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Comparative Analysis of Management Accounting Practices in Australia and Japan: An Empirical Investigation

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Abstract

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Keywords

Japanese Management Accounting, Cost Management, Australian Costing Practices

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A Comparative Analysis of Management Accounting Practices in Australia and Japan: An Empirical Investigation

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Key Words: Japanese management accounting, Cost management, Australian costing practices.

Abstract: *This paper is based on the findings of a questionnaire survey conducted on large manufacturing firms in Australia and Japan during 1997. The results of the survey have revealed a number of important differences between the two countries. For example, while management accounting practices of the Australian companies place an emphasis on cost control tools at the manufacturing stage, those of the Japanese companies devote a much greater attention to cost planning and cost reduction tools at the product design stage. Further, the Japanese companies seem to have introduced more frequent changes to management accounting practices than their Australian counterparts.*

There has been strong criticism in the recent past that accountants in Western countries, particularly in the U.S., have not been able to adapt their management accounting practices to changing technology and methods of production in manufacturing enterprises operating in highly competitive environments (Dilts & Russell, 1985; Brimson, 1986; Johnson & Kaplan, 1987; Lee, 1987). By contrast, several writers have hailed the Japanese management accounting practices as a major contributor to Japan's success in achieving a dominant position in the global competitiveness (Howell, 1989; Morgan & Weerakoon, 1989; Hiromoto, 1988; Kharbanda & Stallworthy, 1991). However, most of these criticisms and claims tend to be supported by anecdotal, rather than systematic, evidence (Shields, et al. 1991). In particular, studies based on empirical investigations aimed at verifying the validity of such criticisms and claims or examining whether Japanese management accounting practices differ from those of other countries are extremely sparse. The latest comparative study reported in the literature is a survey conducted in 1988 on management accounting practices in Japan and Scotland (Yoshikawa et al, 1989). Since then, however, several

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important changes may have occurred in the manufacturing environment and accounting practices of many countries. Furthermore, some of the studies done in Japan have been reported only in the Japanese language. Therefore, there is certainly a need for more systematic comparative studies covering various aspects of management accounting practices in different countries. Findings of such studies, while being useful to academicians in their teaching and research, can provide helpful insights to manufacturers on their relative strengths and weaknesses. Therefore, based on the results of a comparative survey of large manufacturing companies, this paper attempts to present an analysis of some latest empirical evidence on several important aspects of management accounting practices in Australia and Japan.

The survey was conducted in Japan and Australia during 1997. Although the questionnaire used for our survey comprised 31 questions on various aspects of management accounting practices this paper concentrates mainly on areas where a difference was apparent between the Japanese and Australian data. Since Australia represents a Western-type economy an analysis of this sort involves comparison of practices which have evolved within very different cultural contexts. It has been observed by several writers that accounting practices of Japanese organizations are heavily influenced by their unique cultural attributes and the different nature of their management accountants (Takemura & Takamatsu, 1987; Taketera & Yamamoto, 1989; Hudack, 1989; Wijewardena & Cooray, 1995). As such, in order to appreciate the significance of management accounting differences between Australia and Japan, it is important to overview some of the unique features of the Japanese cultural and business environment and their management accountants before examining the survey results. These features are outlined in the next section.

JAPANESE CULTURAL AND BUSINESS ENVIRONMENT

One of the critical features of Japanese organizations is their collective decision-making (*ringi*), which is in direct contrast with individualism of the Western society (Drucker, 1971). Japanese managers debate a proposed decision throughout the organization until there is agreement on it and only then do they make the final decision. Similarly, the responsibility for a decision does not fall directly upon one individual manager. In accordance with the concept of *ringi*, the responsibility for a decision falls on all members of the group (Van Zandt, 1970).

Another very important management strategy which is clearly stated and carried through in Japanese companies is the unique company philosophy. Understanding and supporting the philosophy brings each individual employee closer to the organization and co-employees with shared objectives. This philosophy usually describes the firm as a family, distinct from any other firm, and makes each employee committed to the organization. Accordingly, all employees are identified with their company rather than the profession. For example, if you ask a Japanese cost accountant what his job is, it is quite common to hear from him that he works for a particular company without even mentioning that he is a cost accountant. Japanese cost accountants (like other employees) consider themselves first and foremost company employees rather than functional specialists (Yoshikawa, et al, 1989).

In Japan, many small firms operate as sub-contractors of large firms. Under such a contractual agreement, although the large firm may not hold any shares in the small firm, the

latter firm may actually operate much the same way as a subsidiary. As a result of this relationship, very close co-operation is evident between many manufacturers and their suppliers (Sasaki, 1981). Japanese manufacturing enterprises have benefited immensely from this co-operation. For example, the successful operation of their Just-In-Time inventory system is a result of this close co-operation.

Another factor that has had significant impact on Japanese management accounting practices is the very different nature of their management accountants. In Japanese organizations, management accountants are usually known as 'cost accountants'. Particularly in large enterprises, cost accountants are produced primarily through extensive in-house education and training programs. This firm-specific education and training provided in many Japanese companies is characterized by a unique system of imparting a basic knowledge of cost accounting to all employees in the organization, in addition to providing the accounting staff with a much more comprehensive and advanced program of training (Takemura & Takamasu, 1987). Generally, to become a cost accountant in a Japanese company, the normal route would be via a university degree. However, this may be in any discipline and it is unlikely to be an accounting degree. According to a survey conducted in 1987 by Hiramatsu (1992), 69.4 percent of companies in the sample indicated that there was no relationship between accountants and their university majors. After graduation, employment would commence with two or three years spent in each of various functional areas such as production, marketing, purchasing and accounting. Many Japanese managers have, therefore, worked for two or three years in the accounting division. After perhaps ten years with the company, specialization in cost accounting might commence (Yoshikawa et al, 1989).

