The Effects of the Diagnostic and Interactive Use of Management Control Systems on the Strategy-Performance Relationship

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Abstract

In recent years there has been an increased interest in examining the relationships among management control systems (MCS), business strategy and organizational performance. In this study, the moderating effects created by two uses of MCS (diagnostic use and interactive use as per Simon's 'levers of control' framework) on strategy-performance relationship are examined.

The results of the survey-based research support the postulate that these two uses moderate the relationship between business strategy and performance. However, it is found that the moderating effect created by the diagnostic use of MCS is more significant when the cost leadership strategy is used for performance.

No evidence is found in favor of Porter's proposition on mutual exclusiveness of business strategies for better performance. Consequently, the results of this study have important implications for both management practice and the academic literature.

Keywords

Management Control Systems
Strategy
Performance

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Introduction

In recent years, both managerial accounting practice and research have taken a more strategic approach by focusing on potential associations among management control systems (MCS) and strategy for better organisational performance in different organisational contexts (Ittner and Larcker, 2001; Tucker et al, 2009). Evidence by Kaplan and Norton (2001) within the framework of the Balanced Scorecard (BSC) showed several organisations achieving performance breakthroughs by implementing and using MCS in congruence with organisational strategies. Langfield-Smith (1997) had observed that much of the empirical research in this area followed a contingency approach and involved a search for systematic relationships between specific elements of the MCS and the particular strategy of the organisation.

Case studies, on the other hand, have tended to investigate the role of MCS in supporting and influencing the strategic processes within organisations (Langfield-Smith, 1997). In spite of the growing interest in the relationship between MCS, strategy and organisational performance, the picture presented in the literature is found to be incomplete, so that Tucker et al (2009) suggest that as at the mid-2000's the MCS-strategy-performance relationship remained largely unexplored, little documented or understood.

Decision Making Context and Motivation for the Study

The focus of this paper is on the use of MCS rather than its design. As per the extant literature, MCS are predominantly subject to two types of use by management, namely diagnostic use and interactive use of MCS (Henri, 2005; Simons, 1995). These two types of uses determine the way that managers use their control systems to monitor organisational performance. Chenhall (2003), Simons (1995), Abernethy and Brownell (1999) have concluded that studies which attempt to understand the relationship between MCS and strategy should focus less on the extent of MCS use, and more on the manner in which management uses MCS. This paper therefore examines the influence of diagnostic and

interactive uses of MCS on the relationship between strategy and organisational performance.

It is also important to note that the nature of relationships available among MCS, strategy and organisational performance are contingent upon the organisational context. According to Wickramasinghe and Hopper (2005) only a limited amount of research has been done in the area of MCS and strategy by collecting data from organisations which are operating in less developed countries (LDCs). Thus, this current study is the first empirical research conducted based on data collected from Sri Lanka exploring relationships among uses of MCS, strategic capabilities, competitive strategies and organisational performance.

Research Problem and Objectives

This research aims to examine the problem of "how do the uses of MCS influence the relationship between business strategies and organisational performance". In order to extend the current understanding of MCS-strategy-performance relationships, this research is expected to realise the following three objectives.

(i) To identify the nature of moderating effects created by each use of MCS (diagnostic use and interactive use) over the association between business strategies and organisational performance
(ii) To recognise the effect of each business strategy on organisational performance
(iii) To recognise the interrelationships between cost leadership and differentiation strategies.

Porter's framework (1980, 1985) of generic strategies has been used widely as a basis for numerous follow-up research studies is used in this research as the key strategy typology.

According to Porter (1980, 1985) organisations must adopt either the cost leadership strategy or the differentiation strategy to achieve a sustainable competitive advantage and long-term above average performance. However, this proposition has been criticised by a number of researchers (Hill, 1988; Murray, 1988; Sands, 2006) whose empirical findings challenge the mutual exclusiveness of the two generic strategies. Thus, this research will seek to evaluate the accuracy of Porter's single source proposition for competitive advantage and long-term above average performance.

