

Performance Measurement Systems of Corporations in Developed Countries

by Kazumichi Suzuki

- I. Introduction
- II. Outline of the Research and the Method of Comparison and Analysis
- III. International Comparison of Performance Measurement and Control Systems
 - 1. Comparison of utilization of performance measures
 - 2. Comparison of performance factor's measurement systems
 - 3. Uniformity of performance measurement and control systems and the need for modification
 - 4. Obstacles to modifying performance measurement system
- IV. Conclusion
- Appendix 1. Results of the Survey
- Appendix 2. Analysis on Industry Basis

I. Introduction

From May 1983 till June 1985 I was involved in the study of Japanese Corporation's Performance Measurement Accounting as a member of a group for the study of "Performance Measurement Systems of Japanese Corporations." The study group was organized by the Tokyo Affiliate of the National Association of Accountants. Its chairman was Professor Haruzo Kaneko and its project leader Professor Hideshi Nagamatsu. The result of the study group was published in the 1985 August/September issue of *Management Practice* (Japanese Edition) as the "Report on Japanese Corporation's Performance Measurement Systems." From April 1986 to March 1987, I was a visiting scholar from Daito Bunka University at Sheffield University of the United Kingdom and visited several companies to study their performance measurement methods.

Subsequently, the establishment of a study group for "International Comparison of Performance Measurement Accounting" with Professor H.

Kaneko its leader was approved at the 1986 annual meeting of the Japan Accounting Association (JAA), and I became a member of the group. This study group was to further explore the result which was reported by the former group organized by the NAA Tokyo Affiliate. In addition, the new group was to research high-tech manufacturing companies of the USA, the United Kingdom, France, West Germany (all of which had to "globalize" and "innovate") to find out what kind of problems the management accounting of those companies are facing.

In this new group, I was in charge of analyzing written material on English corporations for an intermediary report and to do actual hearing and analysis of those results for the final report.

This research paper is based on the "Final Report of International Comparison of Performance Measurement Accounting," which this study group reported at the JAA's 1989 annual meeting in Matsuyama University. This paper is also the result of some additional data, further comparison and analysis.

I would like to thank Professors H. Kaneko, H. Nagamatsu and other people from whom I was given friendly and invaluable advice. For field study in the United Kingdom, I would like to express my feeling of gratitude to the people at the Japan Business Services Unit at the University of Sheffield.

II. Outline of the Research and the Method of Comparison and Analysis

The recent trend of globalization and innovation in the economy and industry is greatly affecting the corporate management of various countries and management accounting cannot be immune to the change either. Our study group surveyed high-tech manufacturers of advanced countries by asking to answer attached questionnaires. The object was to compare and analyze the results to determine what is the same and what is different among corporations of different nationalities when they try to adjust their performance measurement accounting to a changing environment.

The questionnaire we used was the same one that Robert A. Howell, James D. Brown, Stephen R. Soucy and Allen H. Seed III used in May 1985 with Computer Aided Manufacturing-International (CAM-I) and reported in the "Questionnaire : Management Accounting in an Automated Manufac-

turing Environment” of *Management Accounting in the Manufacturing Environment*, NAA, 1987.

Their questionnaire was composed of :

- A. About your business (10 questions)
- B. Investment justification (8 questions)
- C. Cost accounting practices (8 questions)
- D. Performance measures (9 questions)
- E. About yourself (2 questions)

There was a total of 37 questions. In Japan, we asked answers for all of the questions but in the UK, France and West Germany, we only asked about A., D. and E. because of time constraints and the priority of our survey. Among them, “D. Performance measures”’s comparison form the core of our survey.

The period and other details of the survey are as shown below :

USA=May, 1986

	Questionnaires sent	Qualified answers	Answering rate
Information users	1,000	260	26%
Information preparers	1,000	64	3.5%
Other participants	217	26	12%
Total	2,217	350	15.7%

There were face to face surveys with 100 officers in charge of finance, accounting and other related activities at 17 corporations.

Japan=February, 1988.

Questionnaires were sent to the companies listed on the first section of Tokyo Stock Exchange.

Questionnaires sent	Qualified answers	Answering rate
833	109	13.1%

UK=December, 1988.

Questionnaires were sent to companies listed on the London Stock Exchange.

Questionnaires sent	Qualified answers	Answering rate
200	25	12.5%

France=December, 1988.

Questionnaires were sent to "Les Entreprises 10,000."

Questionnaires sent	Qualified answers	Answering rate
200	15	7.5%

West Germany=February, 1988.

Questionnaires sent	Qualified answers	Answering rate
200	8	4%

Both in Japan and in France, the companies could have been classified as :

- a. Processing and assembling ; manufacturers of machinery, auto, auto parts, electric appliances and other high-tech oriented goods
- b. Material production (facility oriented) ; chemical and oil
- c. Others ; metal, consumer goods, stationary, industrial goods and so forth

We did research on the characteristics of each type of company. The number of companies in each type was as follows :

	Total	Process Asmby	Material	Others
Japan	109	41	28	40
France	15	6	5	4

The group of questions that was asked in all countries was on "performance measures." The actual nine questions in that group form three sub-groups as follows :

A. The evolutionary stage and classification of performance measurement accounting

- (1) Financial indicators for setting goals
- (2) Non-financial indicators for setting goals
- (3) Factors in the performance measurement/evaluation system

B. Analysis of current condition of performance measurement/evaluation in high-tech companies

- (4) Similarity between performance measurement factors and the control system
- (5) Satisfaction on the current performance measurement/evaluation system
- (6) Measures that became obsolete because of FA (factory automation)
- (7) Performance measures that contribute to FA

C. Problems and trends on present-day performance measurement/evaluation

- (8) Desirable changes to performance measurement/evaluation
- (9) Obstacles to change in performance measurement/evaluation factors and systems

For the above questions, we could not obtain enough number of answers to (6) and (7) and thus they are eliminated from our discussion. For further detail of our survey, please refer to the appendix.

In the following charts, we abbreviated the names of countries as follows :

J=Japan, US=United States, UK=United Kingdom, F=France, WG=West Germany. The answering rate was calculated by dividing the number of qualified answers by the number of letters sent and rounding to one decimal.

III. International Comparison of Performance Measurement and Control Systems

1. Comparison of utilization of performance measures

This chapter discusses about questions (1) and (2) which are about financial and non-financial measures that are used to measure performance.

To define the most widely used measure, we added the number of measures that was answered as either "Always Used" or "Often Used" and compiled the Chart-1.

Chart-1

(%)

Financial Performance Measure Ranking(Summary)	J	US	UK	F	WG
Sales	<u>95</u>	<u>90</u>	84	<u>100</u>	<u>100</u>
Sales growth	<u>76</u>	<u>82</u>	76	87	88
Contribution margin	53	60	84	73	88
Gross margin	74	76	<u>88</u>	87	63
Operating income% sales	73	70	80	60	75
Net income% Sales	71	68	76	27	88
Economic income	32	13	4	53	88
Cash flows	47	73	<u>88</u>	<u>93</u>	<u>100</u>
Inventory levels	59	70	76	87	<u>100</u>

The highest figure is underlined with solid line, the second highest figure is underlined with broken line.

