual performance was compared with the original plan and standard after completion of an action and the following plan was revised. Variance will also be corrected by various methods. In contrast to such a reflective and reactive activity, feed forward control is preventive and proactive. Managers who advocate this control idea adopt various kinds of method to amend the plan frequently and control planning process incessantly in accordance with changing environments, and to realize an expected performance. Actual performance will be almost the same as that expected. In other words, a difference is interwoven beforehand in the planned value or the standard cost (Bromwich and Bhimani, 1996). Cost design (*genka kikaku*) is based on feed forward control thinking. This is the preventive and proactive management system in which managers utilize various methods in controlling the planning process to create an actual performance almost equivalent to the planned value. Cost variance analysis and revision activity had an important meaning in the traditional, and the quantitative management accounting systems as it did before. However, in today's management accounting, it is more important to interweave cost variance in the planned value beforehand and to take measures to get rid of variance before actual performance.

Of course, feed forward management cannot be executed solely by an accounting system. The integration of organization management and accounting management is indispensable for feed forward management. Feed forward management accounting would not be able to fulfill its function without organizational management. Thus, this is named 'integrated management accounting'.[15] As a result, although low cost and high quality had been regarded hitherto as trade-offs, their relation is now considered to be complementary in integrated management accounting. Accordingly, cost design represents the integrated management accounting, since it has the peculiar characteristic of preventive and proactive management in the process of planning and control.

At the same time, cost design is a market-strategic cost management system which was born in order to realize the target profit by forecasting the potential market demands, then uncovering them in international markets, and meeting their demands from the viewpoints of high quality, low cost

and prompt delivery. It may be said that management accounting has developed from a feedback to a feed forward control system, and from a production orientation to a market orientation, when we presume that the integrated management accounting, or the latest management accounting has the two characteristics of market orientation and of feed forward control system. We can describe the development stages of management accounting in accordance with the above-mentioned point of view in the following figure.

Judging from the four stages of management accounting outlined earlier, where does Japanese management accounting fit in? Here, the suggestive research report, carried out in the period 1993–95 by the Accounting Research Institute of the Faculty of Commercial Science at the Nihon University, is pertinent. First, as Table 6.2 shows, the management accounting practice of Japanese manufacturing corporations arrives at the fourth

*Table 6.2* Present situation of management accounting in Japanese manufacturing firms

| *Items (number of respondents)* | *Number* | % |
|---|---|---|
| 1. Standard costing (203) | 130 | 64 |
| 2. Direct costing (205) | 102 | 49.8 |
| 3. Appraisal method of economic calculation of equipment funds (203) | | |
| (1) Accounting profit (ROL) | 72 | 35.5 |
| (2) Payback period | 133 | 65.5 |
| (3) Intra-company profit rate | 31 | 15.3 |
| (4) Present value method | 32 | 15.8 |
| (5) Annual cost sum method | 33 | 16.3 |
| 4. Responsibility centre of division (139) | | |
| (1) Cost centre | 5 | 3.6 |
| (2) Profit centre | 104 | 74.8 |
| (3) Investment centre | 28 | 20.1 |
| 5. Appraisal standard of division (332) | | |
| (1) Sales | 102 | 30.7 |
| (2) Rate of sales growth | 49 | 14.8 |
| (3) Profit | 131 | 39.5 |
| (4) Return on capital | 14 | 4.2 |
| (5) Return on sales | 31 | 9.3 |
| 6. Kind of budget (194) | | |
| (1) Budgeted profit and loss | 168 | 86.8 |
| (2) Sales budget | 175 | 89.7 |
| (3) Production budget | 163 | 84 |
| (4) Selling expenses budget | 174 | 89.2 |
| (5) General administrative expenses budget | 180 | 92.8 |
| (6) R & D expenses budget | 163 | 84.1 |
| (7) Capital budget | 59 | 82 |

| | | |
|---|---|---|
| 7. Cost table (202) | 138 | 68.3 |
| 8. Variance analysis (203) | 123 | 61 |
| 9. Intra-company transfer price (136) | 111 | 81.6 |
| 10. Short-term profit goal (255) | | |
| (1) Sales | 46 | 18 |
| (2) Rate of sales growth | 15 | 5.9 |
| (3) Profit | 175 | 68.6 |
| (4) Return on profit | 3 | 1.2 |
| (5) Return on sales | 13 | 5.1 |
| 11. Method of budget decision (191) | | |
| (1) Top-down | 21 | 10.9 |
| (2) Bottom-up | 35 | 18.8 |
| (3) Combination | 134 | 69.8 |
| 12. Method of budgeting (243) | | |
| (1) Simulation model | 24 | 9.9 |
| (2) Zero-base budget | 35 | 14.4 |
| (3) Direct costing | 38 | 15.6 |
| (4) Linear programming | 4 | 1.6 |
| (5) Break-even point analysis | 36 | 14.8 |
| 13. Adoption of cost design (187) | 115 | 61.5 |
| (1) Systematic execution all over firm | 59 | 31.6 |
| (2) Execution in divisions | 24 | 12.8 |
| (3) Temporary execution | 32 | 17.1 |
| 14. Adoption of activity-based costing (191) | 22 | 11.5 |
| 15. Usage of LP in decision-making (197) | 10 | 5.1 |

*Source*: Construction of General Data Base on Costing Practice, *Research of Accounting*, Faculty of Commercial Science at the Nihon University, vol. 8, no. 9, March 1996.

stage after completing the second stage – that is, skips the third stage – because traditional management accounting such as budget control, standard costing, and variance analysis, as well as cost design, has its roots deep in managerial and operational management and the quantitative methods have hardly been practiced at all. Because the Japanese tax law demands actual cost for valuation of inventory and 'Cost Accounting Standards' based on Business Accounting Principles takes a viewpoint near to the tax law, standard cost is calculated at approximately actual cost. Although its diffusion rate falls owing to recent technical development and changing business environments, most Japanese enterprises have practiced standard costing and direct costing.

At the same time, the diffusion rate of cost design exceeds 60 per cent, and cost improvement (*genka kaizen*) is also seen as important. Cost design and cost improvement are generally utilized in various forms in Japanese enterprises. However, contrary to this, the spread rate of quantitative and information management accounting is low. By and large, Japanese manufacturing corporations have not practiced quantitative models such as linear programming, the present value method, and probability.

Management physical information and non-financial information are broadly used in management control. However, they are not connected to a system of quantitative management accounting. Although the diffusion rate of the quantitative and information management accounting in US enterprises is higher than that in Japan, this management accounting system is not practiced more extensively than other management accounting systems. Therefore, it should be clear that the third stage was to some extent an academic construct, and although academic circles discussed the ideas and methods of quantitative and information management accounting enthusiastically, its implementation in the USA and Japan was rather limited.

It follows from the above that Japanese manufacturing enterprises have more often connected financial accounts and managerial actual results (payback period, profit, sales, and others) to the traditional and integrated management accounting systems than they have to the quantitative management accounting system. They enter the fourth stage having experienced the first and the second stages. This relates to those characteristics of Japanese management accounting that emphasize safety, intelligibility, and simplicity. It also shows that, after the Second World War, the tax law and the commercial code have had a stronger influence on accounting than generally accepted accounting principles, and that the enterprises have been supported sufficiently by government authorities. These conditions were good for raising cost and profit consciousness, and for developing quality improvement movement and mutual cooperation relations within the enterprise and among the affiliates. The following section will give some consideration to an analysis of management accounting in some Asian countries.

## 6.3 The present situation and the characteristics of management accounting in Asia

An investigation of Taiwanese accounting conducted by Professor Tsai (1995) suggests that business budget and inventory control spread have been the most widely used accounting techniques in Taiwanese manufacturing corporations, followed by capital budgets, cost efficiency analysis, responsibility accounting, incremental cost analysis, break-even point analysis, and productivity measurement (see Table 6.3). However, quantitative management accounting of management science and integrated management accounting (cost design or activity-based costing) are not widely practiced (Wu et al., 1997). The spread rate of traditional management accounting (budget control and standard costing) is popular in the Republic of Korea, as shown by the report in which Professors Ahn and Lee (1994) discussed the management accounting practices at many electronic machinery and machine industry corporations. The payback period method

*Table 6.3* Management accounting practices in Taiwan manufacturing firms

| *Items of management accounting* | *Manufacturing (459)* | | *Total (818)* | |
|---|---|---|---|---|
| | *No. of firms* | % | *No. of firms* | % |
| 1 Traditional costing | | | | |
| (1) Full costing | 202 | 44 | 273 | 33.4 |
| (2) Batched costing | 195 | 42.5 | 271 | 33.1 |
| (3) Direct (variable) costing | 163 | 35.5 | 228 | 27.9 |
| (4) Standard costing | 177 | 38.6 | 227 | 27.8 |
| (5) Processing costing | 193 | 42 | 213 | 26 |
| 2 Planning, control, and decision-making | | | | |
| (1) Operating budget | 278 | 82.4 | 681 | 83.3 |
| (2) Cost-effective analysis | 303 | 66 | 511 | 62.5 |
| (3) Capital budget | 312 | 68 | 495 | 60.5 |
| (4) Responsibility accounting | 241 | 52.5 | 431 | 52.7 |
| (5) Incremental cost analysis | 275 | 59.5 | 384 | 46.9 |
| (6) Cost–volume–profit analysis | 235 | 51.2 | 361 | 44.1 |
| (7) Contribution margin analysis | 218 | 47.5 | 326 | 39.9 |
| (8) Cost behaviour analysis | 206 | 44.9 | 305 | 37.3 |
| (9) Transfer pricing | 190 | 41.4 | 272 | 33.3 |
| 3 Quantitative methods | | | | |
| (1) Inventory control | 351 | 76.5 | 477 | 58.3 |
| (2) Decision tree analysis | 62 | 13.5 | 97 | 11.9 |
| (3) Network analysis | 36 | 7.8 | 63 | 7.7 |
| (4) Regression analysis | 42 | 9.2 | 60 | 7.3 |
| (5) Learning curve | 47 | 10.2 | 53 | 7 |
| (6) Linear programming | 37 | 8.1 | 49 | 6 |
| 4 Techniques under current manufacturing environment | | | | |
| (1) Productivity measures | 277 | 49.5 | 306 | 37.4 |
| (2) Analysis of the cost of quality | 114 | 24.8 | 139 | 17 |
| (3) Target costing | 80 | 17.4 | 118 | 14.4 |
| (4) Activity-based costing | 61 | 13.3 | 92 | 11.2 |
| (5) Product lifecycle costing | 14 | 3.1 | 20 | 2.4 |

*Sources*: Tsai, W. (1995), *An Investigative Study of Management Accounting Education and Practices in Taiwan*; F. H. Wu, J. Kang, C.-C. Yeh, and S.-H. Lin, Management Practices in Taiwan, in N. Baydoun, A. Nishimura, and R. Willett (eds), *Accounting in the Asia-Pacific Region* (Singapore: John Wiley & Sons), 254.

for capital budgeting and the sales profit ratio for performance evaluation of divisions are also widely operated (see Table 6.4). Surprisingly, the spread rate of target costing, or cost design, is 39.1 per cent, which is comparatively high in comparison with other Asian countries. This might be related to their investigation method being restricted to the electronic machinery and machine industry (Ahn and Lee, 1994).

*Table 6.4* Management accounting practices in Korea

| *Item* | *No. of firms* | *Ratio* (%) |
|---|---|---|
| 1 Cost management technique | | |
| (1) Standard costing | 51 | 44.3 |
| (2) Target costing or cost design | 45 | 39.1 |
| (3) Budget system | 19 | 16.5 |
| 2 Overhead allocation basis | | |
| (1) Direct labour | 43 | 43.4 |
| (2) Machine hour | 6 | 6.1 |
| (3) Material | 10 | 10.1 |
| (4) Product unit | 12 | 12.1 |
| (5) Combination | 25 | 25.3 |
| (6) Others | 3 | 3 |
| 3 Basis for pricing | | |
| (1) Variable cost | 62 | 55 |
| (2) Absorption cost | 50 | 45 |
| (3) Others | 3 | 2.6 |
| 4 Capital budgeting techniques | | |
| (1) Payback period | 34 | 31.5 |
| (2) Internal rate of return | 27 | 25 |
| (3) Net present value | 6 | 5.6 |
| (4) Accounting rate of return | 23 | 21.3 |
| (5) Subjective judgment | 16 | 14.8 |
| (6) Others | 2 | 1.9 |
| 5 Key division performance evaluation measure | | |
| (1) Return on investment | 5 | 4.9 |
| (2) Return on sales | 47 | 45.6 |
| (3) Profit | 9 | 8.7 |
| (4) Budget vs actual | 31 | 30.1 |
| (5) Value added | 8 | 7.8 |
| (6) Others | 2 | 1.9 |

*Source*: T. Ahn, Financial and Management Accounting Practice in the Public of Korea, in N. Baydoun, A. Nishimura, and R. Willett (eds), *Accounting in the Asia-Pacific Region* (Singapore: John Wiley & Sons), 224.

In Singapore, the practices of business budget, long-term planning, capital budget, and cash budget have been widely adopted. The spread rate of break-even point analysis, capital return rate, and payback period method is comparatively highly ranked. It is noted that the rate of present value method is 51 per cent. According to Ghosh's survey (Ghosh and Chan, 1997), local medium-sized enterprises adopt the same advanced methods as Japanese and multinational companies. In Hong Kong, where there has been a great deal of discussion of management accounting in the course of the 1990s, the spread rate of cash budget and capital budget is high, and, generally, performance evaluation management is exercised through the

*Table 6.5* Management accounting practices in Singapore

| *Items* | *Execution rate* (%) |
|---|---|
| 1 Operating budget | 95 |
| 2 Long-term plan | 68 |
| 3 Cash budget | 75 |
| 4 Break-even point analysis | 55 |
| 5 Standard costing | |
| (1) for management control | 16 |
| (2) for partial usage | 32 |
| 6 Return on capital | 64 |
| 7 Capital budget | 82 |
| 8 Payback period | 69 |
| 9 Present value method | 51 |

*Source*: A. MacGregor, M. Hossain, and K. Yap, Accounting in Malaysia and Singapore, in N. Baydoun, A. Nishimura, and R. Willett (eds), *Accounting in the Asia-Pacific Region* (Singapore: John Wiley & Sons), 114–17.

monthly comparison of budget and actual result. The budget control system in Hong Kong is as complicated as in the West. However, the techniques of linear programming and estimate prediction connected to probability are rarely, if ever, used (Chan et al., 1997).

In the four countries discussed above, which belong to NIEs, the use of traditional methods of management accounting (in particular budget control) is widespread. However, the quantitative and information management accounting and the integrated management accounting have only recently begun to be introduced simultaneously under the influence of Western and Japanese multinational enterprises. In other words, on the basis of management accounting at the second development stage, these nations and areas have established the phase of advanced management accounting systems. Their introduction from overseas accompanies the acceptance of direct investment and multinational enterprises from the West and Japan and development of joint ventures during the past 12 years.

In contrast to the development of management accounting in the NIEs, management accounting in some countries of ASEAN is still at the stage of 'drifting management', since there are a lot of small and medium-sized businesses and the instance of *guanxi* (personal relationship) management is overwhelming. However, multinational enterprises have been investing widely in some ASEAN countries from the 1980s to the 1990s in the same way we saw in the NIEs, and local subsidiary enterprises have adopted the traditional management accounting techniques. This is owing to the influence of their parent companies.

In Brunei, large foreign multinational enterprises draw up management accounts reports once every quarter. They also prepare annual budgets,

production budgets, cost budgets, and cash budgets, and prepare capital budgets in the case of expansion of enterprise and new investment. Standard costing and cost variance analysis are used broadly for cost management (Murshed, 1997). In Malaysia, the enterprises under the influence of American multinational enterprises vigorously practice American management accounting. In particular, capital budget is popular, and the payback period method and the present value method are adopted by a few as a method of investment decision-making. However, activity-based costing and cost design are hardly practiced (MacGregor et al., 1997).

Philippine management accounting is also influenced by the presence of American multinational enterprises. Its popular form is budget, inventory management and standard costing (Diga, 1997). In Thailand, management accounting has not developed fully, since the scale of the domestic enterprises is small, and Buddhism's influence is strong. Recently, the budget system begins to spread under the influence of multinational enterprises (Hossain and Adams, 1997). In Indonesia, the development of management accounting by multinational enterprises is observed. However, because there are a lot of small and medium-sized businesses and their management idea is conservative, management accounting is not generally advanced (Diga and Yunus, 1997).

In ASEAN countries, the amount disbursed for the research and development of advanced management accounting systems does not match the benefits to the domestic enterprises, particularly the small and medium-sized ones. Therefore, a parallel system of advanced and backward management accounting has taken shape between multinational enterprise and domestic firms in some ASEAN countries.

Finally, we should consider a problem, which has been unconsidered hitherto what management accounting system has been adopted in the former planned socialist economies? In one example, China has introduced capitalist accounts and advanced management accounting positively in its move from a planned to a market economy.

According to a questionnaire conducted by Meng and Wang (1997), Chinese management accounting is at the stage of 'drifting' management and traditional management accounting. However, it is clear that there is a difference in development stages between the large cities and the provinces: some big enterprises generally adopt traditional management accounting in the large cities, while small and medium-sized enterprises use financial accounts to manage business in the smaller towns.

In contrast to the Chinese case, Vietnamese firms had been influenced by French chart of accounts (*plan comptable*) before the Second World War, and by a type of standard accounts chart from the former Soviet Union which was introduced along with a change in the social system after the war. Thus, we find a combined system of Soviet accounting and the French chart of accounts. In recent years, however, the Vietnamese government has also

*Table 6.6* Management accounting practices in China

| *Items* | *Ratio of adoption* (%) |
|---|---|
| 1 Sales revenue analysis | over 65 |
| 2 Administrative expenses analysis | over 65 |
| 3 Accounts receivable-trade control sheet | over 65 |
| 4 Establishment of limited departmental expense | 59 |
| 5 Individual management of group expense | 68 |
| 6 Break-even point analysis | 67 |
| 7 Cost prospect | 58–68 |
| 8 Market prospect | 58–68 |
| 9 Basis of budget control | |
| (1) Target profit | 47 |
| (2) Sales | 46 |
| (3) Production | 36 |
| 10 Cash flow table | 11 |
| 11 Cost rejection method | 17 |
| 12 Activity-based costing | 7 |
| 13 Flexible budget | 7 |
| 14 Zero-base budget | 3 |
| 15 Rolling budget | 9 |
| 16 Return on investment | 10 |
| 17 Residual profit | 7 |
| 18 Economic leverage | 7 |
| 19 Profit sensibility analysis | 19 |
| 20 Linear programming | 7 |
| 21 Network chart | 14 |
| 22 Decision tree analysis | 17 |

*Source*: International Accounting Group of Nanjing University, Report on Accounting Position and Role in Decision-Making and Control, *Research of Accounting*, November 1997, 45.

encouraged joint ventures with foreign capital and has invited multinational enterprises from the West on the model of China when it started shifting to a market economy. As a result, her management accounting is now shifting from regulated uniform accounting to the US style of accounting (Aléonard, 1997). Most former socialist nations, which have introduced the market economy and entered into international markets, are currently encouraging the adoption of capitalist management accounting.

In this section, the present situation of management accounting in some Asian countries has been sketched in outline. The following points can be concluded from this sketch. It follows from examining the development of management accounting in several Asian countries, that the NIEs have followed Japanese advanced management accounting, as have some ASEAN countries. China and Vietnam are continuing to pursue NIEs' management accounting. This situation may be termed the 'wild geese flight' accounting model. It may be concluded from the above that the transfer of Japanese

management accounting to Asian nations would enhance this model, causing the Asian economy to grow continually. However, the state of Asian international finances began to be upset with the devaluation of the Thai baht, and the stable manufacturing economy which Asian countries had done their best to establish for many years has also begun to stagnate. In these circumstances the debate regarding management accounting being connected directly with the production economy has taken second place to the financial crisis.

## 6.4 The transfer of Japanese-style management accounting

If we regard American management accounting as the ideal and most advanced form, we can illustrate the accounting development of each Asian country as given by the relevant arrow in Figure 6.1, which is based on the four stages of management accounting that were discussed earlier.

It is clear from the previous section of this chapter that the development of management accounting in Asia reflected the growth of the Asian economy and was also at the same time a driver, promoting the growth of the Asian economy. Had the Asian countries not faced the currency crisis in the late 1990s, the transfer of the Japanese management accounting system to Asia would have continued to promote the physical production economy and strengthened its export orientation more positively, but we must pay

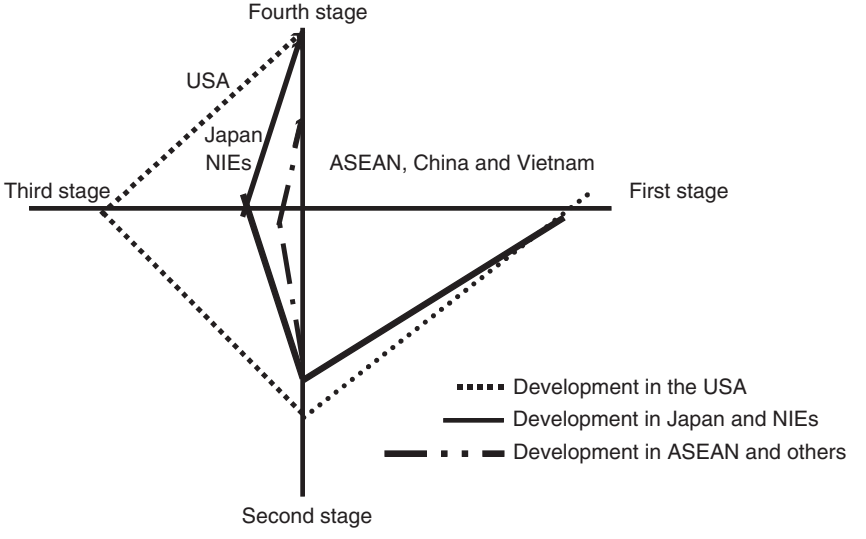



*Figure 6.1* Development of management accounting until 2000

attention to some problems which they have raised as well as did the model of 'wild geese flight'. In this sense, the depiction of the Japanese management accounting development given in the figure serves as a good example for showing Asian countries what mistakes they should avoid.

After the Second World War, the Japanese government introduced the disclosure principle from the West and established it in the accounting legal system as a replacement for the past closed type of accounting system. Business Accounting Principles in 1949, the revision of the commercial code and audit standards in the 1950s, and the establishment of the public certificated accountant system embodied the principle of disclosure. In a society organized on the basis of this principle, the person who discloses information ought to make accountability clear through the disclosure, and the one who accepts the disclosed information must simultaneously establish self-responsibility through it.

It is anticipated that in a civil society based on the disclosure principle each citizen takes his or her own responsibility as an economic unit to solve social problems before entrusting their solution to the state power and law. Many Japanese corporations who have been recently criticized as dishonest and unfair by the international community were acting contrary to the disclosure principle. It seems reasonable to conclude that the disclosure principle, although it was embodied in the legal system after the war, had not yet fully taken root in Japanese society.

As mentioned above, Japanese-style management and management accounting came to attention because of its integration of low cost and high quality, and its adoption of feed forward control and market strategy. This was a result of close cooperation between managers and workers who combined efficiency and effectiveness. Simultaneously, it brought the fruit of preventive and proactive management control that meant the advance to feed forward from feedback control. This feed forward management system depends not only on the functioning of management accounting itself, but also on the stratified and wide-ranging cooperation of managers, engineers, workers and others. Moreover, their ideas and working attitudes have been deep-rooted in the market strategy.

We should return now to the main subject: how has this new management accounting (cost design) been related to disclosure in the Japanese economy? In Japan, the establishment of individual responsibility has been weak among company, employer and employee in both the international community and the domestic society. By contrast, the rationalization of companies has gone well, thanks to widespread cooperation, profitability rose, and employees could have their share. In other words, Japan has witnessed the development of a closed society in which each corporation and individual is not active with self-responsibility in the international society. Thus Japanese society was immature in terms of coexisting equally and intelligibly with other international markets.

Though the disclosure principle was established as a regulated system after the Second World War, the Japanese method of cooperation connected to management accounting has been somewhat tarnished in recent years. Many international scandals involving disclosure have occurred and Japanese companies have been subject to considerable criticism. This may be related to the fact that the calculation rule of commercial law became more dominant than business accounting principles from the latter half of the 1960s.

It is clear from the Japanese experience that the Japanese style of integrated management accounting may play a role in making the open and equal society relatively unimportant. Where the integrated management accounting is transferred unconditionally to Asian countries in which big enterprises tie themselves more strongly and closely to national governments. Asian countries may be isolated from a world based on the disclosure principle, and as a result of the Asian currency crisis, their closed systems may be criticized by some international economic organs.

In this sense, each Asian country must recognize the close relationship between the economic units' accountability and the advanced management accounting when introducing the systems of activity-based costing and cost design. How the integrated management accounting is established in the society, in which the accountability of enterprise and its constituents takes root, is a problem awaiting solution in the international society. This is also a problem of restructuring Japanese-type management accounting. In other words, it is not good for Japanese enterprises merely to push the Japanese-style cooperation system. Japanese corporations should be aware of the importance of accountability, connect it to the advanced management accounting, and reconstruct an internationally acceptable advanced management accounting. Business management involving management accounting in the Honda Motor Company may offer an instructive blueprint for other Japanese corporations.

Another problem with regard to Asian characteristics is that Asian countries have participated in the international competition of integration of high quality and low cost by pursuing the methods of traditional management accounting (budget control and standard costing). Consequently, they must strengthen cost management and intensify labour productivity in order to guarantee quality, which is crucial to success in international markets. They have done their best to achieve a price advantage in international markets depending only on traditional management accounting and on thorough cost reduction methods, while large enterprises in the USA and Japan have used activity-based costing and cost design, or target costing to integrate low cost with high quality, and succeed in world markets. In Asian factories, cheaper labour costs have had priority over integrated management accounting.

