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Strategy, performance measurement techniques and information technology of the firm and their links to organizational performance

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Abstract

This study investigates the relationships between organizational performance and customer-focused strategies, performance measures and information technology. The results indicate that when a firm does not follow a customer-focused strategy, contemporary management accounting systems in combination with advanced information technology are related to high customer performance. The results also indicate that contemporary performance measures do not help firms with a highly customer-focused strategy to achieve high customer performance. Finally, the results show that a fit between the customer-focused strategy and financial performance measures improves customer performance.

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1. Introduction

Management control systems of the firm should be tailored to support business strategy to achieve competitive advantage and superior performance (e.g. Simons, 1987,1990; Dent, 1990). Therefore, it is not surprising that there has been a growing interest in performance measures best suited to different strategies. As pointed out by Guilding and McManus (2002), there appears to be a growing tendency for firms to seek to gain a competitive advantage by applying customer-focused strategies. Customer-focused ideology is also embedded in many management philosophies such as total quality management, just-in-time or flexible manufacturing.

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Information technology used by the firm provides an additional dimension to the relationship between the performance measures and strategy of the firm. In recent years, the relationship between strategy and information technology has been intensively examined in the literature. Davis et al. (2002) provides evidence of the positive relationship between the market differentiation strategy and strategic information technology. The relationship between strategy and information technology is found by Tan (1996), and Palmer and Markus (2000), among others. Many authors (e.g. Mahmood and Mann, 1993; Kettinger et al., 1995; Palvia, 1997; Li and Ye, 1999) suggest that the relationship between the information technology and firm performance should be investigated within a strategic framework. Weill (1992), Mahmood and Mann (1993) and Dans (2001) find links between the information technology and organizational performance. In addition, Chan et al. (1997) report that the business strategic orientation, information systems strategic alignment and information systems effectiveness have positive impacts on performance. By the term *information systems* they refer to different information systems applications. In this study, the term *information technology* refers to a firm's emphasis on advanced information system applications.

While numerous studies have investigated performance measures and strategy, and information technology and strategy, research on the combination of performance measures, strategy and information technology is sparse. From a management control systems perspective, it is of interest whether the level of the information technology of the firm is reflected in the relationship between particular performance measures and strategy. Previous studies suggest that the firms use non-financial measures together with the customer-focused strategies, but the association between this fit and performance is ambiguous (Guilding and McManus, 2002). It is possible that the fit of strategy and performance measures with organizational performance can be understood by examining if information technology enhances the performance measures—strategy fit.

This study investigates the relationships between the customer performance and the respective customer-focused strategy, performance measures and information technology of the firm. Contemporary performance measures refer to currently developed methods such as benchmarking, activity-based cost accounting techniques, balanced performance measures, employee-based performance measures and strategic planning.

The study contributes to the management accounting literature in two main respects. First, it uses the level of information technology used by the firm in order to help understand the relationship between performance measures and strategy. More specifically, we examine whether the fit between particular performance measures, information technology and strategy enhances the performance of the firm. Second, it extends the literature on the relative importance of financial and non-financial performance measures in developing effective strategies (e.g. Kaplan and Norton, 1996; Itner and Larcker, 1998; Luft and Shields, 2000).

The rest of the paper is organized as follows. The next section outlines the theoretical framework. The third section presents the research methodology. The results are reported in the fourth section. Finally, the fifth section discusses and concludes the study.

2. Theoretical framework and hypothesis development

The design and use of the control systems of the firm depends on the context of the organizational setting. The appropriateness of different control systems depends on the setting of the business. Early research in this field investigated the importance of the environment, technology, structure and size for the design

of management control systems. Recent research has considered the relevance of additional contextual variables for the design of management control systems. Perhaps the most important new stream of literature has been that related to the role of strategy (e.g. [Chenhall, 2003](#)). Recently, a customer focus has been identified as an important aspect of the strategy of the firm (e.g. [Kaplan and Norton, 1992](#), [Guilding and McManus, 2002](#)). This form of strategy provides a potential for firms to effectively differentiate their products or services from competitors by satisfying customer demands for product features or for timely and reliable delivery and after sales service. The customer-focused strategy is consistent with Porter's product differentiation strategy.

There are several generic taxonomies for strategy that have been suggested in the literature. This study uses the one based on [Porter \(1980,1985\)](#), who argues that for a firm to compete effectively, it must derive its competitive advantage either from differentiation, cost leadership or focus. Each of these strategies provides a basis for a sustainable competitive advantage within an industry. The successful implementation of these strategies involves different resources and skills, supportive organizational arrangements and control systems. Each of these strategies involves a fundamentally different route to competitive advantage. Other taxonomies used in contingency research are build–hold–harvest ([Gupta and Govindarajan, 1984](#)), entrepreneurial–conservative ([Miller and Friesen, 1986](#)) and defender–prospector–analyzer ([Miles and Snow, 1978](#)).

2.1. Strategy and performance measures

The research investigating the links between customer-focused strategies and performance measures is very limited (e.g. [Guilding and McManus, 2002](#)). However, there has been research into the appropriate design of performance measures for more generic forms of strategy. Links have been identified between performance measures and the generic strategies of product differentiation and cost leadership ([Porter, 1980,1985](#)), prospector, defender and analyzer ([Miles and Snow, 1978](#)) and build, hold and harvest ([Gupta and Govindarajan, 1984](#)). In general, more open, flexible, organic performance measures appear to suit more product differentiation and build types of strategies ([Langfield-Smith, 1997](#)). Since customer-focused strategies are a form of product differentiation strategy, it may be suggested that more open, organic, contemporary measures will be appropriate.

[Guilding \(1999\)](#) provides evidence that, relative to other firms, prospector firms make greater use and perceive greater helpfulness in competitor-focused accounting. The results also show that build firms exhibit greater reliance on long-run performance than harvest firms. [Guilding and McManus \(2002\)](#) show a positive relationship between customer accounting and market orientation, which can be seen to represent the customer-focused strategy in this study.

There is some agreement among researchers that cost control is more important in firms following a defender or cost leadership strategy. Also, the literature shows that contemporary management accounting systems seem to be used in connection with differentiator, prospector or build types of strategies. However, the empirical evidence of the relationship between strategy and management accounting systems is not clear and the performance links of these interactions are not strong.

[Miles and Snow \(1978\)](#) describe the planning and control systems of defenders as likely to be very detailed, focusing on reducing uncertainty and emphasizing problem solving. These systems are unable to assist in new product development or to locate market opportunities. Control systems are also likely to be centralized. [Miller and Friesen \(1982\)](#) characterize conservative firms (defenders) as needing a control system that signals the need for innovation by indicating significant drops in market share, reductions in

the sales of old products and declining profitability. Porter (1980) argues that highly structured (i.e. simple sequential relationships between subunits, the absence of non-routine decisions, stable environment and repetitive operations) organizations support a cost leadership focus.

Govindarajan and Gupta (1985) studied contingency relationships between control systems and strategy. Their study revealed that greater reliance on long-term criteria as well as subjective approaches for determining the bonuses of a strategic business unit's general manager contributes to effectiveness in the case of build organizations but hampers it in the case of harvest organizations. Subjective performance evaluation was also found by Gupta (1987) to be positively associated with effectiveness in organizations following a build or differentiation strategy. Govindarajan (1988) shows that low emphasis on meeting budgets is associated with high performance in organizations employing a strategy of differentiation. However, Simons (1987) found that high performing prospectors placed importance on controls, such as forecasting data, tight budget goals and the careful monitoring of outputs, but gave little attention to cost control. In addition, they found that large highly performing prospectors emphasized frequent reporting and the use of uniform control systems, which are modified when necessary. Control systems were used less intensively by defender firms compared to prospector firms. High financial performance was negatively correlated with tight budget goals and the use of output monitoring. Tight budget goals were positively correlated with high performance in small defender firms. However, the control systems introduced in Simons' study are focused on financial control practices. Simons (1990) also found, contrary to accepted theory, that top managers of low-cost, high-volume businesses do not pay a great deal of attention to efficiency-related controls like cost accounting systems. Merchant (1985) found that the control systems used in organizations following a growth strategy were not noticeably different from the control systems used in organizations under a maintain cash flow or selective growth strategy.