In all countries the use of financial statements was quite popular. As for "Sales", it was listed in the 3rd place in the UK whereas it was much more commonly used in other countries. The detailed utilization ratio of this measure in Japan and France is as follows :

	Japan	France
Procss/Asmbly	35 out of 41 co. s (85%)	6 out of 6 co. s (100%)
Material	27 out of 28 co. s (96%)	5 out of 5 co. s (100%)
Others	37 out of 40 co. s (93%)	4 out of 4 co. s (100%)

This result proves that these measures are used in most nations and industries.

Right after "Sales" are "Sales growth" and "Contribution margin." Yet, among figures in income statements, such factors as "Residual income" and "Economic income" are rarely used except in West Germany.

Among figures in financial condition statements, "Cash flow" is 47% in Japan (low in both utilization ratio and rank) but it is ranked 1st in both the UK and West Germany. It is 2nd in France and 4th in the USA. If we make a closer look at Japan, however, we notice that the figure in the process/ assembling type companies stands at 59%, a much higher level, which proves that "Cash flow" is more crucial in high-tech oriented companies.

The most commonly used financial measures in Japan are "Sales", "Sales

growth”, “Gross margin”, “Operating income % sales”, and “Net income % sales”, in the order named. In comparison with other countries, the emphasis on marketing (sales) related figures is unique. In other countries, more figures are used from wider sources and more frequently. Especially, the figures from balance sheets and financial condition statements are more often used in the USA than in Japan.

The total of “Always Used” and “Often Used” non-financial measures are listed in Chart-2.

Chart-2 (%)

Non-financial Performance Measure Ranking	J	US	UK	F	WG
Market share	<u>83</u>	75	68	80	63
Market growth	71	74	68	80	75
Product quality	66	<u>83</u>	72	<u>93</u>	<u>88</u>
Delivery performance/Customer service	31	75	<u>92</u>	73	<u>88</u>
Labor productivity	73	<u>76</u>	84	<u>93</u>	<u>88</u>
Technological capability	41	36	40	87	<u>88</u>

The highest figure is underlined with solid line, the second highest figure is underlined with broken line.

The result is much more different by country than financial measures. “Product quality”, however, is 1st in the USA, France and West Germany and 3rd in the UK. “Labor productivity” is 1st in France and West Germany, 2nd in other countries. “Performance/customer service” is 1st in the UK and West Germany and high on the list in other countries as well. “Technological capability” is also 1st in France and 3rd in West Germany.

The chart tells us that, like financial measures, the USA and European companies use more measures more frequently than Japanese counterparts. Rather than analyzing the difference of criteria that comes 1st in different countries, we should note the fact that non-Japanese corporations use more criteria as symbolized by the four mentioned above.

Japan is unique in that “Market share” is by far the number one measure that outdistances other measures. “Delivery performance/customer service” that is so widely used in the USA and Europe is in the last position in Japan.

The measure that is often used universally is “Labor productivity.” It is

interesting to note that this measure, which seems to lose importance with high-tech companies that are automated and capital intensive rather than the labor intensive companies of old days, still hangs in the 2nd or higher place. 88% of Japanese processing/assemblying companies and 100% of French processing/assemblying and material production companies regard this measure to be important. Our reasoning of this fact was as follows.

First, even in high-tech oriented companies such as processing/assemblying, there are number of jobs that can better be performed by humans rather than machines because of smaller lots and a shorter life-cycle. Thus, the labor productivity of those people is considered to be of importance.

Second, the labor productivity in high-tech companies is important because of the increasing number of personnel in indirect operations such as system engineers and programmers.

Third, the performance evaluation in corporations is done on the basis of individuals even if an employee works at an automated plant. Thus, "Labor productivity" is used to compare his performance with other people's.

Fourth, this measure is convenient in measuring the improved per worker output after a plant is automated.

Last, even if a plant or division is introduced with high technology or with more equipment, that is often only a partial investment. To evaluate the performance of a company as a whole and see how it compares from the past, "Labor productivity" still is an effective measure.

The analysis of financial and non-financial measures proves that, in general, American and European companies use a wider range of measures than Japanese ones. Measures such as "Sales," "Sales growth," "Market share," "Market growth" are used much more frequently in Japan though Americans and Europeans often use them, too. The measures of Japanese companies show a concentration in the area of sales & marketing, proving the general understanding that the behaviour of Japanese management is market-share-oriented.

Analysis of "Labor productivity" showed that traditional measure are not necessarily eliminated as the case in high-tech companies proved. There seems to be a need to diversify the source of measures and to measure and evaluate from multiple points of view.

2. Comparison of performance factor's measurement systems

This chapter deals with question (3) which is about the department in charge of measuring performance and the continuity of measurement methods. Measures were classified into "Manufacturing performance," "Customer service," and "Other performance" and it was inquired as to whether they belonged to "Output of management accounting system," "Output of operating control system," "Informally measured," or "Not measured". We regarded all measures that do not belong to "Not measured" as being periodically or informally measured and compiled Chart-3.

Chart-3 (%)

Ranking of Performance Measure Monitored Systematically or Periodically (Summary of Manufacturing Performance)	J			US			UK			F			WG		
	M	O	T	M	O	T	M	O	T	M	O	T	M	O	T
Incoming material quality	3	62	65	2	<u>62</u>	64	0	56	56	7	<u>67</u>	74	13	37	50
Process yields	28	51	<u>79</u>	30	33	63	12	52	64	40	60	100	50	50	<u>100</u>
Material usage	17	38	55	52	27	<u>79</u>	28	44	72	47	47	94	63	37	<u>100</u>
Inventory turnover	41	29	70	<u>67</u>	11	<u>78</u>	<u>68</u>	16	<u>84</u>	<u>67</u>	47	<u>114</u>	63	13	75
Labor efficiency	30	42	72	52	23	75	40	36	<u>76</u>	40	<u>67</u>	<u>107</u>	<u>75</u>	13	88
Tooling costs	<u>51</u>	17	68	50	13	63	32	40	72	53	40	93	63	37	<u>100</u>
Machine down time	10	37	47	12	44	56	4	48	52	13	<u>67</u>	80	25	50	75
Set-up and change-over cost	9	30	39	23	25	48	8	28	36	33	47	80	<u>75</u>	25	<u>100</u>
Throughput rates	24	49	<u>73</u>	13	47	60	4	36	40	7	<u>67</u>	74	25	<u>75</u>	<u>100</u>
Product quality	7	<u>63</u>	70	7	57	64	12	<u>64</u>	76	13	53	66	12	50	63

M-Management Accounting System, O-Operating Control system, T-Total. Following figures are underlined: highest of M with ~ ; highest of O with — ; highest of T with — ; second highest of T with ···. (This apply to Chart-4 and Chart-5)

With regards to "Manufacturing performance," the following measures are most commonly used. "Process yields" is 1st in Japan and West Germany and 3rd in France. "Material usage" is 1st in the USA and West Germany. "Inventory turnover" is 1st in the UK and France, and 2nd in the USA.

Among these measures, "Inventory turnover" depends on the management accounting system in most countries but "Process yields" depends usually on the operating control system. "Material usage" depends on the

management accounting system in the USA and West Germany but in Japan and France it depends on operating control system. Overall, it could be said that Japan, the UK and France are operating control system oriented and the USA and West Germany are management accounting system oriented. The former would mean putting importance on operation and quantity management and the latter would mean putting importance on measurement management by the comptroller.