Japanese enterprises have proactively and preventively processed works without defects under the feed forward–cooperative style of management. However, in Asian countries they are repeatedly repaired reactively by using the feedback control method (a simple method to send defective products back to the responsible section which processed them because the method is cheaper than feed forward control method). This way is supported by cheap workforces. A big difference of product superiority occurs between Japan and some Asian countries. Consequently, it is more difficult for most Asian countries than it has been for Japan to develop domestic markets because of low wage levels and the pursuit of rigid cost-reduction policies.

As mentioned above, the Asian way has focused on the development of an economic structure heavily dependent on exports. Moreover, the accumulated wealth was invested in capital goods and real estate, and the asset-inflated economy induced a financial crisis, which caused a chain reaction throughout Asia. Thus, we should clarify the characteristics of the Japanese style of management accounting in relation to the Asian economy and fully recognize the interrelationship between the disclosure system, accountability and management accounting, when we attempt to discuss the 'Japanization' of management accounting in Asia.

# 7

# Japanese Management Accounting and its Effects on the Asian-Pacific Region

## 7.1 Introduction

Most Japanese students stand at a turning point in the research on management accounting. In which direction will they set their research forward? They have learnt a lot of management accounting methods from American scholars since the Second World War. They introduced traditional management accounting (standard costing and budgetary control) from North America in the 1950s and in the 1980 and 1990s imitated field study after learning econometric and quantitative analysis which prevailed there in the 1970s (Nishimura, 1988). For the first time in the 1990s, Japanese scholars had a chance to direct their efforts into studying and introducing Japanese practices of management accounting to foreign scholars thanks to the international success of large Japanese enterprises.

However, Japanese scholars as students of the American scholars did not reach the stage of perfect confidence in management accounting research. Johnson (1992) criticized the American trends in research, which have relied heavily upon accounting information. He claimed that the relevance of management accounting was lost to real organizations not due to using improper accounting information for management, but rather as a result of improperly using accounting information for the control of business operations. Moreover, he placed a high value on Japanese management systems and target costing in terms of their responsiveness and flexibility. Kaplan and Cooper (1998), who have tried to create proper accounting information for management, also recognized the importance on Japanese management systems.

Field study in Japan has never clarified whether the successful management of large Japanese firms depended on proper accounting information system, or on the proper use of accounting information. In addition the aim of such studies was often unclear. This seems to be due to an awkward relationship between the imitative methodology and the sudden development of Japanese management accounting away from the US model. We have yet to clarify what Japanese management accounting is and what contribution, if any, it

makes to accounting science. Thus, first Japanese scholars should establish their own method of study, even if it is important to learn from the outcomes of foreign researches. The time of imitation and introduction should lapse. Second, they should not only make practical aspects of Japanese management accounting clear, but should also inquire into their effects on international and academic societies.

This chapter focuses mainly on the influences of Japanese management accounting and its fundamental features upon Asian-Pacific countries. The explanation of these features is closely related to Chapters 3 and 4. Therefore, the first section aims to examine the successful integration of low cost and high quality in Japanese management and then its development in the Asian-Pacific region. At the same time, attention is paid to different aspects of their integration in some NIEs countries (particularly Korea and Taiwan) and Southeast Asian countries. The next section will address the fundamental features of Japanese management accounting. The third section will examine the present situation of management accounting in the Asian countries. Finally, the effects of Japanese management accounting on the Asian-Pacific countries will be analysed.

## 7.2 Japanese management organization and management accounting

As a result of joint undertakings with foreign enterprises, Japanese overseas affiliates achieved good results in Asian countries in contrast to their difficult position in Europe and North America. Tables 7.1 and 7.2 indicate that

*Table 7.1* Financial results of Japanese overseas affiliated companies in the electronics and transportation machine industries

| *Area* | *Capital*[1] *(millions)* | | *Profit after*[1] *tax (thousands)* | | *Sales*[1] *(millions)* | | *Profit after*[2] *tax (thousands)* | | *Ratio of sales profit*[3] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *(E)* | *(T)* | *(E)* | *(T)* | *(E)* | *(T)* | *(E)* | *(T)* | *(E)* | *(T)* |
| North America | 10.79 | 11.09 | −437 | 368 | 43.9 | 54.9 | −40 | 33 | −1 | −7 |
| Asia | 1.92 | 2.4 | 271 | 563 | 11 | 16.63 | 141 | 235 | 35 | 48 |
| ASEAN | 1.81 | 1.36 | 192 | 401 | 7.6 | 13.86 | 106 | 294 | 31 | 43 |
| NIEs | 2.03 | 5.80 | 339 | 1217 | 16.1 | 25.65 | 167 | 210 | 33 | 64 |
| Europe | 4.62 | 10.18 | −499 | 167 | 27.8 | 22.76 | −108 | 16 | −13 | 1 |
| EC | 4.62 | 10.04 | −502 | 170 | 27.7 | 21.64 | −109 | 17 | −13 | 1 |
| Oceania | 6.78 | 6.93 | −221 | 276 | 34.3 | 30.27 | −33 | −40 | 3 | 9 |
| Total | 3.74 | 5.87 | 3.0 | 143 | 18.6 | 27.23 | −1 | 24 | 9 | 10 |

*Notes*: (E) and (T) means electronics and transportation machines companies; [1] represents 'per worker'; [2] 'per Capital', and; [3] represents business profit to 1000 yen sales.

*Source*: International Business Section of Industrial Policy Department in MITI, *Business Activities of Japanese Companies in Foreign Countries*, no. 22 (Tokyo: Ministry of Finance, 1993), 57–131.

*Table 7.2* Productivity and capital in Japanese overseas affiliated companies (money amounts in millions of yen)

| *Area* | *Electronics companies* | | *Transportation companies* | |
|---|---|---|---|---|
| | *Per capital* | *Per worker* | *Per capital* | *Per worker* |
| USA | 1.300 | 14.037 | 2.002 | 22.200 |
| Asia | 4.010 | 7.717 | 2.665 | 6.389 |
| ASEAN | 3.278 | 5.942 | 4.404 | 6.008 |
| NIEs | 5.130 | 10.404 | 1.723 | 9.985 |
| Europe | 2.223 | 10.613 | 0.441 | 4.485 |
| EC | 2.304 | 10.641 | 0.324 | 3.255 |
| Oceania | 0.584 | 3.959 | 0.101 | 0.701 |
| Total | 2.395 | 8.958 | 1.510 | 8.855 |

*Source*: International Business Section of Industrial Policy Department in MITI, *Business Activities of Japanese Companies in Foreign Countries*, no. 22 (Tokyo: Ministry of Finance, 1993), 57–131.

their financial results and productivity in electronics and transportation machine companies in Asia were in striking contrast to those recorded in the USA and Europe. Their return on investment (ROI) and productivity of capital were higher in Asia than in the West, but the companies in Asia were inferior to those in the West in terms of labour productivity and the amount of capital employed per worker. With regard to the capital stock per worker, in the Asian electronics companies it was 1.92 million yen and transportation machine companies 2.4 million yen. They were diametrically different from the respective 10.8 million yen and 11.1 million yen in North American (International Business Section of Industrial Policy Department, 1993).

In general, Japanese overseas affiliates in Asian countries were poorly equipped and labour-intensive and had low levels of productivity in comparison with their North American counterparts which were capital-intensive, well-equipped and exhibited high labour productivity. However, there were some differences in financial results and productivity between ASEAN (Thailand, Indonesia, Malaysia and Philippines) and NIEs. Although the capital equipment ratio and the productivity of capital and labour were relatively low in ASEAN, their ROI was high. The high profitability in ASEAN countries was based mainly on rapid turnover and low labour costs (Tables 7.1 and 7.2). Take the concrete instance of the automobile industry. There were four different stages of development: (1) semi-knockdown by using low-grade technology; (2) importance of completely knockdown kits (equipments) and local assembly; (3) mass production, and; (4) product improvement and development (Ishizaki, 1994). Japan has already reached the stage of self-improvement and development of new products. However, South Korea and Taiwan still remained at the third stage. Their counterparts

in ASEAN were still in the stage of importation of completely knockdown kits and local assembly. South Korea and Taiwan were above ASEAN but below Japan in the development process of automobile industry.

Generally speaking, the high ROI in Asia was caused chiefly by a high ratio of sales profit, rather than high labour productivity. This high ratio depended upon low investment and labour costs. However, the competitive power of companies in Asia could not be strengthened in the international markets where they relied only on low cost. No affiliate would succeed in enlarging its market share without integrating low cost and *high quality*. How did this integration develop in Japan? How did the Japanese overseas affiliates realize the integration in Asia?

By means of the integration of high quality and low cost, Japanese companies have succeeded in selling their products widely in international markets. This integration was supported in Japan by horizontal organization and two-way management (Nishimura, 1994). The system of horizontal organization consists of a bottom-up decision system and teamworking. It is certain that human resource management is important for the solution of operational problems. In Japan, middle and lower-level managers played an important role in anticipating and resolving problems. Their activities were proactively and preventively cooperative. For this purpose, much depended on the mutual trust between workers and managers, proper training, multi-skilled employees and a firm belief in the ability to amend wrong plans if everyone operated as a team (Nishimura, 1995). Many small groups, consisting of managers and workers, fulfilled their functions in the crossing points of decision-making and control. Two-way management was related closely to this organization. Decision-making always tied strongly with control and performance valuation. Although decision-making started from the top levels of management, these senior figures used to obtain other managers' and workers' consent in advance. They also participated in operational decision-making and had much responsibility for the control of operations. As a result a two-way relationship was established between top, and middle and lower managers, engineers and cost accountants, and managers and workers. The fundamental idea of these methods is summarized as preventive and precautionary feed forward management that permits corrective action with teamworking before errors occur. This style of management, combining with the just-in-time production system, enabled companies to organically integrate high quality with low cost. At the same time, target cost should always be realized through the cooperation of all functional departments.

Target costing consisted of two processes: *genka kikaku* (cost design) and *genka kaizen* (continuous cost improvement). At the cost design stage, the target cost of a new model was estimated on the basis of long-term profit plans and competitive market prices, taking into consideration the existing business environment. First, to satisfy the needs of customers and enhance

competitive power in international markets, the chief engineer designed the shape and structures of the new model, referring to cost information working in cooperation with cost accountants, and at the same time set the target cost based on a long-term profit target. Second, he estimated its estimated cost by analysing the target cost from the viewpoint of value engineering. In the process of cost design all departments, including subcontractors, should do their best to accomplish the target cost by improving production methods and using new materials and technology. This process was carried out through comparing the estimated cost with the target cost and allocating the target for cost reduction to every unit in the organization. At the stage of mass production, the target cost was compared with the basic (standard) cost, which was budgeted for six months ahead. Managers and workers should try to make proposals of technological and cost improvement daily in order to coincide the basic cost with the target cost (Tanaka, 1991; Nishimura, 1994).

The Toyota Motor Corporation adopted the following method to calculate target cost and the target of cost reduction:

$TP = TS \times P'$ ($TP$ = target profit; $TS$ = target sales; $P'$ = sales profit rate)
$TS = UA \times QA$ ($UA$ = selling price)
$TC = TS/QA - TP$ ($TC$ = target cost; $QA$ = selling volume estimated on the basis on the lifecycle of the new car model)
$C_{t+1} = C_t + m$ ($C_{t+1}$ = estimated cost of the new model; $C_t$ = cost of the existing competitor's car; $m$ = increased or decreased cost as a result of changes of design and function)
$G = TP - EP$ ($G$ = profit variance; $EP$ = estimated profit)
$TP = EP + G$ ($TP \geq EP$)
$EP = (UA - EC)\ QA$ ($EC$ = estimated cost; $QA$ = constant)
$TP = (UA - TC)\ QA$
$G = (TC - EC)\ QA$
$\therefore g = TC - EC$ ($g$ = target of cost reduction)

In addition, pull method production contributed to preventive feed forward cost management. According to this method, the following stage in the production process should go to its previous stage for what it needs and when it needs it. This is in definite contrast to the traditional push production method, according to which the previous stage sends processed goods to the following one, whenever the previous stage finishes the process. Accordingly, where both stages are unbalanced in productivity and the production plan is wrong, superfluous inventory and defective parts may be accumulated in the following stages. The pull method is also related to the organizational cooperation in which all managers work together with workers whenever an accident occurs in any process. This plays an important role in quality control and 'no-defect' movement (Hirano, 1990).

As mentioned previously, collective and cooperative decision and control in Japan was in contrast to the model of vertical and one-way management that is adopted in North America. In Japan there was a strong control orientation, which sought the cooperation of middle managers and workers, in contrast to the decisive role which senior management played in North America. The Japanese management system was characterized as a trapezoid type in contrast to the triangle type in North America. The former depended strongly on a collective and horizontal two-way management, which contrasted sharply with the vertical, one-way decision-making and control in North America. In effect, the above shows how feed forward management in Japan is distinguished from feedback management in North America.

The horizontal and two-way management required a two-way information system. This system was embodied in Japanese target costing. In Japanese companies cost management was strongly consumer- and market-oriented. Cost management did not only mean cost control or cost reduction, but also mainly aimed at the realization of a market strategy and long-term profit plan. Therefore, Japanese companies always attached some importance to the integration of cost reduction and quality improvement. They have established the two-way information system of cost and quality, or function (colour, size, and durability). Cost accountants and engineers worked together by using the information system and thereby strengthened the companies' competitive power in the markets. This information system worked for *genka kikaku* (cost design) and *genka kaizen* (cost improvement). The system assumed a strongly visible form, often called *kanban* in Japanese, though it was also supported by computer systems.

As mentioned above, Japanese cost structure and management had organizational and structural features. First, the strong dependence of a parent company on subcontracting factories changed fixed overheads to variable costs (expenses arising from outside manufactures). Second, the just-in-time production system made it possible to keep inventories to a minimum and to curtail storage charges. Simultaneously, thanks to decreased inventories, a company could easily put a system of variable costing into practice. Third, the two-way management of quality and cost was implemented through the two-way relationship between cost accounting and value engineering. In this case, variance was analysed as the target of cost reduction between target and estimated (basic) costs, and its causes were cleared up through value engineering and analysis. The two-way relation of costing and value analysis found out the best way to get the estimated cost closer to the target cost. This ex ante variance analysis of two planned values (estimated and target costs) is doubtless different from the traditional ex post variance analysis of standard and actual costs. Thus in Japan more importance was put on a feed forward management system based on the two-way relation than was the case in the feedback system (Morgan, 1992). This is a revolutionary shift in thought in cost management, which is completely

different from actual costing and standard costing (or ex post programming system) (Nishimura, 1994).

As a result, the two-way relation of controllability and accountability was carried out in operational management in Japanese enterprises. Accountability based on target cost increased the degree of managers' influence on cost drivers (activities). On the other hand, the charge and discharge of management accountants were strongly influenced by the controllability of target cost.

## 7.3 Management accounting in the Asian-Pacific region and Japanese management accounting

Asian countries have developed their financial accounting systems in different ways owing to colonial influences and different patterns of economic growth (Baydoun et al., 1990). However, in recent years they have quickly established advanced financial disclosure systems and measurement methods for the introduction of foreign capital and the modernization of business management. The establishment of multinational enterprises in this region has accelerated the development of these countries.

Nevertheless, management accounting in the Asian-Pacific region is still less advanced than financial accounting. Dart et al. (1990), who surveyed the accounting practices of small and medium-sized enterprises in Thailand, Singapore, and Malaysia, highlighted the underdeveloped management accounting situation. Okada (1993) also pointed out that Japanese overseas affiliates in Thailand were backward in the area of factory accounts and costing.

Table 7.3 indicates that cost management was less popular in three countries than accounting measurement and financial reporting, although there were differences in the stages of development to be found in Singapore, Malaysia and Thailand. These differences seem to have been closely related to the relative levels of economic advance and the openness of the economy. In all three countries medium-sized firms played an important role as suppliers of parts to the developing exported-oriented economy. Product costing and cost budget were the leading methods these countries used in the field of management accounting.

With regard to the effects of Japanese management accounting in the Asian-Pacific region, two types are considered. One of these is the case of local companies in Singapore, Malaysia, Thailand and other Southeast Asian countries. Such companies used only certain aspects of Japanese management accounting in close cooperation with Japanese companies. Japanese companies took the initiative in transferring management accounting into these countries in order to integrate high quality with low cost. Those local companies that had no business relation with multinational companies had no developed management systems and did not possess the fundamental

*Table 7.3* Comparison of management accounting practices between Malaysia, Singapore, and Thailand (usage rate) (percentages)

| *Items* | *Malaysia (n = 387)* | *Singapore (n = 50)* | *Thailand (n = 80)* |
|---|---|---|---|
| Budgetary control | 91.9 | 90 | 93.8 |
| Historical financial statement | 77.6 | 88 | 93.8 |
| Ratio analysis | 57.7 | 66 | 78.8 |
| Cost–volume–profit analysis | 50.8 | 64 | 53.8 |
| Actual costing | 74 | 60 | 96.3 |
| Standard costing | 49.1 | 54 | 60.1 |
| Variable costing | 37.9 | 54 | 58.8 |
| Target costing | 33.3 | 44 | 35.1 |
| ABC | 32.6 | 44 | 22.6 |
| Linear programming | 15.5 | 4 | 25.1 |
| Balanced scorecard | 15.5 | 16 | 31.3 |
| JIT | 41.5 | 16 | 42.5 |
| *Kaizen* costing | 47.3 | 6 | 47.5 |

*Note*: This questionnaire asked respondents to tick the level of importance (most, more, less, and not important). The usage ratio shows the passive attitude, the aggregation of 'most important and more important'. The three countries tend to adopt financial and budgetary control for management.

*Source*: A. Nishimura (ed.), *Comparative Study of Asian Management Accounting* (Monograph of the Project funded by the Japan Society for the Promotion of Science, 2002), 26, 42, 95, 110, 230, 244.

conditions to adopt it independently because of their undeveloped management accounting systems. This was due to the social custom in which more importance was paid to personal relations – *guanxi* in Chinese – than to written documents, or contacts. On the other hand, in Korea, Australia, and other developed countries, local companies actively introduced Japanese management accounting independently of Japanese companies. This is because they were already faced by keen competition in domestic and overseas markets and they were eager to increase the quality of their products and to reduce costs. Generally, under the direct or indirect cooperation with Japanese companies, local companies in the Asian-Pacific region partially introduced Japanese management accounting in compliance with the companies' demand for improvement of quality, inventory control, or cost reduction.

Manufacturing firms in Korea focused on cost design and total quality control on actual costing. This is completely different from Japanese management accounting, in which target costing (cost design and cost improvement) and value engineering linked up with total quality control to realize the integration of high quality and low cost. Although Korean firms attached much importance to quality control and cost design, they did not always show interest in realizing a horizontal two-way management. In its

integration of high quality and low cost, Korea seems not to have been as complete as Japan. Japanese overseas affiliates in Taiwan also used the Japanese training system and collective management to improve quality and raise productivity (Kumon, 1992). In China, the First Automobile Company adopted Toyota's management systems (continuous improvement methods) for high productivity and cost reduction. In 1993 when Changchun Gear Wheel Factory, a subsidiary of the First Automobile Company, started to implement them it raised production by 44 per cent and labour productivity by 37 per cent in the course of one year (*People's Daily*, 1994). This situation was not limited solely to Asian countries.

Although Japanese and Korean enterprises have a common feature in the popularization of traditional management accounting such as budgetary control and standard costing and the unpopularity of mathematical methods such as simulation models, regression analysis, and linear programming, the Japanese attach more importance to budgetary control, cost design, and value engineering or value analysis than the Korean, which have more interest in actual costing and total quality control than the Japanese (Ho, 1992).

Since the 1980s, some companies in Australia have been taking an increasing interest in the Japanese management system. A particular impetus behind this development was the project which the Technology Transfer Council and the Development of Industrial Technology and Commerce implemented in order to stimulate the adoption of the just-in-time production system (JIT). This programme was intended to benefit groups of manufacturers in Victoria and New South Wales. As Clarke and Mia (1993) surveyed, of 85 companies which replied to their questionnaire, 35 used JIT either wholly or partially. These companies were confronted with the severe competition problem at the market since they were equipped with a flexible, small-scale technology suitable to a broad product range. As a result they were strongly cost-conscious. On the other hand, firms which enjoyed a monopolistic share in the markets and large-scale technology were less interested in introducing JIT (Clarke and Mia, 1993).

In particular, inventory control and cash flow management were used mainly for cost reduction in Australia. Thus importance was not put on the same integration of cost and quality as in Japanese. This is the reason why Australian firms only adopted JIT partially in order to increase their competitive strength in costs in the markets. In New Zealand, Nissan New Zealand, employing 3,700 workers, was successful in introducing JIT. This company placed an emphasis on collective and human resource management in order to strengthen quality and productivity (Williams et al., 1991). Teamworking, job flexibility, and continuous quality improvement were the main principles for this management. A team was autonomously and broadly responsible for most matters relating to its area of work: quality, health and safety, skills training, cost, production process (layout,

time-keeping and others), and recruitment. The members of the group had to participate in decision-making, share information and assist each other. Employees who were organized into the teams could learn various skills in company training courses and on the job. They could increase their by acquiring new skills. Circles played an important role in the continuous reduction of overhead costs, rework, materials and the increasing customer satisfaction in the market. Therefore 'quality was assured by the process, not by after-the-fact inspection' (Williams et al., 1991).

Asian countries, as well as Australia and New Zealand, adopted Japanese management techniques on a piecemeal basis in line with their needs. This is because they had no conditions to establish the total system of JIT and target costing based on horizontal two-way management, and because they did not intend to integrate high quality with low cost. How were Japanese overseas affiliates successful in the integration of low cost and high quality in Singapore, Malaysia, and other parts of Southeast Asia?

## 7.4 The integration of high quality and low cost in Southeast Asian countries

As stated above, industrialization and its export orientation encouraged companies in Southeast Asian countries to undertake joint ventures with Japanese companies and to combine their low labour costs with Japanese management in order to improve their competitive position in international markets. Japanese companies were also eager to make inroads into Asian markets as a result of the appreciation of the yen and increasing shortages of cheap labour. How did this integration of high quality and low cost develop in Southeast Asian countries?

Japanese parent companies started not only to transfer advanced machines and equipment to Southeast Asian countries, but also to create a group of leaders who could develop quality control circles in the production process. The companies gave them practical education in quality control in Japan and adopted a policy of continual 'on the job' training' in local factories. In Thailand, education was concentrated on quality control, productivity, safety control and production control (Yamashita, 1993). However, because of different cultures in terms of promotion and employment system, the education system and the structures of ownership and management, the development of total quality control in these countries was very different from the Japanese experience. Japanese managers must take the initiative in increasing quality and reducing cost in the local factories because of the shortage of middle managers in these countries.

In the implementation of target costing, head offices in Japan were in charge of developing and designing new products and planning cost design. Local factories were only responsible for continuous cost improvement. Accordingly, target costing was divided into two stages: cost design in Japan

and cost improvement in Southeast Asian countries (Yahata and Mizuno, 1988). Therefore, Japanese managers in Asian local companies also exerted themselves for quality control. Yamashita pointed out that in Thailand Japanese managers of Japanese overseas affiliates had strong decision-making power in relation to finance management and technology while local managers were only in charge of sales, purchase, and personnel. In addition, head offices in Tokyo were in charge of research and development (Yamashita, 1993). At the stage of cost improvement, local managers and workers had considerable responsibility for increasing quality of products in the process of production.

In Japan managers, cooperating with workers, did their best to anticipate production problems. However, local managers in Southeast Asian countries must check and mend defective parts of products after deficits and failures had occurred. This method was not adopted in Japan because such mending needed many labour hours and was very costly. However, in Southeast Asian factories, the defective parts were repeatedly returned to, and repaired in, responsible units (Yahata and Mizuno, 1988). The costly behaviour of the feedback system was possible only under the condition of low labour costs and labour intensive equipment. It might be profitable for overseas affiliates to adopt this feedback system, rather than the feed forward system that they adopted in their country, since the feedback system was cheaper to implement than the feed forward system, and the costs and quality of products were able to have a competitive power in the international markets. In this case the quality of product was in a trade-off relationship to the cost in contrast to Japan where high quality and low cost were simultaneously realized by the just-in-time system.

Accordingly high quality was closely related to low wage and productivity of labour in Southeast Asian countries. As Dart's survey shows, medium-sized enterprises in Singapore, Malaysia, and Thailand worried about increasing quality under the conditions of poor employee motivation and increasing dissatisfaction with pay. The reason that this trend was particularly strong in Singapore seems to be that she introduced Japanese capital and technology on a wide scale and was very keen to strengthen her share in the international markets.

According to Dart et al. (1990), Singapore is the highest (53 per cent) of the three countries in 'poor employee motivation' (Malaysia: 24.6 per cent and Thailand: 25.4 per cent). 'High absentee' is high (42 per cent) in Thailand (Singapore: 35.3 per cent and Malaysia: 24.6 per cent). 'Lack of concern for quality' is the highest (58.8 per cent) in Singapore in comparison with 24.6 per cent in Malaysia and 26 per cent in Thailand. However, as shown in Table 7.3, at present the three countries have actively introduced advanced costing, for example target costing, ABC, or *Kaizen* costing from USA and Japan to establish a competitive and quality-oriented management

system. They are moving away from 'management based on relatives', or personal relation (*guanxi*) to a rational and modern system of management.

In Taiwan and Korea, export-oriented firms mainly focused on raising the quality of their products by introducing Japanese management systems. They felt that in pursuing this programme integration of high quality and low cost might be realized under the conditions of low labour costs. However, with the recent rapid rises in wage levels and the shortage of cheap labour it may be difficult to integrate high quality with low cost. As a result, Japanese companies may now intend to move their strategic position of production to other Asian countries – for instance, China and Vietnam.

## 7.5 Conclusion

It is certain that the popularization of JIT is related to the strength of competitiveness in the markets and the level of labour costs. Companies in Asian countries had somewhat underdeveloped traditional management accounting techniques such as budgetary control and standard costing. However, rapid economic growth and a shift to export orientation in these countries forced them to combine low cost with high quality and to introduce management systems from Japanese and US companies which gave them the support of capital and technology. In particular, the main object of quality control was to implement JIT in conditions of low labour costs. The local managers in Asian countries were only in charge of *genka kaizen* (cost improvement), which was only one part of target costing. In Australia and New Zealand, the companies abandoned traditional management and tried to adopt JIT in order to increase their competitive power. However, they did not introduce Japanese JIT as a whole, using only those parts that were appropriate to their needs. Companies in Australia aimed at cost reduction by using JIT inventory and cash flow management, and those in Nissan New Zealand also emphasized human resource management. As a result, companies in these two countries did not develop a complete target costing system.