By contrast, in Australia all persons aspiring to become accountants pursue a tertiary education program consisting of courses which are quite similar in structure, content and method of instruction, whereas their Japanese counterparts follow programs of training which vary significantly in all the above aspects, depending on the needs of individual employers. Thus, education provided to potential accountants in Australia is more or less general while it is firm-specific in Japan (Wijewardena & Cooray, 1995). This firm-specific nature of Japanese accounting education is a result of their life-time employment policy and the practice that companies requiring accountants recruit young graduates from universities and train them internally with the objective of meeting the skilled needs of an entity and only that entity (Cooke, 1994). Thus, the Japanese management accountant has a very different background to that of his Australian counterpart.

QUESTIONNAIRE SURVEY

The questionnaire initially prepared for the survey was pilot tested on a small group of company accountants in each country before it was finalized on the basis of their responses. The final questionnaire was mailed to the 1000 largest manufacturing companies in each country. The size of companies was based on their total assets. The addresses of these companies were taken from the 1995 Japan Company Handbook and the Dun & Bradstreet (Australia) Database (1996). Since the names of individuals were not available the questionnaire was addressed commonly to the head of the accounting division in each company. Both the questionnaire and the letter of request used in Japan were presented in the Japanese language. The survey was completed during the first half of 1997 in Japan and

Table 1. Profile of the Sample Firm

<i>Type of industry</i>	<i>Firms %</i>		<i>Total assets US\$ million</i>	<i>Firms %</i>	
	<i>Australia</i>	<i>Japan</i>		<i>Australia</i>	<i>Japan</i>
Food and beverages	20	4	Below 10	20	0
Fabricated metal products	17	6	11-50	47	0
Textile	6	3	51-100	11	1
Chemical products	14	24	101-500	17	39
Machinery and computers	3	16	501-1,000	2	21
Electronic and electric equipment	6	15	1,001-5,000	3	31
Transportation equipment	4	12	5,001-10,000	0	4
Furniture and fixtures	6	1	10,001-20,000	0	3
Miscellaneous	24	19	Above 20,000	0	1

<i>Nature of market competition</i>	<i>Firms %</i>		<i>Export Sales Ratio</i>	<i>Firms %</i>	
	<i>Australia</i>	<i>Japan</i>		<i>Australia</i>	<i>Japan</i>
Slight competition	3	0	0	31	25
Moderate competition	14	9	1-25	51	60
Strong competition	63	27	26-50	12	12
Severe competition	19	64	51-100	6	3

<i>Number of employees</i>	<i>Firms %</i>		<i>Annual Sales US\$ million</i>	<i>Firms %</i>	
	<i>Australia</i>	<i>Japan</i>		<i>Australia</i>	<i>Japan</i>
Up to 250	42	2	1-50	56	2
251-500	30	10	51-100	16	2
501-1,000	16	27	101-500	22	45
1,001-5,000	9	50	501-1,000	3	18
5,001-10,000	1	8	1,001-5,000	3	29
10,001-20,000	1	4	5,001-10,000	0	3
Above 20,000	1	1	Above 10,000	0	1

Respondents: 231 Australian companies and 217 Japanese companies

Source: Survey data (1997).

the latter half of 1997 in Australia. Response rates were quite similar, with 217 usable responses from Japanese companies (21.7%) and 231 usable responses from Australian companies (23.1%). A profile of the sample companies is displayed in Table 1.

Table 1 shows that 52 percent of companies in the Australian sample were in the industry groups of food and beverages, fabricated metal products and chemical products as opposed to 65 percent of the Japanese companies were in the chemical products, machinery and computers, electronic and electric equipment, and transportation equipment groups. When the sample companies were classified by firm-size according to total assets, 95 percent of Australian companies were within the asset structure ranging from 10 to 500 million dollars whereas 91 percent of Japanese companies had assets ranging from 100 to 5,000 million dollars. As indicated by the respondents of our survey, all sample companies in both countries faced some degree of competition, with 82 percent of Australian companies and 90 percent of Japanese companies having strong to severe competition. This shows that the respondents at the Japanese companies reported that they faced a greater degree of competition than their Australian coun-

Table 2. Importance of Management Accounting Tools

	<i>Australia</i>			<i>Japan</i>		
	<i>Mean</i>	<i>CV</i>	<i>Rank</i>	<i>Mean</i>	<i>CV</i>	<i>Rank</i>
Budgets	4.22	0.197	1	4.13	0.229	3
Historical accounting statements	3.29	0.294	2	3.82	0.246	6**
Standard costing	3.81	0.303	3	4.06	0.264	9*
Activity based costing	3.59	0.347	4	3.05	0.330	11**
Cost-volume-profit analysis	3.44	0.350	5	4.05	0.228	2**
Ratio analysis	2.98	0.362	6	3.48	0.257	8**
Responsibility accounting	3.24	0.368	7	3.82	0.236	4**
Variable costing	3.22	0.391	8	4.03	0.245	5**
Quality cost reports	3.05	0.400	9	3.57	0.255	7**
Target costing	2.49	0.535	10	4.23	0.213	1**
Transfer pricing	2.47	0.537	11	3.30	0.313	10**

Responses: 225 in Australia and 209 in Japan

Notes: * Significant at 0.05;

** Significant at 0.01.

terparts. Sixty nine percent of the Australian companies and 75 percent of the Japanese companies participated in export trade. However, the export contribution of about three-fourth of these companies in both countries was within the range of 1 to 25 percent of their total sales. Only 28 percent of Australian companies in the sample had more than 500 employees. By contrast, 90 percent of Japanese companies had employees exceeding 500, with 63 percent exceeding 1,000 employees. When the firm size was measured in terms of annual sales, 94 percent of Australian companies had sales ranging from 1 to 500 million dollars against 96 percent of Japanese companies with sales over 100 million dollars. Forty five percent of Japanese firms had an annual sales turnover exceeding 1,000 million dollars. Overall, in terms of total assets, employment and annual sales, the Japanese firms were much larger than the Australian firms.