Literature Review

Management Control Systems

Anthony (1965) defined MCS as the processes by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organisation's objectives; Simons (1995) viewed MCS essentially as a means to successfully implement strategies and defined MCS as the formal information based routines and procedures managers use to maintain or alter patterns in organisational activities. Simons (1995) argued that the most important fact is not the identification of types of controls firms use, but rather how they are used, making a distinction in his 'levers of control' framework between the diagnostic and the interactive use of controls. As noted by Thoren and Brown (2004), the difference between diagnostic and interactive control systems is not in their technical design features, but in the way managers use these systems. Table 1 provides a comparison of diagnostic use and interactive use of MCS based on specified criteria.

Business Strategy

Campbell-Hunt (2000) conducted a meta-analysis of generic competitive strategy-based studies over twenty years, and concluded that Porter's theory of generic business (competitive) strategies was among the most substantial and influential contributions made to the study of business strategies in organisations. According to Porter (1980, 1985), companies that attempt to become the lowest-cost producers in an industry can be referred to as those following a "cost leadership" strategy. Alternatively, those who adopt a "differentiation strategy" differentiate their products or services and are able to charge a premium price in the market (Hanson et al, 2008). According to Porter, companies employ these two strategies either in a mass market or in a specific niche market. However, Porter specified that these two strategies have to be mutually exclusive.

Table 1: A Comparison of Diagnostic Use and Interactive Use

	Diagnostic Use of Controls	Interactive Use of Controls
Purpose	Provide motivation and direction to achieve goals.	Stimulate dialogue and organisational learning.
Goal	Prevent surprises	Creative search
Analytic Reasoning	Deductive	Inductive
System Complexity	Complex	Simple
Time Frame	Past and present	Present and future
Targets	Fixed	Constantly re-estimated
Source: Thoren K. and Brown T. (2004). Development of Management Control Systems in Fast Growing Small Firms.13th Nordic Conference on Small Business Research. p. 3.		

Porter (1980, 1985) predicted that firms must adopt either a cost leadership or differentiation strategy as a source to achieve above-average long-term financial performance outcomes as firms that adopt a combination of these strategy sources will become 'stuck in the middle' and experience below-average long-term financial performance.

Organisational Performance

Organisational performance is one of the most important constructs in accounting and management research. According to Richard et al (2009), organisational performance is the most important criterion in evaluating organisations, their actions, and environments. They suggest that the narrower domain of organisational performance encompasses three specific areas of firm outcomes: (1) financial performance (e.g. profits, return on assets, return on investment); (2) market performance (e.g. sales, market share); and (3) shareholder return (e.g. total shareholder return, economic value added).

The broader view of organisational performance is reflected in, for example, the Balanced Scorecard (BSC) framework (Kaplan and Norton, 1992) which uses as a performance measurement framework incorporating strategic non-financial performance measures to complement traditional financial metrics, to give managers and executives a more 'balanced' view of organisational performance (Norreklit, 2000).

In this context, it is prudent, as in this paper, to incorporate multi-dimensionality to measure organisational performance rather than solely relying on traditional financial measures (Kaplan and Norton, 1992; Norreklit, 2000).

Conceptual Framework and Hypotheses Development

Understanding sources of organisational performance has become a major area of accounting and management research (Richard et al, 2009). Growing evidence of empirical studies has demonstrated that successful formulation and implementation of business level (competitive) strategies have a positive impact on organisational performance (e.g. Allen et al, 2006; Dess and Davis, 1984; Hambrick, 1983; Hill, 1988; Rubach and McGee, 2004; Sands, 2006). Interestingly, researchers in management accounting have recognised the need to extend the interface between strategy and performance by incorporating the way MCS is being used as a research variable (e.g. Simons, 1987; 1990 Govindarajan and Gupta, 1985; Govindarajan, 1988). Though the extant literature suggests that MCS can be used diagnostically or interactively with strategies for better organisational performance (Henri, 2005; Simons, 1995; Abernethy and Brownell, 1999), the extent to which the two uses of MCS can make an impact over the strategy-performance relationship remains largely unexplored. Thus, this paper extends our understanding of the strategy-MCS-performance relationship by testing the seven hypotheses shown in Figure 1.