More recently, companies in Asia have been reorganizing their management systems to adapt them to the new economic conditions of shortage labour and higher wages, and keen competition in international markets. It may be difficult for them to increase product quality at the expense of cheap labour. Therefore, they are zealous in importing the whole system of JIT and target costing. Under the strong business pressures of the appreciation of the yen or expensive labour costs, Japanese joint ventures have also been more enthusiastic in developing new models for their products and making their design in Asian countries. This will mark a new epoch in the development of Japanese management accounting in Asian countries. (See Nishimura (2003) for more information on Asian management accounting practices.)

# 8

# Implications of Target Costing and its International Application

## 8.1 Cost design and target costing in Japan

Cost design, which focuses on cost reduction at the stage of planning rather than production, has become well known as a representative type of Japanese management accounting since the 1970s, although interest in it has declined recently in the light of the Japanese economic crisis. As it has been extensively described in other articles (Nishimura, 1995, 1997, 2000a) only the fundamental aspects of cost design, which the Toyota Motor Corporation started to develop in the latter half of the 1960s and systematized in the 1970s (Tanaka, 1993), will be summarized in this section.

First, at the stages of development planning and design, various proactive and preventive measures for cost reduction and functional improvement are examined and implemented through a comparative examination of two planned costs (for example, allowable and estimated costs). Through this comparative examination, a company can set suitable targets for cost reduction and recognize the necessity of proactive and preventive cost management in each place. In other words, this accounting system not only establishes the target of cost reduction beforehand, but also brings the issue of cost reduction to managers' attention. Accounts can settle the target and its actual achievement. At the same time, a high degree of importance should be attached to proactive and preventive activities for cost reduction and quality improvement prior to production.

Second, the comparative examination of two planned costs combines closely with the development of a new product. This is because the target cost is examined from the aspect of long-term profit planning and allowable cost is compared with estimated cost based on the present situation – that is, estimated cost is accumulated through drawing on the experience an existing product that shares similarities with the new proposal. In order to determine the target cost, allowable cost must be founded on the basis of the long-term profit plan that lies on a strategy of a product development plan. On the other hand, with regard to estimated cost, costs of improvements are

accumulated on top of the original cost of an existing product through improvement processes, in which engineers and designers make it approach to a strategic new product under the present conditions. These two planned costs are based on market strategies and the development plan of a new strategic product. Thus, the target cost, as a result of comparative examination, means a target for cost reduction and cost strategy.

Third, the comparative examination of target cost and standard cost is also carried on in the production process by means of proactive and preventive cost management. The emphasis at this point of the process is on the simultaneous pursuit of the integration of low cost with high quality. Fourth, preventive and proactive cost reduction would not materialize without the integration of new production methods (such as the just-in-time system, the pull production method, multi-skilling, and so on) and visible management (*kanban* system), even if the comparative examination system existed. In addition, cooperative organizations of employees and individual initiatives, in particular their voluntary activities in pursuit of a common target, are essential for the successful implementation of these systems. Fortunately, during the 1970s and 1980s, these management systems produced compelling results in Japanese enterprises under the support of the age-limited employment system and seniority systems, and others Japanese cultural practices.

Under the integration of the new production system, visible management, and a new costing (target costing) system, and the cooperative organizations, Japanese car companies could proactively reveal and solve problems in the process of strategic product development. Therefore, target costing forms a part of the feed forward management tied to marketing strategy.[16]

Tanaka (1991) describes Toyota's cost design as follows:

> Cost design is not an engineering method to merely estimate cost, but an activity related closely to a total quality activity and a part of synthetic development activities to improve functions and quality of a product and simultaneously reduce its cost.

As mentioned above, cost design, which is a quintessential feature of Japanese cost management, includes the target costing system, which aims not only to estimate costs associated with market price and target profit, but also to carry out feed forward cost management from the viewpoint of market strategy. 'Cost design' means a Japanese style of target costing instead of target costing in general. Target costing related to cost design is a new form of feed forward management regulated by market strategies and profit planning. Under the support of the comparative examination of the two planned costs, the feed forward cost management acts to the best of its ability. At the same time, it is closely related to the new production methods and the visible management.

## 8.2 Investigations of practical cost design, or target costing in Japan

Some investigations by Japanese researchers attest to the high diffusion rate of cost design practice in Japanese enterprises. Table 8.1 gives us some representative findings. In December 1991, the Management Accounting Study Team in Kobe University sent out questionnaires involving the practices of cost design to 703 industrial companies listed on the Tokyo Stock Exchange's first section. The effective number of answers was 181, whose collection rate was 25.6 per cent (Management Accounting Study Team, 1992). According to this finding, 60.6 per cent of actual answers in the whole industry practiced cost design in various forms. Findings of examination by Sakurai, who did similar investigation in January 1988, proves that the implementation rate is about 20 per cent higher than the investigation results of Kobe University Team (Sakurai, 1991).

In the areas of general machinery, electronic machinery and transportation equipment (mainly assembly industries), the implementation rate of respondents is higher (80 per cent or more) than in the whole industry. However, it falls to 55 or 65 per cent when the content of implementation is limited to 'systematical implementation over all company'. In the main

*Table 8.1* Practices of cost design (target costing) in Japanese companies

| | *Management Accounting Study Team*[1] *at Kobe University (December 1991)* | | *Investigation by Sakurai, M.*[2] *(January 1988)* | | |
|---|---|---|---|---|---|
| | *Enforcement* | *Not doing* | *Introduction* | *Not doing* | *Not understanding* |
| Industry | 109 (60.5) | 71 (39.4) | 227 (84.1) | 35 (13) | 8 (2.9) |
| (1) Machine | 24 (82.8) | 5 (17.2) | 64 (85.4) | 10 (13.3) | 1 (1.3) |
| (2) Electronics | 23 (88.4) | 3 (11.5) | 74 (88.1) | 9 (10.7) | 1 (1.2) |
| Transport equipment | 26 (100) | 0 (0) | 43 (87.8) | 2 (4.1) | 4 (8.1) |
| Precision instruments | 3 (75) | 2 (25) | 18 (90) | 2 (10) | 0 (0) |

[1] It sent questionnaires to 703 companies listed on the Tokyo Stock Exchange's first section. 180 (25.6 per cent) answered. Enforcement includes three types: enforcing systematically all over the company, systematically only in some business places, and as a project in some business places;

*Source*: Investigation of Actual Conditions on Cost Design (1), *Business Accounting (Japan)*, vol. 44 no. 5, (1992), 88.

[2] He sent questionnaires to 575 companies in machine, electronics, transport equipment, and precision instrument industries listed on the Tokyo Stock Exchange's first and second sections. He received answers from 300 (52.4 per cent).

*Source*: *Changing Business Environment and Management Accounting, 1991* (Tokyo: Doubunkan Publishers), 280ff.

assembly industries, findings by Sakurai report almost the same high diffusion ratio as that found by the Kobe University Team. Concerning the whole industry, the finding of an investigation, which the Accounting Research Institute of College of Commerce at Nihon University made for two years from 1993, also shows almost the same result as that of the Kobe University Team (The Accounting Research Institute, 1996).

Nishizawa (1995), who sent out questionnaires to 1000 companies and received replies from 229 in 1994, confirms that among them only 34 (31.5 per cent) of 108 respondents in the manufacturing industry had put cost design in practice. Taking this fact into consideration, he surprisingly concludes that although the cost design has been hailed as be a creative management system made in Japan and to have a qualification to export to overseas, the implementation rate of 30 per cent may be thought to be insufficiently low. It is debatable how this great difference occurs among investigations. Some questions remain on this debate: first, although many findings by these investigations indicate the high popularity of cost design, is the diffusion rate of target costing as a Japanese type of management really so high? And second, how widespread in practice is cost design, or target costing, among the main assembly industries?

Concerning the implementation rate across the whole of industry, it is questionable whether the high popularity can be proved by these statistical figures given their comparatively low collection rate (about 25 per cent). This and the second question are connected closely with the following question: is it not possible that the respondents did not distinguish target cost as the Japanese type of cost target from cost target and target cost in general when answering the questionnaires? This question seems to be important for clarifying the actual situation of cost design practice, because target cost plays a very important role in carrying out cost design. This issue will be considered in depth in the next section.

As the findings of the investigation by Kobe University point out, some respondents might confuse the Japanese type of cost design with standard costing management and budgetary control management (Management Accounting Study Team, 1992). The finding of the investigation by Kobe University shows that 23 (21.7 per cent) of cost design executors in the whole industry determined target cost by comparing allowable cost (= planned selling price minus target profit) with the estimated cost (or drifting cost), and 37 companies (34.9 per cent) did it by comparing the estimated cost with the allowable cost that was calculated as a result of applying target profit rate to estimated selling price. On the other hand, five companies (4.9 per cent) directly calculated it by subtracting target profit from planned selling price, 16 companies (15.1 per cent) by using target profit rate to planned selling price, 19 companies (17.9 per cent) by applying cost reduction rate to planned selling price, and six (5.7 per cent) by simulating the methods of other similar-sized companies (Management Accounting Study Team, 1992).

In the case of this finding, if we consider only the former two methods as the Japanese type of target costing, 60 companies (56.6 per cent) in the main assembly industries executed cost design, as whose result the average implementation ratio of cost design will reduce from 88.1 per cent to 72 per cent. The findings of the investigation by Nihon University also proves that only 65 companies (47.1 per cent) adopted the comparative method of two planned costs: the former two methods (The Accounting Research Institute, 1996).

It is confirmed that there are mainly two calculation methods as to target cost: one is to compute target cost through comparing two planned costs (allowable and estimated costs) and another to directly estimate target cost on the basis of expected profit and planned selling price. Some respondents might not distinguish these methods when responding to each questionnaire. Moreover, the different year of implementation also proves this cognitive confusion. According to the findings of the investigation by Nihon University, 33 companies (31.42 per cent) of 105 respondents adopted cost design before the first halt of 1970 (The Accounting Research Institute, 1996). If we understand the Japanese type of target cost as what Japanese automobile companies developed in the1970s, about 30 per cent, which had implemented the different ones from the Japanese type, will have to be eliminated from the implementation ratio of respondents. This manipulation will clarify the actual state of implementation of Japanese target costing, although we need to allow for the fact that some companies might do a pioneering work for target costing.

Although many findings of the investigations give us some valuable information about Japanese practices of target costing, it should be concluded that the diffusion rate of the Japanese type of target costing is comparatively low across the whole of industry. Even with regard to the spread of target costing in the main assembly industries, we must also analyse it more deeply and distinguish target cost before the 1970s from that of later years. As a result, we can further recognize some special characteristics of Japanese target costing and its limitation to internationalization. Therefore, the next section will refer to conceptual differences between cost target, target cost, and the Japanese type of cost target.

## 8.3 Cost target and target cost

Concerning cost target as a goal for cost control, we find two kinds of cost target from a historical viewpoint. One is related to budgetary control, while the other concerns standard costing. Early in the 1930s, C. E. Knoeppel (1933) had already calculated cost target, or allowance for costs, from the viewpoint of the profit graph and budgetary planning. His formula was as follows:

> Allowance for costs = net sales income at budget – (surplus profits budgeted as owner's profit + provision for excess outgoing, interest, and income taxes)

At the same time, he points out:

> This calculation determines all that this hypothetical situation can afford to expend for cost of sales, which automatically standardizes outgo allowances, at least in total, if the required profits are to be made on sales that can reasonably be expected. After all, there are no more or no less than 100 cents in the sales dollars, and in this work of profit engineering, the *first* deduction is this 11.67 cents for surplus net profits.
>
> (Knoeppel, 1933)

His idea is grounded so strongly on an overall standpoint of corporate business and so strongly market-oriented as to guarantee the stability of owner's profit. Consequently, the cost target regulates the direction of cost management in the production process, considering it in terms of market conditions. In contrast to this, another cost target is related to a standard of task and job to strengthen efficiency control in workshops. Thus, in this case, the cost target is standard cost and an individual and efficient norm based on time study and motion study. We name the market-oriented target 'cost target (1)' and the efficient one 'cost target (2)'. Next, the conversion of these cost targets into target cost will be addressed.

Up to the Second World War, Japanese companies lagged well behind the Americans in management control. Foreign managers inspecting Japanese enterprises in the 1950s might have found much evidence of unskilled management. Because, unlike American managers, the Japanese lacked management ability, they could not be devoted to their duties for a long term and concern themselves with economic efficiency at work. This was a crucial defect of Japanese industrial organization in those days. In these underdeveloped circumstances, Japanese financiers and businessmen organized investigative missions to observe advanced business management systems in American companies. On 13 October 1955, one such mission, the Cost Control Team of the Japan Productivity Center, consisting of ten financial leaders, visited the Juvenile Manufacturing Company, which was located in St Antonio, Texas and manufactured children's clothes with 700 employees, to find a target cost system (Japan Productivity Center, 1957).

According to the report, the company calculated 'target cost (standard factory cost)' by subtracting budgeted general expenses (for example, transport costs, administration costs, distribution costs, discount costs and so on) and expected profit from the proposed selling price. Thus, it could fix the target cost satisfactorily enough to secure an amount of normal profit in the selling price of each product. Simultaneously, a standard of work and

performance was fixed for each individual section. Therefore, this target cost was an allowable factory cost to yield normal net income. In this case, the target cost represented a standard factory cost related to profit and efficiency management. As this system was named 'Interlocking Standard Method' in this company, the traditional standard cost as an efficiency norm was regulated from the angle of budgetary planning linked with market price and expected profit. We can find a new type of integrating 'cost target (1)' with 'cost target (2)'. This system is exactly the same as a method to calculate a target cost by 'subtracting target profit from planned selling price', which is among the findings of the investigations by Kobe University and Nihon University. Of course, we should pay attention to the fact that even 'cost target (1)' might also be included in the category of the 'target cost' in these findings.

In November 1958, the Nissan Motor Company also described a plan to start the adoption of target costing from the following year by using the formula (Nishino, 1959):

> Cost reduction target = actual cost per car − (expected selling price − target profit − administration cost)

The company had previously adopted the following calculation of target cost:

> The ratio of cost reduction = 1 − {(selling price × volume − target profit − administration costs)/total actual manufacturing cost}

These methods are similar to the content of the 'target cost' that Kobe University and Nihon University included as an item in the questionnaire: 'application of target profit rate to estimated selling price' or 'adding cost reduction rate to practically accumulated cost'. Under these methods, 'cost target (1)' also linked with cost reduction management, while 'cost target (2)', the standard cost, was regulated by budgetary and profit management. They are also closely allied to the target cost in the American Juvenile Manufacturing Company. If we place these pre-1970s target costs in the same category as the Japanese type of target cost, we will make the special characteristics of the Japanese management accounting system ambiguous. Therefore, it is important to recognize fundamental differences of category between pre-1970s target cost and the Japanese type of target cost in order to clarify the latter's new philosophy and structures.

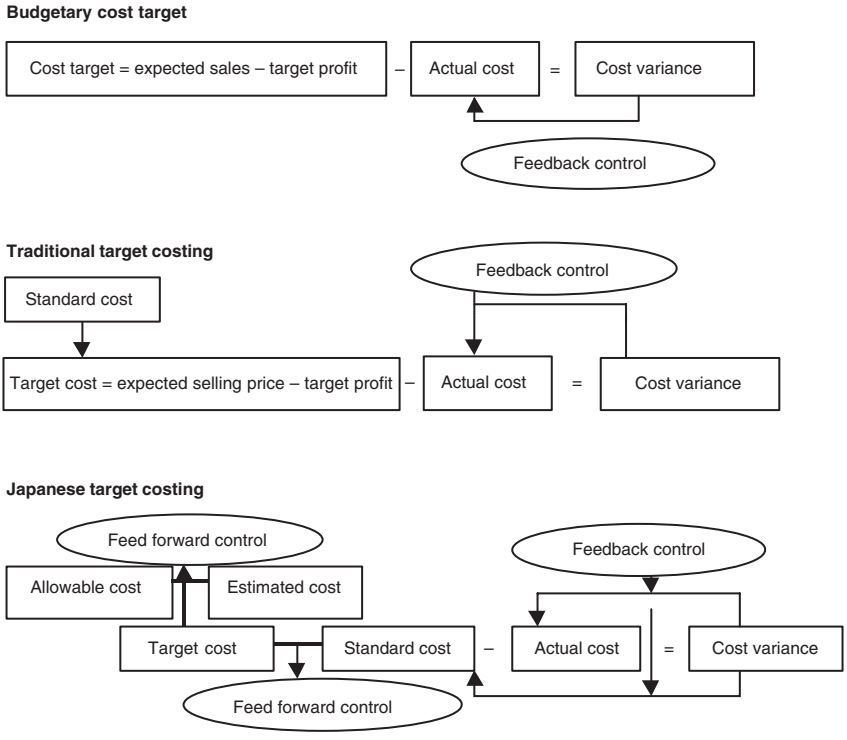
Before we proceed to the next section, it will be helpful to show a comparative table of the two types of target costing, where the target costing before the 1970s is named 'traditional target costing' (Table 8.2).

Below is a series of three diagrams illustrating the differences between the budgetary cost target, traditional target costing, and Japanese target costing.

We may go on from the above comparison of the three types to the conclusion that the traditional standard cost regulated by market-oriented

*Table 8.2* Comparison of traditional with Japanese target costing systems

| | *Japanese type of target costing* | *Traditional target costing* |
|---|---|---|
| Commonality | * Setting target cost relating to market strategy (market price)<br>* Fixing the target of cost reduction | |
| Specialty | Comparative examination of allowable cost and estimated cost, and estimated cost and standard cost: two fold comparative study of two planned costs | Variance analysis of target cost and actual cost |




profit management results in traditional target costing and that only the Japanese type of target cost is characterized as feed forward management. This is because except for the Japanese type all the three types have the common feature of market-oriented profit management and, the two remaining, are marked by the feedback management. The Japanese type emphasizes the comparison of expectation (allowable cost) and forecasts based on practical

conditions (estimated cost), and their adjustment, while the others focus only on either the expectation or the forecast. The creative development of target costing in Japan might be a result of the financial difficulties created by the oil crisis of the 1970s. In particular, the Japanese automobile companies had grown under conditions of a stratified subcontracting system and a community bound together by a common destiny: age-limited employment and seniority systems. Cooperative organizations and activity had played a beneficial part in driving up productivity and profitability. However, the crisis condition brought about by the rapid rise in oil prices imposed a serious burden on senior managers during the depression days because of the costly maintenance of these systems. While maintaining such systems, Japanese automobile companies used just-in-time (zero inventory), the *Kanban* system, the pull production method, and others to save funds and make products of high quality and low cost. This philosophy is to sense the dangers of failure beforehand and proactively settle them in collaboration with the employees. Japanese managers might recognize that these failures could not be restored and, even if possible, a large amount of money must be paid for restoration.

It seems reasonable from Table 8.2 and the diagram to conclude that the Japanese type of target costing has a strong complicity and peculiarity, since it consists of feed forward management and accounting. The next section will examine the development of target costing systems in Taiwan and China.

## 8.4 Target costing in the Taiwanese Guorui Car Company

The Guorui Car Company is the second largest company in Taiwan's motor industry, whose annual output is 77,200 cars with a capital of 32 million Taiwanese dollars. A controlling interest, 57 per cent, of its capital stock is owned and controlled by two Japanese partners: the Toyota Motor Corporation and the Hino Motor Company. The company carries out target costing in the manner shown in the following diagram (Figure 8.1) (Yang and Liao, 1999).

The company begins the stage of development design about three or four years before it wishes to commence the mass production of a new product. First at this stage, members of the design department make development and design plan of a new product after examining the trends in international car markets at the time. At the same time, the sales policy, the selling price and the sale amount of an individual product, and the various elements (exchange fluctuation, environment preservation) which will give influence target costs must be considered. In the meetings to discuss product development, the senior decision-maker authorizes the market potentiality and production profit of the new car. Continuously, once the development production of the new car was assessed and its development proposal was authorized, target profit begins to be established.

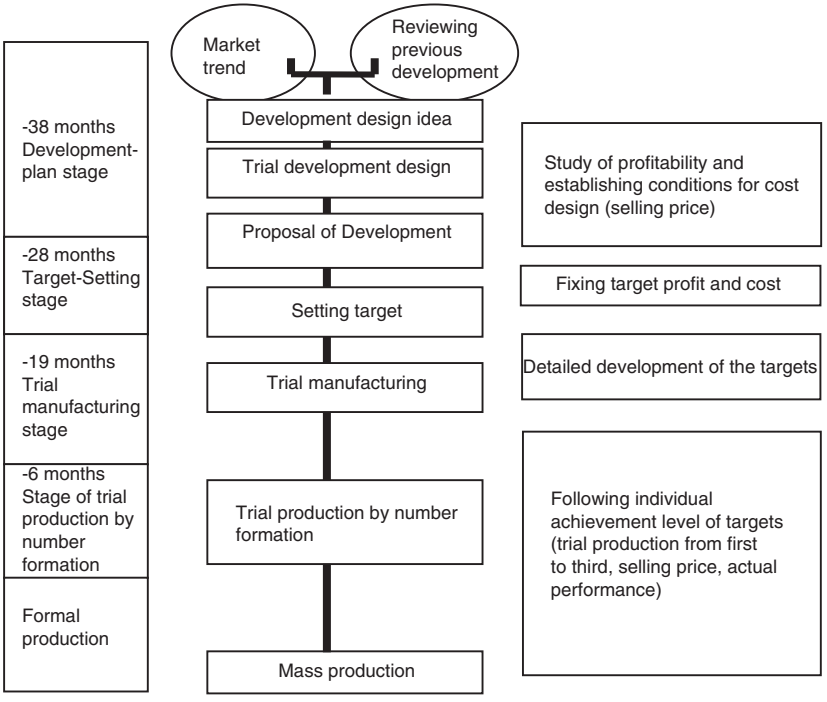



*Figure 8.1* Cost design activity in the Guorui Motor Company

*Source*: Yang, Q. X., and Liao, Y. X., Practical Problems of Target Costing and Experimental Study of Improvement Method: the Case Study of the Guorui Motor Company, *The Proceeding of 1999 Contemporary Accounting Theory and Practice Conference*, Department of Accounting, National Chunghsing University, 30 June 1999, 149–63.

The Guorui Car Company and each group under the Japanese Toyota Motor Corporation hold a meeting for management planning in Japan to make tentative consultations about target profit. After a profit necessary for dividends and bonus is taken into account on the basis of rewarding the demands of stockholders in domestic and foreign decision meetings, the company finally decides on the target profit. As soon as the target profit is established, target cost is fixed by reference to the market price for the product.

After the setting of target cost, the activity of cost design proceeds to the stages of trial manufacturing and of separate test production by number formation. The process of the trial manufacturing is undertaken in Japan. The important work at this stage is to assemble a new car according to the production procedure based on the specification of a designed product. At this assembly stage, product design can be changed, and parts and materials are not yet fixed. Considering from the experimental assembly

situations, they are furthermore adjusted and revised in connection with cost and functions, if necessary, at any time.

The separate test production by formation number is accomplished in factories in Taiwan. At this stage, each formation number is orderly assigned to some pilot manufacturing cars, and necessary functions are examined for those cars in terms of every item (waterproof, shockproof, speed, guard against twist force, and so on). The company will start the mass production of the car, if all the functions of the cars are satisfied. Cost management is carried out through budget control after the product enters into the mass production stage, and it takes aim at the achievement of the target profit by continuous cost maintenance and improvement. The budgetary management of the company is carried out as target management, in which centralized authority decides the planned profit at the development design stage and allocates it to subordinate units. Every responsibility section must always observe these targets of cost and profit.

The target cost system in the Guorui Car Company is spatially separated in Taiwan and Japan at the stages of the product development and design plan. Simultaneously, because parts or structural elements are imported from Japan and a part of the assembling processes is supported by the Japanese companies for the Taiwanese car company it is not as easy as for the Japanese to carry out the just-in-time system and total cooperative system. Therefore, target costing, and the integration of visible management and the new production system would not display their best functions without a total cooperative management system, even if their systems had excellent contents. Furthermore, they would not do much more, because the company adopts a centralized system of decision-making, and the target cost fulfills its function as a command from the top to the bottom rather than as means to voluntarily evoke preventive and proactive action for cost reduction.

It follows from the above that target costing in Taiwan is tied to product strategy, but is weak at feed forward management. Thus, it seems that the process is in a transition period from traditional target costing to the Japanese style of target costing. It cannot necessarily be the same as that which operates in Japan. If we further carry the discussion forward a step, we will have to consider a new issue: how to reform cost design from the angle of an international cooperative management. It is apparent that there is likely to be a difficulty in directly transferring Japanese target costing to other countries.