Chenhall and Morris (1995) provide evidence that the association between enhanced performance and the interaction of organic processes with the use of management accounting systems is stronger in entrepreneurial than in conservative firms. The findings from Abernethy and Guthrie (1994) indicate that the effectiveness of the business unit is dependent on a match between the design of the information system and the firm's strategic postures. Management systems that have the characteristics of broad scope systems are found to be more effective in firms employing a prospector strategy than a defender type of strategy. Abernethy and Brownell (1999) show in their study that an interactive style of budgeting can mitigate the disruptive performance effect of the strategic change process. Van der Stede (2000) study suggests that differentiation business units generally undergo less rigid budgetary controls, which are associated with more budgetary slack, and presumably allow a higher degree of flexibility to respond to changes in the environment.

Many companies are nowadays seeking to gain a competitive advantage by applying customer-focused strategies. Customer-focused ideology is embedded in many management philosophies, i.e. in total quality management, just-in-time or flexible manufacturing. There are several general reasons why customer satisfaction should lead to better performance. High customer satisfaction should indicate increased loyalty for current customers, reduced price elasticity, insulation of current customers from competitive efforts, lower costs of future transactions, reduced failure costs, lower costs of attracting new customers, and an enhanced reputation for the firm (e.g. Anderson et al., 1994). There is little empirical research concerned with customer profitability/satisfaction (e.g. Shields, 1997; Foster and Young, 1997; Guilding and McManus, 2002). Ittner and Larcker (2001) show that customer-related performance is perceived to be more important for long-term success when the firm follows an innovative strategy. Conventional management accounting systems have been criticised for an excessive internal orientation and this

internal orientation can be expected to be tempered in those firms pursuing a customer-focused philosophy (Guilding and McManus, 2002). Perera et al. (1997) find support for the hypothesized association between customer-focused strategy and the use of non-financial performance measures but not for the link to organizational performance.

Customer-focused strategies are of particular interest in this study. We examine what kinds of performance measures help customer-focused strategies generate high performance. The theory above suggests that contemporary management accounting systems seem to be used in connection with differentiator, prospector or build type of strategies. The link to organizational performance has also been of interest in earlier research but the evidence is weak. It is suggested here that a fit between contemporary performance measures and customer-focused strategies will enhance performance. Therefore, the following hypothesis is tested:

Hypothesis 1A ((H1A)). A fit between the customer-focused strategy and contemporary performance measures will lead to enhanced customer performance of the firm.

Earlier research concerning management accounting systems shows that these new contemporary measures are being widely adopted in organizations but there is confusion on whether they improve performance. Ittner and Larcker (1997) also show that several strategic control practices are negatively associated with performance. They identify four primary limitations in formal strategic quality control systems: (1) Unfocused strategic action plans, (2) Limitations in performance measures, (3) Increased bureaucracy and (4) Inflexibility in strategic control systems.

While there has been extensive interest in the role of contemporary measures to assist in developing differentiation strategies (Ittner and Larcker, 1998; Kaplan and Norton, 1996) including customer-focused strategies (Guilding and McManus, 2002), survey evidence suggests that financial measures remain important to managers. For example, Chenhall and Langfield-Smith (1998a) found that financial performance measures are perceived to be important to the highest performing firms following differentiation strategies. Traditional accounting techniques provided the highest benefits of all management accounting practices. Many studies confirm the importance of financial measures of performance (see for example Bruggeman et al., 1996; Groot, 1996; Israelsen et al., 1996). Increased emphasis on both traditional and non-traditional measures is also noted by Ittner and Larcker (1998).

It is apparent that there is evidence to suggest that both contemporary and financial performance measures enhance customer performance. It may be that financial measures ensure that there is a careful attention to the long-term financial viability of customer-focused strategies. Thus, **Hypothesis 1B** formalizes the relationship between customer-focused strategies and customer performance.

Hypothesis 1B ((H1B)). A fit between the customer-focused strategy and financial performance measures will lead to enhanced customer performance of the firm.

2.2. *Strategy and information technology*

Massive investments in information technology have given rise to concerns about its contribution to the organization (McKeen and Smith, 1993). This has encouraged researchers to investigate situations within which extensive investments in information technology are likely to be most effective. One important situational characteristic is the strategy of the firm (e.g. Mahmood and Mann, 1993;

Kettinger et al., 1995; Palvia, 1997; Li and Ye, 1999; Prahalad and Krishnan, 2002). As pointed out by Porter (2001), information technology has become a powerful tool for strategy. Porter and Millar (1985) claim that information technology choices are strategic to the extent that they support or enable the firm's business strategy. The special advantage of information technology is the ability to link one activity with other and make real time data widely available through such tools as customer relationship management, enterprise resource planning, electronic data interchange or the Internet. The existence of a link between strategy and information technology has been proposed by Benjamin et al. (1984), Bakos and Treacy (1986), Tan (1996), Palmer and Markus (2000) and Davis et al. (2002), among others.

There is evidence that suggests links between the potential usefulness of advanced information technology in situations where the strategies are highly differentiated. One early study examines links between information technology and competitive strategy (Tavakolian, 1989). This study indicates, among other things, that organizations with conservative competitive strategies possess more centralized information systems than organizations with aggressive competitive strategies. Chan et al. (1997) found evidence that more proactive business strategies combined with more advanced information systems had positive impacts on business performance. Li and Ye (1999) studied the effect of environmental dynamism, firm strategy, and CEO/CIO arrangements on the impact of information technology investment on firm performance. They found that firms need to make greater investment in information technology if they are in more dynamic environments and are also pursuing more externally oriented strategies involving product market expansion.

Bouwens and Abernethy (2000) provide explanations why information technology is particularly relevant to customer-focused strategies. First, a customer-focused strategy requires the development of an organizational culture where individuals are encouraged to be innovative and responsive to customer requirements. To manage effectively in this setting requires an advanced information system to ensure that managers have the information necessary to cope with continual changes in product design and processes. Second, the pursuit of a customer-focused strategy also changes the nature of the relation between functional subunits within the firm as the workflows between subunits become highly interdependent. Additional information requirements are created to ensure that these workflows are coordinated (Bouwens and Abernethy, 2000).

In summary, there is a strongly held view that performance can be enhanced when advanced information technology is used in situations where the strategy involves a more dynamic, externally oriented, differentiation. It is therefore suggested here that the fit between customer-focused strategy and advanced information technology will lead to enhanced customer performance. Advanced information technology here refers to newer information technology innovations like customer relationship management, supply chain management, etc. It is proposed:

Hypothesis 2 ((H2)). A fit between the customer-focused strategy and advanced information technology will lead to enhanced customer performance of the firm.

2.3. Strategy, performance measures and information technology

Thus far it has been argued that the combination of a customer-focused strategy and both contemporary and financial performance measures will enhance performance, and that customer-focused strategies and advanced information technology will enhance performance. A natural extension of these research

questions is whether high performance for firms following customer-focused strategies requires both advanced information technology and performance measures focused on both contemporary and financial metrics. This section presents arguments to support these ideas by linking performance to the three-way interaction between strategy, information technology and performance measures. The essence of this argument is, first, that the effectiveness of customer-focused strategies is enhanced by contemporary innovations in performance measures and financial metrics (hypotheses H1A and H1B). It is then necessary that advanced information technology is sufficiently comprehensive and strategic to provide information to enable both contemporary and financial measures to relate to customer-focused strategies.