RESULTS AND DISCUSSION

In four questions used for this study, a five-point Likert scale ranging from "much less important" to "much more important" was utilized for obtaining the respondents' views on the importance of various areas of management accounting. The responses to these questions were ranked in accordance with the coefficient of variation (CV). The Kruskal-Wallis non-parametric analysis of variances was used to examine the statistical significance of differences between Australian and Japanese responses to these questions. The other questions were intended to obtain factual information on the respondents' companies and their management accounting practices. The answers to such questions were analyzed in terms of percentages. Since some respondents failed to answer all questions, the percentages and averages used in the results were based on the total number of firms having responded to each question. The summarized results are given in Tables 2-16. The number of responses to each question is also shown in the tables.

The remainder of this section presents a comparative analysis of the results under several key areas covered in the survey, with emphasis placed on differences in Australian and Japanese practices.

Management Accounting Tools

Some writers seem to hold the view that in the process of cost management Western manufacturing enterprises place heavy emphasis on cost control tools such as standard costing and variance analysis at the manufacturing stage whereas Japanese manufacturers devote greater attention to cost planning and cost reduction tools such as target costing and value engineering at the product design stage (Berliner & Brimson, 1988; Howell, 1989; Yoshikawa, et al, 1989). However, empirical evidence to support this view is limited. In order to gain some insights into one important aspect of this view, we asked the respondents to indicate on a five-point Likert scale the degree of importance they attached to a set of major management accounting tools in planning and controlling product costs in their organizations. The results based on their responses are presented in Table 2.

In the case of budgets, however, there is no statistically significant difference between the two sets of responses. This means that budgets are considered to be an equally important management accounting tool for planning and controlling product costs in both countries. The difference in responses on the use of standard costing is statistically significant at 5 percent while the differences in responses in respect of all the other management accounting tools included in the table are statistically significant at the 1 percent level. The ranking of importance indicates that the Australian companies placed heavier emphasis on budgets, historical accounting statements and standard costing while Japanese companies concentrated more heavily on target costing, cost-volume-profit analysis and budgets. The emphasis of Australian companies on the above three management accounting tools suggests that they pay greater attention to tools that are primarily used for planning and controlling costs and preparing financial statements. By contrast, the emphasis of Japanese companies particularly on target costing indicates that they pay greater attention to cost reduction at the planning and design stage of a new product. This supports the observation of Howell and Sakurai (1992) that "Japanese companies seem to understand better than their Western counterparts that costs should be managed and avoided during the product planning and development cycle rather than after products have entered full scale production." The technique of target costing is commonly referred to as *genka kikaku* in Japanese. This technique has been defined as a product costing system based on market-driven target costs. The target cost of a new product is estimated on the basis of a long-range profit plan and market price estimates. Usually, target costs are established somewhere between standard costs and allowable costs, which are determined by subtracting a target profit margin from the target price. Target price is the price that would provide the company with a competitive edge in the market (Martin et al, 1992). Since target costs are continuously reduced both during and after the design stage to promote continuous improvement this approach helps Japanese manufactures in maintaining a high level of competitiveness (Sakurai, 1989). Target costing is a collective effort of a team consisting of several persons such as product designers, engineers, cost accountants and suppli-

Table 3. Uses of Cost Accounting Data

	<i>Australia</i>			<i>Japan</i>		
	<i>Mean</i>	<i>CV</i>	<i>Rank</i>	<i>Mean</i>	<i>CV</i>	<i>Rank</i>
Decision Making	4.00	0.201	1	4.00	0.200	4
Budgeting and budgetary control	4.12	0.223	2	4.40	0.186	3*
Cost management	4.04	0.224	3	4.46	0.147	1**
Producer pricing	4.04	0.251	4	4.26	0.180	2*
Preparation of financial statements	3.80	0.301	5	4.27	0.244	5**
Performance evaluation	2.73	0.379	6	3.14	0.282	6**

Responses: 227 in Australia and 212 in Japan

Notes: * Significant at 0.05;

** Significant at 0.01.

ers. The Japanese collective decision making philosophy is well reflected in this team work (Nishimura, 1995). According to a survey by Sakurai (1988), 80 percent of the Japanese companies surveyed in 1987 adopted target costing. It has been often suggested by several writers that target costing is the major management accounting tool that Japanese companies have used for competing with powerful international competitors (Worthy, 1991). On the other hand, the above result supports the view that Australian accounting places greater emphasis on financial accounting which is based on external reporting while Japanese accounting devotes greater attention to cost and management accounting (Wijewardena & Cooray, 1995).

Another noteworthy difference between management accounting practices of these two countries lies in the importance attached to activity based costing (ABC). While the Australian companies gave the fourth highest ranking to this tool in our survey, the Japanese companies ranked it as the least important tool. This result is consistent with the view that although ABC is increasingly popular among Western companies it is rarely used in Japan (Scapens, 1991). The reasons for the low popularity of ABC in Japan are said to be several. One of the principal reasons seems to be that Japanese companies are interested in charging overhead costs directly to product lines rather than using the sophisticated overhead allocation criterion of ABC because they prefer simple methods (Ito, 1993; Kobayashi, 1993).