The Japanese total on "Labor efficiency" is 72% but this figure is 88% for processing/assemblying companies. The figure corresponds to the same figure on "Labor productivity" for Japanese processing/assemblying companies.

Chart-4 (%)

Ranking of Customer Service Measures Monitored Systematically or Periodically (Summary)	J			US			UK			F			WG		
	M	O	T	M	O	T	M	O	T	M	O	T	M	O	T
On-time delivery performance	8	43	51	9	45	54	12	48	60	7	47	54	0	75	75
Out-of-stock rates	5	32	37	7	32	39	8	48	56	0	53	53	13	75	88
Order lead time	6	44	50	6	41	47	0	64	64	7	57	64	13	62	75
Accuracy of demand forecasts	6	34	40	10	25	35	8	40	48	13	47	60	13	25	38

The percentage of "Customer service" depending on the management accounting system is a mere 10% and in most cases it depends on the operating control system. However, its utilization ratio is not necessarily high as a measure of "Manufacturing performance", which depends on the operating control system. "Customer service" is in less demand than "Manufacturing performance." The most notable measures are "On-time delivery performance" and "Order lead time" both of which are measured by operating control systems.

Chart-5

(%)

Ranking of Other Performance Measures Monitored Systematically or Periodically (Summary)	J			US			UK			F			WG		
	M	O	T	M	O	T	M	O	T	M	O	T	M	O	T
Product development performance	9	21	<u>30</u>	4	<u>13</u>	17	4	4	8	0	<u>33</u>	33	<u>88</u>	0	<u>88</u>
Cost of engineering change order	<u>12</u>	15	27	10	7	17	4	8	<u>12</u>	13	13	26	75	13	<u>88</u>
Warranty costs/field performance	11	<u>23</u>	<u>34</u>	<u>28</u>	11	<u>39</u>	<u>12</u>	<u>16</u>	<u>28</u>	<u>47</u>	13	<u>60</u>	38	<u>25</u>	63
Cost of non-conformance	9	15	24	10	11	<u>21</u>	0	12	<u>12</u>	33	27	<u>60</u>	25	13	38

Measures that belong to "Other performance" are not systematically measured by either management accounting systems or operating control systems except in West Germany. The only measure that is measured sometimes is "Warranty cost/field performance."

The next chart shows major measures that are monitored either formally or informally.

Chart-6

(%)

Ranking of Performance Measures that Are Measured Systematically or Non-systematically (Summary)	J	US	UK	F	WG
Incoming material quality	90	80	80	87	88
Physical scrap counts	75	88	72	93	75
Process yields	86	75	80	107	<u>100</u>
Material usage	71	86	80	107	<u>100</u>
Inventory turnover	<u>96</u>	87	88	<u>121</u>	<u>100</u>
Labor productivity	88	87	<u>92</u>	114	<u>100</u>
Tooling costs	78	80	60	113	<u>100</u>
Machine downtime	68	82	72	100	88
Set-up and change-over costs	59	74	72	107	<u>100</u>
Throughput rates	79	76	60	87	<u>100</u>
Product quality	86	<u>91</u>	<u>92</u>	106	<u>100</u>

Underlined is the figure for a country's number one measure.

Other than the measures listed here, "On-time delivery," "Out-of-stock rates" and "Order lead time" (measures that belong to "Customer service") are rated 100% in West Germany. Also, the following measures are ranked number one in each country: "Inventory turnover" in Japan, France and West Germany; "Labor productivity" in the UK and West Germany; "Prod-

uct quality” in the USA, the UK and West Germany. These three measures are high in both utilization rate and rank in most countries and are measured in one way or another.

The measures that are monitored by management accounting systems or operating control systems seem to be different in each country. Yet, a wave of innovation is resulting in the levelling of technological capability among high-tech companies. Performance management systems of these companies have to share in some of their traits.

3. Uniformity of performance measurement and the performance control system and the need for modification

This chapter analyzes the question (4) which asks how similar the performance measurement and performance control systems are in automated work places and non-automated work places. We learned from the data in the appendix that the USA is most assertive on the idea of using a unified system. France is the least assertive, but the difference between the two countries is minimum. 70% of those that were asked said that the introduction of automation should not result in a major change of performance measurement and the control system, regardless of their nationality.

In Japan, those who answered “Using the same system” was 22 out of 28 with material manufacturers, showing a slightly higher figure than average. In France, the figure was 5 out of 6 with processing/assembly companies versus 3 out of 5 with material manufacturers. Thus, no identical pattern by industry-basis was established comparing the figures of the two countries.

By the way, we believed that the performance measurement and performance control systems of high-tech companies should be different from that of traditional manufacturing companies. Past systems could not possibly function effectively under new circumstances.

Analyzing the following questions, however, would reveal that the establishment of a new measurement system for a new environment is difficult for many reasons. Therefore, it is vital for the corporations to solve those problems and to introduce appropriate performance measurement and performance control systems.

Question (5) asked about the satisfaction level felt with the current

performance measurement and performance control systems.

There were no "Very satisfied" replies in Japan and West Germany. On the other hand, there were no "Dissatisfied" in the UK , France and West Germany. The Chart-7 shows the total of "Very satisfied" and "Seems resonable" as "Satisfied," and the total of "Needs improvement" and "Dissatisfied" as "Dissatisfied."

Satisfaction to the Current System(Summary)	Chart-7			(%)
	Satisfied		Dissatisfied	
J	45	<	48	
US	39	<	59	
UK	64	>	36	
F	47	<	53	
WG	38	<	63	

The UK was the only country that "Satisfied" outnumbered "Dissatisfied." Even among English companies, 4 out of 4 companies that were employing a relatively high level of technology (i. e. auto and : electric) answered "Needs improvement." In the USA and West Germany, the level of "Dissatisfaction" is pretty high. High-tech companies in the USA, especially, are showing greatest level of dissatisfaction as seen in electronics (80%) and aerospace (72%) companies.

Japanese companies seems to have neglected the different characteristics of each division and employed a unified performance measurement and control system. They also seem to overlook the need to improve their system. That would be the explanation of the result that showing a high rate of "Satisfaction" among with a strong need for improvement.

Next, the industry based statistics in Japan and France were as follows :

	Satisfied	Dissatisfied
Japan-Processing/Assembling	44%	54%
Japan-Material Manufacturing	50%	43%
Japan-Others	43%	43%
France-Processing/Assembling	17%	83%

France-Material Manufacturing	80%	20%
France-Others	50%	50%

The processing/assembly companies showed strong dissatisfaction both in Japan and in France. On the contrary, material manufacturing companies expressed general support of the system. This trend is more apparent in France than in Japan. In combination with the result from the former question, it could be said that processing/assembly companies which employ the same performance measurement and control system are most dissatisfied with the current system and are feeling the need to modify it.

Question (8) asked how they want to change the current performance measurement/control system. The result is compiled in the Chart-8.