Recently, it has been recognized that firms are faced with the challenge of integrating information technology into accounting practices (Olsen and Cooney, 2000). The notion that there are important links between management accounting systems and information technology has been widely suggested (Chapman and Chua, 2000; Ittner and Larcker, 2001; Chenhall, 2003). Burns and Vaivio (2001) point out that advances in information technology have driven innovation and change in the collection, measurement, analysis and communication of information within and between organizations. Information technology innovations such as enterprise resource planning systems, e-commerce, the Internet, electronic data interchange, supply chain management and customer relationship management have been implemented and provide a rich source of information for management accounting systems (Burns and Vaivio, 2001). As yet there is not much empirical evidence of the link between management accounting systems and information technology. Olsen and Cooney (2000) suggest that data warehousing has influenced the practice of accounting but the relationships were not tested empirically. As pointed out by Olsen and Cooney (2000), data warehouses are valuable for making market projections and investigating potential new markets, as well as performing dysfunction analysis regarding sales of particular items and the work of individual salespeople. A recent study by Granlund and Malmi (2002) examined the effects of integrated, enterprise-wide information systems on management accounting. Their findings indicate that enterprise resource planning systems projects have led to relatively small changes in management accounting and control procedures.

As presented earlier, there has been considerable interest in how the relationship between strategy and performance measures influences performance. To help understand this relationship, this study has proposed that information technology has a role. Without appropriate information technology firms do not have an information platform upon which to develop the customer-focused strategy and the contemporary and financial performance measures. Thus, including consideration of information technology provides for an elaboration of how the two-way interaction of strategy and performance measures enhances performance. The above-mentioned phenomena suggest that there is an interaction between customer-focused strategies, performance measures and information technology that affects customer performance. This is illustrated in Fig. 1. This relationship forms the basis for the following hypotheses:

Hypothesis 3A ((H3A)). A fit between the customer-focused strategy, contemporary performance measures and advanced information technology will lead to enhanced customer performance of the firm.

Hypothesis 3B ((H3B)). A fit between the customer-focused strategy, financial performance measures and advanced information technology will lead to enhanced customer performance of the firm.

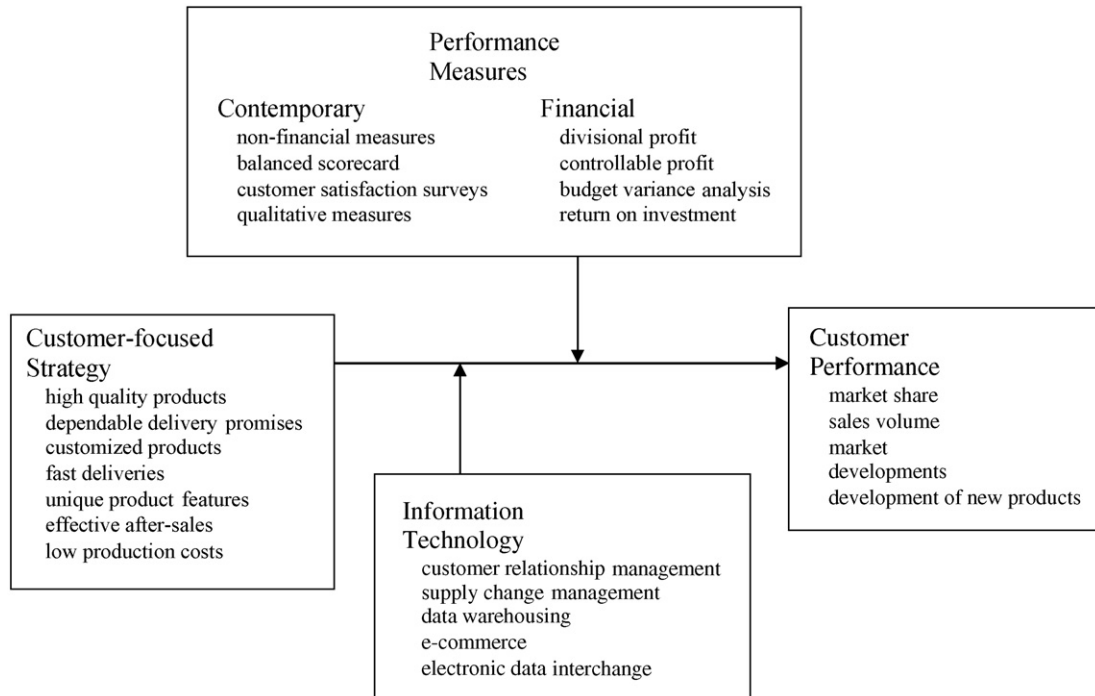


Fig. 1. Interaction model of customer-focused strategy, performance measures, information technology and customer performance.

3. Data and research design

3.1. Sample selection

The design of the survey follows that used by De Meyer et al. (1989), Joye and Blayney (1990), Miller et al. (1992), Innes and Mitchell (1995) and Chenhall and Langfield-Smith (1998b). The survey was pilot tested by a group of managers from eight different companies before the mailing of the questionnaire. Each organization was phoned beforehand to verify the correct address and names. A reminder letter was posted 3 weeks after the first mailing.

The data were collected as a part of a larger mailed questionnaire survey in Finland. The sample consists mainly of large firms (at the business unit level) operating in three industries important for Finland, i.e. forest, metal and electronics. Some of the firms in the sample are among the largest in their field in the world and also leading companies in their line of business. These firms were chosen because one would expect that the leading companies use advanced management tools. The two mailings resulted in 51 usable responses, the response rate being 39%. This is fairly high rate given the number of total items (188) in the questionnaire. The demographic data are shown in Table 1.¹

¹ To examine non-response bias, the first ten and last ten responses of management accounting systems are compared (using *t*-test) to test whether the responses differ between the groups. The results indicate that there are no statistically significant

Table 1
Demographic data

	Number	%
Position at work		
Senior management	33	64.7
Middle management	14	25.5
Specialist	4	7.8
Educational background		
Academic	37	72.5
Polytechnic or college	14	27.5
Annual sales (in million Euros)		
2–10	2	3.9
11–40	6	11.8
41–80	8	15.7
81–160	12	23.5
>160	23	45.1
Function		
Production	7	13.7
HR	1	2
Finance	38	74.5
R&D	4	7.8
Number of employees		
20–100	8	15.7
101–200	6	11.8
201–500	14	27.5
501–1000	10	19.6
>1000	13	25.5
Industry classification		
Forest industry	18	35.3
Metal industry	18	35.3
Electronics industry	8	15.7
Other	7	13.7

3.2. Variable definitions

The questionnaire is used to measure the strategy, contemporary and financial performance measures, information technology and customer performance of the firm. The survey questions are shown in [Appendix A](#). Factor analysis is first used to select the questions within each group for calculating the final measures. Factor analysis provided three to four factors for each group. Each variable representing information technology, contemporary and financial performance measures, and the strategy of the firm is determined by standardizing the survey responses among each group to a zero mean and then computing the

differences between the groups. Also, the data was divided into two parts according to their time of arrival. Regression analysis for Models (1), (2), (3), (4), (5) and (6) were completed for both sets of data. The results show that there are no differences between these groups.

Table 2
Descriptive statistics

Variables	Mean	S.D.
Customer-focused strategy	5.32	1.04
Performance measures		
Contemporary measures	3.91	1.30
Financial measures	4.59	1.26
Information technology	3.53	1.27
Customer performance	5.03	0.90

equally weighted averages of the standardized item scores. Details of the items including in each factor and the factor loadings are provided in [Appendix B](#). Descriptive statistics of the factors are presented in [Table 2](#).