As emphasised by Porter (1980, 1985) organisations are able to gain competitive advantage by adopting either a "cost leadership" or "differentiation" strategy in a broad or narrow market. Porter (1985) specified that a cost leadership strategy has the potential to ensure above average returns in the industry in two ways: (i) producing organisational products at a lower cost than competitors and charging the same market

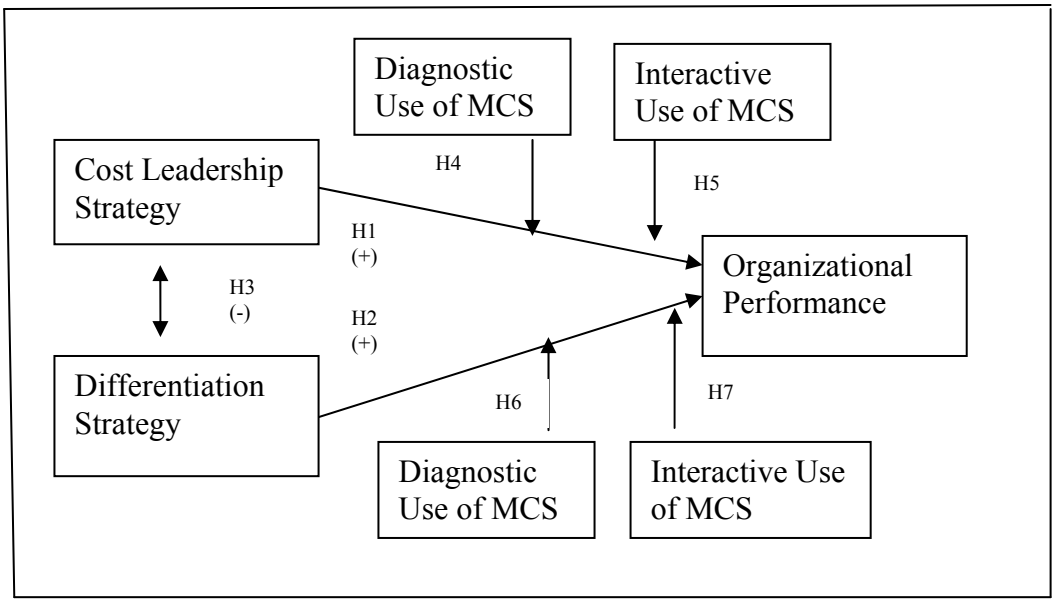
price (which leads to a higher profit margin from each unit) and (ii) producing products at a lower cost than competitors and charging a lesser price from customers (which leads to a higher market share). In consequence, a cost leadership strategy leads to substantial profits (Rubach and McGee, 2004). On the contrary, a differentiation strategy may lead to higher costs but will enable firms to earn more revenue by offering higher value products than competitors (Wright, 1987). According to

Wright (1987), a differentiation strategy may create a competitive advantage comparatively over a long period of time as it creates difficulties of imitation and imperfect mobility over organisational resources. Furthermore, Johnson et al (2008) provided another factor for sustaining differentiation based competitive advantage i.e. reinvesting margins. The literature supports the view that organisations can charge a price premium by offering unique products and that enables organisations to earn more revenue and profits (Porter, 1985; Wright, 1987). Accordingly, the following hypotheses are suggested.

H1: Cost leadership strategy positively affects organisational performance.

H2: Differentiation strategy positively affects organisational performance.

Figure 1: Theoretical Framework and Study Hypotheses



Porter (1980, 1985) described generic competitive strategies as alternatives which should be mutually exclusive to guarantee a better performance. According to Porter (1985), by trying to provide all things to all people, these firms are setting themselves up for mediocrity. While Porter's typology (Dess and Davis, 1984; Hambrick, 1983; Robinson and Pearce, 1988) has received considerable support, it has also been attacked on empirical fronts (Hill, 1988; Murray, 1988; Wright, 1987; Miller; 1992). However, according to Rubach and McGee (2004) most of the prior research that supported Porter's mutual exclusiveness proposition was based on manufacturing firms. As this study was carried out in a manufacturing environment (textile and apparel industry in Sri Lanka), it was decided that it may not be prudent to reject Porter's argument on mutual exclusiveness of generic strategies out-of-hand, especially because no empirical study has been conducted so far in the Sri Lankan textile and apparel (T&A) industry examining the reality of mutual exclusiveness of competitive strategies. As a consequence, the hypothesis below is developed.