Chart-8 (%)

Required Improvement (Summary)	J	US	UK	F	WG
Emphasize longer term financial returns	<u>37</u>	37	24	7	38
Emphasize responsibility accounting	<u>41</u>	<u>47</u>	40	<u>47</u>	<u>88</u>
Emphasize variance analysis	<u>37</u>	<u>48</u>	<u>48</u>	13	13
Emphasize exception reporting	15	44	<u>52</u>	27	13
Introduce non-financial operating measures	19	27	32	<u>47</u>	38
Measure cost of quality variances	13	36	20	33	<u>63</u>
Measure cost of carrying inventory	18	37	40	7	50
Emphasize productivity measurement	27	39	32	40	13
Measure cost of product development	32	19	20	13	38
Simplify measurement system and focus on key results	10	28	32	<u>60</u>	13

Each country's highest and second highest figures are underlined with solid line and broken line, respectively.

By going through the list, one can easily tell what are the factors that make the total performance measurement system of today's high-tech companies work.

"Emphasize responsibility accounting" was 1st in Japan and West Germany, 2nd in France and 3rd in the UK. "Emphasize variance accounting" was 1st in the USA and 2nd in Japan and the UK. "Emphasize exception reporting" was 1st in the UK, "Simplify measurement system and focus on

key results” was 1st in France.

It was interesting that “Emphasize exception reporting” in Japan and “Emphasize longer term financial return” and “Measure cost of carrying inventory” in France were ranked relatively low, respectively. “Measure cost of quality variances” was high on the chart in West Germany but low in Japan. In the UK, the level of satisfaction was high but their need for improving current systems was also strong and 20% checked “No significant changes required.”

On the basis of industry, “Emphasize responsibility accounting” and “Emphasize variance analysis” was 1st with Japanese processing/assemblying companies at 51% each. “Measure cost of product development” was 2nd. With Japanese material manufacturing, “Emphasize responsibility accounting,” “Measure cost of product development” and “Emphasize productivity measurement” topped the chart in the order named. Various types of modifications were called for but there was no change that was uniformly cited.

With France processing/assemblying companies, “Simplify measurement system and focus on key results” was 1st, “Emphasize responsibility accounting” and “Emphasize productivity measurement” were 2nd. With France material manufacturing companies, “Simplify measurement system and focus on key results,” “Introduce non-financial operating measure” and “Measure cost of quality variance” were required.

It is noteworthy that in processing/assemblying companies of both in Japan and France, they regarded “Emphasize responsibility accounting” as a top priority. This reveals how those companies are trying to adjust their systems towards the future.

4. Obstacles in changing performance measurement systems

Question (9) asked what are the obstacles in changing performance measurement systems. Chart-9 shows the result.

Chart-9

Obstacle to Improve System(Summary)	J	US	UK	F
Inappropriate performance measurement concepts	<u>27</u>	21	8	20
Emphasis of management on short-term financial results	13	<u>42</u>	<u>56</u>	27
Management compensation based on short-term results	0	29	32	7
Conservative accounting and financial practices	<u>22</u>	18	16	<u>33</u>
Management policies	4	<u>34</u>	16	13
Other system development priorities	19	25	<u>36</u>	20
Habit	12	27	20	<u>47</u>

Solid line underlines a country's highest figure and broken line underlines its second highest figure. This survey was not conducted in West Germany.

The chart reveals that "Emphasis of management on short-term results" is 1st in the USA and the UK and 3rd in France. Much publicized traits of American and European management are apparent here. "Management compensation based on short-term results," which might be the reason for the management's short-sightedness is ranked 3rd in the USA and in the UK. In the USA, "Management policies" is 2nd, which proves that the mind-fix or behaviour of managers is perceived to be an obstacle.

In Japan, none of these factors were mentioned as obstacles. Especially, "Management compensation based on short-term results" was 0%. "Lack of understanding of options by decision makers" was also 0% and the fact that neither are mentioned as an obstacle would mean that the human aspect was not preventing changes in performance measurement systems.

"Inappropriate performance measurement concept" topped the chart in Japan at 27%. The percentage was high in comparison to the USA or other European countries and suggests that further fine-tuning of performance measurement systems is needed. This factor is a mere 8% in the UK. Coupled with the 16% figure given to "No significant changes required" in the country and the general satisfaction expressed on the current systems, one could say that performance measurement systems themselves are perceived to be of a satisfactory standard in the UK.

On an industry basis, "Conservative accounting and financial practice," "Inappropriate performance measurement concept" and "Other system development priorities" were pointed out as obstacles by both processing/ assembling and material manufacturing companies in Japan. In France,

processing/assemblying companies cited "Habit" and "Conservative accounting practices" as frequent obstacles. Material manufacturers quoted "Emphasis of management on short-term results" as frequent obstacles. The result proves that each industry recognizes its own problems clearly in France.

IV. Conclusion

Previous analysis proves that in the USA and in Europe, companies use a wide array of financial and non-financial measures to set objectives whereas Japanese companies tend to put emphasis on marketing activity related measures.

While these measures are measured by operating control systems in Japan and the UK, they are measured by management accounting systems in the USA, West Germany and other countries.

It was interesting to find out that "Labor productivity" was still an active yardstick though high technology is increasingly incorporated into the companies' operation.

70% answered that there was no change in performance measurement/evaluation system after the introduction of automation. Yet, obviously this was not to mean that the old system was still adequate. Only the UK showed satisfaction with the current system. In the USA and West Germany, where management accounting systems are relatively sophisticated, there was strong dissatisfaction over the current system. Processing/assemblying companies in Japan and in France that use unified systems expressed the same dissatisfaction.

In Europe and especially in the USA, the view or behaviour of management was perceived to be the obstacle to improving the current system. In Japan, the problem was thought to be in the "Performance measurement concept."

The survey reaffirmed some country's management characteristics. Nevertheless, we found through this survey that companies of all surveyed countries are looking for more sophisticated management accounting systems despite their difference in cultural background or level of sophistication. Also, if the wave of innovation is universal and if it proliferates rapidly to result in a levelized standard of technology in different com-

panies, the performance measurement system required by them would have a lot in common. we believe that the study of international comparisons of management accounting will increase in importance more and more in the future.

Appendix 1
Result of the Survey

Please make your responses reflect operations at the *single* most automated business unit (plant, multi-plant division or corporation as a whole) with which you are primarily associated.

A. About Your Business

1. My response to this questionnaire is from the viewpoint of the following type of business unit:

	J	US	UK	F	WG
	%	%	%	%	%
a. Corporation	31	26	56	26	88
b. Group/multi-plant division	25	28	44	67	13
c. Plant	42	43	0	7	0
d. Other	2	0	0	0	0

2. Which classification best describes your business unit ?

	J	US	UK	F	WG
	%	%	%	%	%
a. Metal	7	} 11	} 12	0	25
b. Chemical	22			27	0
c. Paper	1			0	13
d. Oil	3			7	0
e. Gas producer	0			0	0
f. Machinery manufacturer	10	6	0	0	0
g. Automobile or Automobile parts manufacturer	7	10	4	20	25
h. Electronics manufacturer	16	10	12	7	25
i. Other high-technology products manufacturer	5	6	0	13	13
j. Other industrial products manufacturer	6	15	16	13	13
k. Consumer products manufacturer	5	15	32	7	0
l. Diverse products manufacturer	1	5	8	7	0
m. Other	18	0	12	0	0
n. N/A	0	0	4	0	0