3.3. Strategy

The questionnaire items related to customer-focused strategies are derived from broader studies into strategic priorities designed by [Miller et al. \(1992\)](#) and used by [Chenhall and Langfield-Smith \(1998a\)](#). On the basis of pilot testing, one additional variable (broad range of products) is added to the questionnaire. Respondents were asked to indicate the emphasis placed on strategic priorities over the last 3 years, from no emphasis (scored one) to great emphasis (scored seven). Factor analysis provides four constructs for strategic priorities as seen in [Appendix B](#). The first factor (*S1*) provides a measure for a customer-focused strategy used in the study.

3.4. Contemporary and financial performance measures

The contemporary and financial performance measures follow those used by [Chenhall and Langfield-Smith \(1998b\)](#), [Joye and Blayney \(1990\)](#), and [Innes and Mitchell \(1995\)](#). The respondents are asked to indicate whether their businesses had adopted a particular performance measure, and for those who had adopted each technique, to assess the *benefits* obtained from each of the measures over the past 3 years, from no benefits (scored one) to a high benefit (scored seven). Two sets of performance evaluation measures are identified. Four measures are used to assess the extent to which the organizations benefit from contemporary performance measures: non-financial measures, qualitative measures, balanced scorecard and customer satisfaction surveys (*M1* in [Appendix B](#)). These are selected from the list of fourteen performance measures based on how well they represent these newly developed measures that organizations deem beneficial. Budget variance analysis, controllable profit, divisional profit and return on investment (*M2* in [Appendix B](#)) represent financial measures in this study. These measures were chosen because they are financially aggregate measures that organizations deem beneficial. The results of factor analysis with respect to these separate variable groups are also seen in [Appendix B](#).

3.5. Information technology

Questions related to the information technology were selected after a review of the literature and are exploratory by nature ([Small and Chen, 1997](#); [Rahman, 1998](#); [Schwartz, 1999](#); [Olsen and Cooney,](#)

Table 3

Pearson correlations among customer-focused strategy, performance measures, information technology and customer performance

	Information technology	Strategy	Contemporary PM	Financial PM
Strategy	0.506**			
Contemporary PM	0.412**	0.378**		
Financial PM	0.516**	0.438**	0.435**	
Performance	0.356*	0.363**	0.198	0.183

** $p < 0.01$, two-tailed.

* $p < 0.05$, two-tailed.

2000; Porter, 2001). The respondents were asked to indicate the emphasis they place on information technology innovations, from no emphasis (scored one) to great emphasis (scored seven). Factor analysis provides three constructs for information technology (see Appendix B). The first factor (IT1) includes five variables and it is used in the study to measure information technology. Because specific information technology innovations are employed in many ways in different organizations, information technology innovations are measured here by using only one construct that represents the use of information technology innovations in general. This construct includes electronic data interchange, supply chain management, data warehousing, customer or continuous relationship management and e-commerce.

3.6. Customer performance

The customer performance measure was derived from Govindarajan (1988), De Meyer et al. (1989), Govindarajan and Fisher (1990), Joye and Blayney (1990), Miller et al. (1992) and Innes and Mitchell (1995). First, the respondents are asked to evaluate the performance of their business unit relative to competitors for ten different dimensions on a scale from one to seven. Secondly, the respondents are asked to evaluate the degree of importance for their business unit also on scale from one to seven. Following Govindarajan and Fisher (1990), these two scores (performance and importance) for ten different dimensions are multiplied and finally factor analysed. Appendix B shows the results of the factor analysis. The first construct ($P1$) provides a measure for customer performance and is used in this study. The construct consists of market share, sales volume, market developments and development of new products. The final measure for customer performance is the mean of these four measures.

4. Results

Table 3 presents the Pearson correlations matrix for contemporary and financial performance measures, customer-focused strategy, information technology and customer performance. The results of the correlation analysis indicate that information technology and strategy both have significant positive correlations with customer performance.²

² Scatterplots for every variable were also analyzed. We could not find any outliers affecting the data.

Table 4

Results of two-way regression analysis for customer performance (PM variable: contemporary measures)^a

	Unstandardized regression coefficient	<i>t</i> -value	<i>p</i> -value
Constant	25.82	21.36	0.000
STRA	2.92	2.32	0.025
CPM	0.32	0.31	0.756
STRA × CPM	0.35	0.41	0.683
Adjusted <i>R</i> ²	0.08		
<i>F</i>	2.45		
<i>P</i>	0.08		
<i>N</i>	51		

^a All *t*-tests are two-tailed tests of significance. The model used here follows the equation: $Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{CPM}_i + b_3 \text{STRA}_i \times \text{CPM}_i + e_i$, where Y_i is the customer performance of the *i*th firm, STRA_i is the strategy of the *i*th firm, CPM_i is contemporary performance measures of the *i*th firm, and e_i is the error term.

4.1. Effects of contemporary performance measures

Hypothesis 1A suggests that a fit between the customer-focused strategy and contemporary performance measures will lead to enhanced customer performance. This hypothesis is tested by estimating the following regressions from the data:

$$Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{CPM}_i + b_3 \text{STRA}_i \times \text{CPM}_i + e_i \quad (1)$$

where Y_i is the customer performance of the *i*th firm, STRA_i is the strategy of the *i*th firm, CPM_i is contemporary performance measures of the *i*th firm, and e_i is the error term.

The results of the regression analysis are reported in Table 4. The estimated parameter for the two-way interaction term is not statistically significant ($b_3 = 0.35$, $p = 0.683$) indicating that contemporary performance measures do not enhance the performance of the firms that follow a customer-focused strategy. This is contrary to the view that contemporary management accounting may be best suited for firms with customer-focused strategies. However, the results are similar to those reported by Perera et al. (1997), who empirically find support for the hypothesized association between the customer-focused strategy and the use of non-financial performance measures but not for the link to organizational performance. The findings are also consistent with the recent results that managers find it difficult to use contemporary performance measures in a more complex business environment.

Hypothesis 2 predicts that a fit between the customer-focused strategy and information technology will lead to enhanced performance. This hypothesis is tested by estimating the following regression model:

$$Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{IT}_i + b_3 \text{STRA}_i \times \text{IT}_i + e_i \quad (2)$$

where IT_i is the level of the information technology of the *i*th firm and the other variables are as described in Model (1).

The results of the regression analysis are reported in Table 5. The estimated parameter for the two-way interaction term is not statistically significant ($b_3 = 0.20$, $p = 0.833$). Earlier evidence showed links between information technology and the competitive strategy, and the combination of proactive business strategies with advanced information technology had positive impacts on performance.

Table 5
Results of two-way regression analysis for customer performance^a

	Unstandardized regression coefficient	t-value	p-value
Constant	25.87	20.45	0.000
STRA	2.19	1.62	0.113
IT	1.46	1.37	0.177
STRA × IT	0.20	0.21	0.833
Adjusted R ²	0.11		
F	3.13		
P	0.03		
N	51		

^a All t-tests are two-tailed tests of significance. The model used here follows the equation: $Y_i = b_0 + b_1 STRA_i + b_2 IT_i + b_3 STRA_i \times IT_i + e_i$, where Y_i is the customer performance of the i th firm, $STRA_i$ is the strategy of the i th firm, IT_i is the level of the information technology of the i th firm, and e_i is the error term.

Hypothesis 3A stated earlier that there is a significant association between customer performance and the three-way interaction involving the customer-focused strategy, contemporary performance measures and advanced information technology. To test this hypothesis, the following three-way interaction regression model is estimated:

$$Y_i = b_0 + b_1 STRA_i + b_2 CPM_i + b_3 IT_i + b_4 STRA_i \times CPM_i + b_5 STRA_i \times IT_i + b_6 CPM_i \times IT_i + b_7 STRA_i \times CPM_i \times IT_i + e_i \tag{3}$$

where all variables are as described in Models (1) and (2).