## 8.5 Target costing in the Handan Steel Company, China

Target cost in the Handan Steel Company, which is described as 'Market-Simulation Accounting and Evaluation by Cost Performance', was authorized and has been implemented across the whole country as a key process in the reform of state-owned enterprises by the Chinese government. In Chinese

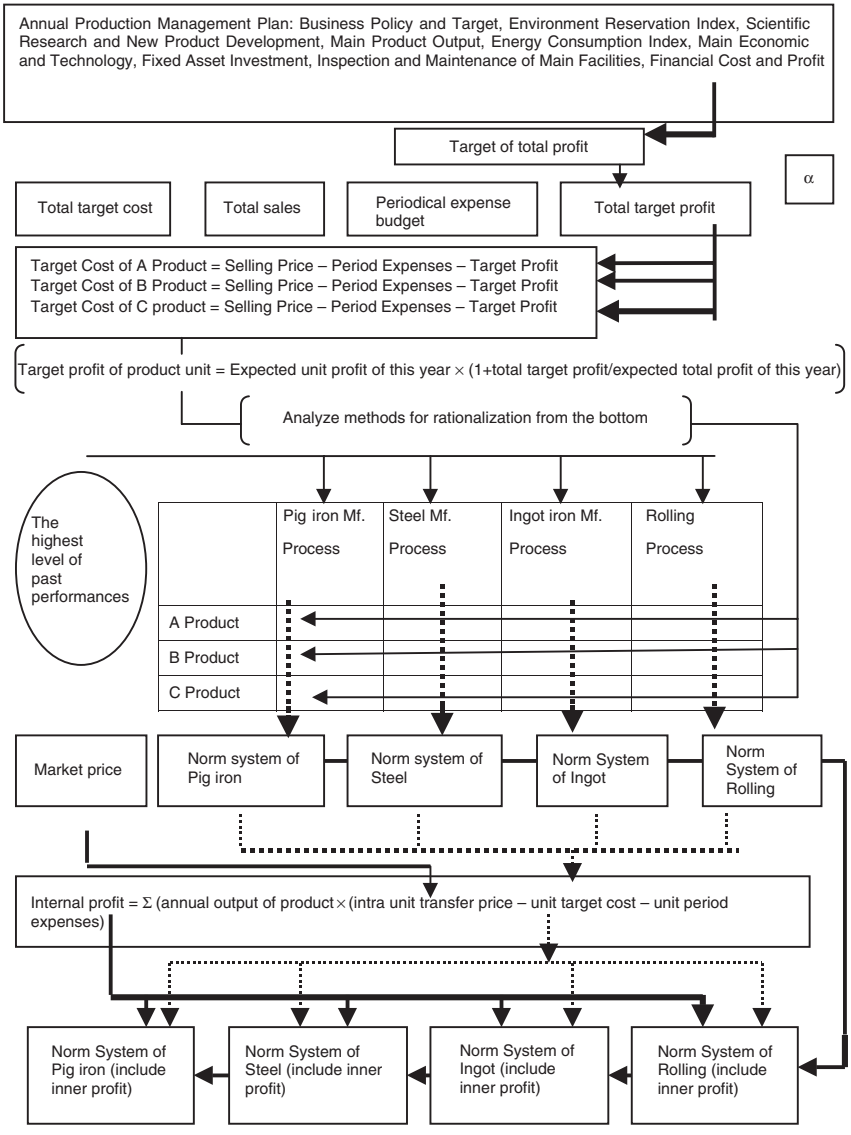



*Figure 8.2* Diagram of target costing in Handan Steel Company

*Source*: N. Nakaya, Business Management Model of Handan Iron & Steel Group, *Study of Economics* (Keizai Ronkyu, Graduate School of Economics at Kyushu University), vol. 106, March 2000, 70.

academic circles, this also has a good reputation as a combination of Chinese traditional management and the most advanced management, and is considered to be far superior to Japanese-style target costing. The model of target costing was introduced in this factory in 1991, and, following its successful implementation, the National Economy Trade Committee and the Ministry of Metallurgical Industry adopted it. After that time, it was suggested that this model should be introduced in the state-owned enterprises in each province (Nakaya, 2000).

The Handan Steel Company, located at Handan City in Hebei Province, China, was founded in 1958. It is a state-owned company and is one of 12 big iron and steel integrated complexes. It had 27,879 employees in 1992, including 2,230 managers and 2,274 engineers and technicians.

In the target costing process in the Handan Steel Company, first, the annual production management plan is determined at the head office of a company which has many branch factories. In this case, the office collects and analyses a wide range of information on domestic and foreign market situations and the internal position of the company. This company information includes data on the production facilities and production capacities, stocks of various materials, half-finished goods, and finished products, the development of a new model for product, the adoption of new materials, the investment plan of fixed assets, and the long-term development plan. Technical and economic norms and engineering ones for the new accounting period are settled on the basis of the highest of past performances in the company, and its most advanced level in the iron and steel industry. Moreover, situations such as not doing worse than the performance in the previous period and keeping the company's balance, in particular the balanced capacity of production, are also considered.

At the second stage, target cost is calculated by subtracting total target profits and period expenses from the total expected sales which are calculated with reference to output, the anticipated rate of sale of the product, and the expected selling price. The target profit is regulated by the financial, cost, and profit plan included in the annual production plan. The target cost is examined in terms of product and production process. With regard to the target cost and the target profit of each manufacturing process, the calculation starts from the finished product closest to the market. In this case, technical and economical norms are established relying on the historically highest level of performance in each process and a comparison of costs with other companies of the same size and with the same facilities. The method to calculate backward from the downstream to the upper stream is adopted so that the final product will be competitive in the domestic and international markets. Therefore, the intra-company transfer price is regulated by competitive market price.

The target cost in each branch factory, which is finally determined by the company head office, becomes one item for which the company makes a

contract with the branch factory. This is one of a number of traditional contract items in China: quantity of production, quality, variety, consumption, cost, internal profit, and stability. However, the present contract system differs from the previous one. At present, the achievement of cost target plays an important role in the evaluation of performance and the performance of each factory and section. The performance would not be highly evaluated without its complete achievement, even if other items were sufficiently realized. On the other hand, the evaluation of performance in the past depended upon the achievement of every item. Under the present system, approval or rejection of bonus to each unit or person is strongly related to the achievement level of target cost. This system is referred to as 'market-simulation costing, and approval or rejection of bonus by cost', since target cost is calculated by simulating the market price and target cost is the most important norm for judging the propriety of bonus.

In sum, the target costing system in China focuses on the calculation and distribution of cost reduction targets and the combination of the achievement of target cost with economic incentives. This suggests a model that is closer to the cost target (1) than the Japanese target cost, because it does not combine with the development of a new model for product and it is comparatively poor at feed forward control. In the Chinese system cost target is decided at the level of the company and is given as a command from the upper units to the lower units. Little importance is attached to preventive and proactive cost management through the cooperative organization of employees. The reason why target costing in China takes different forms from that of Japan is that price is stable and there is little room for the development of a new model for products in the Chinese iron and steel industry. Moreover, in Chinese society, stimulating employees' productivity through cost targeting and economic rewards may be more important than to make a proactive cost management by depending upon the voluntary cooperation of workers. In this sense, Chinese target costing is a market-oriented cost control, but it is weak at feed forward management. Therefore, doubts remain as to whether or not the target costing system adopted in the Handan Steel Company can be applied successfully to assembly manufacturing factories.

## 8.6 Conclusion

Although many Japanese accounting scholars have said a great deal about target costing as a creative production made by Japanese companies, nobody has ever distinguished it from budgetary cost management and traditional target costing and clarified its special characteristics and structures. Some bodies have mistaken cost target and the traditional target cost for a Japanese-style system of target cost. Some scholars have suggested that target costing in China is superior to that in Japan. Target costing in Taiwan seems to follow the same system as that to be observed in China.

It follows, from what has been analysed, that in the Japanese type of target costing, feed forward control is integrated with product development strategy, and the comparative examination of two planned costs (allowable and practically estimated ones) embodies feed forward control in terms of accounting. At the same time the systems of feed forward control and accounting are supported by cooperative organization and voluntary working attitudes. As a result, they can fulfill its unique function of preventive and proactive cost management and quality control in Japanese business management. However, we should accept that the Japanese target costing has great complexity and varieties in natures.

We should also recognize that Japanese target costing is too complicated and too specific to the peculiarities of Japanese society to be readily applied to foreign countries. However, today, business enterprises around the world are faced by complex and severely competitive markets which are subject to sudden changes. The consequences of managerial mistakes are increasingly far-reaching. Feedback control would not fulfill its function in business management. Even when it is possible to return to the status quo, doing so is extremely costly. Today, when we are confronted by such issues, we should pay attention to the feed forward management system that Japanese companies have created and developed, and consider its further development.

# 9
# Integrated Management Accounting and the Analysis of Cost Reduction

## 9.1 Introduction

This chapter considers several issues which management accounting needs to address and makes a proposal for integrated management costing which metamorphoses activity-based costing and cost design in combination with contribution margin statement. At the same time, a method for cost reduction analysis is discussed. To begin with, however, we examine the advantages and disadvantages of activity-based costing (ABC) and cost design (target costing), which are popularly discussed today. This chapter also considers the evolutionary process of management accounting to clarify how it has developed from its traditional roots. Furthermore, the chapter explains in detail an integrated cost accounting system, in which cost design and ABC are connected with contribution margin, as well as the implication and accounts procedure of cost reduction analysis, which contributes to the recognition and control of strategy in organizations.

## 9.2 Fundamental problems in recent management accounting

### Changing ideas of strategic management

In recent years, business strategy tends to be discussed in connection with empowering employees, yet the powers and responsibilities of higher managers still play an important role in strategic decision-making.[17] Therefore, discussion has shifted from how higher managers make decisions about corporate strategies to how they take roots of corporate strategies in organizations and draw them out from organizations. The Honda Motor Company in Japan has focused for some considerable time on the principle of equality in its organizations and made daily proposals based on technology and management improvement by workers.

Honda has enforced Total Quality Management since 1992 in order to revolutionize its old stereotyped management style. Even before this time,

the 'Now Next New Honda Circle' and the Voluntary Involvement Program had been adopted in its North American factory. In the former scheme, one group consists of four or five persons, who usually cooperate and make proposals to improve issues such as working conditions, quality and safety. The targets, conditions, solution methods, and countermeasures for their realization are examined. The latter is the personnel merit system used to reward groups for participation in all kinds of company activities (Shook, 1988). These systems play an important role in carrying out Honda's feed forward control system, which here generally means the adoption of various proactive and preventive methods and procedures before actual performance in order to realize targets, in contrast to reactive and reflective activities of feedback control. We should further pay attention to their close relationship to the corporate philosophy, which is based on equality, personal respect, democracy, and promotion of personal ideas.

Honda's culture fulfills its function as a catalyst to connect the top-down system with the bottom-up system and to develop the stratified feed forward control system. Honda lays stress on a democratic atmosphere in its workplaces, promoting principle of equality, and encouraging workers' ideas. Each employee has a large degree of freedom to propose technological and managerial improvements, chances for promotion, and grievance disposition than in other Japanese companies. For example, employment of relatives of higher managers is prohibited at any level. Employees enjoy free and equal atmosphere in implementing strategy, which contrasts remarkably with rigid and scientific decision making of strategy.

At the same time, there may generally be some customs in Japanese business society that make it easy to empower employees. For example, managers wear the same uniform as other workers and take lunch in the same canteen. This is likely to reduce the gap between both parties, which in many countries is very significant, possibly resulting in inefficiency and a loss of trust between them. Members of the team are both collectively and individually responsible for the outcome of that team's efforts (Nishimura, 1994). The promotion of freedom and equality in workplaces is surely advantageous to fixing strategy in the lower parts of an organization and absorbing proposals for improvement from employees at all levels of the organization. Spontaneous proposal systems related to improvement activities in the lower parts of the organization have contributed to the process that higher managers make decision of strategy in Japanese business society, although the decision-making powers for strategy have mainly been laid in the hands of founders of a company.

At present, the most important problem for large international companies is to study how to integrate a scientific strategic decision by high-level managers with the formation of strategic ideas in the lower parts of an organization. In Japanese companies, to establish such a system at the level of upper managers is still a most urgent matter. In the West, it is highly

necessary to establish interactive organizations for spontaneous formation of strategic ideas at the bottom of organizations.

With regard to the empowerment of employees, theoretically, Mintzberg (1994) pays attention to a *formation* process of strategy, rather than one of *formulation*. In this formation process, big strategies grow from little ideas in the place that is not expected, at unexpected times, and makes the concept of 'emergent strategy' clear. Mintzberg states:

> Indeed, in the case of emergent strategy, the term of form*ul*ation has to be replaced by *formation* because here strategies can form without being formulated. . . . But in the case of emergent strategy, because big strategies can grow from little ideas (initiations), and in strange places, not to mention at unexpected times, almost anyone in the organization can prove to be a strategist. All he or she needs is a good idea and the freedom and resources required to pursue it.

Moreover, Simons (1995) develops the emergency strategy to address the importance of empowering employees under increasingly competitive and rapidly-changing markets. He advocates four control levers by which managers can integrate strategies with operational control and avert some dangerous situations from causing the ceding of decision-making powers to subordinates. In the current world, business success depends not only on the strategic talents of upper managers, but is also powerfully dependent on diffusing strategies throughout the whole organization, and organizing strategic buds to be born from lower managers and workers who are in close contact with customers. Concerning empowering employees, Simons (1995) explains thus:

> As markets have become increasingly competitive and fast moving, managers have realized they must push decision making down to employees who are in close contact with customers. Empowering employees – moving decision-making authority from higher to lower levels in the organization – is a necessary condition for building responsive organizations. At the same time, however, the ceding of decision authority to subordinates can be dangerous.

Today, it is crucial for companies to establish a flexible and interactive management system to enable them to adapt themselves to highly competitive and changeable economic environments. Under these circumstances, 'balance' or 'integration' is a well-known term for combining corporate strategies with operational management. According to Kaplan and Norton, balanced scorecard sets its sight on measuring organizational performance according to four different perspectives: financial, customers, internal business processes, and learning and growth. To keep their balance is very

important. As a result, managers are provided with the instrumentation to navigate to future competitive success. What they want to emphasize is 'translating strategy to action' (Kaplan and Cooper, 1998). In an examination of Honda's integrated production and management systems, Clark and Fujimoto (1995) advocate the necessity of 'product integrity' to win intense international competition, rapid technological advances, and sophisticated, demanding customers.

## 9.3 Concerns of today's management accounting

It is clear from the above analysis that management accounting must also contribute to the fusion of strategic decision-making and operational management under the above-stated conditions. In 1993, the Japan Accounting Association established a special committee on integrated cost management in order to establish a comprehensive value-chain approach to strategic cost management for products, software, and services (Sakurai, 1996). However, this integrated cost management has a global implication, in connection with which we find back flush costing or lifecycle costing as a recent new idea of managerial costing, except for cost design, target costing, and activity-based costing which we will discuss below. Back flush costing is a costing system which focuses first on throughput of an organization and then works backward at allocating costs between cost of goods sold and inventory. This is almost the same idea as just-in-time (JIT) which pursues zero inventory and simplifies not only the process of costing, but also the allocation procedure of fixed overhead by eliminating work in process inventory account (Foster and Horngren, 1997; Berliner and Brimson, 1988).

Lifecycle costing also relates to the development of product and market strategy. It aims to accumulate costs for activities that occur across the entire lifecycle of a product, from inception to abandonment by manufacturers and customers (Berliner and Brimson, 1988). This costing clarifies an important role of the calculation of development and design costs in the process of a product's lifecycle. However, these two costing systems cannot offer a complete response to today's business management strategic concerns, although they have partly contributed to the improvement of management accounting. Activity-based costing and cost design, or target costing, may be more complete systems in comparison with the lifecycle and the back-flush costing systems whose validity for strategic organizational and overheads cost managements has been tackled only by a few researches (Bromwich and Bhimani, 1996).

With the exception of the strategy problem, we should moreover pay attention to another issue that is peculiar to cost accounting when we clarify the characteristics of today's management accounting: strategic and integrated management accounting. This is the problem of fixed overhead cost management, which has presented considerable difficulties since the

beginning of the twentieth century. In the days of mass production, fixed properties could act to the best of their functions in terms of reducing product costs in proportion to the increase in output. However, expanded fixed facilities and costs have been burdensome to cost accounting, since the functional difficulty of the principle of mass production began to be clear particularly after the end of the First World War. As huge fixed facilities began to be contradictory to internationally shrinking markets and to be laid under the unused situation, managers should be faced with how to recover fixed costs and how to allocate them to products. Therefore, this situation has urged accountants to study the measurement and allocation of fixed overheads in connection with the recognition of accurate cost and corporate price policies.

At the beginning of the twentieth century, two influential theories on the allocation of overhead costs appeared on the stage of management accounting in Germany and North America. In the early days of this century, E. Schmalenbach (1908/09) developed the concept of marginal cost (business value) and analysed the relationship between cost and price policy to lead to an optimum operation level. According to his theory, total cost was first divided into four cost categories (proportional, fixed, 'degressive', and progressive costs) in relation to the rate of capacity utilization, then the 'degressive' and the progressive costs were split into proportional and fixed costs, and finally a price was calculated on the proportional cost, a price which induced capacity utilization to the optimum. This is because this method raises a low price at the time of depression, or at the time business is situated in the area of 'degressive' cost, and pump in demand, while it raises the high price at the prosperous time, or at the time business is situated in the area of progressive cost, and restrains demand.

At the same time, in North America, Church (1910) developed the 'scientific machine rate method' to realize a stable price and improve efficiency in the production process. He concretely recognized idle cost and waste through the analysis of cost variance. Thereafter, in North America, standard costing has spread itself in order to protect prices from distortions caused by fixed costs and to stabilize prices in the long term (Harrison, 1918). This cost accounting system, based on the scientific management method, could also recognize idle capacity cost and waste through cost variance analysis and was useful for efficiency management. In the 1930s, direct costing, which focused on the direct relation between output and contribution margin, was also implemented in making a short-term plan for production.

In this case, after total cost was split between fixed costs and variable costs, the contribution margin was calculated as a result of deducting variable costs from a selling price, and the fixed cost was dealt with as period expense without allocation to products. This system of costing would solve the problem of fixed costs by avoiding the need to allocate precisely (Harris, 1936). Generally, in Germany the problem of fixed costs was discussed in

relation to price policy, while in North America, it was dealt with as a management problem. Anyway, the problem of fixed overheads has stimulated the progress of costing methods and theories.

Fixed cost is still an unsolved fatal problem in cost accounting. Management accounting has not only had as a birthmark with the recognition and allocation of fixed costs, but also, presently, should grapple with the problem of integrating strategy with operational management. Strategic management is a special problem to be solved by today's management accounting, while the problem of the allocation of fixed overheads has been a troublesome matter common to all costing systems since the birth of management accounting. All management accounting experts and students should tackle these two problems in order to create and develop a new management accounting system.

## 9.4 New paradigm and management accounting

In response to this concern, in the latter half of the 1980s Kaplan developed activity-based costing by using a field-study method. This move gave a considerable impetus to management accounting research and practice, as did the remarkable success of Japanese enterprises in the world economy. Companies such as Sony, Toshiba and Honda produced many kinds of products at low cost and high quality. Acting in concert with the government, they introduced advanced management accounting systems from the West after the Second World War, and in the 1970s, devised a new production method and management system. Japanese-type management, the JIT, depended on a completely different production method and management principle from the traditional Western one. This Japanese heroic deed might have affected Western accounting researchers and accountants. Table 9.1 shows the difference between the traditional and the latest paradigms, which might have developed under the influence of Japanese management.

Hall et al. (1991) compared the new paradigm of production method with the old: small lot, high variety, zero inventory, right first time, continuous flow slow, fast set up, low overhead cost, and short lead time versus mass production, homogeneous output, buffers, rework, discontinuous, changeovers, high overhead cost, and long lead time. Although new paradigms are pointed out in Japanese type production system, the integration of visible management and pull method, which is closely connected with standardized production, one by one production on an assembly line system, and voluntary continuous improvement, characterizes the new paradigm of Japanese type production. At the same time, the new paradigm of management system should be recognized in relation to Japanese type production (see Table 9.1).

The JIT production system essentially consists of two subsystems: visible management and a new production system. Visible management, often

*Table 9.1* Comparison of the paradigms of the old and new management systems

| *Old paradigm* | *New paradigm* |
|---|---|
| Specialization | Multi-skilling |
| Individual responsibility | Collective responsibility |
| Division of labour | Cooperation |
| One-way information | Two-way information |
| Vertical organization | Horizontal organization |
| Reactive management | Proactive management |
| Feedback control | Feed forward control |
| Financial goal | Stable management. |
| Economic order quantity | Total quality control |

called the *Kanban* system in Japanese, relies partly on old Japanese culture (for example, *miseshime*, the putting of an individual or group's failure on public display, and *andon*, a paper-covered light in the old days), and partly on advanced electronic data processing and communication systems. To implement the principle effectively at the workshops of a motor company, the *kanban* system is combined with computer-aided management systems and their essential joint function is to discover and remedy problems quickly and in advance (Nishimura, 1997).

The new production system consists of a strategy of small lots, zero inventory, multi-skilling, short lead times, and a suitable arrangement of machines and a horizontal relationship between managers and workers (Hirano, 1990). The production system must be sufficiently flexible to solve the problems discovered in the process of visible management. In particular, the new 'pull production' method has contributed to the prevention of excess inventories and defects. Under this method, each stage of the production process should respond only to explicit demand from a subsequent stage and should be able to rely on the immediately preceding stage of production for its input requirements. This contrasts with the traditional 'push production' method, in which the previous stage of a process results in output regardless of demand from its subsequent stage; often leading to superfluous inventories and the accumulation of defective parts. Under the new paradigm, quality is not necessarily traded off against cost (Daniel and Reitsperger, 1991).

The Japanese style of production and management system is distinguished by the integration of market strategy and a feed forward control based on the cooperative organization. Pull production method, multi-skilling, collective responsibility, and teamwork, joining hands with the two-way communication and the horizontal organization, have supported feed forward control which corresponds to the market strategy and makes the integration of high quality, low cost, and timely delivery possible. Such

a management system is a method in which various traditional management systems are integrated and reorganized under a cooperative organization from the viewpoint of market strategy and feed forward control. Therefore, as it typically results in zero inventory and spoilage, it has conspicuous characteristics of the proactive and preventive management which aims to adopt the most suitable method and procedure beforehand in order to bring a real result close to an expected value.

However, today this method has exposed its weaknesses at the time of unstable markets, which is particularly shown as the weak ability of high executives' strategic decision-making, although it displayed its strength in comparatively stable markets and under steady decision-making of strategy. For instance, if the forecast of sales is vague, the 'pull production' method will find it difficult to fulfill its function in the JIT system. Japanese managers are confronted with the problem of reorganizing not subjective but scientific systems of strategic decision-making. Incidentally, the JIT process is strongly dependent on the business environment: subcontracting, transportation, and delivery system. Under recent traffic congestion in big cities, it can hardly fulfill its function in Japan.

Apart from the present problem of Japanese management, in the 1980s, Japanese management systems, going hand and hand with Kaplan's proposal to establish new management accounting systems,[18] offered great stimulation for accounting researchers and practitioners. As a result, we were able to reap some fruits such as activity-based costing (ABC) and cost design, which will be examined in the next section.

## 9.5 Activity-based costing

Activity-based costing (ABC) offers useful information for strategic decision-makers through its accurate measurement of costs. Thus, activity is its fundamental concept. Because activities involve the consumption of resources, the cost of product, or process, is calculated by cost drivers related to them. As a result, ABC not only clarifies the relation between activities and costs in each production process, strengthening those with high value added and restraining those with low value added, but it also enables managers to adopt the strategic price policy, according to which product based on high-value activities is costly and product based on low-value activities is cheap. Moreover, it seems to have solved the allocation of fixed overheads, since the stationing of various activities in a process makes the transformation of fixed overheads to direct cost possible. Differentiating its method from the traditional allocation of fixed overheads by output, Kaplan and Cooper (1998) outline the characteristics of ABC as follows:

> Activity-based systems differ from the traditional cost systems by estimating the costs of all resources, both flexible and committed, used by

> activities and products. ABC system recognizes that almost all organizational costs (other than those of flexible resources) are not variable in the short run just because demand fluctuates. Rather, committed costs become variable costs over longer time periods via a two-step procedure.

At the same time, they emphasize the function of ABC as the provider of an economic map of the organization's expense and profitability:

> An activity-based cost system provides companies with an economic map of their operations by revealing the existing and forecasted cost of activities and business processes, which, in turn, leads to knowledge of the cost and profitability of individual products, services, customers, and operating units.

In this way, ABC seems to have solved the fixed overhead problem, and to have connected costing with strategic management. It is likely that the analysis of activities plays a part in displaying the cost finding and the profitability of an organization with diversified and complicated production processes. However, ABC cannot solve all the problems related to strategy as well as the allocation problem of fixed overheads.

The general concept of activity is extremely abstract and vague, because it is not clear whether it represents human action, or physical movement, or both. Because various and complicated activities exist in society, there should be many and various standards to measure activities and allocate their costs to products. However, even if activity can be minutely subdivided, an entirely accurate transformation of fixed overheads into direct costs will be impossible, so long as common costs that cannot be allocated to specific activities exist in an enterprise. Bromwich and Bhimani (1996) duly appreciate the significance and limitations of ABC: 'Such general problems of overhead allocation cannot easily be resolved through a change of cost system. Joint costs cannot be dealt with by ABC, nor can be the fixed costs associated with activities.'

What is more serious is that if activity is subdivided further, in an attempt to achieve proportionality of cost to activity and to secure the accurate measurement of product cost, the number of activities will increase more and the allocation measure will become more complicated. Cooper (1997) classifies activities according to four categories: unit-level, batch-level, product-level, and facility-level activities. Simultaneously, he accepts that the cost of facility-level activity is treated as period cost or allocated to products in some arbitrary manner. As the accuracy of the calculation increases, the complexity of calculation and its costs will grow burdensome and become high. The questionnaire by the Cost Management Group of the Institute of Management Accountants (IMA) (1998) points out the difficulty with which small and medium-sized firms adopt it because of their meagre resources

and their lack of qualified personnel. Therefore, many small and medium-sized companies may reduce the number of activities or cost drivers to reduce the cost of calculation. At a result, the allocation of fixed overheads may be more arbitrary, so that the accuracy of measurement of product cost may be lessened.

Advocates of ABC get practically stuck into the same hole as they have criticized as a defect of traditional costing: the imperfect allocation of fixed costs. In ABC, the measurement of accurate cost and the cost of calculation continue to play the seesaw game: the more fixed overhead is precisely allocated to products on the basis of activity, the more expensive is the calculation cost. The level at which managers can tolerate the cost accuracy depends on the cost-benefit of calculation. This cost–benefit base is especially significant in ABC, because its key concept of activity closely relates to it. Research by the Cost Management Group of IMA makes it evident that the perfection of ABC depends on the size of the company that can invest funds and staffs to establish the calculation system. Actually, the questionnaire by the Cost Management Group also shows that about half of the respondents use ABC for decision-making *outside the accounting function* (Krumwiede, 1998). According to the findings of the investigation implemented before that before, most of the enterprises which practiced ABC did not improve profitability, but the half of them expected its future improvement (Roberts and Silvester, 1996). Probably the result seems to have not been as good as they had expected, as the above research by IMA made it clear.