Use of Cost Accounting Data

The respondents of our survey were also asked to indicate their views on the use of cost accounting data for a series of managerial activities. The responses are summarized in Table 3. There is no statistically significant difference in responses of both groups with regard to the use of cost accounting data for decision making purposes. The differences in responses on the use of cost accounting data for budgeting and budgetary control and product pricing are statistically significant at the 5 percent level whereas they differ significantly at the 1 percent level in respect of cost management, preparation of financial statements and performance evaluation. When taken together, cost management and product pricing were ranked by Japanese companies as the most

Table 4. Purposes of Standard Costing

	<i>Australia</i>			<i>Japan</i>		
	<i>Mean</i>	<i>CV</i>	<i>Rank</i>	<i>Mean</i>	<i>CV</i>	<i>Rank</i>
Product costing	3.92	0.332	1	4.11	0.249	4
Budgeting	3.70	0.340	2	3.91	0.232	1
Inventory valuation	3.85	0.345	3	3.63	0.298	6**
Management control	3.37	0.366	4	3.82	0.254	3**
Cost control	3.44	0.373	5	4.04	0.242	2**
Cost reduction	3.22	0.395	6	3.98	0.253	5**
Simplification of book keeping	3.89	0.458	7	3.31	0.317	7**

Responses: 214 in Australia and 193 in Japan

Note: ** Significant at 0.01.

important uses of cost accounting data against a similar ranking of decision making, budgeting and budgetary control by Australian companies. This result supports the view that Japanese companies devote greater attention to cost management and product pricing as a strategy for gaining a competitive advantage in the international market place (Sakurai, 1991). Both groups of responses, however, have similar ranking of importance on the use of cost accounting data for financial statement preparation and performance evaluation purposes.

Standard Costing

It has been reported in the accounting literature that the importance of standard costing has declined significantly in recent years as a result of the changes occurred in the manufacturing environment (Lessner, 1989; Cheatham, 1990; Drury, 1992). To be able to shed some light on this assertion, we asked the Australian and Japanese manufacturers to indicate the degrees of importance they would attach to a series of possible purposes of standard costing. The results depicted in Table 4 show that there is no statistically significant difference in responses in respect of product costing and budgeting. However, significant differences exist on all the other purposes listed in the table. In essence, for Australian companies the most important purpose of standard costing was product costing, which was, however, given a lower ranking by the Japanese companies. Because of the heavy emphasis placed by Japanese companies on target costing it would be realistic that they gave standard costing a lower ranking. Even though the generally held view in Western countries is that standard costing is used primarily for cost management purposes the Australian respondents in our survey assigned a lower ranking to this function because they considered standard costing to be more useful for the first four functions listed in the table. In the case of Japanese responses, however, the ranking given for cost reduction is considerably lower than that for cost control. The reason for the low ranking of cost reduction could be their more extensive use of target costing than standard costing for cost reduction. The reason for their high ranking of cost control may be that even though target costing is used extensively for cost

Table 5. Investment Appraisal Methods

	<i>Australia</i>			<i>Japan</i>		
	<i>Mean</i>	<i>CV</i>	<i>Rank</i>	<i>Mean</i>	<i>CV</i>	<i>Rank</i>
Payback	3.81	0.298	1	3.93	0.219	2
Net present value	3.37	0.405	2	3.32	0.310	4
Internal rate of return	3.27	0.419	3	3.44	0.292	3
Accounting rate of return	2.53	0.505	4	3.97	0.218	1**

Responses: 223 in Australia and 207 in Japan

Note: ** Significant at 0.01.

reduction at the pre-production stage, they may be using standard costing for cost control at the production stage.

Investment Appraisal

A previous study reported that when compared with their Western counterparts Japanese manufacturers made little use of discounted cash flow (DCF) approaches when making investment appraisals (Yoshikawa, et al. 1989). For the purpose of getting further empirical evidence on this aspect, we asked the two groups of respondents to indicate the degree of importance they would attach to each of the investment appraisal methods listed in our questionnaire. The responses received are summarized in Table 5. The difference in responses is statistically significant at the 1 percent level only in respect of accounting rate of return, which is ranked most highly by the Japanese respondents as against its lowest ranking by the Australian respondents. In contrast, net present value which is one of the major DCF approaches used in Western countries has received the lowest ranking from the Japanese respondents as against the second highest ranking received from the Australian respondents. However, it is interesting to see that the payback method has received the highest ranking from Australian firms with the second highest ranking from the Japanese. In essence, our findings reveal that Japanese manufacturers report the use of more non-DCF approaches than their Australian counterparts in appraising capital expenditure projects. According to Sakurai (1991), one possible reason for the less popularity of DCF approaches in Japan may be that they are more individualistic in nature and conflict with collectivism, which is a salient feature of Japanese organizations.

Use of Budgets

The survey questionnaire carried two separate questions for obtaining factual information from respondents with regard to the types of budgets prepared and the frequency of their preparation. The responses to these two questions are presented in the form of percentages in Tables 6 and 7. Accordingly, the balance sheet and the capital expenditure budget are the only budgets on which considerable differences between the two countries were apparent. These two budgets were seen to be less popular in Japan. Annually prepared budgets are the most popular in Australia as opposed to biannually prepared budgets in Japan.