Table 6
Results of three-way regression analysis for customer performance (PM variable: contemporary measures)^a

	Unstandardized regression coefficient	t-value	p-value
Constant	26.39	22.79	0.000
STRA	3.50	2.46	0.180
CPM	0.80	0.77	0.444
IT	2.80	2.50	0.016
STRA × CPM	-0.59	-0.65	0.519
STRA × IT	0.40	0.34	0.734
CPM × IT	0.41	0.40	0.691
STRA × CPM × IT	-2.30	-3.40	0.001
Adjusted R ²	0.29		
F	3.87		
P	0.00		
N	51		

^a All t-tests are two-tailed tests of significance. The model used here follows the equation: $Y_i = b_0 + b_1 STRA_i + b_2 CPM_i + b_3 IT_i + b_4 STRA_i \times CPM_i + b_5 STRA_i \times IT_i + b_6 CPM_i \times IT_i + b_7 STRA_i \times CPM_i \times IT_i + e_i$, where Y_i is the customer performance of the i th firm, $STRA_i$ is the strategy of the i th firm, CPM_i is contemporary performance measures of the i th firm, IT_i is the level of the information technology of the i th firm, and e_i is the error term.

Table 7

Results of two-way regression analysis for customer performance (PM variable: contemporary measures)^a

	High strategy			Low strategy		
	Unstandardized coefficient	<i>t</i> -value	<i>p</i> -value	Unstandardized coefficient	<i>t</i> -value	<i>p</i> -value
Constant	30.57	17.57	0.000	24.31	16.41	0.000
CPM	0.53	0.42	0.677	1.48	1.03	0.316
IT	1.79	1.11	0.281	4.71	3.32	0.003
CPM × IT	−2.30	−2.54	0.019	3.46	2.55	0.019
Adjusted <i>R</i> ²	0.14			0.26		
<i>F</i>	2.33			3.84		
<i>P</i>	0.10			0.02		
<i>N</i>	26			25		

^a All *t*-tests are two-tailed tests of significance. The model used here follows the equation: $Y = b_0 + b_1 \text{CPM}_i + b_2 \text{IT}_i + b_3 \text{CPM}_i \times \text{IT}_i + e_i$, where Y_i is the customer performance of the i th firm, CPM_i is contemporary performance measures of the i th firm, IT_i is the level of the information technology of the i th firm, and e_i is the error term.

The results of estimating Model (3) are reported in Table 6.³ The estimated parameter for the three-way interaction term is significantly negative ($b_7 = -2.30$, $p = 0.001$), which is opposite to Hypothesis 3A.⁴ In other words, there is a significant association between customer performance and the three-way interaction involving strategy, contemporary management accounting systems and information technology, but it does not enhance performance⁵. Although the results are opposite to Hypothesis 3A, they are in line with those reported by Perera et al. (1997), who find a significant association between customer-focused strategies and the use of non-financial performance measures, but not a link to organizational performance. In addition, Ittner and Larcker (1997) report that several strategic control practices are negatively associated with performance. Negative association with performance is consistent with claims that formal strategic control systems can actually hinder performance in some circumstances.⁶

To further investigate the findings reported in Table 6, the data are split into two subsets based on the type of strategy of the firm such that one group consists of firms with a high emphasis on a customer-focused strategy and the other one consists of the firms with a low emphasis on a customer-focused strategy. The following two-way interaction regression model is estimated:

$$Y_i = b_0 + b_1 \text{CPM}_i + b_2 \text{IT}_i + b_3 \text{CPM}_i \times \text{IT}_i + e_i \quad (4)$$

where all variables are as described in Models (1) and (2).

The results of regressing Model (4) are reported in Table 7. In the sub-sample of firms with a high emphasis on a customer-focused strategy, the estimated parameter for the two-way interaction term is significantly negative ($b_3 = -2.30$, $p = 0.019$). However, in the sub-sample of firms with a low emphasis

³ Note that the lower-order effects in an interaction model cannot be interpreted because the variables are not measured with ratio scales (see Southwood (1978) or Hartmann and Moers (1999)).

⁴ The same three-way interaction regression is done using the mean of all ten dimensions of organizational effectiveness as a dependent variable. The results show that the coefficient b_7 is significantly negative ($b_7 = -1.24$, $p = 0.005$).

⁵ Model 3 is also tested using the combination of contemporary and financial performance measures (both $M1$ and $M2$). The results show that the coefficient b_7 is also significantly negative ($b_7 = -2.50$, $p = 0.017$).

⁶ Two more sets of analysis are performed using the same model except that information technology was replaced with IT2 and IT3 from the factor analysis. The coefficient was not significant in either of the cases.

on a customer-focused strategy, the estimated parameter for the interaction term is significantly positive ($b_3 = 3.46$, $p = 0.019$) indicating that in the case of low customisation, contemporary performance measures and information technology are related to high performance. This is opposite to earlier management accounting literature arguing that contemporary management accounting may best suit firms with customer-focused strategies (e.g. Bouwens and Abernethy, 2000). The results are however consistent with recent findings that managers in a more complex setting find it difficult to use contemporary performance measures. Lillis (2002) suggests that it is the management of customer responsiveness strategies with other manufacturing performance dimensions that is most difficult. Management appears to be able to anticipate and measure the performance impacts of quality to a much greater extent than they are able to with customer responsiveness manufacturing. As Lillis (2002) points out, performance management problems appear to occur more in the context of a strategic emphasis on customer responsiveness than quality. Therefore, there is support for the view that performance measures are hard to use when they are involved with customisation strategies.

It seems that in the sub-sample of firms with a high emphasis on customer-focused strategy, the benefits of contemporary performance measures and information technology emphasis are not helping to improve performance on their own. As pointed out earlier, it may be that customer-focused strategy makes it hard to use contemporary performance measures. Alternatively, maybe emphasizing information technology is not helpful, as customer-focused strategy requires the information system to be so complicated and expensive that they do not provide desired benefits. So when combining ineffective contemporary performance measures with expensive information technology it will lead to lower performance. Also, maybe information technology cannot be aligned with contemporary performance measures when the situation is ambiguous, as it is in connection with customer-focused strategy.

4.2. Effects of financial performance measures

Hypothesis 1B suggests that a fit between the customer-focused strategy and financial PM will lead to enhanced customer performance. The hypothesis is tested by estimating the following regression:

$$Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{FPM}_i + b_3 \text{STRA}_i \times \text{FPM}_i + e_i \quad (5)$$

where FPM_i is financial performance measures, and the other variables are as described in Model (1).

Table 8 displays the results of estimating Model (5). The estimated parameter for the two-way interaction term is significantly positive ($b_3 = 2.25$, $p = 0.043$) supporting **Hypothesis 1B**. A fit between the customer-focused strategy and financial performance measures improves customer performance. Many earlier studies have confirmed the importance of financial measures to managers. These findings support the view that financial measures could ensure that careful attention is paid to the long-term financial viability of customer-focused strategies.

According to **Hypothesis 3B**, a fit between the customer-focused strategy, financial performance measures and advanced information technology should lead to enhanced customer performance of the firm. The following three-way interaction model is estimated to test this hypothesis:

$$Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{FPM}_i + b_3 \text{IT}_i + b_4 \text{STRA}_i \times \text{FPM}_i + b_5 \text{STRA}_i \times \text{IT}_i \\ + b_6 \text{FPM}_i \times \text{IT}_i + b_7 \text{STRA}_i \times \text{FPM}_i \times \text{IT}_i + e_i \quad (6)$$

where all variables are as described earlier.

Table 8
Results of two-way regression analysis for customer performance (PM variable: financial measures)^a

	Unstandardized regression coefficient	<i>t</i> -value	<i>p</i> -value
Constant	24.77	19.95	0.000
STRA	2.67	2.17	0.035
FPM	−0.01	−0.01	0.994
STRA × FPM	2.25	2.08	0.043
Adjusted <i>R</i> ²	0.15		
<i>F</i>	3.99		
<i>P</i>	0.01		
<i>N</i>	51		

^a All *t*-tests are two-tailed tests of significance. The model used here follows the equation: $Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{FPM}_i + b_3 \text{STRA}_i \times \text{FPM}_i + e_i$, where Y_i is the customer performance of the *i*th firm, STRA_i is the strategy of the *i*th firm, FPM_i is financial performance measures of the *i*th firm, and e_i is the error term.