With regard to the successful implementation of ABC, Krumwiede (1998) concludes from the results of the questionnaire that ABC can be more difficult to implement than earlier articles had suggested, and not all organizations have achieved the success they had hoped for. Simons (1995) also points out that ABC as a method of effective management is not suitable for the interactive control system by reason of 'elaborate cost accounting system' or 'complex system'. The method of cost allocation based on activity has existed since long ago in Japan and the UK. Morrow (1992), distinguishing between this method and ABC, pointed out that activity-based *costing* might be out of the question and not be recognized as 'an objective'. An activity-based *approach* might take its place and be multilaterally applied as a generally accepted method which can provide meaningful information. Brimson (1998) also referred to ABC: Although ABC has been transformed into the method with which managers is easy to control product cost, its present form may not become a main stream of cost system in many companies. This reason is that ABC is too complicated to collect accounting data in compliance with continuous activity information.

We should consider an effective usage of ABC with reference to its advantages and disadvantages.

## 9.6 Cost design, or target costing

In contrast to ABC, the cost design which Japanese motor companies created and developed in the 1970s places a particular emphasis upon market strategy, although the traditional allocation of overheads remains in cost accounting. At the design and development stage of a new product model, the investment and collection of fixed capitals are studied from the viewpoint of the product lifecycle. What is most important in cost design is to develop and produce the strategic products that reveal market potentials in international markets. For this purpose, companies should try to attain competitive advantage through the integration of low cost, high quality, and timely delivery. Cooperative organization also fulfills its function at the stages of cost design and cost improvement in Japanese companies.

The cost design, or the target costing, is a representative expression of JIT in the realm of management accounting, which aims to develop a new product model using the cooperation of designers, engineers, and cost accountants. Feed forward control based on market strategy is also a characteristic of this cost design, since, from the angle of the integration of low cost, highly quality, and timely delivery, it adopts suitable methods and procedures in advance to avert defects, spoilage, and excessive inventory. Thus, the cost design has opened up a possible road towards a new model of management accounting, although the problem of cost allocation remains unsettled. It focuses more strongly on the proactive and preventive management than the allocation of fixed overheads.

Cost design, or target costing, is typical of Japanese management accounting and is closely related to the process of JIT. Cost design plays an important role in JIT. The interaction between cost accountants and engineers, the relationship between feedback and feed forward, and the process cost reduction at the design stage are unique features of JIT. As stated above, the JIT system essentially consists of visible management and a new production method. The fundamental function of visible management is to discover and remedy problems quickly. The new production methods consist of small lot, multi-skilling, short lead times, pull production method, and the optimum arrangement of machines under a horizontal cooperative relationship in order to realize zero inventory and no defective work, as shown in Table 9.1. They must be designed to solve the problems discovered in the process of visible management.

In the implementation of JIT, Japanese management exhibits a strong control orientation, which seeks collective, cooperative and interactive management. This stands in contrast to the decisive role played by senior management in North America (for example, total quality control versus economic optimum order). The benefit of human resource management in the solution of problems is explicitly recognized in the Japanese model. In particular, Japanese middle and lower-level managers play an important

proactive role in anticipating and solving problems before they become damaging. In this system, much depends upon the mutual trust between managers and workers, proper training, multi-skilled employees and a firm belief in the ability to amend inappropriate plans if every one unites to control the operating management process. For this purpose, middle managers come down to the workshop, wear the same uniform as other workers, take lunch in the same canteen with them, and hold sports meeting or go picnicking with them (Simons, 1995).

Management of target costing consists of four stages: long-term profit planning, the development and design of a new product model, the determination of cost reduction targets, and cost improvement. First, top-level executives make a long-term profit plan from the viewpoint of market strategy. Second, the *shukan* (chief manager) starts analysing problems about the development and production of the company's existing cars and compares their commercial values (specification, performance, cost and value engineering) with those of cars in other companies. Top management determines the basic policy of cost design and the framework of target cost. Third, in the establishment of target cost, the target cost takes a definite form of *daiatari* (target cost per car) and the cost is distributed into functional departments. The distributed cost becomes the long-term goal with which each department should comply. At the same time, the target of cost reduction is fixed by comparing the target cost with the estimated cost (*nariyuki cost*), which is calculated on the basis of accumulated improvement of the existing product. This is also a subject to be realized in each department. Lastly, activities of cost improvement are continually carried out in the process of production from the viewpoint of the target cost and the target of cost reduction.

It may be advisable for the understanding of cost design to offer a more precise explanation the accomplishment process of the target cost at the third and fourth stages, because these stages closely relate to its special process. The design department puts together a team from several different departments, the responsibility of which is to make a more concrete plan of the accomplishment stage before the trial car drawing stages. Then the team is also responsible for the target cost through the whole process from the issuance of the trail car drawing to the establishment of the estimated cost in the sales department. This process is carried out by comparing trail drawing with that of the regular drawing and monitoring them. While the trial drawing is based on materials and parts specification at the stage of design, the regular drawing is based on the specification at the stage of manufacturing. The team compares the result of two monitors with the target cost, clarifies the cost problems of each functional department and tackles the problems from the angle of value analysis and value engineering. The estimated cost results from the final summary of cost design activities which is checked through two monitors, and is an important factor for

pricing. Of course, quality control circles or team working activities always strengthen the quality of products, motivation, and the firm's continuous quest for improvements in efficiency and effectiveness (see Chapter 2).

Target costing, or cost design in a broad sense, consists of cost design in a narrow sense carried out before production and cost improvement (*genka kaizen*) in which managers cooperate with workers to reduce cost and improve quality in production processing. In the process of cost minimization which takes place at the stage of mass production, the target cost is compared with the standard cost over a certain number of budgeted months (for example, six months in Toyota), during which time improvements in efficiency may be obtained. Workers and managers in all departments at all levels are expected to suggest new cost and technological improvements on a daily basis in order to bring the standard cost close to the target cost (Tanaka, 1991).

In relation to cost design, or target costing, recent studies argue that its specialty is more powerful than its generality, because it has its roots deep in Japanese culture, and it would be difficult to transfer it to other countries. Moreover, this costing emphasizes the management of direct rather than indirect costs. The investigation by Nihon University (1996) confirms that as an important item, direct cost (material costs, costs of purchased parts, direct processing expenses) occupies higher ratio to control target costs than indirect processing expenses and depreciation of new facilities. The reduction of working hour per product and material cost is the most important object in the implementation of the cost design. Here, the allocation of fixed overhead costs which ABC has its best for solution is a main subject.

Cost design is even more essential for product strategy than a general business strategy. Under the existence of a reliable general strategy, cost design can act to the best of its ability to develop a new product of low cost and high quality, but it is powerless in the case of building a general business strategy. A special committee of the Japan Accounting Association (1996) expresses the problems of Japanese management as follows:

> Japanese enterprises make so much of effectiveness and formalizing to attach importance to the pursuit of not general, but particular solution rather than universality and conceptualizing. Here, competitive behavior is valued to achieve short-term subjects related to time limit of delivery and cost. As a result, the central idea of workshop without strategy, lack of individuality of organization member, and employees' impoverishment by long time labor become conspicuous. Distortions such as traffic environmental problems by excessive delivery frequency and the overwork of subcontractors to save inventory cost, are also found out.

Although ABC has tried to solve problems related to strategic management and the allocation of fixed overheads, and the cost design also has

tried to develop the product strategy and strategic management, each in itself could not completely solve these problems. Thus, we cannot yet know how to take the roots of strategy in organizations and how to absorb strategy to top management from the bottom of organizations, and simultaneously find the entire solution of the cost allocation. However, we might solve what management accounting systems cannot do. It may be wrong that the two problems of strategic management and allocation of fixed overheads can be completely solved, if each costing system is treated separately.

The use and application of an accounting system is strongly related to its social and historical context. However, its essential characteristics may not change greatly. Even now, it preserves parts which have not developed since the time of Lucas Pacioli (1445–1517), although it may have experienced a change of form. Accordingly, given today's management concerns, we should clearly establish what accounting can and cannot do in order to avoid confusion. This is particularly important in the present rapidly-changing economic conditions, although only by accounting method would accounting scholars try to solve the whole problems that a company must do by various means. Next, in order to get close to a reasonable and realistic solution, we will address the fundamental features of today's management accounting, looking back over its development process.

## 9.7 Integrated cost accounting

### The development of management accounting

The development of management accounting is generally divided into four stages, as shown in Table 6.1. Although the development process of management accounting was described in Chapter 6, this section dares to explain it again in order to make the meaning of integrated management accounting clear.

At the first stage, an independent calculation system of management accounting was not established – financial accounting data were used for business management. During this stage, management (through financial accounting and actual costing) represented the strong character of 'drifting' (*nariyuki*) management, since business was on a time-to-a-time basis managed according to the development of the situation and by using past financial accounts. The financial ratio analysis or comparative business analysis were mainly used as methods to control production and business management (Nishimura, 1999).

At the beginning of the twentieth century, F. Taylor created and advocated scientific management. This philosophy, based on the idea of government budget, influenced the formation of the second stage. More precisely, this stage in the development of management accounting was the formative period of management accounting. Budget control, standard costing, and

break-even point analysis were mainly representative of management accounting methods at this stage. In particular, budget control was used to wholly run corporation production and business on purpose, and the standard costing to some extent for the administration of jobs or tasks. The standard cost or budgeted profit was thought to be a criterion or a standard that all the members of a company should attain. Efficiency was measured by the standard value or the criterion. Thus, if actual cost was far different from the standard or the plan, they should revise it and develop new activities towards the standard. Cost variance should be eliminated in the following step. In this case, the standard was absolutely true, and variance between the standard and the actual costs was abnormal and should be eliminated. Therefore, variance analysis and control by exception played an important role in cost and profit management during this stage. This stage may be named 'traditional management accounting', since its fundamental contents still have deep influences on today's management accounting system, despite their changed forms over times.

Quantitative and information theory became more innovative relative to the traditional management accounting during the 1970s. At this third stage, management accounting rested on the philosophy of management science. Optimum profit was pursued in profit management instead of the break-even point analysis, or profitability in traditional management accounting. Probability, linear programming, economic optimum stock model, and information theory were broadly discussed in connection with profit management. At the same time, behaviour science and agency theory, relating to this idea, became conspicuous during this stage. The fundamental idea was to control planning process itself by entering business environment information into a model and to forecast the future of business precisely according to changing environment, that is to control abilities and process of upper managers' planning and make the evaluation of their performance more reliable. At the stage, planned value was recognized as relative truth with relation of the change to environment.

It is further ascertained that two fundamental control concepts, that is feedback and feed forward, basically crossed each other in management control. In the progression from 'drifting' to traditional management accounting, the feedback control exerted a strong influence. This control philosophy became a complete form through switching from the traditional management accounting to the quantitative and information management accounting. At the same time, feed forward control thinking was beginning to develop. In particular, Demski (1967, 1969) used the idea to develop a new theory to consistently control the decision-making process and performance evaluation. His work contributed the most to the development of management accounting theory in the twentieth century. According to feedback control thinking, actual performance was compared with the original budget and standard after completion of an action and after that the

following plan was revised and some new methods were adopted. As a result, variance is reduced in the next period. In contrast to such a reflective and reactive activity in feedback control, feed forward control is preventive and proactive. Managers who advocate this control idea adopt different methods and policies to amend the plan frequently and control the planning process incessantly in accordance with changing environment, and to realize an expected performance. Actual performance will be almost the same as that expected. In other words, a difference is interwoven beforehand into the planned value or the standard cost. Cost design (*genka kikaku*), or target costing, is based on the feed forward control thinking. This is the preventive and proactive management system in which managers utilize various methods in controlling the planning process to create an actual performance almost equivalent to that planned.

As mentioned above, cost variance analysis and revision activity had an important meaning in traditional and quantitative management accounting systems. However, in today's management accounting, it is more important to interweave cost, or profit variance in the planned value beforehand and to take measures to get rid of variance before actual performance. Of course, feed forward management cannot be executed by only an accounting system, but its integration with organizational managements. Feed forward management accounting would not fulfill its functions without organizational management. Thus, this is named 'integrated management accounting', which includes manifold meaning such as the integration of feed forward and feedback control systems, and feed forward control and market strategy. Consequently, although low cost and high quality had been regulated as trade-offs, their relation is now considered to be a complementary-matched one in integrated management accounting.

At the same time, cost design is the market-strategic cost management system which was created in order to realize the target profit by forecasting potential market demands and making them actualize from the viewpoints of high quality, low cost and prompt delivery. Therefore, it may be said that management accounting has developed from a feedback to a feed forward control system, and from production to market orientation, when we presume that the integrated management accounting, or the latest management accounting, has the two characteristics of market orientation and feed forward control. Figure 9.1 describes the development stages of management accounting in accordance with the above-mentioned point of view.

It is concluded, from the four development stages of management accounting, that market strategy and feed forward control distinguish today's management accounting from others. It must, furthermore, solve the allocation of fixed overheads.

As mentioned above, activity-based costing or cost design (target costing) in itself could not wholly solve the allocation of fixed overheads and the strategic problem, despite its strenuous tackling. Therefore, the only

solution to these problems is to link the various methods together.[19] Both cost design and ABC are market-oriented. The former produced new ideas of product strategy and feed forward control in management costing, while the latter developed the allocation of fixed overheads from the viewpoint of business strategy. If we make the best use of their strong points, we will be able to design a more market-oriented and stronger feed forward management costing. We can take the Honda Motor Company as an example of taking this combination into account, because its experience of management accounting gives us some insights into the allocation of fixed overheads and strategic problems involving organizational management.

### Integrated management costing

Concerning the process of integrated management costing, we will begin with the setting of target cost. As mentioned above, at the stage of developing a new model for a product, chief managers must wholly examine new materials, new technologies, improved working methods, relations to suppliers and dealers, and others to integrate low cost and high quality from the angles of product lifecycle and market strategy. In this case, target cost is fixed after subtracting a long-term target profit from an estimated selling price. Next, an estimated cost is calculated by summing up costs incurred through improvement of an existing model. At the same time, the target of cost reduction is fixed after subtracting the target cost from the estimated cost. Lastly, the estimated cost, the target cost, and the target of cost reduction are subdivided into annual budgets, and the target of cost reduction also takes its annual shape.

In this case, the allocation of fixed overheads in calculating the estimated costs is equally burdensome as it is in ABC. We use an idea close to ABC to allocate fixed overhead costs to product through activities, but do not forcibly

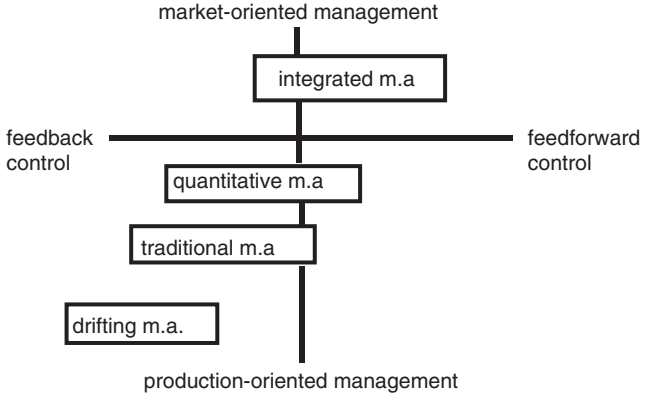



*Figure 9.1* Development of management accounting

allocate what cannot be allocated to products. We pay attention to Honda's costing and the German flexible marginal plan costing in order to establish a reasonable and realistic management costing (Horvath, 1996). First, a company establishes sections (or departments) identical with the activities, and then the overhead costs can be directly allocated as direct cost according to these activities. Identical activities are collected in a section and then many sections are built in a factory. For example, the Suzuka factory of the Honda Motor Company in Mie prefecture, Japan, has between 300 and 400 sections (Sato, 1993). In this case, overhead costs such as common expenses of administration and head office must not be forcibly allocated to sections. Second, the total working time of each section is measured per second, not by hour or by minute. Direct cost per second in each section is calculated by dividing the whole direct cost by the total number of working seconds. Lastly, product cost is easily calculated by accumulating direct costs of sections passed through for processing. With regard to undistributed overhead costs, they are wholly dealt with as period expenses in the income statement. This idea is a mixture of direct costing and activity-based costing which is transformed by cost per second and a group of identical activities (section) (Table 9.2).

Some may criticize the adoption of the unit of the working second as the allocation standard for fixed overheads in the day when the ratio of labour expense decreases in proportion with fixed overheads such as maintenance cost and depreciation. However, we should consider the quality of labour, rather than simply its quantity. In a highly automated factory, importance should be attached not only to the quantity but also to the quality of labour, because here the content of labour becomes more valuable and expensive than in a handicraft-manufacturing factory. Workers must also have high-grade technologies and knowledge. Moreover, attention should be paid to a changing form of labour in an advanced management organization. Labour generally assumes two forms: manufacturing and management. The former transforms natural resources into economic goods, while the latter rationally and economically combines manufacturing labour and resources to produce economic goods. Although manufacturing labour and management activities are generally carried out by different people, workers must be equipped with some knowledge of management and engage in some management activities in advanced manufacturing organizations. The quantity of labour can be

*Table 9.2* Transformation of fixed overheads to direct cost

| *Items of expense* | *Relative to operation capacity* | *Relative to section activity* | *Control of cost* |
|---|---|---|---|
| Direct labour | Variable cost | Section cost | Cost per product (unit cost) |
| Processing expense | Fixed cost | Common cost | Gross management cost as period cost |

inseparable from its quality. Thus, it may be rational to measure and control working activity per second. Working activity and its cost must be measured and controlled per second, not hour or minute, because the shortest-time of human activity is the most important factor in high technology industry.

The changing quality of labour should distinguish the human activity from the movement of natural resources: machine activity, or transfer of resources that cannot be carried out without human activity. At the same time, we can obtain a common basis for the allocation of overhead costs by using cost per second and this will liberate us from the complexity and diversity of cost allocation basis. However, sections based on identical activity can reflect the complexity and diversity of the production process. We can further recognize and manage not only direct cost and contribution margin related to each product and area, but also the total indirect cost such as head office expenses and common activity costs, which are displayed as period cost in contribution margin (income) statement. We will illustrate this procedure with a simple example in the following exhibit.

## Exhibit

The expense allocated to a section in a company is ¥2,700,000. Ten employees in the section work 20 days a month under the condition of eight-hour working day, including an hour's rest time. Thus, the total working seconds in the section are 504,000 seconds. Cost per second is calculated as in the following table.

In this case, if it takes 6 seconds to process x parts in this section, the cost of the parts will be ¥32.16 (6 × 5.36). Product cost is also calculated on the basis of cost per second. The cost per second lays the foundation for the calculation of product-estimated and actual costs. As mentioned above, the triplet of cost design, ABC, and contribution margin (income) statement is a form of managerial accounting system suitable for this age of advanced automation and high technology.

| *Estimated expenses in section (unit = Japanese yen)* | | | |
|---|---|---|---|
| *a group of same activity* | *allocated costs* | | *cost per second* |
| labor cost (about 80% is variable) | 1,000,000 | 1,000/504 | 1.98 |
| operating expense (variable) | 400,000 | 400/504 | 0.79 |
| cost of equipment (fixed) | 600,000 | 600/504 | 1.19 |
| service cost (fixed) | 200,000 | 200/504 | 0.40 |
| depreciation of molding shot (variable) | 300,000 | 300/504 | 0.60 |
| direct processing cost | 2,500,000 | 2,500/504 | 4.96 |
| semi-direct processing cost | 200,000 | 200/504 | 0.40 |
| total processing cost | 2,700,000 | 2,700/504 | 5.36 |

Table 9.3 shows the system of profit management in Honda. By each divisional headquarter, this budget income statement is prepared on the basis of direct cost calculated at the estimated cost per second. This statement gives us a matrix of cost and profit, and products, wheeler divisions, and country location.

This is a budgeting system connected to the direct costing philosophy. The income calculation system facilitates profit management and simulates the management of target profit and cost by product and area. Each sales department can examine remedies for cost reduction and quality improvement according to the headquarters' profit target. On the basis of direct profit per car, area, and division, the head office and each divisional headquarter can make simulation models for actualizing the company profit, and harmonizing each division's operation repeatedly by examining the product mixture and methods of cost reduction (Sato, 1993).

*Table 9.3* System of profit management in Honda

| *Items of expense* | *four-wheeler division* D A E F | *two wheeler division* D A E F | *general wheeler division* D A E F |
|---|---|---|---|
| Sales unit of wheel | | | |
| Domestic production | | | |
| foreign production sales | | | |
| Factory direct cost | | | |
| materials | | | |
| other materials | | | |
| processing cost | | | |
| Processing on commission | | | |
| expense of transport and packing | | | |
| (direct cost) | | | |
| direct profit | | | |
| expenses of sales division selling | | | |
| expenses of production division factory | | | |
| administrative expenses | | | |
| general administrative expenses | | | |
| (total expenses) | | | |
| (division profit) | | | |

*Notes*: *D means 'Domestic area'; A 'North America area'; E 'European area'; and F 'other Foreign area'.

*Source*: H. Sato (1993), Costing System in Honda, in Y. Sato (ed.), *Management Accounting System in Japanese Enterprises* (Tokyo: Hakutoshobo), 145.

Next, we will discuss the analysis of cost reduction in detail, since this analysis clarifies a function that only accounting control can fulfill to empower employees and establish an interactive strategic organization. This method is a distilled result from recent experience of cost design and target costing by Japanese companies.

## 9.8 Analysis of cost reduction and feed forward

Until now, the analysis of cost variance between planned and actual values has played an important part in traditional standard costing. This made efficiency, volume, and budget variances clear. By using variance analysis, managers could analyse causes of variance and their responsibilities, and think about steps towards the improvement of efficiency and planning in the next term. Demski (1969) expanded its analysis into the analysis of profit variance and paid attention to control of the planning process. This method is named ex post programming, since he calculated the ex post value that is considered the optimum under the same condition and in the same time as the actual value occurs and compared it with ex ante (original plan) and actual values.

The variance between the ex ante and the ex post profits represents profit forecast variance, and evaluates the planning ability of upper managers. Thus, its analysis is useful for the control of the planning process. The variance between the ex post and actual profits shows opportunity cost variance and is used to improve and control production methods and the use of resources, and to conform the production plan to the sales plan. This cost variance analysis is fundamentally related to reactive and reflective control and feedback management, although Demski's model of profit variance analysis is more inclined towards feed forward control and strategic management than it is to standard costing.

In contrast to these methods, cost design and target costing are fundamentally based on feed forward control and market strategy orientation, due to which proactive and preventive management systems Japanese companies have achieved great success in international markets. In cost design, the target cost of a new product is calculated after target profit is deducted from the target selling price, reflecting market conditions. The new product must be greatly superior to an existing product in terms of cost and quality. Therefore, the target cost must be compared with the estimated cost, which would accrue when an existing product is improved in order to bring it close to the new product. Methods and procedures of cost reduction should be examined before the production process starts and during the process to materialize the target cost. The analysis of cost reduction gives managers an indicator of cost reduction activities, and evaluates performance of proactive and preventive cost reduction that managers and workers have tried to carry out at the stages of cost design and cost improvement. At the processing

stage, methods and procedures of cost reduction and improvement should also be examined in advance. The 'standard cost' mentioned in this costing is different from that of traditional standard costing, since this is prescribed by market strategy (target profit and cost) and scientific operation efficiency (standard of operation).[20] For this reason, the analysis of cost reduction can provide managers and other employees with the measures in which efficient control is tied up with market strategy to strengthen an interactive and horizontal management.

In the cost design of some Japanese motor companies, the unit cost of a new product (cost per car) is a main object of cost reduction. This is in contrast to the traditional cost management in which periodic expense and profit have been dealt with as object of analysis and control. We will explain this analysis of cost reduction on the simple assumption that the target cost ($T$) is ¥100, the estimate cost ($E$) ¥110, the normal cost (standard cost) in production process ($S$) ¥105, and the actual cost ($A$) ¥102.

'The estimated cost minus the target cost' ($E - T$) shows the target of total cost reduction to achieve the target cost, and should be zero in order to achieve the target cost. This variance is the planned amount of cost reduction that upper managers should investigate and materialize before production by examining proactive and preventive procedures and methods in the whole process from purchase of materials through processing to delivery. The planning managers, in cooperation with the engineers and cost accountants, must examine the purchasing method for materials, reduction of production personnel, usage of new materials and parts, changed production organization, improved security management and so on. In other words, this variance is an indicator for feed forward management.

When the cost variance is zero, the actual cost becomes equal to the target cost, which is usually set below the actual. When 'the actual cost minus the target cost' ($A - T$) is not zero, the positive variance shows the distance away from the target cost, and the negative the extent of actual cost reduction exceeding the target. Because the latter case is rare, the variance generally shows the former, or the unrealized amount of the cost reduction target.

We can compute the target of the total cost reduction ($TR$) as follows:

$$TR = E - T = 110 - 100 = 10$$

Next, its unrealized amount ($AR$) is calculated:

$$AR = A - T = 102 - 100 = 2$$

As a result, the realized amount (R) is recognized:

$$R = TR - AR = (E - T) - (A - T) = 10 - 2 = 8$$

In the above equation, $R$ does not mean the reflective and reactive indicator to suggest improvement steps in the next term, but shows the extent of preventive and proactive cost improvement which was carried out before

and throughout the production process, or more concretely, how much proactive measures were successfully implemented in this period. Thus, this is important for examining how a step of cost improvement and reduction was concretely executed in the stages of cost design and cost improvement. Let us analyse the *R* variance in detail.

'The estimated cost minus the standard cost' ($E - S$) explains the implemented degree of proactive and preventive cost reduction activity before production. More definitively, it shows how much the proactive and preventive activity of cost reduction was executed at the stage of cost design. By contrast to this, 'the standard cost minus the actual cost' ($S - A$) clarifies the progress of cost reduction activity, namely how much proactive and preventive activities were implemented at the stage of production.