Table 6. Components of Budgets

	<i>Australia</i> %	<i>Japan</i> %
Profit and loss statement	100	100
Balance sheet	97	79
Operating budgets	98	99
Cash budget	99	94
Capital expenditure budget	99	79

Responses: 225 in Australia and 209 in Japan

Table 7. Timing of Budgets

	<i>Australia</i> %						<i>Japan</i> %					
	<i>P & L</i>	<i>BS</i>	<i>OB</i>	<i>CB</i>	<i>CEB</i>	<i>Overall</i>	<i>P & L</i>	<i>BS</i>	<i>OB</i>	<i>CB</i>	<i>CEB</i>	<i>Overall</i>
Monthly	46	33	48	50	29	41	43	14	53	43	10	33
Quarterly	14	13	15	15	14	14	6	3	10	5	4	6
Bi-annually	8	7	4	4	5	6	51	47	41	44	40	45
Annually	63	65	57	58	70	63	24	27	22	17	27	23
Beyond one year	17	14	14	12	18	15	5	3	5	3	5	4

Response: 228 in Australia and 211 in Japan

Notes: P & L = Profit and loss statement; BS = Balance sheet; OB = Operating budgets; CB = Cash budget; CEB = Capital expenditure budget; Overall = All budgets on average.

Surprisingly, despite the long-term view typically associated with Japanese management, our survey revealed that only 4 percent of the Japanese companies prepared budgets beyond one year. However, this did not suggest that Japanese companies were not engaged in long-term planning. In fact, when we asked the respondents, through another question, to indicate whether they prepared long-range plans 95 percent of the Japanese companies answered positively. The corresponding rate for the Australian companies in this respect was 83 percent.

Overhead Allocation

As pointed out by Kaplan (1985), the traditional cost accounting systems were developed in the early part of the twentieth century for a very different type of production environment compared to what we see today. Those systems were designed to closely monitor direct labor cost for mass production of a few standard items because direct labor cost was a significant portion of total product costs. Manufacturing overhead costs, under those systems, were allocated to products primarily on the basis of direct labor costs. As a result of automation, however, direct labor content in the production cost structure has decreased dramatically over the years since the 1920.

However, several writers have revealed that many manufacturing firms particularly in Western countries continue to allocate overhead costs on the basis of direct labor despite

Table 8. Main Overhead Allocation Bases

	<i>Australia</i> %	<i>Japan</i> %
Direct labor hours/cost	73	68
Machine hours	17	27
Units of output	17	32
Direct material cost	14	36
Responses: 226 in Australia and 212 in Japan		

the dramatic decline of its significance (Kaplan, 1984; Shank & Govindarajan, 1988; Yoshikawa et al, 1989, Langfield-Smith et al, 1996). More importantly, some writers have noted, particularly when the direct labor component in the cost structure of a manufacturing firm has declined significantly, the continuous use of direct labor as the principal cost allocation base may distort product costs, leading to miscosting and mispricing of products (Cooper & Kaplan, 1988a). Accordingly, more refined alternatives such as ABC have been advocated as being more suitable for handling overhead under modern manufacturing conditions. As such, in order to obtain some empirical evidence on overhead allocation in Australia and Japan, we asked the respondents in our survey to indicate the methods being used by their companies for allocation of overhead. The responses received are presented in Table 8.

The data in this table showed no evidence of using non-traditional methods even by Japanese companies. Direct labor has been reported by our respondents as the most extensively used overhead allocation base in both Australian and Japanese companies. This result of the Australian survey in our study confirms the finding of a previous Australian study by Joye and Blayney (1990) that 71 percent of Australian companies allocated overhead on the basis of direct labor. Our finding of the Japanese experience is also consistent with the findings of two other surveys conducted by Kato (1986) and Yoshikawa et al, (1989).

It is interesting to note, however, that the continuous use of direct labor as the major overhead allocation base in Japan is said to be a deliberate act of company policy (Hiro-moto, 1988). According to Bromwich and Bhimani (1989), even though many Japanese manufacturers are aware that with increased automation in their plants, direct labor may not have a cause-and-effect relationship with factory overhead, they continue to use direct labor as the principal basis to allocate overhead because they are said to believe that using direct labor for this purpose provides organizational sub-units with an incentive to use less labor. In other words, the use of direct labor as the major allocation base in Japanese companies provides a direct stimulus to automate production (Yoshikawa et al, 1989).

The accounting literature in recent years has shown that in some industries, when direct labor costs constitute a small percentage of total costs, an increasing number of manufacturers have begun to treat direct labor as indirect costs and charge them to overhead (Horn-gren and Foster, 1991). Since such a treatment could affect the size of both labor and overhead of manufacturing companies, we included another question in our survey to cover this aspect of product costing. The responses to this question revealed that 35 percent of Japanese companies and 15 percent of Australian companies charged direct labor to

Table 9. Manufacturing Cost Structure

<i>Type of industry</i>	<i>Australia</i>			<i>Japan</i>		
	<i>Direct material</i> %	<i>Direct labour</i> %	<i>Factory overhead</i> %	<i>Direct material</i> %	<i>Direct labour</i> %	<i>Factory overhead</i> %
Food and beverages	62.3	21.5	16.6	72.1	12.8	15.2
Fabricated metal products	52.7	22.7	24.6	57.6	18.4	24.0
Textile	50.2	27.1	22.6	52.9	20.8	26.4
Chemical products	65.7	16.8	17.6	57.8	15.6	26.6
Machinery and computers	44.8	23.5	31.7	63.6	15.1	21.3
Electronic & electric equipment	54.1	23.8	22.1	63.7	16.0	20.3
Transportation equipment	63.3	15.5	21.3	59.9	16.0	24.1
Furniture and fixtures	55.3	20.6	24.1	65.0	15.0	20.0
Miscellaneous	51.9	25.0	23.2	54.2	18.0	27.8
Total	56.5	22.1	21.4	59.6	16.3	24.1

Responses: 208 in Australia and 194 in Japan

overhead. This indicates another possible reason for the higher percentage of overhead in the manufacturing cost structure of Japanese companies shown in Table 9.