Table 9
Results of three-way regression analysis for customer performance (PM variable: financial measures)^a

	Unstandardized regression coefficient	<i>t</i> -value	<i>p</i> -value
Constant	24.30	17.79	0.000
STRA	1.32	0.89	0.379
FPM	−1.69	−1.23	0.227
IT	0.95	0.82	0.418
STRA × FPM	3.05	2.19	0.034
STRA × IT	−0.32	−0.03	0.768
FPM × IT	−0.26	−0.05	0.799
STRA × FPM × IT	1.74	1.77	0.083
Adjusted <i>R</i> ²	0.18		
<i>F</i>	2.52		
<i>P</i>	0.03		
<i>N</i>	51		

^a All *t*-tests are two-tailed tests of significance. The model used here follows the equation: $Y_i = b_0 + b_1 \text{STRA}_i + b_2 \text{FPM}_i + b_3 \text{IT}_i + b_4 \text{STRA}_i \times \text{FPM}_i + b_5 \text{STRA}_i \times \text{IT}_i + b_6 \text{FPM}_i \times \text{IT}_i + b_7 \text{STRA}_i \times \text{FPM}_i \times \text{IT}_i + e_i$, where Y_i is the customer performance of the *i*th firm, STRA_i is the strategy of the *i*th firm, FPM_i is financial performance measures of the *i*th firm, IT_i is the level of the information technology of the *i*th firm, and e_i is the error term.

The results of estimating Model (6) are reported in Table 9. The estimated parameter for the three-way interaction term⁷ is not significant ($b_7 = 1.74$, $p = 0.083$) at conventional levels. The results, therefore, indicate that information technology does not provide any elaborations of how the two-way interaction of strategy and financial performance measures enhances performance.⁸

⁷ The same three-way interaction regression is done using the mean of all ten dimensions of organizational effectiveness as a dependent variable. The results show that the coefficient b_7 is significantly positive ($b_7 = 1.65$, $p = 0.003$).

⁸ Two more sets of analysis are performed using the same model except that information technology was replaced with IT2 and IT3 from the factor analysis. The results show that the coefficient b_7 is significantly positive in both cases. The results show that when information technology represents IT2 from the factor analysis (area networks, image processing, cooperative and client/server computing) the coefficient b_7 is significantly positive ($b_7 = 2.31$, $p = 0.002$) and in the case of IT3 (enterprise resource planning systems) the coefficient is also significantly positive ($b_7 = 1.73$, $p = 0.011$).

Table 10
Results of two-way regression analysis for customer performance (PM variable: financial measures)^a

	High strategy			Low strategy		
	Unstandardized coefficient	<i>t</i> -value	<i>p</i> -value	Unstandardized coefficient	<i>t</i> -value	<i>p</i> -value
Constant	26.83	12.73	0.000	23.27	14.29	0.000
<i>FPM</i>	0.60	0.38	0.708	2.94	−0.89	0.044
<i>IT</i>	−0.58	−0.35	0.281	−1.88	2.15	0.390
<i>FPM</i> × <i>IT</i>	−2.81	1.68	0.108	−0.15	−0.11	0.915
Adjusted <i>R</i> ²	0.02			0.09		
<i>F</i>	1.19			1.77		
<i>P</i>	0.34			0.19		
<i>N</i>	26			25		

^a All *t*-tests are two-tailed tests of significance. The model used here follows the equation: $Y = b_0 + b_1 FPM_i + b_2 IT_i + b_3 FPM_i \times IT_i + e_i$, where Y_i is the customer performance of the i th firm, FPM_i is financial performance measures of the i th firm, IT_i is the level of the information technology of the i th firm, and e_i is the error term.

Again, the data are split into two sub-samples based on the emphasis on the customer-focused strategy of the firm, and the following two-way interaction model is estimated:

$$Y_i = b_0 + b_1 FPM_i + b_2 IT_i + b_3 FPM_i \times IT_i + e_i \quad (7)$$

where all variables are as described earlier.

The results of estimating Model (7) are reported in Table 10. The results indicate that the combination of high customisation, financial performance measures and information technology is not significant and neither is the combination of low customisation, financial performance measures and information technology. These results confirm those reported in Table 9, i.e. information technology does not provide any elaboration of the financial performance measures—customer performance fit.⁹

5. Discussion and conclusions

There are two main findings in this study. First, the results indicate that when the firm does not follow a customer-focused strategy, contemporary management accounting systems in combination with advanced information technology are related to high customer performance of the firm. The results also indicate that contemporary performance measures do not help to enhance performance of those firms that follow a customer-focused strategy. This finding is interesting as it is contrary to the view that contemporary management accounting may best suit firms with customer-focused strategies (Bouwens and Abernethy, 2000). However, the findings are consistent with the recent findings according to which managers in a more complex business environment find it difficult to use contemporary performance measures. Lillis (2002) suggests that it is the management of customer responsiveness strategies with other manufacturing performance dimensions that is the most difficult. Management appears to be able to anticipate and measure the performance impacts of quality to a much greater extent than they are able to do with customer

⁹ We also examine industry and size effects on Models (1), (2), (3), (4), (5), (6) and (7). Control variables for industry and size (measured by turnover) are added to the regression models both separately and jointly. There are no changes in the results.

responsiveness manufacturing. As Lillis (2002) points out, performance management problems appear to occur more in the context of a strategic emphasis on customer responsiveness than quality. There is support for the view that performance measures are hard to use when they are involved with customisation strategies, which gives potential for the use of the contemporary measures. However, when strategies become customised these measures are hard to use and do not enhance the performance. Possibly emphasising information technology is not helpful, as customer-focused strategy requires the information system to be so sophisticated and expensive that they do not provide desired benefits. So when ineffective contemporary performance measures are combined with expensive information technology it will lead to lower performance. Also maybe information technology cannot be aligned with contemporary performance measures when the situation is ambiguous, as it is in connection with customer-focused strategy.

Second, the results indicate that a fit between the customer-focused strategy and financial performance measures will improve customer performance. Earlier evidence also suggests that financial measures remain important to managers (e.g. Chenhall and Langfield-Smith, 1998b; Hyvönen, 2005).

The purpose of this study was to investigate the relationship between customer performance and customer-focused strategies, contemporary and financial performance measures and information technology. The first hypothesis proposed that a fit between strategy and performance measures will lead to enhanced performance of the firm. Hypothesis 1 is supported in the case of financial performance measures, but not in the case of contemporary measures. The second hypothesis suggested that a fit between customer-focused strategy and advanced information technology will lead to enhanced performance. The results do not support Hypothesis 2. There is earlier evidence of the relationships between strategy, contemporary performance measures and organizational performance as well as of the relationships between strategy, information technology and organizational performance. It was believed that a deeper understanding of the relationships can be achieved by examining how these three contextual variables together influence firm performance. The results indicate that there is a significant association, but it is negative. There has not been much research on non-financial management accounting systems. This study investigated contemporary performance measures, i.e. non-financial measures, qualitative measures, balanced scorecards and customer satisfaction surveys, thereby increasing our knowledge of these measures. The question of whether information technology has effects on organizational performance has been addressed by many studies. Information technology was investigated in this study as a part of a contingency framework. There were no previous measures for information technology in a contingency literature so these measures are exploratory by nature.