The analysis of these cost variances is intended to make the feed forward cost control clear from the viewpoint of the feedback aspect as in the following way:

$$R = TR - AR = (E - S) + (S - A) = (110 - 105) + (105 - 102) = 5 + 3$$

The above equation shows the cost reduction process at the stage of cost design and at the stage of cost improvement. This not only gives managers and workers information on preventive and proactive activity for cost reduction, but also contributes to the evaluation of their proactive and preventive performance for cost reduction.

As discussed above, cost reduction analysis has a stratified structure of feed forward cost control, its feedback recognition, and performance evaluation. This special feature deeply depends on the philosophy of cost design, in which market strategy is tied up with feed forward cost control.

## 9.9 Cost reduction analysis and accounts procedure

Bookkeeping not only gives a historical and periodical recognition to managerial activities carried out at a specific time in a fixed place, but also evaluates them from the viewpoint of corporate profitability. Thus, bookkeeping makes it easy for us to recognize the contribution of cost reduction activity in achieving the key aim of corporate activity – profit. We will use a simple model for the analysis of cost reduction to illustrate its accounts procedure.

In this case, bookkeeping is not for profit measurement, but for management control, by whose feed forward activities the target cost and the target of cost reduction are recognized and controlled. We can take recognition and measurement of the progress of cost reduction through this accounts procedure. First, the target of cost reduction, or ¥10,000, is fixed at the stage of determination of target cost and estimated cost. At the same time, various measures and methods of cost reduction and improvement begin to be examined before production. The target of cost reduction account shows the proactive and preventive activity for cost reduction (see Figure 9.2).

## Example

| | *unit cost of product* | *volume of production and sales* | *total cost* |
|---|---|---|---|
| target cost | ¥100 | 1,000 units | ¥100,000 |
| estimated cost | ¥100 | 1,000 units | ¥110,000 |
| standard cost | ¥105 | 900 units | ¥94,500 |
| actual cost | ¥102 | 900 units | ¥91,800 |

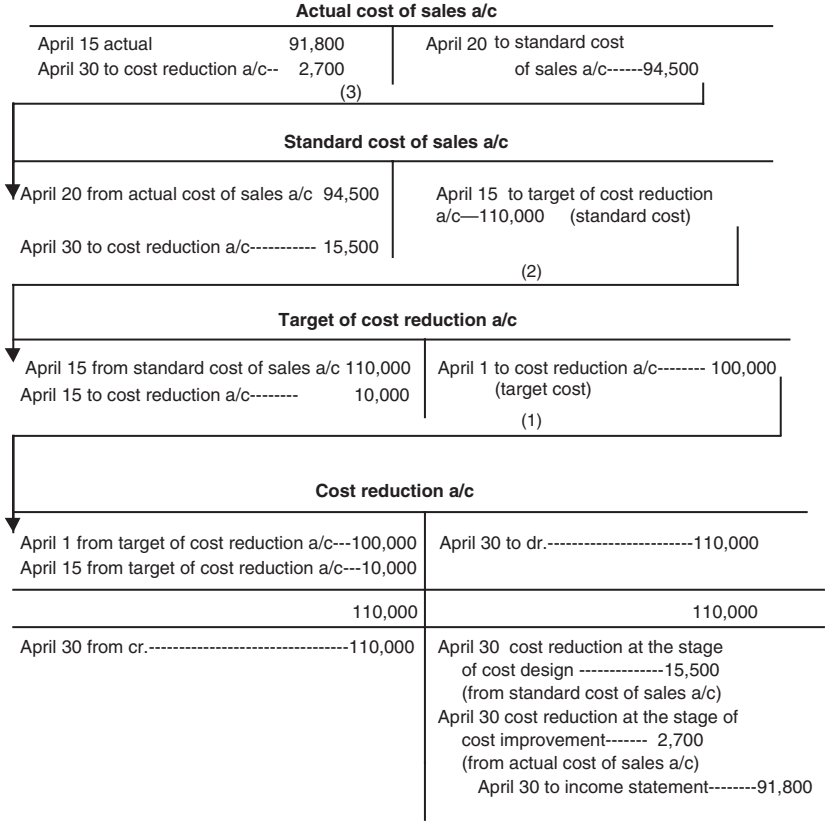



*Figure 9.2* Accounts organization of cost reduction variance

When the actual cost of sales is determined, the 'standard cost of sales' account shows the cost reduction of ¥15,500 at the stage of cost design (before production), and the actual cost of cost reduction account the cost reduction of ¥2,700 at the stage of cost improvement (during production).

The total amount of cost reduction becomes ¥18,200 ($110,000 − 91,800) and is an excess of ¥8,200 ($10,000 − 18,200) over the target.

However, this cost reduction does not directly link up with increased profit, since the cost reduction related to decreased production volume is included in the ¥15,500. Therefore, accounts related to target sales and target profit should furthermore be added to this accounts scheme, so that an exact relationship between cost reduction and increased profit may be made clear. Here, due to apace limitations, we should be contented with such a simple illustration. Table 9.4 shows the relationship between cost reduction, decreased production volume, and increased profit in this example.

## 9.10 Conclusion

Today's model of management accounting presents managers with the onerous task of solving two problems: (i) the fixing of strategy in organizations and the absorption of strategy by top management from the bottom of organizations; and (ii) the allocation of fixed overhead costs. ABC and

*Table 9.4* Analysis of cost reduction

| *Causes of cost reduction* | *unit cost* | *total cost (in ¥)* | *relation to profit (in ¥)* |
|---|---|---|---|
| Target of cost reduction | 10 | 10,000 = 110,000 − 100,000 | target profit, 20,000 = (120,000 − 100,000) *10,000 (based on cost reduction) *10,000 (based on others) |
| Actualization of cost reduction | 8 | 18,200 = 110,000 − 91,800 | actualized profit 16,200 = (108,000 − 91,800) *7,200[(a)] (based on cost reduction) *9.000(based on others) = (10,000 − 1,000[(b)]) |
| Cost reduction at the stage of cost design | 5 | 4,500 = 900 × (110 − 105) | (a) 4,500 (increased profit based on cost reduction) |
| Cost reduction at the stage of cost improvement | 3 | 2,700 = 900 × (105 − 102) | (a) 2,700 (increased profit based on cost reduction) |
| Cost reduction based on decreased production volume | | 11,000 = 110 (1,000 − 900) | (b) −1,000 (decreased profit based on decreased production volume) = (120 − 110)(900 − 1000) |
| Target cost | 100 | 100,000 | |

*Note*: It is assumed that the selling price of the product is ¥120.

cost design have coped with these works in a particularly ingenious manner. ABC, by using the concept of activity, created a means to give us cost recognition for business strategy and strategic allocation of fixed overhead costs. Cost design also made clear the importance of cost recognition and management at the development and design stages of a product, and paved a way to proactive and preventive cost management through the integration of accounting and organization of management.

However, neither method by itself could offer a complete solution to the problems involved. Therefore, it may be a road that has been provided for us to create a new management accounting system by integrating the two cost accounting systems. This chapter has attempted to develop an integrated management costing system in which the contribution margin management was combined with cost design and ABC. At the same time, we offered analysis of cost reduction and the accounting recognition of cost reduction. By using these methods to give the accounting recognition of cost reduction to managers and workers, they can easily understand marginal profit by product and area through moving fixed overheads to direct cost and carrying out profit management by product and area. In particular, the analysis of cost reduction and its accounts recognition give them the standard of efficiency related to market strategy (target profit and target cost) and urges them to carry out preventive and proactive cost management. This will be useful for the present strategic management to empower employees and establish an interactive organization.

When today's management accounting is examined, a clear distinction must be made between accounting and management, and accounting and other information systems. The range of concerns of today's business management is too wide and changeable to be responded to by the existing traditional methods. With that purpose, each peculiar function that accounting, management, and other information systems can fulfill must be crystallized. In the domain of accounting, we should correctly recognize and solve the concerns of business management, or strategic cost allocation problems, and elucidate their theoretical implications. After all, the most important problem today is to clarify what progress today's management accounting has made in the realm of accounting and what pathway it will take in future.

# 10

# Feed Forward Cost Accounting and Strategic Management

## 10.1 Introduction

As a result of a number of rapid recent changes in the business environment, today's accounting scientists should eagerly wrestle with two major issues: how to define the object of their study; and how to research it. Concerning the object of study, today's management accounting is faced by a number of strategic problems. Strategic management accounting and strategic cost management have become vogue words, although their meaning is not always clear (Wilson, 1997). Thus, it is an important question whether management accounting can deal directly with strategic problems. Moreover, we must consider how they can be dealt with. Anyway, it is certain that the study of management accounting faces a turning point centred around these strategic problems. Accordingly, scholars should clarify the relationship between strategic problems and management accounting. In order to make the present object of accounting study clear and force accounting research to take a scientific step forward, they should face the relationship between the strategic problems and accounting from a scientific point of view.

Another issue relates to making the method of management accounting study more innovative. Although many students, as Shank (1989) points out, have been reluctant to change fundamental concepts of management accounting, some have tried to innovate the method of study as well as accounting methods. Johnson and Kaplan (1987) clarified that the present financial information-oriented management accounting had become increasingly irrelevant to actual organizations because of the present global economic conditions. At the same time, they proposed carrying out research into the reform of the prevailing style of study – field-based research. While Johnson (1992) warned us against the current strong dependence on accounting and monetary information, Kaplan proposed the use of field studies to systematize activity-based costing in connection with strategic management. In the UK, Scapens (1991) proposed building up a theoretical

framework capable of practical application for practical research and tried to fill a gap between the theory and practice of management accounting.

Moreover, Shank and Govindarajan (1993) considered the transition from cost accounting to strategic cost management through managerial cost analysis in the face of strategic problems. In that case, they emphasized that, 'Trying to lock ABC and ABM into the formal cost accounting system significantly reduces the probability that the insights they yield will be acted upon.' According to their thought, the idea of trying to use a transactions bookkeeping system tied to generally accepted accounting principles for strategic purposes is ill-conceived. As strategic problems and their management acquire social aspects, a negative attitude toward the bookkeeping system is spreading throughout the academics of management accounting.

Recently, many accounting researchers have entered into the forest of business organization, industrial structure, or culture across the bookkeeping system and 'the formal accounting system'. As a result, concepts such as value chain, product lifecycle, employee empowerment, mini-profit centre, and balanced scorecard are becoming more influential in management accounting circles. Under these circumstances, we should repeatedly reconsider the nature of accounting and what relation there is between accounting and strategy. This chapter focuses on influential functions of cost bookkeeping over strategic management in the defiance of the mainstream view. Therefore, first the meaning of business strategy should be clarified from the viewpoint of feed forward control in the next section. Following this, the relationships between strategy and feed forward will be addressed for the ensuing discussion. The fourth section will introduce two existing analyses trying to connect the accounting model to strategic planning, or strategic decision-making: Anthony's framework of management control and Demski's ex post system. These studies play an important role in establishing the feed forward bookkeeping system which the present writer has researched for many years. The last section will develop management bookkeeping concerning strategic management from the viewpoint of feed forward control.

## 10.2 Strategy and accounting

The notion of strategy is derived from the art of war and relates to the management of an army or armies in a campaign. To be concrete, a battle group should know its enemy and attack the enemy's weakness with its own strength in order to win. When we apply this to business management, the enemy is the competitor in the markets and a company should know the technology, resources, and organizations of the competitor. Tricker (1989) made the acute observation that business was a battleground, the enemy was the competitor, and the object was to win.

While conventional management accounting has internally treated monetary information around a company and regarded the volume of production as a cost driver in cost management, today's management accounting is going to an outward and forward way and tends to treat non-monetary information and use various activities as cost drivers for cost management (Wilson, 1991; Simmonds, 1981). Recently, strategy has become more contingent. The more contingent strategic management becomes, the stronger the outward and forward trend of management accounting seems to be. In the current business environment, management accounting must cope with sudden fluctuations in bank rates and foreign exchange, takeovers, closures and other economic events. If strategic management accounting can be established, it will have some different features from the conventional management accounting. Table 10.1 shows the differences between the two accounting systems. Strategic management accounting must lay stress on a contingent plan rather than a conventional ordinary plan, since it is strongly influenced by the changing business environment. Wilson (1991) expressed with felicity that 'strategy' is not synonymous with 'long-term plan' but rather consists of a business' attempts to reach some preferred future state by adapting its competitive position as circumstances change. Consequently, the high ground of 'business intelligence' or 'creativity, flexibility' is markedly requested (Tricker, 1989; Preston, 1991). In contrast with accounting which basically scores daily economic activities and contributes to their improvement, at a critical time strategy negates existent activities and changes them to the entirely different activities (Porter, 1998). After that time, accounting begins its function again.

Under this situation, Shank and Govindarajan (1993) question the up-to-date function of any formal accounting system, or transactions bookkeeping systems. According to their ideas, any formal accounting system has a limitation under strongly strategic management, because it necessarily accounts for today, rather than tomorrow. They also pointed out that much of strategic analysis and thus strategic cost management involves constantly re-evaluating today's competitive positioning in favour of alternatives that

*Table 10.1* Differences between the two management accounting systems

| *Item* | *Conventional* | *Strategic* |
|---|---|---|
| Standpoint of management | Internal (efficiency) | External (competition) |
| Object of cost management | Cost | Cost, quality, time of delivery |
| Value formation | Cost of production (enterprise structure) | Value chain (industrial structure) |
| Information for management | Monetary | Non-monetary |
| Cost driver | Volume (single) | Various activities |

would be better adapted to current perceptions of tomorrow's competitive environment. In addition, they concluded that it was not possible to try to use transactions bookkeeping systems tied to generally accepted accounting principles. Although we agree with their idea that management accounting must shift from today's operation to tomorrow's strategy, is it true that a 'formal accounting system', or 'transactions bookkeeping system' has very little significance for strategic management?

We must recognize that accounting shows its limit in the face of special contingent situations of strategy, since it is a general and periodic system in opposition to the contingent characteristic of strategic management (Otley, 1980). If a company copes with these strategic problems, a system that can forecast 'the pattern of conflict over the longer term' should be developed as a special management system (Simmonds, 1981). Contingent strategic planning is intersectional and horizontal, while the traditional one is vertical since it starts from goal to plan and policy through object and strategy; the goal means the forecast of the overall result to be achieved in general terms, object is related to a special result of the goal in a special period, strategy is a method to achieve the goal and the object, and plan refers to the actions of management in the financial areas of the organization to implement the strategy (Macaulay et al., 1994). Management accounting has tried to be in conformity with the traditional strategic management. It may certainly be paralysed with recently strengthened contingent strategic management.

Accordingly, creative, flexible and intelligent organizations, which are sensitive to changing markets and technology, are required in order to cope with business contingencies. Under contingent situations, ordinary employees and businessmen sensitive to changing technologies and markets may sometimes play an important role in the formation of business strategy (Mintzberg, 1994). Thus, the empowerment of the employees is of vital importance to the formation of the strategy. In the West, concepts such as the 'balanced scorecard', the mini profit centre, and 'four levers of control' have been widely discussed in relation to organizational management and strategy (Simons, 1995; Kaplan and Norton, 1996). In France, some tried to restructure 'Tableau de bord' (a relational diagram of nonfinancial indexes) and join it with ABC from the strategic point of view (Lebas, 1996).

In Japan, the Honda Motor Company is renowned for the empowerment of its engineers and workers – an approach that had led to better business results. In the recent sluggish economic conditions in Japan, the Toyota Motor Corporation, which earned the highest ordinary profit of ¥972 billions in 2001, has also adopted the Japanese type of management that attaches importance to the merit system and the promotion of the young employees from the shopfloor (Fujita, 2001). Japanese enterprises, which have close links with the government, have used the subcontracting system and the structural reform of industry, business and production to enforce

the strategic cost management (Nishimura, 1995). In the past, Japanese companies used the subcontracting system and cooperative work-system to acquire the same fruits as the value chain and the lifecycle costing that Western counterparts have widely advocated. However, at present, they face more relentless and contingent situations than they used to do.

It is undeniable that the contingent strategy occupies prominent importance in the business organization and the decision-making in the level of top management. In that sense, the Japanese style of management undergoes an ordeal to adjust itself to contingent situations and strengthen the intelligence of top management. Besides, it is also true that management accounting should make some meaningful contribution to business development such as takeovers, mergers, closures, business tie-ups, mass dismissals, and others. However, management accounting fundamentally consummates management control functions that are regulated by the usual strategic decision-making. Therefore, it is important for management accounting to introduce the contingent decision-making into managerial and operational control. Many students seem to confound the growing importance of the contingent strategy with the peculiar function of management accounting: management control. The increasing importance of contingent strategy management cannot deny the existence of the conventional management accounting. It is also an undeniable fact that a company would not exist without accounting: accounting visibility.

Another more important point to note is that most students use a feedback viewpoint in order to analyse contingent strategic management as well as management control. We must consider the limits of feedback control more carefully in this situation of growing strategic management.

## 10.3 Strategy and feed forward control

As a result of the globalization of markets and the socialization of production, those enterprises which can develop a new product of high quality and low cost and control their markets have a great possibility to earn enormous profits. However, if they create defective merchandise causing environmental and ecological disruption, or products not meeting the needs of their consumers, the consequences of such business failures will also be enormous and irrecoverable. Accordingly, when contemplating strategic decision-making they should prepare for the management system that leads to maximum profit and minimum risk: minimum loss and opportunity cost.

Table 10.2 shows the notable examples of defective merchandise and recalls the experiences of some Japanese enterprises in 2001.

As a result of the sale of injurious beverage, the Yukijirushi Daily Company fell into a vicious circle of a drop in output and an increase in selling expenses owing to a sales slump in daily products which had assumed overwhelming control of market share: milk, butter, and cheese. In another

*Table 10.2* Recent examples of deficit product and loss in 2001 (billion Japanese yen)

| *Company* | *Sales* | *Ordinary profit* | *Net earnings* |
|---|---|---|---|
| Mitsubishi Motors[1] | 3,400 (1.9%) | −45 | −160 |
| Snow Bland[2] | 1,155 (−10.3%) | −43.8 | −47.5 |
| Ajinomoto[3] (seasoning) | 875 (5.5%) | 42 (1.9%) | −11 |
| Sankyo Medicine[4] | 545 (−7.6%) | 89.5 (−37.5%) | 42.4 (0.8%) |

*Notes*: Concerning the reasons; [1] related to the increased cost of recall; [2] is food poisoning; [3] related to the recall of products in Asia; and [4] depended on averse reaction. The number in the parenthesis shows the growth against the previous year.

*Source*: A Special Edition, The Sharp Turn of Company Clearing Accounts to the Worse, *Economist* (Japan: Mainichi Newspapers), 6 March 2001, 52–3.

case, according to a report (see also Table 10.2) the Ajinomoto Company had to recall seasoning products because it used a component of pork whose eating is prohibited by Islam and sold them in some Islamic areas. The enormous losses that resulted will trigger a closedown of factories and the laying off of many employees. These losses are too enormous to be recovered by feedback system. At present the framework of management accounting should be converted from feedback to feed forward control (Nishimura, 2000b).

Feed forward control does not simply mean forecast or ex ante programming, but the proactive and preventive management that consists of decision-making control and continual performance improvement. What is more important is to create 'a reasonably predictable relationship between inputs and outputs' (Wilson and Chua, 1993) prior to production through planning and by proactive and preventive actions. This is in distinct contrast to the reflective and reactive action in feedback control. As stated before (Nishimura, 2000b), cost design is typical of feed forward control where managers develop and create a new product of high quality and low cost in advance of production through the comparison of the target cost which is based on a long-term profit plan, and estimated cost based on reverse engineering, or value engineering.

In addition feed forward control must take root in the whole organization of a company in the face of contingent strategic management. The entire membership of a corporate organization should always take feed forward action for the implementation of its missions. This contrasts in a striking way with traditional management where top management mainly shouldered the responsibility of feed forward management. Figure 10.1 compares the present situation of feed forward management with that of the past one.

We must also draw attention to another change of strategy. While conventional management accounting focused on the strategy of production (efficiency, productivity, and cost control), management accounting is

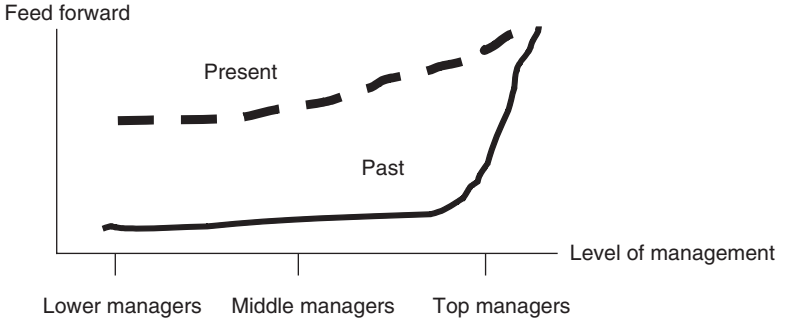



*Figure 10.1* Recent trend of feed forward control

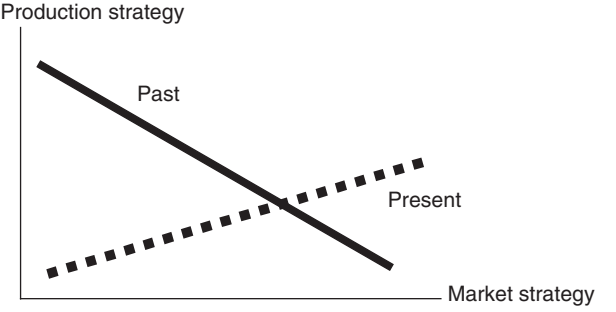



*Figure 10.2* Integration of the two strategies

currently shifting its standpoint from the strategy of production to market strategy: corporate strategy. However, corporate strategy must be understood to be the integration of the production and market strategies as illustrated in Figure 10.2.

The present management system may be characterized as a combination of corporate strategy and feed forward management through which enterprises can tackle the rapidly changing economic environment. There is the question of whether present management accounting can also be restructured in a way suitable to the management system, or whether it can be reshaped by corporate strategy and feed forward control. As mentioned above, even if management accounting cannot cope with all aspects of strategic management, this is no reason for the denial of management accounting. We should study and develop a new type of management accounting adaptable for today's management issues: strengthened accounting eye which can synertically reflect strategic issues.

## 10.4 Preceding literature on strategic management accounting

### Anthony's management control

Anthony was the first to apply strategy to the framework of management accounting. According to this book published in 1964, the three elements of strategic planning, management control, and operational control associate with the basic framework of plan and control in a matrix (Anthony, 1964). Strategic planning is considered to decide the best of alternatives to cope with changing organizations, resources, and policies. Anthony took up cost theory, probability, and mathematical methods for optimum decision-making. He emphasized the framework of management control in whose process senior managers motivated members of the organization to implement the strategies successfully. Simultaneously, he referred to linear programming, PERT system, and profit centre in relation with the operational control. As stated above, strategic planning was included in the circle of management control:

> programming—budgeting—assessing—reporting—analysis—programming.
> (Anthony, 1970)

We should notice that he considered strategy to be a goal immanent in management control. Consequently, management accounting can deal with strategic issues from the angle of a long-term goal. According to Anthony's theory, there are two key issues: one concerning strategic management and the other how to absorb it into the circulation of management control. However, at present the rise of contingency strategy magnifies the separation between strategic management and management accounting, and tends to neglect the latter. Anyway, we should confirm Anthony's role of linking strategy to management accounting. Management accounting plays a major part in ordinary operating and management controls, not in making contingent strategic decision. Of course, although accounting can contribute to contingent strategic management, its contribution is due not only to management accounting, but also to the integration of managerial and financial accounting systems: 'free cash flow' and 'Economic Value Added' involving the valuation of corporate value.

As illustrated in his circulation of management control, Anthony regarded changes of organization, resource, and policy as changing factors of the business environment and used feedback control to tackle these changes. Thus, his theory, although it played a role in absorbing strategy into management accounting, is eventually based on the internal product strategy, and feedback control. In comparison with his theory, Demski expanded the changes in the business environment to changes in markets, resources, and technology, and established a model of strategic decision-making which connected with the formal accounting system. The next section will discuss Demski's theory.

**Demski's theory and ex post system**[21]

Demski was concerned with putting various elements of input into a decision model which could deal with a changing environment. His model is related to improvements in the decision-making process, namely optimum decision-making under the conditions of changing business environments. It is labelled the ex post system, which improves the control process of decision and the performance evaluation-process (Demski, 1967, 1969, 1977).

While the traditional ex ante system compares the observed value with the planned value and uses variance analysis to control operations and revise planned values in the following period, the ex post system compares the ex ante value (the optimum value in the beginning of a period) with the ex post value (the optimum value after the changes in environments in the same period) and the latter with the observed value (the actual result in the period), and uses variance analysis to certify forecast variance and opportunity cost variance and improve the decision-making process by senior managers and the performance control in the operational process. While the ex ante value is also primarily calculated by linear programming (LP), the ex post value is the optimum secondarily calculated by the same method after considering changes in the business environments: fluctuation in the prices of materials and labour.

Demski's model aims not to make the estimate of parameters more precise in accordance with changing information and experience, but rather to improve the model of decision-making including the alteration of the model, through monitoring the original programme according to changes in the business environment, and controlling the process of decision-making and performance evaluation. This seems to take Anthony's theory of strategic planning to a higher level. At the same time, we find a new idea of feed forward control in the comparison between the two planned values: ex ante and ex post values. He states: 'Thus, feed forward consists of specifying all facets of, as well as optimizing, the model in order to predict the optimum control variable values for the next decision period' (Demski, 1969).

Demski also moved away from the product strategy and proceeded to the market strategy in the form of an optimum product mix. The product mix leading to the highest profit is a major object of his method. His method makes it possible to develop cost management bookkeeping (see note 21). Demski's work can be seen as particularly important because of the recognition that he intended to systematize Anthony's strategic idea as an accounting model from the viewpoint of the integration of feed forward control and market strategy.