3. How large is your business unit (annual sales of manufactured products) ?

		J	US	UK	F	WG
		%	%	%	%	%
a.	Under ¥100 million (J, WG)	0	7	0	0	0
	" \$ 10 million (US)					
	" £ 10 million (UK)					
	" Fr 50 million (F)					
b.	¥100 million— 1 billion (J, WG)	4	29	36	0	13
	\$ 10— 50 million (US)					
	£ 10— 50 million (UK)					
	Fr 50—500 million (F)					
c.	¥ 1 — 5 billion (J, WG)	6	15	8	0	13
	\$ 50—100 million (US)					
	£ 50—100 million (UK)					
	Fr 500—2.5 billion (F)					
d.	¥ 5 — 10 billion (J, WG)	12	23	12	0	38
	\$ 100—500 million (US)					
	£100—250 million (UK)					
	Fr 2.5— 5 billion (F)					
e.	¥ 10— 30 billion (J, WG)	14	8	16	7	13
	\$ 500 million— 1 billion (US)					
	£250—500 million (UK)					
	Fr 5 — 15 billion (F)					
f.	¥ 30— 50 billion (J, WG)	29	11	8	0	13
	\$ 1 — 5 billion (US)					
	£500—1000million (UK)					
	Fr 15— 25 billion (F)					
g.	Over ¥ 50 billion (J, WG)	32	4	20	93	13
	" \$ 5 billion (US)					
	" £1000million (UK)					
	" Fr 25 billion (F)					
N/A		4	0	0	0	0

D. Performance measures

1. In setting goals for your business unit, which of the following financial indicators are used? Rate all applicable items.

	Always used						Often used						Occasionally used					
	J	US	UK	F	WG	J	US	UK	F	WG	J	US	UK	F	WG			
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%			
a. Sales	92	80	80	93	88	3	9	4	7	13	0	1	12	0	0			
b. Sales growth	59	56	64	67	75	18	26	12	20	13	4	4	8	13	13			
c. Contribution margin	42	35	64	60	63	12	24	20	13	25	6	18	12	13	13			
d. Gross margin	58	49	72	67	63	17	27	16	20	0	4	7	4	7	25			
e. Operating income % sales	56	48	68	33	75	17	22	12	27	0	2	11	4	33	25			
f. Net income % sales	54	51	60	20	75	17	17	16	7	13	3	13	8	60	13			
g. Return of total assets	20	39	36	40	63	27	23	44	27	25	17	20	8	33	13			
h. Return on total capital	17	26	44	20	63	25	22	28	33	13	17	23	8	40	25			
i. Return on equity	14	27	8	20	63	17	20	40	20	13	23	25	24	47	25			
j. Residual income	2	5	4	7	50	3	8	16	13	0	22	43	40	60	50			
k. Economic income	8	4	0	20	63	24	9	4	33	25	15	40	48	27	0			
l. Cost of capital	7	21	28	13	50	22	27	16	20	38	10	21	32	53	13			
m. Cash flows	30	48	88	67	75	17	25	0	27	25	8	9	4	7	0			
n. Inventory levels	46	47	52	67	63	13	23	24	20	38	3	7	4	7	0			
o. Other	5	0	16	0	0	1	0	4	0	0	0	0	4	0	0			

2. In setting goals for your business unit, which of the following non-financial indicators are used?
 Rate all applicable items.

	Always used						Often used						Occasionally used					
	J	US	UK	F	WG		J	US	UK	F	WG		J	US	UK	F	WG	
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
a. Market share	65	49	48	80	63	17	26	20	20	0	0	3	11	20	20	20	25	
b. Market growth	50	43	56	60	63	20	31	12	20	13	13	6	10	20	13	13	13	
c. Product development performance	31	15	32	40	38	28	32	28	20	25	25	10	23	16	27	27	25	
d. Product quality	49	52	48	80	50	17	31	24	13	38	38	3	8	4	7	0	0	
e. Delivery performance/ Customer service	11	38	56	53	50	20	37	36	20	38	38	11	11	0	20	0	0	
f. Throughput rate (eg., Output per day)	31	26	40	60	63	17	30	12	13	13	13	7	20	24	13	13	13	
g. Labor productivity	46	41	56	47	75	58	35	28	47	13	13	6	11	8	7	0	0	
h. Material yield	39	27	40	60	38	23	28	24	20	25	25	5	20	12	13	25	25	
i. Equipment productivity	26	18	20	53	50	27	28	40	27	38	38	8	26	16	13	0	0	
j. Manufacturing flexibility	9	10	12	47	50	23	29	20	13	25	25	11	29	40	27	13	13	
k. Technological capability	22	11	16	40	63	19	25	24	47	25	25	6	25	24	7	0	0	
l. Other	2	0	16	0	0	0	0	0	0	0	0	0	0	4	0	0	0	

3. How are the following factors measured in your business unit ?

	Output of Management Accounting System						Output of Operating Control System						Informally Measured						Not Measured															
	J		US		UK		F		WG		J		US		UK		F		WG		J		US		UK		F		WG					
	%		%		%		%		%		%		%		%		%		%		%		%		%		%		%					
Manufacturing Performance																																		
a. Incoming material quality	3	2	0	7	13	62	62	56	67	38	25	28	24	13	38	2	4	4	13	0														
b. Vendor delivery and/or quality performance	3	2	0	7	0	58	58	40	53	25	26	38	40	27	63	3	6	0	13	0														
c. Physical scrap counts	24	32	16	33	63	39	39	28	47	13	12	15	28	13	0	9	5	8	13	13														
d. Process yields	28	30	12	40	50	51	33	52	60	50	7	12	16	7	0	11	12	4	0	0														
e. Material usage	17	52	28	47	63	38	27	44	47	38	16	7	8	13	0	12	4	4	0	0														
f. Inventory turnover	41	67	68	67	63	29	11	16	47	13	17	4	4	7	25	5	5	4	0	0														
g. Labor productivity	39	52	40	40	75	25	23	36	67	13	24	12	16	7	13	2	3	4	0	0														
h. Labor efficiency	30	51	28	20	63	42	21	44	53	13	13	12	16	7	25	7	5	4	7	0														
i. Material handling costs	26	45	20	40	50	19	15	12	40	38	16	20	32	20	13	18	13	24	0	0														
j. Tooling costs	51	50	32	53	63	17	13	16	40	38	10	17	12	20	0	6	11	24	0	0														
k. Machine utilization	9	15	4	20	13	39	43	44	60	75	27	22	24	27	13	5	12	12	0	0														
l. Machine downtime	10	12	4	13	25	37	44	48	67	50	21	26	20	20	13	11	11	12	13	13														
m. Set-up and change-over costs	9	23	8	33	75	30	25	28	47	25	24	26	36	27	0	17	15	12	7	0														
n. Daily schedule attainment	7	8	8	7	38	53	52	44	60	50	13	22	20	13	13	8	8	16	13	0														
o. Throughput rates (e.g., output/day)	24	13	4	7	25	49	47	36	67	75	6	16	20	13	0	7	11	20	0	0														
p. Cycle efficiency	20	5	8	0	13	34	26	20	33	38	13	20	24	40	38	11	34	32	7	13														
q. Cost of rework	27	46	24	33	75	23	15	20	20	13	21	21	24	53	0	9	10	12	0	13														
r. Product quality	7	7	12	13	13	63	57	64	53	50	15	27	16	40	38	5	1	0	0	0														
Customer Service																																		
s. On-time delivery performance	8	9	12	7	0	43	45	48	47	75	19	30	24	40	25	14	9	0	7	0														
t. Out-of-stock rates	5	7	8	0	13	32	32	48	53	75	21	28	20	27	13	22	24	8	20	0														
u. Order lead time	6	6	0	7	13	44	41	64	57	63	29	32	20	20	25	7	13	0	27	0														
v. Accuracy of demand forecasts	6	10	8	13	13	34	25	40	47	25	26	34	28	33	50	18	22	8	13	13														
Other Performance																																		
w. Product development performance	9	4	4	0	38	21	13	4	33	25	39	44	56	33	25	7	29	24	13	0														
x. Cost of engineering change orders	12	10	4	13	75	15	7	8	13	13	21	33	32	47	0	28	41	44	13	13														
y. Warranty costs/field performance	11	28	12	47	88	23	11	16	13	0	21	23	36	13	0	18	27	24	27	13														
z. Cost of non-conformance	9	10	0	33	25	15	11	12	27	13	18	29	32	33	0	28	39	36	13	63														
aa. Other performance measures	0	0	0	7	0	0	0	0	0	0	0	0	20	0	0	3	0	20	0	0														