More research is needed to study the association between performance and the three-way interaction involving strategy, performance measures and information technology. Also, more work on non-financial measures is needed. Further work could also benefit from investigating information technology in relation to other contextual variables. The effects of using certain types of performance measures and information systems may not be seen immediately so future research could benefit from longitudinal studies. Some words of caution should be stated regarding this research. The results should be carefully interpreted, as the chosen sample is not random: firms represented mainly three different industries and business units belonging to large firms. The results should be seen as representing these firms and not as a general representative of Finnish firms. Also, sample size and cultural issues may be potential limitations to the study. Further research could test the generalisability of the findings reported here. These issues could also be studied in greater depth. Single case studies may elaborate on the design of management accounting systems and their links to strategy and information technology. Despite these limitations, this study sheds light on performance measures, strategy as well as information technology as a part of an organizational fit.

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Appendix A. Survey questions used in this study

Strategic priorities

- Provide high quality products
- Provide low costs
- Provide unique product features
- Low price
- Broad range of products
- Make changes in design and introduce new products quickly
- Make rapid volume and/or product mix changes
- Provide fast deliveries
- Make dependable delivery promises
- Provide effective after-sales service and support
- Product availability (broad distribution)
- Customized products and services

Performance measures

- Performance evaluation based on contemporary practices
 - Non-financial measures
 - Qualitative measures
 - Balanced scorecard (mix of financial and non-financial measures)
 - Customer satisfaction surveys
- Performance evaluation based on financial accounting techniques
 - Budget variance analysis
 - Controllable profit
 - Divisional profit
 - Return (profit) on investment

Information technology

- E-commerce
- Enterprise resource planning (ERP)
- Customer or continuous relationship management (CRM)
- Supply chain management (SCM)
- Data warehousing
- Electronic data interchange (EDI)
- Area networks
- Image processing
- Cooperative and client/server computing

Effectiveness of business units

- Return on investment
- Profit
- Cash flow from operations
- Cost control

Appendix A (Continued)

Development of new products
 Sales volume
 Market share
 Market developments
 Personnel developments
 Political-public affairs

Appendix B. Results of factor analysis and Cronbach statistics

Strategic priorities

S1	$\alpha = 0.82$	Factors			
		1	2	3	4
	Provide high quality products	0.863	0.002	0.001	-0.200
	Make dependable delivery promises	0.845	-0.002	0.090	-0.015
	Customized products and services	0.723	0.023	-0.096	0.379
	Provide fast deliveries	0.702	0.171	0.119	0.060
	Provide unique product features	0.586	0.471	-0.415	-0.099
	Provide effective after-sales service and support	0.568	0.142	0.471	-0.260
	Low production costs	0.487	-0.279	0.179	0.091
S2	$\alpha = 0.84$				
	Make changes in design and introduce new products quickly	-0.028	0.886	0.166	-0.006
	Make rapid volume and/or product mix changes	-0.005	0.868	0.135	0.107
S3	$\alpha = 0.83$				
	Broad range of products	0.009	0.113	0.825	0.113
	Product availability (broad distribution)	0.189	0.207	0.802	0.001
S4					
	Low price	0.008	0.079	0.069	0.922

Performance measures

M1	$\alpha = 0.66$	Factors
	Non-financial measures	0.780
	Balanced Scorecard (mix of financial and non-financial measures)	0.725
	Customer satisfaction surveys	0.673
	Qualitative measures	0.665
M2	$\alpha = 0.47$	
	Divisional profit	0.712
	Controllable profit	0.660
	Budget variance analysis	0.557
	Return (profit) on investment	0.551

Appendix B (Continued)

Information technology				
IT1	$\alpha = 0.87$	Factors		
		1	2	3
	Customer or continuous relationship management (CRM)	0.937	−0.122	−0.196
	Supply chain management (SCM)	0.840	−0.055	0.159
	Data warehousing	0.776	0.178	0.055
	E-commerce	0.642	0.064	0.227
	Electronic data interchange (EDI)	0.566	0.284	0.044
IT2	$\alpha = 0.82$			
	Area networks	−0.114	0.929	−0.048
	Image processing	0.094	0.853	−0.091
	Cooperative and client/server computing	0.084	0.735	0.116
IT3				
	Enterprise Resource Planning (ERP)	0.032	−0.046	0.976
Organizational performance				
P1	$\alpha = 0.80$	Factors		
		1	2	3
	Market share	0.893	−0.063	−0.063
	Sales volume	0.851	0.048	−0.028
	Market developments	0.801	−0.066	−0.124
	Development of new products	0.509	0.456	0.052
P2	$\alpha = 0.72$			
	Political-public affairs	−0.099	0.855	0.119
	Personnel developments	0.248	0.719	0.010
	Cost control	−0.189	0.684	−0.424
P3	$\alpha = 0.86$			
	Return on investment	0.123	−0.054	−0.865
	Profit	0.211	−0.169	−0.848
	Cash flow from operations	−0.086	0.152	−0.840

References

- Abernethy, M.A., Brownell, P., 1999. The role of budgets in organizations facing strategic change: an exploratory study. *Acc. Organ. Soc.* 24, 189–204.
- Abernethy, M.A., Guthrie, C.H., 1994. An empirical assessment of the fit between strategy and management information systems design. *Acc. Finance* 33, 49–66.
- Anderson, E.W., Fornell, C., Lehmann, D.R., 1994. Customer satisfaction, market share, and profitability: findings from Sweden. *J. Marketing* 58, 53–66.
- Bakos, J.Y., Treacy, M.E., 1986. Information technology and corporate strategy: a research perspective. *MIS Quart.* 10, 107–119.

- Benjamin, R.I., Rockart, J.F., Morton, M.S.S., Wyman, J., 1984. Information technology: a strategic opportunity. *Sloan Manage. Rev.* 25, 3–10.
- Bouwens, J., Abernethy, M.A., 2000. The consequences of customisation on management accounting system design. *Acc. Organ. Soc.* 25, 221–241.
- Bruggeman, W., Slagmulder, R., Waeytens, D., 1996. Management accounting changes: the Belgian experience. In: Bhimani, A. (Ed.), *Management Accounting: European Perspectives*. Oxford University Press, Oxford, pp. 1–30.
- Burns, J., Vaivio, J., 2001. Management accounting change. *Manage. Acc. Res.* 12, 389–402.
- Chan, Y., Huff, S., Barclay, D., Copeland, D., 1997. Business strategic orientation, information systems strategic orientation, and strategic alignment. *Inform. Syst. Res.* 8, 125–150.
- Chapman, C.S., Chua, W.F., 2000. Technology, organizational form and accounting. In: 25th Anniversary Conference, *Acc. Organ. Soc.* Pergamon, Oxford.
- Chenhall, R., 2003. Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Acc. Organ. Soc.* 28, 127–168.
- Chenhall, R., Langfield-Smith, K., 1998a. The relationship between strategic priorities, management accounting techniques and management accounting: an empirical investigation using a systems approach. *Acc. Organ. Soc.* 23, 243–264.
- Chenhall, R., Langfield-Smith, K., 1998b. Adoption and benefits of management accounting practices: an Australian study. *Manage. Acc. Res.* 9, 1–19.
- Chenhall, R., Morris, D., 1995. Organic decision and communication processes and management accounting systems in entrepreneurial and conservative business organizations. *Omega* 23, 485–497.
- Dans, E., 2001. IT investment in small and medium enterprises: paradoxically productive? *Electron. J. Inform. Syst. Eval.*, 4.
- Davis, P., Dibrell, C., Janz, B., 2002. The impact on the strategy–performance relationship—implication for managers. *Ind. Market. Manage.* 31, 339–347.
- De Meyer, A., Nakane, J., Miller, J., Ferdows, K., 1989. Flexibility: the next competitive battle—the manufacturing futures survey. *Strategic Manage. J.* 10, 135–144.
- Dent, J., 1990. Strategy, Organization and control: some possibilities for accounting research. *Acc. Organ. Soc.* 15, 3–25.
- Foster, G., Young, S.M., 1997. Frontiers of management accounting research. *J. Manage. Acc. Res.* 9, 63–77.
- Govindarajan, V., 1988. A contingency approach to strategy implementation at the business-unit level: integrating administrative mechanisms with strategy. *Acad. Manage. J.* 31, 828–853.
- Govindarajan, V., Fisher, 1990. Strategy, control systems, and resource sharing: effects on business-unit performance. *Acad. Manage. J.* 33, 259–285.
- Govindarajan, V., Gupta, A.K., 1985. Linking control systems to business unit strategy: impact on performance. *Acc. Organ. Soc.* 10, 125–135.
- Granlund, M., Malmi, T., 2002. Moderate impact of ERPS on management accounting: a lag or permanent outcome? *Manage. Acc. Res.* 13, 299–321.
- Groot, T.L.C.M., 1996. Managing costs in Netherlands: past theory. In: Bhimani, A. (Ed.), *Management Accounting: European Perspectives*. Oxford University Press, Oxford, pp. 164–179.
- Guilding, C., 1999. Competitor-focused accounting: an exploratory note. *Acc. Organ. Soc.* 24, 583–595.
- Guilding, C., McManus, L., 2002. The incidence, perceived merit and antecedents of customer accounting: an exploratory note. *Acc. Organ. Soc.* 27, 45–47.
- Gupta, A.K., 1987. SBU strategies, corporate-SBU relations, and SBU effectiveness in strategy implementation. *Acad. Manage. J.* 30, 477–500.
- Gupta, A.K., Govindarajan, V., 1984. Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. *Acad. Manage. J.* 27, 25–41.
- Hyvönen, J., 2005. Adoption and benefits of management accounting systems: evidence from Finland and Australia. *Adv. Int. Acc.* 18, 97–121.
- Innes, J., Mitchell, F., 1995. A survey of activity-based costing in the UK's largest companies. *Manage. Acc. Res.* 6, 137–153.
- Israelsen, P., Anderson, M., Rohde, C., Sorensen, P.E., 1996. Management accounting in Denmark: theory and practice. In: Bhimani, A. (Ed.), *Management Accounting: European Perspectives*. Oxford University Press, Oxford, pp. 31–53.
- Ittner, C.D., Larcker, D.F., 1998. Innovations in performance measurement: trends and research implications. *J. Manage. Acc. Res.* 10, 205–238.
- Ittner, C.D., Larcker, D.F., 2001. Assessing empirical research in managerial accounting: a value-based management perspective. *J. Acc. Econ.* 32, 349–410.