It has been indicated in the accounting literature that technological developments in the past few decades have made significant changes in the cost structure of manufacturing enterprises (McNair et al, 1988; Berliner & Brimson, 1988; Scapens, 1991). For the purpose of gaining some understanding of the nature of such changes in Australian and Japanese companies, we asked the respondents in our survey to state each cost element as an approximate percentage of total manufacturing costs in their firms. Their responses are illustrated in Table 9. As shown in this table, direct labor represented 16.3 percent and 22.1 percent of total manufacturing costs in the Japanese and Australian firms respectively. However, when the cost structure was classified by industry groups wider differences among cost elements became apparent in some groups of industries. These differences may be attributable, at least partly, to the different nature of each industry group. In addition to the responses demonstrated in Table 9, both groups of respondents, in reply to another question, indicated that they experienced a tendency of decreasing direct labor and increasing factory overhead in recent years.

Inventory Levels

Tying up of large sums of funds in inventories to some extent prevents a business from investing. In addition to the price paid for the inventory, various types of acquisition and carrying costs are associated with inventories. Therefore, these factors usually have adverse effect on the profitability of a firm. It has also been pointed out by many writers in recent years that the Japanese invention of maintaining no inventories or very low levels of inventories under their Just-In-Time (JIT) system was a major weapon that helped them in beating even the most powerful competitors in the international market place (Kaplan, 1983; Gietzman and Inoue, 1991). However, since no current empirical evidence other

Table 10. Inventories as a Percentage of Total Assets

<i>Type of industry</i>	<i>Australia</i>			<i>Japan</i>		
	<i>Finished goods inventory</i>	<i>Work in process inventory</i>	<i>Raw material inventory</i>	<i>Finished goods inventory</i>	<i>Work in process inventory</i>	<i>Raw material inventory</i>
	%	%	%	%	%	%
Food and beverages	10.6	2.1	11.3	2.5	0.2	0.9
Fabricated metal products	6.3	3.2	3.3	5.8	2.0	0.9
Textile	18.9	11.1	8.0	8.6	3.5	1.8
Chemical products	13.8	1.7	6.2	2.9	1.0	0.8
Machinery and computers	14.7	22.6	10.8	5.7	5.9	1.8
Electronic & electron equipment	11.4	15.7	22.1	4.7	12.0	1.3
Transportation equipment	12.3	6.3	6.0	1.3	15.6	1.2
Furniture and fixtures	9.0	2.7	2.7	11.0	0.7	2.0
Miscellaneous	14.7	6.1	10.2	4.2	2.5	1.6
Total	11.2	4.7	7.6	3.8	4.6	1.3

Responses: 184 in Australia and 203 in Japan

than anecdotal information was available on this aspect of manufacturing firms even in Japan, we asked our respondents to indicate the costs of inventories and total assets in their organizations at the end of the last financial year. The information received is summarized in Table 10.

As anticipated, each type of inventory as a percentage of total assets, on average, was lower in the Japanese companies. This situation revealed by our data supports the widely held view that the Just-In-Time system aimed at minimizing inventories is popular among Japanese manufacturers (Gietzman and Inoue, 1991). Comparatively, Australian companies in our survey reported higher percentages in respect of finished goods and raw materials inventories. In this regard, it is important to note that a recent study has revealed that many Australian manufacturing firms are often located long distances from their suppliers, thereby facing high transportation costs and relatively low inventory holding costs. As a consequence, such manufacturers tend to prefer holding inventories rather than receiving a steady supply of raw materials when needed, on the basis of a cost-benefit analysis (Kendall and Steen, 1998). However, the nature of finished goods and work-in-process inventories has not been examined in the above study.

Quantitative Techniques

Accounting textbooks in recent years have devoted increased attention to the use of quantitative techniques in management accounting (e.g. Garrison & Noreen, 1994; Burch, 1994; Rainborn et al., 1996; Langfield-Smith et al, 1996). Therefore, we were interested in finding out what quantitative techniques are actually used by large manufacturing firms in Japan and Australia. Accordingly, the respondents in our study were asked to indicate the quantitative techniques they used in their cost and management accounting activities. The summarized responses are presented in Table 11. The most striking finding emanating

Table 11. Use of Main Quantitative Techniques

	<i>Australia</i> %	<i>Japan</i> %
Forecasting techniques	59	38
Statistical analysis	46	35
Simulation	9	36
Input-output analysis	20	9
Inventory models	42	29
Spreadsheet analysis	92	23

Responses: 212 in Australia and 206 in Japan

from the data in this table is that Australian accountants have used quantitative techniques, in general, more extensively than their Japanese counterparts. A similar situation between U.S. companies and Japanese companies was reported by Kato (1989) as a finding of a U.S.-Japan comparative study on the use of quantitative methods in cost and management accounting practices. However, according to our data, the use of simulation as a quantitative technique in management accounting practices appeared to be much more extensive in Japanese companies than in Australian companies. A possible reason for this may be that simulation exercises are well amenable to the collective decision making (*ringi*) philosophy of Japanese firms. In the collective decision making process a problem is analyzed from different perspectives and possible alternative solutions are considered collectively on the basis of views and suggestions of all members of the group (Van Zandt, 1970). What-if types of questions allowed in simulation models are frequently used in this process (Kato, 1989). Another difference emerged from the above data was that Australian accountants used spreadsheet analysis much more widely than their Japanese counterparts. The use of inventory models was also considerably lower in Japan. Kato (1989) in the study mentioned previously has also reported a similar situation in Japanese companies when they were compared with similar companies in the United States. This seems quite realistic due to the fact that the Just-In-Time inventory system used by several Japanese manufacturers has reduced the need for using traditional inventory models.