4. Are the same performance and control measurement systems used for both automated and non-automated environments ?

	J	US	UK	F	WG
	%	%	%	%	%
a. Yes	67	77	72	67	75
b. No	22	17	16	33	13
c. No answer	11	6	12	0	13

5. How satisfied are you with your business unit's performance measurement systems ?

	J	US	UK	F	WG
	%	%	%	%	%
a. Very satisfied	0	6	8	7	0
b. Seems reasonable	45	33	56	40	38
c. Needs improvement	47	51	36	53	62
d. Dissatisfied	1	8	0	0	0

6. and 7. are eliminated because we could not obtain enough number of answers.

8. What changes to your business unit's performance measurement systems are desirable? Check all applicable items.

	J	US	UK	F	WG
	%	%	%	%	%
a. No significant changes required	5	11	20	7	0
b. Emphasize longer term financial results	37	37	24	7	38
c. Reduce return on investment objectives	4	9	0	13	0
d. Emphasize responsibility accounting	41	47	40	47	88
e. Emphasize functional accounting	15	14	16	13	13
f. Deemphasize labor efficiency measurements	4	18	4	7	25
g. Deemphasize machine utilization measurements	2	5	4	0	13
h. Emphasize variance analysis	37	48	48	13	13
i. Emphasize exception reporting	15	44	52	27	13
j. Emphasize current (net replacement value) costing	13	9	0	7	0
k. Introduce non-financial operating measures	19	27	32	47	38
l. Emphasize daily schedule attainment	15	22	16	13	13
m. Emphasize market share	17	15	20	0	13
n. Measure cost of quality variances	13	36	20	33	63
o. Measure cost of delivery variances	5	15	4	7	50
p. Measure cost of carrying inventory	18	37	40	7	50
q. Measure manufacturing cycle time	12	23	4	0	0
r. Emphasize productivity measurements	27	39	32	40	13
s. Measure cost of product development	32	19	20	13	38
t. Measure cost of engineering change	8	21	12	13	50
u. Measure manufacturing capacity utilization	15	27	16	13	50
v. Replace straight line with unit-of-production depreciation	3	7	0	0	0
w. Increase book lives of machinery and equipment	0	2	0	0	0
x. Decrease book lives of machinery and equipment	14	6	0	7	0
y. Simplify measurement system and focus on key results	10	28	32	60	13
z. Other	3	1	4	0	0

9. What obstacles stand in the way of the changes checked in the previous question in your business unit? Check all applicable items

	J	US	UK	F
	%	%	%	%
a. No significant changes required	7	12	16	7
b. Inappropriate performance measurement concepts	27	21	8	20
c. Emphasis of management on short-term financial results	13	42	56	27
d. Management compensation based on short-term results	0	29	32	7
e. Government procurement regulations	0	5	0	13
f. A change would make us look bad	3	2	0	0
g. Conservative accounting and financial practices	22	18	16	33
h. Management policies	4	34	16	13
i. Other system development priorities	19	25	36	20
j. Habit	12	27	20	47
k. Lack of understanding of options by decisionmakers	0	28	8	20
l. Other	3	0	0	0

E. About Yourself

1. What best describes your primary function ?

	J	US	UK	F	WG
	%	%	%	%	%
Information User					
a. Senior operating executive	6	5	16	20	75
b. Engineering executive/engineer	5	2	0	0	50
c. Manufacturing executive	6	6	0	0	88
d. Manufacturing support staff	15	2	4	0	50
e. Project manager	2	1	0	0	75
f. Contract administrator	0	0	0	0	13
g. Other user of information	30	1	8	0	38
No answer	41	0	72	80	0
Information Preparer					
h. Corporate chief financial	35	3	32	13	38
i. Corporate controller or assistant	14	14	16	27	50
j. Group controller or assistant	3	7	24	7	50
k. Division controller or assistant	9	19	8	33	50
l. Plant controller or assistant	11	27	0	0	38
m. Financial analyst	11	3	4	0	50
n. Data processing professional	1	1	0	0	25
o. Other preparer of management information	11	1	8	0	38

Appendix 2
Anysis on Industry Basis

JAPAN

J - 1

Financial Measure Ranking	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
1. Sales	94.5	103	35.8	39	24.8	27	33.9	37
2. Sales growth	76.1	83	29.4	32	18.3	20	28.4	31
3. Gross margin	74.3	81	24.8	27	19.3	21	30.3	33
4. Operating income% sales	72.5	79	24.8	27	17.4	19	30.3	33
5. Net income% sales	70.6	77	28.4	31	15.6	17	26.6	29
6. Inventory levels	58.7	64	22.0	24	16.5	18	20.2	22
7. Contribution margin	53.2	58	19.3	21	13.8	15	20.2	22
8. Return on total assets	46.8	51	22.9	25	11.0	12	12.8	14
9. Cash flows	46.8	51	22.0	24	11.9	13	12.8	14
10. Return on total capital	42.2	46	22.9	25	9.2	10	10.1	11
11. Economic income	32.1	35	11.9	12	9.2	10	11.0	12
12. Return on equity	31.2	34	18.3	20	5.5	6	7.3	8
13. Cost of capital	29.3	32	12.8	14	10.1	11	6.4	7
14. Residual income	4.6	5	1.8	2	—	—	2.8	3
15. Other	5.5	6	0.9	1	1.8	2	2.8	3

"%"shows checking rate to the total of 109 companies, of which 3 companies (2.8%) did not answer the question.