- Ittner, C.D., Larcker, D.F., 1997. Quality strategy, strategic control systems, and organizational performance. *Acc. Organ. Soc.* 22, 293–314.
- Joye, M.P., Blayney, P.I., 1990. Cost and management accounting practices in Australian manufacturing companies: survey results, monograph no. 7. The Accounting and Finance Foundation, University of Sydney.
- Kaplan, R.S., Norton, D.P., 1992. The balanced scorecard—measures that drive performance. *Harvard Business Rev.* 70, 71–79.
- Kaplan, R.S., Norton, D.P., 1996. *The balanced scorecard: translating strategy into action*. Harvard Business School Publishing, Boston, MA.
- Kettinger, W., Grover, V., Segars, A., 1995. Do strategic systems really pay off? *Inf. Syst. Manage.* 12, 35–43.
- Langfield-Smith, K., 1997. Management control systems and strategy: a critical review. *Acc. Organ. Soc.* 22, 207–232.
- Li, M., Ye, L., 1999. Information technology and firm performance: linking with environmental, strategic and managerial contexts. *Inf. Manage.* 35, 43–51.
- Lillis, A., 2002. Managing multiple dimensions of manufacturing performance—an exploratory study. *Acc. Organ. Soc.* 27, 497–529.
- Luft, J.L., Shields, M.D., 2000. The effects of financial and nonfinancial performance Measures of judgment and decision performance. Unpublished working paper, Michigan State University.
- Mahmood, M., Mann, G., 1993. Measuring the organizational impact of information technology investment: an exploratory study. *J. Manage. Inform. Syst.* 10, 97–122.
- McKeen, J.D., Smith, H.A., 1993. The relationship between information technology use and organizational performance. In: Banker, R., Kauffman, R., Mahmood, M.A. (Eds.), *Strategic Information Technology Management: Perspectives on Organizational Growth and Competitive Advantage*. Idea Group Publishing, Harrisburg, PA, pp. 405–444.
- Merchant, K.A., 1985. Organizational Controls and Discretionary Program Decision Making: A Field Study. *Acc. Organ. Soc.* 10, 67–85.
- Miles, R.W., Snow, C.C., 1978. *Organizational Strategy, Structure and Process*. McGraw Hill, New York.
- Miller, J.G., De Meyer, A., Nakane, J., 1992. *Benchmarking Global Manufacturing*. Homewood, Illinois, Irwin.
- Miller, D., Friesen, P.H., 1986. Porter's (1980) generic strategies and performance: an empirical examination with American data: part 1: testing Porter. *Organ. Stud.* 7, 37–55.
- Miller, D., Friesen, P.H., 1982. Innovation in conservative and entrepreneurial firms: two models of strategic momentum. *Strategic Manage. J.* 3, 1–25.
- Olsen, D.H., Cooney, V., 2000. The strategic benefits of data warehousing: an accounting perspective. *Inf. Strategy: Executive's J. Winter*, 35–40.
- Palmer, J.W., Markus, M.L., 2000. The performance impacts of quick response and strategic alignment in specialty retailing. *Inf. Syst. Res.* 11, 241–259.
- Palvia, P., 1997. Developing a model of the global and strategic impact of information technology. *Inf. Manage.* 32, 229–244.
- Perera, S., Harrison, G., Poole, M., 1997. Customer-focused manufacturing strategy and the use of operations-based non-financial performance measures: a research note. *Acc. Organ. Soc.* 22, 557–572.
- Porter, M.E., 2001. Strategy and the internet. *Harvard Business Rev.* 79, 63–78.
- Porter, M.E., 1985. *Competitive advantage*. Free Press, New York.
- Porter, M.E., 1980. *Competitive strategy*. Free Press, New York.
- Porter, M.E., Millar, V.E., 1985. How information gives you competitive advantage. *Harvard Business Rev.* 63, 149–160.
- Rahman, M., 1998. Concurrent accounting systems for technology-enabled organizations: possibilities and implications. *J. Financial Inf. Syst. Engl.*
- Prahalad, C.K., Krishnan, M.S., 2002. The Dynamic synchronization of strategy and information technology. *MIT Sloan Manage. Rev.* 43, 24–33.
- Schwartz, B.M., 1999. Information integration. *Transp. Distrib.* 40, 43–46.
- Shields, M.D., 1997. Research in management accounting by North Americans in the 1990s. *J. Manage. Acc. Res.* 9, 3–61.
- Simons, R., 1987. Accounting control systems and business strategy: an empirical analysis. *Acc. Organ. Soc.* 12, 357–374.
- Simons, R., 1990. The role of management accounting systems in creating competitive advantage: new perspectives. *Acc. Organ. Soc.* 1/2, 127–143.
- Small, M.H., Chen, I.J., 1997. Economic and strategic justification of AMT Inferences from industrial practices. *Int. J. Product. Econ.* 49, 65–75.

- Tan, R.R., 1996. Information technology and perceived competitive advantage: an empirical study of engineering consulting firms in Taiwan. *Construct. Manage. Econ.* 14, 227–240.
- Tavakolian, H., 1989. Linking information technology structure with organizational competitive strategy: a survey. *MIS Quart.* 13, 309–317.
- Van der Stede, W.A., 2000. The relationship between two consequences of budgetary controls: budgetary slack creation and managerial short-term orientation. *Acc. Organ. Soc.* 25, 609–622.
- Weill, P., 1992. The relationship between investment in information technology and firm performance: a study of the valve manufacturing sector. *Inf. Syst. Res.* 3, 307–333.