Performance Evaluation

There has been a sizable amount of negative criticism on the use of return on investment (ROI) by U.S. companies for evaluating performance of their divisional managers (Mechlin & Berg, 1980; Kaplan, 1984; Sakurai, 1991). The essence of this criticism lies in the belief that ROI leads managers to place excessive emphasis on short-term profitability, which in turn brings about a decrease in research and development investment, with a corresponding restriction on innovation. For example, according to Sakurai et al (1989), "it might be that the United States could have expanded its economy much more, if most companies had not used ROI to measure performance." Conversely, it has also been said that many Japanese companies prefer to use return on sales (ROS) for this purpose in order to overcome the above limitation. The essence of their approach lies in separating ROI into two parts, ROS and turnover. By doing this, they obtain separate measurements, and thus

Table 12. Performance Evaluation Measures

	<i>Australia</i> %	<i>Japan</i> %
ROI (Return on investment)	59	37
RI (Residual income)	6	9
ROS (Return on sales)	40	82
ARR (Accounting rate of return)	4	7
Variances	48	20

Responses: 216 in Australia and 200 in Japan

Table 13. Product Costing Methods

	<i>Australia</i> %	<i>Japan</i> %
Job order costing	30	40
Process costing	52	46
Hybrid costing	9	27
Batch costing	15	4
Product life cycle costing	5	13
Activity based costing (ABC)	23	2

Responses: 221 in Australia and 215 in Japan

avoid ROI weaknesses (Sakurai et al, 1989). In this respect, Sakurai (1991) further states that ROI is oriented toward stockholders while ROS is market-oriented and provides more useful insights to Japanese manufacturers for making price decisions in target costing.

In order to obtain further empirical evidence on the above issue from Australian and Japanese companies, we asked our respondents to indicate the measures they used for evaluating divisional performance. The responses received, as shown in Table 12, confirmed the Japanese situation discussed above. Thirty-seven percent and 82 percent of Japanese companies reported to have used ROI and ROS respectively as opposed to 59 percent and 40 percent of Australian companies. Our results also showed that the use of variances for performance evaluation was much less popular in Japan than in Australia. This result is consistent with our finding on the importance of standard costing discussed previously.

Product Costing

As a result of numerous technological developments in the recent decades the manufacturing environment has undergone fundamental changes, permitting manufacturers to move from mass production of a few standardized items to efficient production of small batches of customized products on short notice. These changes created a need for more refined methods of product costing (Kaplan, 1984). In response to this need, several new approaches such as activity-based costing and target costing have been developed (Cooper & Kaplan, 1988b; Sakurai, 1989). To gain some factual information on the use of such approaches in Australia and Japan, we asked the respondents in our survey to indicate the

Table 14. Major Participants in New Product Cost Estimation

	<i>Australia</i> %	<i>Japan</i> %
Production Manager	79	44
Product designer	42	69
Accountant	84	46
Purchasing manager	52	23

Responses: 225 in Australia and 210 in Japan

product costing methods being used in their manufacturing operations. Table 13 presents a summary of their responses. Most of the Australian companies used process costing (52 percent) or job order costing (30 percent) as the main product costing method. A greater number of Japanese companies reported the use of job order costing as well as hybrid costing which is a mix of both job order costing and process costing. This points to a situation observed by some writers that Japanese manufacturers are increasingly using hybrid systems because with the increased use of new manufacturing technologies many of them have begun to cater for more and more individual customer preferences as a strategy for increasing their market share and competitiveness (Stewart, 1992; Takahashi, 1992). However, since our data are confined to the situation prevailed at the time of our survey in 1997 they cannot explain whether such changes have been actually occurring in recent years. Another striking difference revealed by our data was that the users of activity-based costing (ABC) in Japan were as low as 2 percent compared to 23 percent in Australia. This result corroborates the situation observed previously under Table 2.

Particularly in Japanese manufacturing enterprises where target costing is widely used, the product designer plays a greater role in the product cost estimating process than the cost accountant. For the purpose of obtaining empirical evidence on this view of product costing, we requested our respondents to indicate the major participants in the new product cost estimation process in their firms. Table 14 gives the summarized responses to this question. Accordingly, the accountant has accounted for the highest percentage participation (84%) in new product cost estimation in Australian companies as opposed to the highest participation (69%) by the product designer in Japanese companies. In the context of the different nature of product cost estimation processes in the two countries, this finding can be considered realistic. According to Worthy (1991), when developing a new product, manufacturing companies in Western economies, in general, typically design it first and then calculate the cost. If the cost seems too high, the product is either sent back to designers for modification or the company settles for a smaller profit margin. As such, the accountant occupies a prominent place in the product cost estimation of such companies. By contrast, in Japanese companies where target costing (*genka kikaku*) is widely used, it is the product designer who plays the prominent role in the product cost estimating process.