J - 2

Non-financial Measure Ranking	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
1. Market share	82.5	90	33.9	37	22.0	24	26.6	29
2. Labor productivity	73.4	80	33.0	36	14.7	16	25.7	28
3. Marke growth	70.7	77	29.4	32	19.3	21	22.0	24
4. Product quality	66.0	72	28.4	31	15.6	17	22.0	24
5. Material yields	62.4	68	22.0	24	19.3	21	21.1	23
6. Product development performance	58.7	64	26.6	29	17.4	19	14.7	16
7. Equipment productivity	52.3	57	22.9	25	13.8	15	15.6	17
8. Throughput rate	48.6	53	19.3	21	11.9	13	17.4	19
9. Technological capability	41.3	45	17.4	19	11.9	13	11.9	13
10. Manufacturing flexibility	32.1	35	13.8	15	13.8	15	4.6	5
11. Delivery performance customer service	31.2	34	12.8	14	11.0	12	7.3	8
12. Other	1.8	2	—	—	—	—	1.8	2

"%"shows checking rate to the total of 109 companies, of which 4 companies (3.7%) did not answer the question

Ranking of Performance Measures that are Systematically or Periodically Measured	Total of Periodical Measurement		Processing/Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
1. Process yields	71.6 (7.3)	78 (8)	27.5 (1.8)	30 (2)	20.2 (3.7)	22 (4)	23.9 (1.8)	26 (2)
2. Throughput rate	68.8 (4.6)	75 (5)	27.5 (0.9)	30 (1)	19.3 (1.8)	21 (2)	22.0 (1.8)	24 (2)
3. Labor efficiency	68.8 (3.7)	75 (4)	33.0 (1.8)	36 (2)	12.8 —	14 —	22.9 (1.8)	25 (2)
4. Product quality	68.8 (2.8)	75 (3)	30.3 (0.9)	33 (1)	17.4 —	19 —	21.1 (1.8)	23 (2)
5. Inventory turnover	67.9 (2.8)	74 (3)	23.9 (0.9)	26 (1)	21.1 (0.9)	23 (1)	22.9 (0.9)	25 (1)
6. Tooling costs	68.8 —	75 —	27.5 —	30 —	18.3 —	20 —	22.9 —	25 —
7. Incoming material quality	64.2 (0.9)	70 (1)	29.4 (0.9)	32 (1)	14.7 —	16 —	20.2 —	22 —
8. Labor productivity	62.4 (0.9)	68 (1)	25.7 —	28 —	16.5 (0.9)	18 (1)	20.2 —	22 —
9. Physical scrap counts	61.5 (0.9)	67 (1)	22.9 (0.9)	25 (1)	19.3 —	21 —	19.3 —	21 —
10. Daily schedule attainment	61.5 (0.9)	67 (1)	28.4 —	31 —	11.0 —	12 —	22.0 (0.9)	24 (1)
11. Vender delivery and/or quality performance	59.6 (0.9)	65 (1)	25.7 (0.9)	28 (1)	14.7 —	16 —	19.3 —	21 —
12. Cycle efficiency	55.0 (1.8)	60 (2)	18.3 —	20 —	17.4 (0.9)	19 (1)	19.3 (0.9)	21 (1)
13. Material usage	53.2 (1.8)	58 (2)	19.3 (0.9)	21 (1)	16.5 (0.9)	18 (1)	17.4 —	19 —
14. On-time delivery performance	49.6 —	54 —	17.4 —	19 —	10.1 —	11 —	22.0 —	24 —
15. Machine utilization	46.8 (0.9)	51 (1)	20.2 —	22 —	11.0 (0.9)	12 (1)	15.6 —	17 —
16. Machine downtime	46.8 —	51 —	17.4 —	19 —	12.8 —	14 —	16.5 —	18 —
17. Cost of rework	45.0 (0.9)	49 (1)	20.2 (0.9)	22 (1)	9.2 —	10 —	15.6 —	17 —
18. Material handling costs	44.0 (0.9)	48 (1)	13.8 (0.9)	15 (1)	14.7 —	16 —	15.6 —	17 —
19. Order lead time	43.1 (0.9)	47 (1)	19.3 —	21 —	10.1 (0.9)	11 (1)	13.8 —	15 —

"%" shows checking rate to the total of 109 companies, of which 2 companies (1.8%) did not respond.

J - 4

Uniformity of Performance Measurement and Performance Control Systems	Total		Processing/Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	109	37.6	41	25.7	28	36.7	40
1. Use the same system	67.3	73	23.9	26	20.2	22	22.9	25
2. Use different systems	22.0	24	11.0	12	3.7	4	7.3	8
3. No answer	11.0	12	2.8	3	1.8	2	6.4	7

J - 5

Satisfaction at the Current System	Total		Processing/Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	109	37.6	41	25.7	28	36.7	40
a. Very satisfied	—	—	—	—	—	—	—	—
b. Seems reasonable	45.0	49	16.5	18	12.8	14	15.6	17
c. Needs improvement	46.8	51	20.2	22	11.0	12	15.6	17
d. Dissatisfied	0.9	1	—	—	—	—	0.9	1
e. No answer	7.3	8	0.9	1	1.8	2	4.6	5

J - 6

Desired Modification	Total		Processing/Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	109	37.6	41	25.7	28	36.7	40
1. Emphasize responsibility accounting	41.3	45	19.3	21	9.2	10	12.8	14
2. Emphasize longer term financial returns	36.7	40	15.6	17	6.4	7	14.7	16
3. Emphasize variance analysis	36.7	40	19.3	21	5.5	6	11.9	13
4. Measure cost of product development	32.1	35	17.4	19	8.3	9	6.4	7
5. Emphasize productivity measurements	26.6	29	10.1	11	7.3	8	9.2	10
6. Introduce non-financial operating measures	19.3	21	9.2	10	4.6	5	5.5	6
7. Measure cost of carrying inventory	18.3	20	7.3	8	7.3	8	3.7	4
8. Emphasize market share	17.4	19	6.4	7	7.3	8	3.7	4
9. Emphasize exception reporting	14.7	16	7.3	8	2.8	3	4.6	5
10. Emphasize daily schedule attainment	14.7	16	8.3	9	2.8	3	3.7	4
11. Emphasize functional accounting	14.7	16	6.4	7	4.6	5	3.7	4
12. Measure manufacturing capacity utilization	14.7	16	6.4	7	4.6	5	3.7	4
13. Decrease book lives of machinery and equipment	13.8	15	8.3	9	3.7	4	1.8	2
14. Measure cost of quality variances	12.8	14	4.6	5	2.8	3	5.5	6
15. Emphasize current (net replacement value) costing	12.8	14	4.6	5	0.9	1	7.3	8

Obstacles to Modification	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	109	37.6	41	25.7	28	36.7	40
1. Inappropriate performance measurement concepts	26.6	29	8.3	9	7.3	8	11.0	12
2. Conservative accounting and financial practices	22.0	24	11.0	12	8.3	9	2.8	3
3. Other system development priorities	19.3	21	8.3	9	4.6	5	6.4	7
4. Emphasis of management on short-term financial results	12.8	14	5.5	6	0.9	1	6.4	7
5. Habit	11.9	13	4.6	5	3.7	4	3.7	4
6. No significant changes required	7.3	8	1.8	2	3.7	4	1.8	2
7. Management policies	3.7	4	—	—	—	—	3.7	4
8. A change would make us look bad	2.8	3	0.9	1	0.9	1	0.9	1
9. Other	2.8	3	—	—	1.8	2	0.9	1
10. No answer	28.4	31	11.3	12	6.4	7	11.0	12