However, although Demski often used the term feed forward, his method is fundamentally based on feedback control, since the ex post value is not calculated before the actual result is observed, but after its observation and under the same conditions that regulated the actual value. Cushing (1968) also wondered whether the ex post programme was valid

for the framework of his theory when the ex ante value was changed prior to the observed value by immediate information of changing price (Demski, 1968). This is because the most important aspect of Demski's theory is related to the recognition of opportunity cost variance which is calculated in the same circumstances as the observed value. Although he divides profit variance into forecast variance and opportunity cost variance, the former also has much to do with the *opportunity-forecast* of profit and loss (see note 21).

According to Demski's method, senior managers made a wrong forecast of the spreading opportunity of profit when the ex post is over the ex ante, while they wrongly forecasted the occurrence of loss-opportunity. Because the observed value cannot logically exceed the ex post value, the opportunity cost variance inevitably occurs as a result of the excess of the observed value over the optimum ex post value. His theory definitely exposes its limit in carrying out the feed forward, or preventive and proactive control, since it moves around the core concept of opportunity cost. His understanding of feed forward is different from ours. According to Demski's recognition, 'feed forward' means the decision-maker adopts certain forecasts and an optimum decision by using the 'best' decision model based on internal and environmental information (Demski, 1969). He focused only on the optimum forecast and the best decision-making, but neglected to compare the two planned values before the actual observation and to adopt some preventive and proactive activities to improve the forthcoming results beforehand: predicting input–output relationships. His method eventually results in the feedback control in which managers optimize the forecast model and recognize the opportunity cost variances and improve the decision process and performance in the next period.

However, we should concede that Demski's ex post model has advanced the study of strategic management accounting, which improved managers' decision processes and performance evaluation under changing business environments. In addition, we can learn about the possibility of developing a management bookkeeping system from his theory, although many scholars agree with Kaplan's 1984 idea that there have been no substantial developments in management accounting since the 1920s. We can say with a fair degree of certainty that Demski's theory was a progressive outcome of management accounting, because his *theory* can connect with Japanese management *practices* such as cost design and cost improvement in terms of feed forward thought and market strategy. This will be addressed in the next section. Even if some theories seem to offer little from the short-term viewpoint, they will be relative and practical when they reflect an objective truth. On the contrary, even if some theories are very useful from the short-term viewpoint, they will leave the historical scene from the long-term viewpoint when it does not reflect the truth.

## 10.5 Target cost accounting and strategic management

As discussed in earlier papers (Nishimura, 1995, 2000b), cost design, or target costing, has been characterized as the integration of feed forward control and market strategic management. It does not aim at revising an ex ante plan and controlling its implementation process in the next period, focusing instead on predicting and controlling future input–output relations by using various environmental information and methods before actual results occur. The most important aspect is to use the best method and means to continually improve planned objectives prior to production. This is proactive and preventive cost management. With regard to the strategic issues, cost design differs from conventional strategic costing: Table 10.3 lists these differences. Although cost design gave us the new idea of strategic cost management, it has never created a formal accounting system, or management bookkeeping, to contribute to feed forward and market strategic management. Most Japanese companies have dealt with this new idea in traditional cost bookkeeping. This section will try to develop the idea of cost design from the angle of a formal accounting system, or management bookkeeping.

First we start by calculating and displaying the Demski's ex post system in the formal accounting system, or bookkeeping. Let us suppose that ex ante marginal profit is 100, observed marginal profit 90, and ex post marginal profit 95. Traditional variance analysis clarifies profit variance 10 by subtracting 90 from 100. In the traditional accounting system, the cost variance account is prepared on the basis of this calculation. Similarly, the following accounts system can be established according to the profit variance analysis of the ex post program (see Figure 10.3).

Traditional profit variance:

Profit variance = ex ante profit − observed profit = 100 − 90 = 10

*Table 10.3* Cost design and conventional strategic costing

| *Strategic subjects* | *Conventional strategic costing* | *Cost design* |
|---|---|---|
| * External (competition, contingent situations)<br>* Value chain<br>* Complexity and variety<br>* Non-monetary information | * Feedback control<br>* Integration of monetary and non-monetary information<br>* Organizational approach<br>* Rejection of formal accounting system, or bookkeeping | * Feed forward control<br>* Integration of monetary and non-monetary information<br>* Cooperation system of subcontractors and employees<br>* Traditional formal accounting systems |

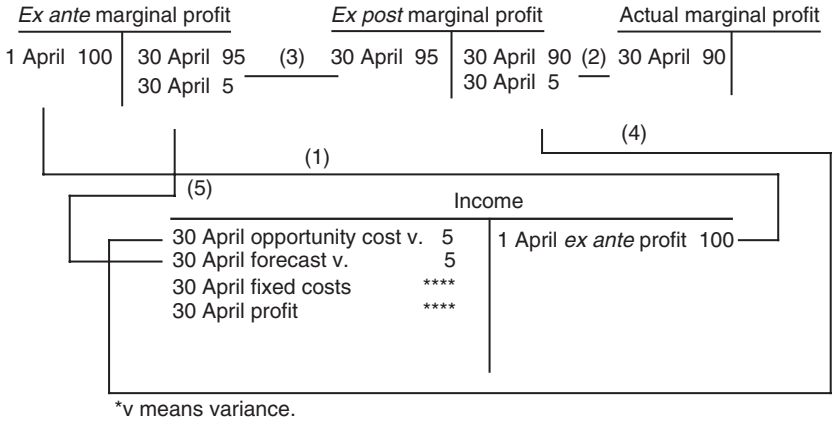



*Figure 10.3* *Ex post* system and formal accounting system

Demski's ex post system:
Forecast variance = ex ante profit − ex post profit = 100 − 95 = 5
Opportunity cost variance = ex post profit − observed profit = 95 − 90 = 5

As for the accounting structure, on the first of April the ex ante value is entered on the debtor side of the ex ante marginal account and the creditor side of income account (1). At the stage of confirming the actual observed value (on 30 April), it is transferred from the debtor side of the actual profit account to the creditor side of the ex post marginal profit account (2). At the same time, the optimum value of the ex post is calculated and is transferred from the debtor side of the ex post marginal profit to the creditor side of the ex ante marginal profit (3). As a result we find the opportunity cost variance in the ex post account and forecast variance in the ex ante account. They are transferred to the income account with fixed costs (4 and 5).

Even those who have no knowledge of linear programming and the ex post programme model can, by using this formal accounting system, understand the reasons for the difference between planned and actual profits, and improve the decision-making and performance process in order to minimize opportunity costs in the next period. Simultaneously, they can find the effect of these variances on corporate profit. The formal accounting system functions as a catalyst connecting individual management activities with corporate profit. The visibility, which only the 'accounting eye' can give us, namely accounting visibility, is indispensable to any organizational management (Hopwood, 1986). However, as the flow of accounts and date of the entry show, this formal accounting system exposes its limit in the development of feed forward management, because the ex post value is entered in a book on 30 April, after the actual profit is observed. The formal accounting system further makes it clear that the ex post system is substantially based on feedback

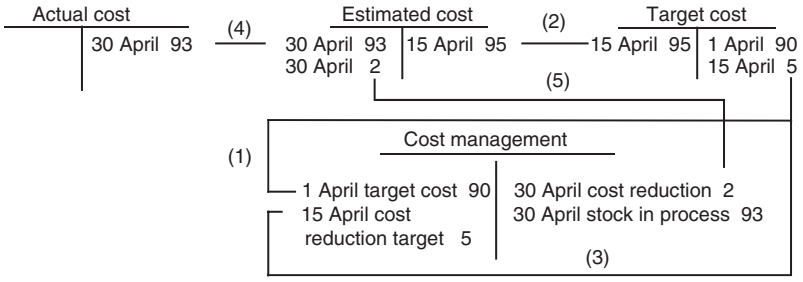


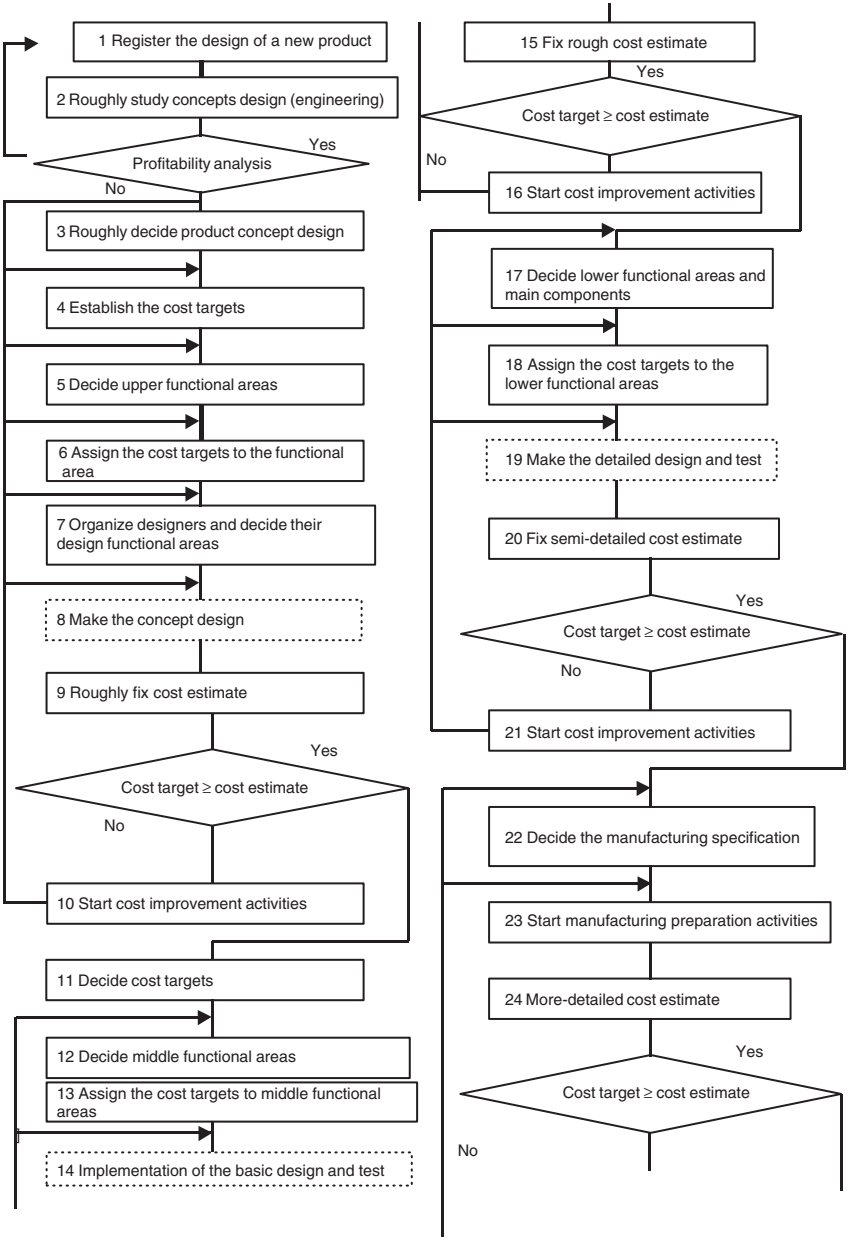

*Figure 10.4* Target costing and formal accounting system

thought. We can easily identify the problems of Demski's system with the 'accounting eye'. Cost design offers a step towards solving the problems.

Cost design, as illustrated in Figure 10.5, repeats the comparative analysis between target and estimated costs, and the preventive, proactive action for improvement – that is to say, feed forward control. Thus, it is a most important issue whether a formal accounting system can reflect this repeated process of the feed forward control in a bookkeeping system. With reference to the above system, this would be easy to construct in accounts. Supposing that target cost is 90, estimated cost 95, and actual cost 93, we can show above the accounting system that reflects cost design activities. First, the target cost is given 90 on the credit of the target cost account and the debit of cost management account (1). The estimated cost is fixed on 15 April by using value engineering and value analysis (see Figure 10.4).

Cost variances are recognized as the cost reduction target at the stage of design and plan of a new model for product and the unrealized target of cost reduction at the stage of production process (2–5). In particular, the target of cost reduction at the stage of design is useful for giving managers information for preventive and proactive cost management. If the actual cost is lower than the estimated cost, the variance will show the realized part of the cost reduction target, namely the variance between the target and the estimated cost (Nishimura, 2000a). This system can illustrate the relationship between the target of cost reduction and its result away from the analysis of opportunity and its cost variance. However, this accounting system cannot make clear relations between the target of cost reduction and the continual improvement at the level of design and plan of the product. It does not give managers preventive, proactive information in advance. Accordingly, this formal accounting system should be more deeply examined.

As indicated in Figure 10.5, cost design consists of repeated feed forward and feedback control systems, and cost accounting, which compares the target cost with the estimated and standard costs, plays an important role in carrying out feed forward control. In order to distinguish the target of cost reduction from the achievement of the target, we should establish the


1 Register the design of a new product
2 Roughly study concepts design (engineering)
Profitability analysis
Yes
No
3 Roughly decide product concept design
4 Establish the cost targets
5 Decide upper functional areas
6 Assign the cost targets to the functional area
7 Organize designers and decide their design functional areas
8 Make the concept design
9 Roughly fix cost estimate
Cost target ≥ cost estimate
Yes
No
10 Start cost improvement activities
11 Decide cost targets
12 Decide middle functional areas
13 Assign the cost targets to middle functional areas
14 Implementation of the basic design and test
15 Fix rough cost estimate
Cost target ≥ cost estimate
Yes
No
16 Start cost improvement activities
17 Decide lower functional areas and main components
18 Assign the cost targets to the lower functional areas
19 Make the detailed design and test
20 Fix semi-detailed cost estimate
Cost target ≥ cost estimate
Yes
No
21 Start cost improvement activities
22 Decide the manufacturing specification
23 Start manufacturing preparation activities
24 More-detailed cost estimate
Cost target ≥ cost estimate
Yes
No

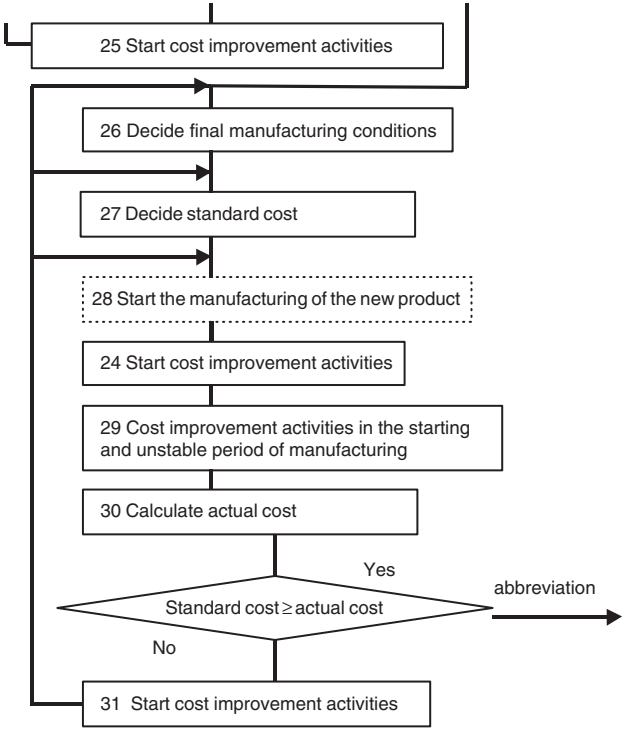



*Figure 10.5* Outline of target costing (cost design) activities

*Notes*: Numbers 1 to 4 shows the activities of product design, from 4 to 10 the activities of product concept design, from 10 to 15 the activities of basic design, from 15 to 20 the activities of detailed design, from 21 to 26 the activities for manufacturing preparation of a new production, and from 26 to 30 the activities in the starting and unstable period of manufacturing.

*Source*: M. Tanaka, *Theory and Practices of Target Costing (Cost Design)* (Tokyo: Chuo Keizaisha, 1995), 19.

concept of *virtual cost*[22] that would occur over several years without improvement and model changes. The virtual cost is not the same as the actual cost, since it must reflect changing price of production elements and changes such as official rate and exchange rate over forthcoming several years. We will use a very simple example to explain feed forward cost bookkeeping.

## Example

We suppose that the volume of production is one unit and the company adopts monthly cost accounting in order to simplify the explanation. All journal entries are abbreviated. However, the reader can understand them through the number and by following up each journey entry and arrow.

**1 April 2000**: Suppose that the hypothetical product cost will be ¥120 in the future, if the product continues to be manufactured without improvement over several years. It is certain that the cost of the product will not be competitive in the markets in terms of cost and quality. The *virtual cost* is ¥120. At the same time, the company is planning to develop a new product similar to this product and knows that the target cost must be ¥100 in order to realize the target profit from the viewpoint of the long-term profit plan.

**10 April**: The planning department cooperated with the costing department to compare the cost of its own product with that of the most competitive product of the rival company. The department resolved the rival product into pieces and parts and reassembled them into a new product after making improvements to materials, engineering, working system, and so on. The cost of the new product is estimated at ¥110 as a result of using new materials and engineering processes. The estimated cost is ¥110.

**15 April**: The company could reduce cost by ¥2 by changing parts and rearranging the manufacturing method and tools as a result of improvements throughout the whole company.

**20 April**: The company carried out the improvements and accepted some beneficial proposals from employees before production. It adopted them to change the labour organization and rationalize maintenance works. This improvements resulted in bringing the cost down to ¥105. Therefore, the standard cost is now ¥105.

**30 April**: We found from the ledgers that actual direct materials were ¥50, the actual direct labour ¥40, and the actual overhead ¥30. The cost of the finished product is ¥107 and the work in process at the end of the month is ¥13.

The flow of accounts of the above journey entries is shown in Figure 10.6.

First, the virtual cost is entered on the creditor of virtual product cost account and on the debtor of product cost management account (1). At the same time, the target cost is entered on the creditor of product cost management account and on the debtor of cost of sales account (2). The company recognizes the target of cost reduction, ¥20 in the product cost management account. On 10 April, the estimated cost is entered on the debtor of the virtual product cost account and the creditor of the estimated product cost account (3). Cost improvement, ¥2 at the design stage of the product is recorded on the debtor of the estimated product cost and the creditor of the virtual product cost account (4). Thus, the company totally realized the achievement of cost reduction by ¥12 at the stage of design and plan process. This amount is transferred to the creditor of the cost management account (5). The cost improvement before starting production is moreover entered on the debtor of the estimated cost account and the creditor of the

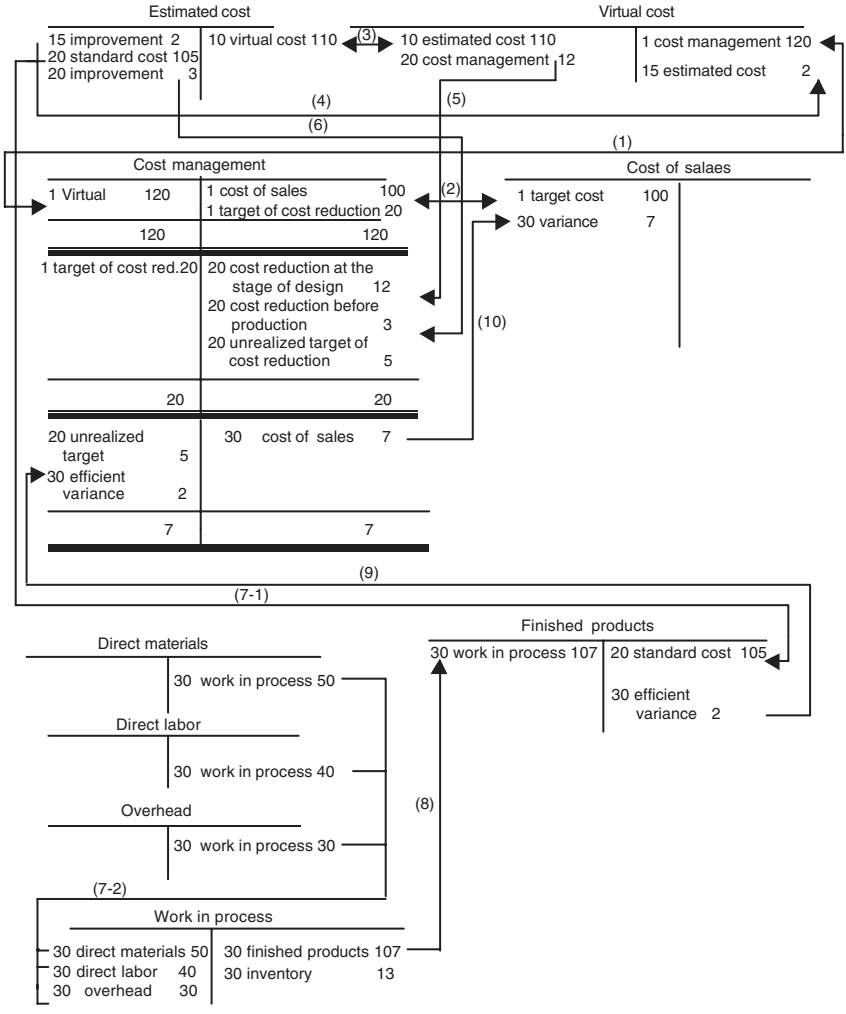



*Figure 10.6* Feed forward and cost bookkeeping

cost management account (6). As a result, the standard cost on the debtor side is transferred to the creditor of finished product account (7). At this stage, the company knows that there remains the unrealized target of cost reduction, ¥5, in the cost management account and tries to do its best for cost reduction in the production process. However, waste or inefficiency occurs in the manufacturing process, which is shown as efficient variance in the finished product account (9). The sum of the unrealized target and

efficient variance, ¥7 is transferred from the creditor of the cost management account to the debtor of the cost of sales account (10).

The formal accounting system makes it possible to follow the continual process of improvement at the level of product plan and design, momentarily give managers information, and urge them to adopt some proactive, preventive management for more advanced improvement. The virtual account is the very core of the feed forward formal accounting system, which can support feed forward management. This is also the 'accounting eye' to look at predictable input–output relationships. The accounting system can recognize the target of cost reduction and its achievement as the variance between the target, estimated, and standard costs before starting production. However, finally the variance between the standard cost and the actual cost represents either waste, or efficiency as a result of the feedback system. Accordingly, the company can understand the relations between the preventive, proactive cost management and the reactive, reflective cost management. This accounting system can obtain access to strategic issues jointly with management control.

While management activity is related to one that is carried out in a peculiar time and place, accounting to the activity that is periodically implemented: daily systematical record and calculation and periodical summarization. Although management intends to expand in strategic and non-monetary activities, accounting cannot take the same shape as the trends of management, since its controllable area is mainly limited to the monetary world, or profit concept. Therefore, it is most important for accounting systems to rearrange the strategic, non-monetary information for profit and cost information and absorb them into the formal accounting system and management control. Consequently, relations and effects of management activities with and on the profitability of the whole company can be made clear through the formal accounting system.

## 10.6 Conclusion

It is evident that the strong recent demand for strategic management has revealed the current limits of the accounting function, and that accounting cannot directly respond to the issues that have been raised. A company must skilfully deal with monetary as well as non-monetary information in order to cope with contingent strategic issues. While the corporate strategy is closely connected with a peculiar activity related to the future way for the company, accounting has the general characteristic of converting peculiar activities into profit or cost information. Some of the present-day accounting scholars insist on the limit and weakness of strategic function in the accounting system and tend to shift their focus from the formal accounting system to organizational management and culture. We should question whether the accounting visibility becomes dysfunctional under the strengthened strategic

management, or whether our world changes to one that everything can do without accounting.

Accounting has been undermined in the past in the face of rapidly-changing environments. For example, so enhanced was the socialist ideology among labour and farm classes in the periods of the Great Leap Forward and the Great Cultural Revolution in China that governments and peoples neglected and denied the use of accounting systems. However, it was clear from the final results of these movements that the planned economy in China could go badly, and her economic order finally ended in chaos (Nishimura, 1989).

The more important strategic management is and the more intelligent and creative managers must become, the more useful information on profit and costs is for proactive, preventive management. At present it is an important theme for accounting students to investigate how to flow strategic and non-monetary information into the profit and cost accounting stream. Even if the function of accounting is currently rather limited, it is impossible to conceive of economic systems existing without it. At the same time, accounting must not be forced into other areas. We have no alternative but to realize its narrow controllable sphere and its particular role in today's business management. It may be a patient and unattractive work. The accounting function should be conceptually divided from the management function, and the two must be connected to each other. In this case, the visible function inherent in accounting, or the accounting eye, should be created and evolved.

We should firmly believe that accounting can quantify much of the business world by means of profit and cost concepts, without which nobody would reach to the concrete recognition of a business enterprise and for which nothing could be substituted. This book attempts to show the present role of management accounting by developing feed forward thought and market strategy as part of the bookkeeping function. Moreover, with regard to the method of study, it is clear that there are many ways to obtain access to objective truth: mathematical analysis, case study, or historical analysis. All methods are tied to the development of accounting science, or the scientific recognition of accounting phenomena. Although Demski's linear programming approach seemed to be very far removed from practical issues and irrelevant to business matters in the real world, it held the same common philosophy as cost design. At the same time, we should understand that practices of cost design do not directly reflect scientific theories and concepts, which we could not definitely obtain until the practices are sublimated in some theoretical contents by several research methods. Accounting *scientists* should inquire into the long-term truth rather than trying to find some methods that contribute to practical utility in the short term. Accounting is also a science.

# 11
# Conclusion

The analysis in this book has focused on the concept of feed forward control. However, the concept should be further systemized, since each chapter has not necessarily been systematically conscious of the concept and used it to analyse objects of research overall. Rather, as a result of the analysis, the author simply arrives at a conclusion that the concept of feed forward control should be more fully developed in the realm of management accounting. In this sense, the study should be seen as the start of a journey for plentiful feed forward management. In this last chapter, the author will rudimentarily summarize its framework in relation to management accounting.