Costing Systems

Accounting literature in recent years indicated an increasing tendency of new developments in costing systems as a result of changes taken place in the manufacturing environ-

Table 15. Costing Systems

	<i>Australia</i> %	<i>Japan</i> %
Actual costing	31	48
Standard costing	69	31
Absorption costing	30	27
Variable costing	17	20
Responses: 229 in Australia and 217 in Japan		

Table 16. Significant Changes to Cost Accounting Systems

	<i>Australia</i> %	<i>Japan</i> %
1-4 times	53	78
5 or more times	11	14
No change	<u>36</u>	<u>8</u>
	<u>100</u>	<u>100</u>
Responses: 221 in Australia and 173 in Japan		

ment. Based on this tendency, we asked the respondents to indicate the costing systems they used in their organizations. Critical features of their responses included a relatively higher percentage use of standard costing in Australian companies (Table 15). This is consistent with the responses reported previously on standard costing. However, it is important to note in this respect that several writers in the recent past have questioned the relevance of conventional standard costing systems to modern manufacturing environments (Kaplan, 1990; Sakurai, 1990; Drury, 1992). The Japanese companies, on the other hand, indicated a higher percentage use of actual costing than their Australian counterparts. A similar situation has been reported by Nagamatsu and Tanaka (1988) in a comparative survey conducted in the U.S. and Japan during 1986-87. According to their survey, the percentage use of actual costing was 26 in the U.S. and 33 in Japan. With regard to absorption costing and variable costing, our data did not indicate any significant difference between Australian and Japanese companies. This aspect of the results is consistent with the finding of a study by Inoue (1988), which reported that there was about the same use of variable (direct) costing and full (absorption) costing in Japan, USA, UK and Canada.

It has been suggested by many writers that if accounting is to contribute more effectively to the success of manufacturing organizations, accountants must make timely changes in their accounting systems to suit the changes occurred in the manufacturing environment (Kaplan, 1984; Peavey, 1990; Mackay, 1991). With the intention of obtaining some factual information on this aspect, we included a question in our survey questionnaire, asking the respondents to indicate whether they made any significant changes to their cost accounting systems within the past two decades and, if so, to give the number of changes they have made. The responses, as summarized in Table 16, indicated that 64 percent of Australian companies made changes to their cost accounting systems while the corresponding rate for Japanese companies was 92 percent. This supports the view that Japanese companies have

introduced more timely changes to management accounting practices than their Australian counterparts.

SUMMARY AND CONCLUSION

It is important to mention a few limitations of this study before any conclusion may be drawn. Some of the responses may have been influenced by the problems of question bias and misinterpretation. Also, despite the mailing of questionnaires to the largest manufacturing companies in both countries, the sample firms may not have been the 'largest' because of the high non-response rate. Despite these imperfections, the results of the study provide some important insights into the differences in management accounting practices of Australian and Japanese manufacturing firms.

A most striking difference revealed by the survey data is that while management accounting practices of the Australian companies place an emphasis on cost control tools such as budgeting, standard costing and variance analysis at the manufacturing stage, those of the Japanese companies devote a much greater attention to cost planning and cost reduction tools based on target costing at the product planning and design stage. In this regard, it is important to note the observation of Howell and Sakurai (1992) that "Japanese companies seem to understand better than their Western counterparts that costs should be managed and avoided during the product planning and development cycle rather than after products have entered full scale production." Furthermore, Australian companies appear to have placed greater emphasis on budgets and historical accounting statements while Japanese companies concentrating more heavily on target costing and cost-volume-profit analysis (Table 2). This emphasis of Australian companies suggests that they pay greater attention to accounting tools that are primarily used for planning and controlling costs and preparing financial statements. By contrast, the concentration of Japanese companies, particularly on target costing, indicates their greater attention to cost management. Since cost management places a heavier emphasis on cost reduction relative to cost control without jeopardizing product quality and other desirable characteristics it is said that this aspect of Japanese management accounting practices has contributed greatly to Japan's success in achieving a dominant position in the global competitiveness (Sakurai, 1991; Worthy, 1991). Another noteworthy difference emanated from our survey is that activity-based costing (ABC) appears to be more popular among Australian companies while it is rarely used in Japanese companies. This is similar to the situation observed by Sakurai (1991) in the US. and Japanese companies. On the other hand, despite the decreased labor component in the manufacturing cost structure, manufacturing companies in both countries seem to allocate factory overhead mainly on the basis of direct labor. Yet, as pointed out earlier, this practice in Japanese companies is said to be a deliberate act aimed at reducing labor (Hiromoto, 1988). However, an important difference is seen in the levels of inventories maintained in the two countries. It is apparent from our survey data that the inventory levels are significantly lower in Japanese companies for finished goods and raw materials. This seems consistent with the Japanese concept of Just-In-Time inventory system, which aims at minimizing inventories without hindering production and sales. By contrast, the higher inventory levels of Australian manufacturers may weaken their competitiveness and profitability because tying up of large sums of funds in inventories can restrict investments

and increase acquisition and carrying costs. It is also seen from our data that more Australian companies have used the return on investment (ROI) measure for evaluating divisional performance. In contrast, most of the Japanese companies have used the return on sales (ROS) measure for such purposes. It is important to note that this practice is said to have helped the Japanese manufacturers in overcoming the adverse effect of ROI on their research and development investment (Sakurai et al, 1989). Another noteworthy difference revealed by our survey is that 92 percent of Japanese companies in the sample have made changes to their cost accounting systems within the last two decades while the corresponding rate for Australian companies was 64 percent. This shows that Japanese companies have introduced more timely changes to management accounting practices than their Australian counterparts.

Finally, since our study was confined to situations at a particular point in time the survey data could not explain what management accounting practices in Australia and Japan have changed over time. In certain periods of time, however, some of these practices in both countries may have been different from those revealed by our survey. For example, although our data indicated that the discounted cash flow (DCF) approaches to investment appraisal were not popular among Japanese companies at the time of our survey, as a consequence of the financial crisis erupted recently in Asia it appears that many Japanese companies are now placing emphasis on DCF approaches to evaluate the efficiency of capital investment projects. The increased use of DCF appears to be driven by the Japanese banks, which are suffering from bad debt losses and a lack of interest in financing new projects. Similarly, based on the experience of the Asian financial crisis, several other important changes are likely to occur particularly in the Japanese financial and management accounting practices. As such, further research is needed to examine what management accounting practices in these countries have changed in the recent past and in what direction they are moving at the present time.

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