FRANCE

F-1

Financial Measure Ranking	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
1. Sales	100	15	40	6	33	5	27	4
2. Cash flows	93	14	40	6	33	5	20	3
3. Sales growth	87	13	33	5	27	4	27	4
" .Gross margin	87	13	33	5	33	5	20	3
" .Inventory levels	87	13	40	6	33	5	13	2
6. Contribution margin	73	11	20	3	33	5	20	3
7. Return on total assets	67	10	27	4	20	3	20	3
8. Operating income%sales	60	9	40	6	7	1	13	2
9. Return on total capital	53	8	7	1	33	5	13	2
" .Economic income	53	8	13	2	27	4	13	2
11. Return on equity	40	6	7	1	20	3	13	2
12. Cost of capital	33	5	20	3	13	2	0	0
13. Net income % sales	27	4	20	3	7	1	0	0
14. Residual income	20	3	7	1	7	1	7	1

F-2

Non-financial Measure Ranking	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
1. Product quality	93	14	40	6	27	4	27	4
2. Labor productivity	93	14	40	6	33	5	20	3
3. Technological capability	87	13	40	6	27	4	20	3
4. Market growth	80	12	33	5	33	5	13	2
" .Market share	80	12	27	4	33	5	20	3
" .Material yields	80	12	40	6	27	4	13	2
" .Equipment productivity	80	12	40	6	20	3	20	3
8. Throughput rate	73	11	40	6	27	4	7	1
" .Delivery performance/customer service	73	11	33	5	20	3	20	3
10. Product development performance	60	9	33	5	20	3	7	1
" .Manufacturing flexibility	60	9	33	5	7	1	20	3

Ranking of Performance Measures that are Systematically or Periodically Measured	Total of Periodical Measurement		Processing/Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
1. Process yields	93.3 (6.7)	14 (1)	33.3 —	5 —	33.3 (6.7)	5 (1)	26.7 —	4 —
" . Inventory turnover	93.3 (20.0)	14 (3)	40.0 (20.0)	6 (3)	26.7 —	4 —	26.7 —	4 —
" . Labor productivity	93.3 (13.3)	14 (2)	40.0 (6.7)	6 (1)	26.7 (6.7)	4 (1)	26.7 —	4 —
4. Material usage	80.0 (13.3)	12 (2)	33.3 (6.7)	5 (1)	26.7 (6.7)	4 (1)	20.0 —	3 —
5. Incoming material quality	73.3 —	11 —	33.3 —	5 —	26.7 —	4 —	13.3 —	2 —
" . Material handling costs	73.3 (6.7)	11 (1)	26.7 —	4 —	26.7 (6.7)	4 (1)	20.0 —	3 —
" . Tooling costs	73.3 (20.0)	11 (3)	26.7 (13.3)	4 (2)	26.7 (6.7)	4 (1)	20.0 —	3 —
" . Machine utilization	73.3 (6.7)	11 (1)	26.7 —	4 —	20.0 —	3 —	26.7 (6.7)	4 (1)
9. Labor efficiency	66.7 (6.7)	10 (1)	33.3 (6.7)	5 (1)	20.0 —	3 —	13.3 —	2 —
" . Machine downtime	66.7 (13.3)	10 (2)	33.3 (6.7)	5 (1)	20.0 —	3 —	13.3 (6.7)	2 (1)
" . Set-up and change-over costs	66.7 (13.3)	10 (2)	33.3 (6.7)	5 (1)	20.0 —	3 —	13.3 (6.7)	2 (1)
" . Throughput rates	66.7 (6.7)	10 (1)	26.7 (6.7)	4 (1)	33.3 —	5 —	6.7 —	1 —
13. Vendor delivery and/or quality performance	60.0 —	9 —	33.3 —	5 —	20.0 —	3 —	6.7 —	1 —
" . Daily schedule attainment	60.0 (6.7)	9 (1)	33.3 (6.7)	5 (1)	13.3 —	2 —	13.3 —	2 —
" . Physical scrap counts	60.0 (20.0)	9 (3)	33.3 (13.3)	5 (2)	13.3 (6.7)	2 (1)	13.3 —	2 —
" . Product quality	60.0 (6.7)	9 (1)	40.0 (6.7)	6 (1)	6.7 —	1 —	13.3 —	2 —
" . Order lead time	60.0 —	9 —	33.3 —	5 —	6.7 —	1 —	20.0 —	3 —
" . Accuracy of demand forecast	60.0 (6.7)	9 (1)	33.3 (6.7)	5 (1)	13.3 —	2 —	13.3 —	2 —
19. On-time delivery performance	53.3 —	8 —	40.0 —	6 —	6.7 —	1 —	6.7 —	1 —
" . Out-of-stock rates	53.3 —	8 —	33.3 —	5 —	6.7 —	1 —	13.3 —	2 —
21. Warranty costs/field performance	46.7 (13.3)	7 (2)	33.3 (13.3)	5 (2)	6.7 —	1 —	6.7 —	1 —
22. Cost of non-conformance	40.0 (20.0)	6 (3)	33.3 (20.0)	5 (3)	6.7 —	1 —	0 —	0 —

F — 4

Uniformity of Performance Measurement and Performance Control Systems	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	15	40.0	6	33.3	5	26.7	4
1. Use the same system	66.7	10	33.3	5	13.3	2	20.0	3
2. Use different systems	33.3	5	6.7	1	20.0	3	6.7	1
3. No answer	—	—	—	—	—	—	—	—

F — 5

Satisfaction at the Current System	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	15	40.0	6	33.3	5	26.7	4
a. Very satisfied	6.7	1	0.7	1	—	—	—	—
b. Seems reasonable	40.0	6	—	—	26.7	4	13.3	2
c. Needs improvement	53.3	8	33.3	5	6.7	1	13.3	2
d. Dissatisfied	—	—	—	—	—	—	—	—
e. No answer	—	—	—	—	—	—	—	—

F — 6

Desired Modification	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	15	40.0	6	33.3	5	26.7	4
1. Simplify measurement system and focus on key results	60.0	9	33.3	5	20.0	3	6.7	1
2. Emphasize responsibility accounting	46.7	7	26.7	4	6.7	1	13.3	2
3. Introduce non-financial operating measures	46.7	7	13.3	2	20.0	3	13.3	2
4. Emphasize productivity measurements	40.0	6	26.7	4	6.7	1	6.7	1
5. Measure cost of quality variances	33.3	5	6.7	1	20.0	3	6.7	1
6. Emphasize exception re- porting	26.7	4	13.3	2	6.7	1	6.7	1
7. Reduce return on invest- ment objectives	13.3	2	6.7	1	6.7	1	—	—
" . Emphasize functional accounting	13.3	2	6.7	1	6.7	1	—	—
" . Emphasize variance analy- sis	13.3	2	6.7	1	6.7	1	—	—
" . Emphasize daily schedule attainment	13.3	2	13.3	2	—	—	—	—
" . Measure cost of product development	13.3	2	13.3	2	—	—	—	—
" . Measure cost of engineer- ing change	13.3	2	13.3	2	—	—	—	—

Obstacles to Modification	Total		Processing/ Assembling		Material Manufacturing		Others	
	%	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies
	100.0	15	40	6	33.3	5	26.7	4
1. Habit	46.7	7	26.7	4	13.3	2	6.7	1
2. Conservative accounting and financial practices	33.3	5	20.0	3	6.7	1	6.7	1
3. Emphasis of management on short-term financial results	26.7	4	—	—	20.0	3	6.7	1
4. Inappropriate performance measurement concepts	20.0	3	6.7	1	13.3	2	—	—
" . Other system development priorities	20.0	3	13.3	2	6.7	1	—	—