In this book, feed forward management is divided into a feed forward planning process and a control process in a narrow sense. However, it is in practice very difficult to separate the two, since the processes are closely connected. Concerning the planning process, plural planned values are repeatedly compared and examined according to changing business environment information, and a planned value is crystallized through a feed forward control process. On the other hand, feed forward control is a proactive and preventive activity intended to set up an attainable target by comparing the differences in the planned values, allocate it to each unit in an organization, and consequently minimize variance between the planned and actual values beforehand by using proactive and preventive activities. Feed forward management is a circle in which planned values are set up and corrected according to different environment information by means of many proactive and preventive procedures and methods. Therefore, feed forward management is a management system aimed at minimizing risk and prevents the breeding of opportunity cost.

The relationship between feed forward and feedback management systems is illustrated in Figure 11.1. The vertical relation shows feed forward management, which is composed of the planning process, environment information and correction (control process) of objects, while the horizontal relationship presents feedback management, which consists of the traditional plan and control system. Japanese target costing not only suggested

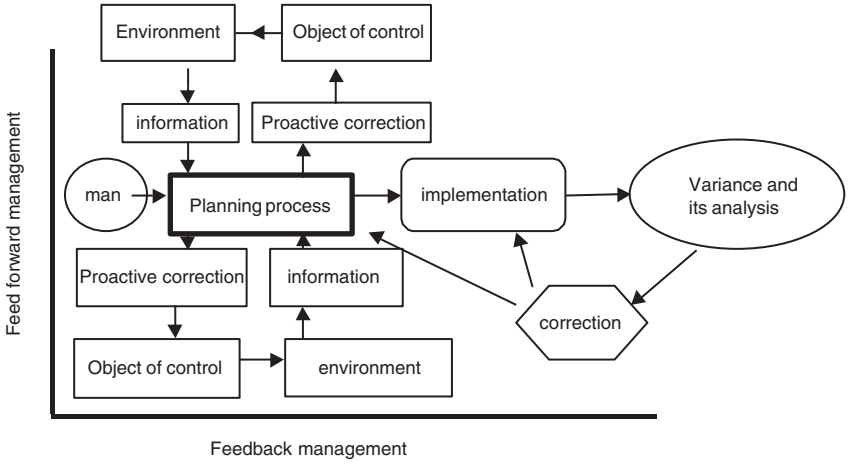



*Figure 11.1* The relation of feedback and feed forward control systems

some ideas of feed forward management, but also progressed itself by virtue of its development. As described in various chapters in relation to the Demski model, the quantitative approach of management accounting also contributed to the development of feed forward thought. We could recognize the essence of the latest phenomena of management accounting, when we historically and synthetically studied them from the viewpoint of feed forward management. At present, when it is difficult for feedback control to fulfill its function in the societies that face too high a risk and opportunity cost, many companies must place a great emphasis on feed forward management. Thus, we should also take basically the direction of study toward feed forward management.

Although feed forward control has been considered to be part of feedback control, or the planning process, until now, it will be more relatively independent of feedback control and have its peculiar function in the future. In the social sciences, it has been a very important principle that every failure is a stepping-stone to success. However, in the current competitive business environment, a simple failure may cause catastrophic damage to a company and the size and scale of production and complexity of market are so substantial that a few senior managers can hardly control them without the cooperation of all employees. Thus, successful big businesses have numerous checking systems, which can absorb opinions from a wide range of customers and employees. In this sense, inner-cooperative management, equality and democracy in workshops, and constant monitoring to perceive the needs of customers and societies will become more and more important. Social science should also pay sincere attention to feed forward control in a broad sense just as do environmental science, fuzzy control, or psychoanalysis.

When we apply the concept of feed forward to management accounting, we can see new possible developments in today's management accounting. All economic activities are controlled through feedback and feed forward processes. Thus, these activities can be pertinent and productivity-oriented. As the production process became complicated and socialized, human beings can no longer control them single-handedly. Humans invented bookkeeping as a means of feedback control in order to systematically continue the pertinent and productive production. Business men used it to control the production process before the twentieth century.

With regard to management accounting, in the early days of scientific management managers and accountants created budgetary control and standard costing and added a feed forward analysis to bookkeeping. However, the management accounting system at this time was still based on feedback thought as it then existed, since the analysis of cost and profit variances was implemented after the occurrence of actual costs and profits. As a result of these procedures managers recognized inefficiency, waste or loss, and could revise future plans.

Moreover, in the 1970s Western accountants developed the feed forward control system through the study of quantitative and mathematical management accounting methods. They also adopted the variance analysis of costs and profits in order to advance the decision-making process. A particular emphasis was placed on the control of the decision-making process and the evaluation of senior managers' performance. However, although the method of analysis had a feed forward thought as it compared ex ante value with ex post value, it could not fly out of feedback thought because of the overemphasis of opportunity cost.

At the same time, Japanese enterprises started to adopt a different direction from the quantitative and mathematical approach. They created the concepts of 'cost design' and 'cost improvement' and developed the preventive and proactive methods for cost reduction as well as new production methods and organizational management. Although their analysis, which compares target cost with estimated costs and standard costs, is similar to the Demski model, it mainly focuses on the preventive and proactive cost reduction, feed forward control, not the recognition of opportunity cost. The analysis method can clarify the attainment of cost reduction target, or 'irreversible cost', to prevent the occurrence of opportunity cost. This is completely regulated by feed forward thought. Generally, the irreversible cost is related to customer-creation and retention cost or pollution preservation cost.

The relationship between feed forward and feedback in management accounting is given in Table 11.1. What can be seen from this table is that feed forward management accounting is still based on feedback bookkeeping. This remains an unsolved problem. We must make a step forward to the new development of feed forward accounting system.

*Table 11.1* Feedback and feed forward in cost accounting

| | *Planning process* | *Control process* |
|---|---|---|
| Feed forward management | Comparison of plural planned values (target and estimated costs), the relativity of planned value | Allocate target (cost reduction target) to each unit and proactive, preventive action |
| Feedback management | Comparison of planned and actual values (standard and actual costs), the absolute of planned value | Variance analysis and investigation of its causes, and reflective, remedial action |

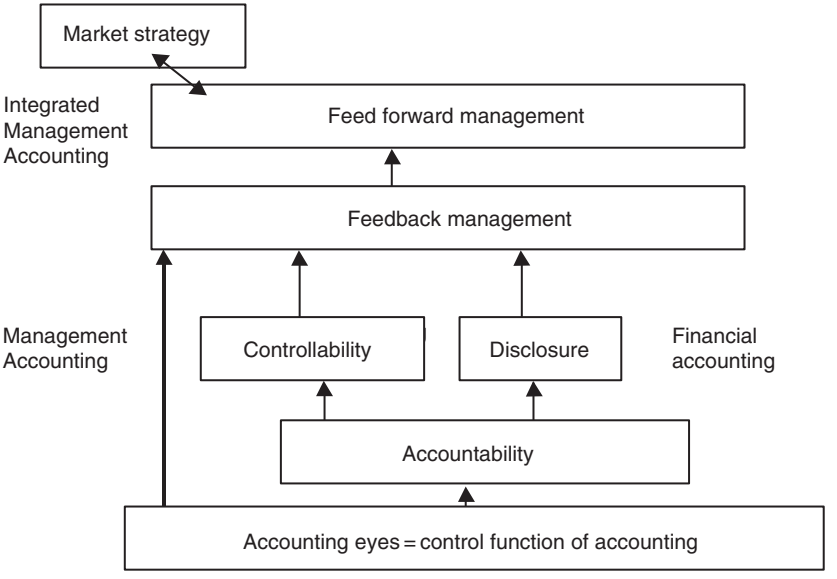



*Figure 11.2* Accounting function and management accounting

This book concludes that Japanese management accounting is characterized by the integration of feed forward management and market strategy and by the possibility of building a feed forward formal accounting system, and Asian management accounting is shifting from feedback management and efficiency control to feed forward management and market strategy. At the same, this book can depict the essential structure of management accounting by using the feedback and feed forward concepts as in Figure 11.2.

Finally, this book should stress that accounting continues to progress without interruption, and sometimes makes rapid progress thanks to the scientific reorganization of accounting phenomena. Every method of study in every country can contribute to this reorganization. At the same time, it should be mentioned that although many non-financial information and management methods can support the progress of management accounting, accounting cannot be given birth to only by them, since accounting eyes can develop only through the progress of the accounting function of control.

This book also analysed Asian management accounting practices from the viewpoint of feedback and feed forward control systems. Further information on these is given by the monograph, *Comparative Study of Asian Management Accounting*, in which the author summarized findings of the questionnaire implemented in cooperation with some staff of universities in Singapore, Malaysia, and Thailand (Nishimura, 2003). Although most Japanese accounting students have regarded Asian management accounting as 'underdeveloped' by Western standards and their recognition is infallible in terms of labour productivity, as experienced in Japan, Asian management accounting may also have a possibility of development of feed forward control system, since under the establishment of wide knowledge assets the cooperative society and collectivism in Asia may be advantageous for the formation of proactive and preventive organization. Asian accounting scholars should open a path to the extensive development of international management accounting by generalizing and specializing Asian management accounting.

# Notes

1. With regard to the relation between bookkeeping and mathematics, see R. P. Brief (ed.), *Four Classics on the Theory of Double-Entry Bookkeeping* (New York: Garland Publishing, Inc., 1982), where the works of F. W. Cronhelm (1818), A. D. Morgan (1853), C. E. Sprague (1880), and A. C. Cayley are introduced. Concerning the economic and political aspects of accounting, a Japanese critical school debated them. In the 1930s, some researchers analysed the basic nature of cost in comparison with K. Marx's value concept. After the Second World War, the Japanese critical accounting school was formed which criticized large business in terms of the exploitation and its window dressing of monopoly profit.
2. Professor K. Kurosawa introduced J. F. Schar's *Grenzgebieten der Wirtschaftwissenschaft* and developed the thought of the boundary science. See K. Kurosawa, Basic Thoughts in Accounting – 3, *Accounting*, (Japanese) vol. 87 no. 6 (1965), 1–10.
3. Hopwood (1986) pointed out that accounting was one of the methods of revealing the situation of functions immanent in the organizational economy. According to him, the accounting system offers a clear and rational picture. It can translate events which could not be known without it, into the organizational records. The accounting eye, although not visible in itself, makes the physical aspects of an organization not only visible, but also controllable.
4. The National Association of Accountants (NAA), Tokyo Division produced a survey on the usage of costing in Japan and the USA. Some of the results are shown in Table 4.1. For further detail interested readers are referred to the actual survey published in *Management Accounting in New Production Environment* (1988).
5. The Nissan Motor Company was the second-ranked company in the domestic production of cars, producing 2.37 million cars in 1989. The sales and recurring profit were 45.5 billion yen and 18.4 million yen in the same year (Tanaka, 1991). The corporation had 25 subsidiary and related companies in foreign countries. On 31 March 1994, the corporation fell into the red (a group net loss of US$500 million) for the first time since the Second World War. However, on March 2001, the company improved ROA from −10.17 per cent in 2000 to 5.10 per cent and ROE from −62.67 per cent to 35.08 per cent.
6. The fixed amount of model cycle means to depreciate the whole expense of product project by a fixed percentage on the original cost method. The service life is about four years. However, the company adopts the diminishing balance method in calculating depreciation across all facilities (Tanaka, 1991).
7. 'Horizontal organization' has been examined in previous research. Interested readers are referred to Hall et al. (1991) and Kharbanda et al. (1991).
8. Culture is considered behaviour and thought patterns in a particular society, which have been established over a long period of time in relation to its religions, arts and way of life. However, with regard to Japanese culture, the main subject of discussion in this chapter will be strong collectivism and masculinity.
9. Business economists in Japan have discussed the cultural background of Japanese management mainly from the viewpoint of *ie* (household) or collectivism. They tend to praise Japanese management culture in prosperous days, but criticize it and lean towards Western individualistic management in depression days. They miss

the different aspects of national and organizational cultures. Therefore, it is an unsettled question whether the seniority system, lifetime employment and teamwork are caused by *ie* or collectivism (Kawakami et al., 1994).

10. They conclude that Japanese collectivism placed more emphasis on team performance than on individual achievement – the latter being a characteristic of American budgetary control. However, in Japanese companies, 'team-based work' is 'a very threatening form of social control' for individual workers (Rehder, 1989). Even if it is taken for granted that collectivism is strong in Japanese management, collectivism does not necessarily exclude the strict evaluation of individual performance.
11. In Japanese automobile companies, *sarashikubi* (the customary practice in the Japanese feudal age, when a feudal lord killed a criminal, cutting his head off, and displaying it in public to prohibit further occurrence of the crime), *andon* (Japanese oil lamp) and *kanban* (sign board) are combined with computer-aided management systems to effectively implement visible management in workshops, although these Japanese words imply a somewhat strong feudal and oppressive attitude.
12. Yearly average labour hours in Japanese motor companies are 230 hours longer than their American counterpart (Murayama and Fujii, 1991).
13. For Japanese car manufacturers affiliated in Thailand, cost design is in the hands of the head offices in Tokyo; the affiliates are only in charge of continuous cost improvement (Yahata and Mizuno, 1987).
14. In 1981, when the Nissan Motor Company studied the feasibility of establishing a new motor plant in the UK, it concluded that the project would suffer deficits for ten consequent years. Therefore, the company could not join the UK motor industry without strong urging by and subsidy from the British government (Hashimoto, 1986).
15. 'Integrated management accounting' may remind us of the balanced scorecard (see Kaplan and Norton, 1996). This is also an integration of strategic goal and performance valuation indicators. However, there is a fundamental difference in control thought between cost design and balanced scorecard. The former adopts a stratified feed forward control system to integrate many factors of management into business strategy in contrast to the complicated loop of feedback control system in the latter. We attach much importance to the integration based on the feed forward control system.
16. A feedback control system is one of cybernetics, monitoring the variance between planned and actual values when behaviour is based on the planned value and the actual performance is inconsistent with it, and adopting various methods to minimize the deviation. Therefore, this is named a reactive and reflective control system, since revised actions follow the completion of planned actions. Because operational processes are regulated by planned values, they are supposed to be truly standards that need not be revised beforehand. Regulators begin to fulfill their functions after observing the actual results.

    On the other hand, a feed forward control system is one that monitors and censors the variances among the planned values in the light of changing environmental information, and adopts various methods and equipment beforehand to realize the most practical goal. Therefore, this is considered a proactive and preventive control system. Planned values are supposed to be truly controllable and modifiable objects; they are objectives to be controlled, and regulators should fulfill their functions before observing the actual results. Accordingly, this censor should be wide-ranging and sensitive to environmental information.

Intuition and experience as well as the use of computer, as a censor, play important roles in realizing the most practical goal.

In the case of business management, this censor should be installed in the decision-making structure of not only senior managers, but also of all employees, just like hands and feet whose touch to the exterior links to a cranial nerve. At present, it is most important how every enterprise pumps up strategic technical and marketing information from employees at the workplace. This is also connected with the democratic and egalitarian atmosphere at the workplace: empowering employees. Thus, the establishment of the feed forward control system calls for a revolution in business control and organization. Were it not for the revolution, it would not be realized.

In addition, the feed forward control system has a longer-term and more strategic aspect than the feedback control system. Although the feedback control system is also applied to a long-term plan, it runs more efficiently in the short-term, because some irrevocable cases occur and their restoration costs are high when actual results deviate greatly from planned values. Feed forward control focuses on the planned process for preventive management, while feedback control depends on the enforcement process of the plan. Wilson and Chua (1993) conclude that feedback systems are typically cheaper and easier to implement than feed forward systems. They reach this conclusion by using the relative strengths of the two systems as in the method followed by Cushing (1982).

| *Characteristic* | *Feed forward* | *Feedback* |
|---|---|---|
| Low cost | | Yes |
| Ease of implementation | | Yes |
| Effectiveness | | Yes |
| Minimal time delays | Yes | |
| Self-regulation | Yes | Yes |

However, if one reconsiders them from the viewpoint of the elapsed time of control, the conclusion may be different from the above.

| *Characteristic* | *Feed forward* | | *Feedback* | |
|---|---|---|---|---|
| | *Short-range* | *Long-range* | *Short-range* | *Long-range* |
| Cost | High | Low | Low | High |
| Implementation | Difficult | Easy | Easy | Difficult |
| Effectiveness | Low | High | High | Low |

Feed forward control is inseparably related to feedback control. However, one should recognize that recent business management must lay more emphasis on feed forward control, since it relates closely to worldwide marketing and industrial effects on an ecosystem. If a big company produced and sold poor healthy goods in international markets, restoration would be difficult and its cost to the company would be severe, as some Japanese food and motor companies recently experienced. Currently, many cases are occurring, against which feedback control is not efficacious. We should clarify the fundamental natures of feed forward control system in order to establish more strategic and preventive business management from the viewpoint of the ecosystem.

17. Based on his observation on research in management accounting by North Americans in the 1990s, Shield (1997) concludes:

> Businesses are continuing to be more strategic in terms of developing and coordinated long-term plans for optimizing their global value chains. Strategic management concurrently is being decentralized to many employees in contrast to it being the domain of a small group of central staffs. Most research in management accounting, however, is related to tactical, operational, and short-term decisions and actions.

18. Kaplan and Cooper (1998) describe the relation between Japanese management and Western researchers as follows:

> Most Western observers first became familiar with *kaizen* by studying the Japanese approach to improving quality and cycle time performance. The observers are somewhat less acquainted with how Japanese companies apply *kaizen* to reduce cost. Cooper, in his extensive study of Japanese cost management practices, has documented *kaizen*-costing systems used by several important companies. (p. 58).

19. Adler (1999) exquisitely arrives at the same conclusion. He concludes that the best way forward is not to choose one of alternatives, but a hybrid approach that embraces the two alternatives and combines them into one.
20. Cooper (1996) describes the implication of standards recently carried out by Japanese companies as follows: 'In environments in which *kaizen* programs are operating, the standards that are used to generate those standards either reflect the expected improvements due to continuous improvement activities or the analysis of variances has to be modified accordingly.'
21. Concerning Demski's model
*Revision of ex ante value based on immediate information or after the observed value*
The ex post method is effectual under the condition of changing marginal profit, or the changes of sale price, or the cost of production elements. However, it faces problems in the case of changing resource restriction.
Example: Suppose the following objective and restrictive functions.

$$\begin{aligned}&\text{Max } 3x + 5y\\ &\text{s.t. } 2x + y \le 16 \text{ – materials}\\ &\qquad x + 2y \le 11 \text{ – labour hours}\\ &\qquad x + 3y \le 15 \text{ – machine work-hours}\\ &\qquad x, y \ge 0\end{aligned}$$

In this case, we find 31 as the ex ante profit (optimum $x$ and $y$ are 7 and 2) when solving this LP. After starting production, the company found that one material was in short supply due to some mistakes. Moreover, the marginal profits of $x$ shifted from 3 to 4 and that of $y$ changed from 5 to 4 because of fluctuation in price. The observed value is 36 according to Demski's thought that a senior manager produces the ex ante volume as a optimum one even under changing conditional variables: $\begin{pmatrix}4\\4\end{pmatrix} \times \begin{pmatrix}7\\2\end{pmatrix}$. The ex post value is 34.67: $\begin{pmatrix}4\\4\end{pmatrix} \times \begin{pmatrix}\frac{19}{3}\\ \frac{7}{3}\end{pmatrix}$. Thus, the variance of 5 as a result of deducting 31 from 36 is analysed as follows.

Forecast variance: $31 - 34.67 = -3.67$
Opportunity cost variance: $34.67 - 36 = -1.33$

$-1.33$ represents profit variance, not opportunity cost. However, its solution is unreal, since the observed value cannot exceed the optimum of the ex post. Actually the company cannot produce 7 units of $x$ and 2 units of $y$, because one material is in short supply, or because of the restriction on the resource. Thus, the company must immediately alter the original ex ante model according to information on changing resources.

$$\begin{aligned}&\text{Max } 3x + 5y\\ &\text{s.t. } 2x + y \le 15\\ &\qquad x + 2y \le 11\\ &\qquad x + 3y \le 15\\ &\qquad x, y \ge 0\end{aligned}$$

Accordingly, the second ex ante profit is 30.67, because of $x = \frac{19}{3}$ and $y = \frac{17}{3}$. The observed profit represents 34.67 by multiplying the volume of each product by 4, the marginal profit per the unit of $x$ and $y$, while the ex post profit is also 34.67. As a result, the variance of $-3.67$, namely 31 minus 34.67, is analysed as follows:

First forecast variance: $31 - 30.67 = 0.33$
Second forecast variance: $30.67 - 34.67 = -4$
Opportunity cost variance: $34.67 - 34.67 = 0$

What is the meaning of 0.33 and $-4$? The former shows the decreased opportunity of earning profit owing to the changing restriction of resources, while the latter the wrong forecast of profit-earning opportunity owing to the fluctuation in price. Both of them are related to the forecast of profit opportunity. Consequently, the opportunity cost variance can be recognized as the difference between the ex post profit and the observed one. It follows that the Demski model is strongly based on the recognition of profit opportunity and opportunity cost, and faces some problems in the face of changing resources restriction and in the case of introducing immediate information into his model, where opportunity cost variance disappears.

*The Demski model and dual analysis*

We must adopt dual analysis to solve the resource restriction problem in order to clarify the essential feature of the Demski model and develop it further. Let us illustrate this by means of an example.

A company calculates the ex ante program under the following objective function and restrictive conditions.

$$\begin{aligned}&\text{Max } 3x + 5y\\ &\text{s.t. } 2x + y \le 16\\ &\qquad x + 2y \le 11\\ &\qquad x + 3y < 15\\ &\qquad x, y \ge 0\end{aligned}$$

The ex ante optimum is 31: $\begin{pmatrix}3\\5\end{pmatrix} \times \begin{pmatrix}7\\2\end{pmatrix} = \begin{pmatrix}\frac{1}{3}\\ \frac{7}{3}\\ 0\end{pmatrix} \times \begin{pmatrix}16\\11\\15\end{pmatrix} = \frac{16}{3} + \frac{77}{3} = 31$

At present, suppose the change of the original model to the following owing to the changes of marginal profit and resource restriction:

$$\begin{aligned}&\text{Max } 4x + 4y\\ &\text{s.t. } 2x + y \leq 19\\ &\qquad x + 2y \leq 14\\ &\qquad x + 3y \leq 18\\ &\qquad x, y \geq 0\end{aligned}$$

According to Demski's model, the observed profit makes 36 by multiplying 4 and 7, and 4 and 2, and adding the products. At the same time, the ex post profit represents 44 by solving LP: $\begin{pmatrix}4\\4\end{pmatrix} \times \begin{pmatrix}8\\3\end{pmatrix} = \begin{pmatrix}\frac{4}{3}\\ \frac{4}{3}\\ 0\end{pmatrix} \times \begin{pmatrix}19\\14\\18\end{pmatrix}$
Consequently, the variance is analysed as follows: 5 profit variance, −13 forecast profit variance, and 8 opportunity cost variance.

Forecast variance: $31 - 44 = -13$
Opportunity cost variance: $44 - 36 = 8$

−13 indicates the wrong forecast of profit opportunity, of which only 8 is lost as opportunity cost variance. Accordingly, the company realized 5 of 13 profit opportunities, namely earned 5 profits more than the ex ante. However, we can know nothing more than that. We must further proceed to the dual analysis in order to get information on reasons of the variance. The following table indicates the forecast variance of profit opportunity when we made the dual analysis. We already knew each shadow price and number of the resources in the ex ante and the ex post: $\begin{pmatrix}\frac{1}{3}\\ \frac{7}{3}\\ 0\end{pmatrix} \times \begin{pmatrix}16\\11\\15\end{pmatrix} = 31$ as the ex ante value and $\begin{pmatrix}\frac{4}{3}\\ \frac{4}{3}\\ 0\end{pmatrix} \times \begin{pmatrix}19\\14\\18\end{pmatrix} = 44$ as the ex post value.

| Production elements | Volume variance | Price variance | Total |
|---|---|---|---|
| Material | (1) −4 | (3) −16 | −20 |
| Labor | (2) −4 | (4) 11 | 7 |
| Total | −8 | −5 | −13 |

* (1): $(16 - 19) \times 4/3 = -4$ (2): $(11 - 14) \times 4/3 = -4$ (3): $(1/3 - 4/3) \times 16 = -16$ (4): $(7/3 - 4/3) \times 11 = 11$

Although Demski's model, or the primal analysis, only indicates the increase of 13 profit opportunities, the dual analysis can clarify the increase of 20 profit opportunities about materials and the decrease of 7 profit opportunities, namely loss opportunity, about labour-working hours, as a result of which we can find the increase of 13 profit opportunities. Consequently, this recognition can lead to a deeper analysis of opportunity cost variance.

We can calculate the opportunity cost variance caused by the changes of resources by using the dual approach: 4 opportunity cost variance about materials since their actual usage is 16 units, and 4 opportunity cost variance about labour-working hours since their usage is 11 units.

Materials: $(19 - 16) \times 4/3 = 4$
Labor working hours: $(14 - 11) \times 4/3 = 4$
Machine hours: $(18 - 15) \times 0 = 0$

These variances indicate at what distance the actual usage of each resource is away from the optimum use of the ex post program. We can understand the total structure of variances in detail: Concerning the use of materials, the company lost 4 of 20 expanding profit opportunities, and actualized 16 profit opportunities. As for labour-working hours, it lost 4 profit opportunities in addition to 7 shrunk profit opportunities. Ultimately the loss of 11 occurred. As a result, 5 profit opportunities are realized as profits by deducting 11 as the loss of profit opportunity from 16 as the expanded profit opportunity. In the primal analysis, they are recognized as a result of deducting 8 opportunity costs from 13 expanding profit opportunities. On the contrary, the dual analysis can clarify the mutual relations between profit opportunity and opportunity cost, and effects of each changing condition (for example, price and resource) on the occurrence and loss of profit opportunity.

It can be seen from the above examination that the Demski model is developed in the core concept of '*opportunity*' and is fundamentally based on feedback thought. However, it has some possibilities for further development and in several ways: feed forward control by entering immediate information into decision-models, and repeatedly altering them, and dual analysis which makes clear relationships between changing business environments and cost reduction management.

22. Virtual cost: the hypothetical unit cost which, without *Kaizen*, (continuous cost improvement) a company would pay for the production of a product over its lifecycle in a future changing environment: fluctuation rates of prices, interest, or foreign exchanges.

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