H3: There is a negative relationship between cost leadership strategy and differentiation strategy.

The current study also aims to explore the impact made by the two uses of MCS, namely diagnostic and interactive, so Hypotheses 4 to 7 are developed. As per Henri (2005), diagnostic use reflects two important features associated with mechanistic controls: (i) tight controls of operations and strategies, and (ii) highly structured channels of communication and restricted flows of information (Burns and Stalker, 1961). Following the requirements of a cost leadership strategy, it is possible to assume that introducing tight controls could be favourable for cost reduction initiatives in order to enhance organisational performance (Sands, 2006). However, no research has been conducted to find out the effects that diagnostic use creates over the association of cost leadership strategy and performance.

Generally, diagnostic use is described by researchers as a negative force that creates constraints and ensures compliance with orders (Henri, 2005; Simons, 1995). However, Otley (1994) noted that traditional diagnostic use of MCS encourages conservatism and the result could be stifled creativity and impaired uniqueness. Following a similar argument, Simons (1995) noted that diagnostic systems may constrain innovation and differentiation seeking behavior. The comments provided by Otley and Simons highlight the possibility of having a negative relationship between diagnostic use of MCS and differentiation strategy. However, there is no supporting empirical evidence provided by Otley or Simons to establish such a negative relationship between diagnostic use and differentiation strategy.

Conversely, interactive use reflects two important features associated with organic controls: (i) loose and informal control reflecting norms of cooperation, communication and emphasis on getting things done, and (ii) open channels of communication and free flow of information throughout the organisation (Burns and Stalker, 1961; Henri, 2005). According to Simons (1995, p. 95) interactive use has the power to represent a positive trigger that fosters creative and inspirational forces; '…senior managers use interactive control systems to build internal pressure to break out narrow search routines, stimulate opportunity seeking, and encourage the emergence of new strategic initiatives'. According to Dent (1987), curiosity and experimentation can be fostered by interactive use of MCS and the outcomes may lead to better business level strategies with reduced cost or/and unique products while improving firm performance. However, in the absence of profound empirical evidence, the impact made by interactive use of MCS over cost leadership and differentiation strategies leading to organisational performance, needs to be explored.

Interestingly, while explaining the dichotomy between diagnostic and interactive uses of MCS, the existing literature supports the joint use of MCS by following the concept of dynamic tension. As suggested by the conflict literature, tension is not necessarily negative but instead may be beneficial to organisations (DeDreu, 1991; Nicotera, 1995). In response, Henri (2005) concluded in his research that the joint use of MCS strengthens the strategy-performance relationship.

However, as available empirical evidence is inadequate or ambiguous, exact relationships are difficult to specify. So, the following four hypotheses are suggested.

H4: Diagnostic use of MCS moderates the relationship between cost leadership strategy and organisational performance.

H5: Interactive use of MCS moderates the relationship between cost leadership strategy and organisational performance.

H6: Diagnostic use of MCS moderates the relationship between differentiation strategy and organisational performance.

H7: Interactive use of MCS moderates the relationship between differentiation strategy and organisational performance.

Research Method

Measurement

The key concepts relating to the current study are conceptualised first into three constructs: (i) business level strategies (ii) uses of MCS and (iii) organisational performance. The first two constructs are operationalised and measured by a 1-5 Likert-type scale while using a 0-5 Likert type scale for the third construct.

The two key business level strategies, namely: cost leadership and differentiation, are operationalised using established measurement items from prior strategic management studies. Eighteen aspects used by Sands (2006) to operationalise cost leadership and differentiation strategies were selected for this study. Most of these items were developed and tested initially by Dess and Davis (1984). Kotha and Vadlamani (1995) and Robinson and Pearce (1988). Diagnostic and interactive uses of MCS were measured using an adapted version of the Vandenbosch's (1999) instrument, developed originally to measure the use of Executive Support Systems (ESS),[1] and based on several dimensions of diagnostic and interactive uses. Organisational performance is recognised as being a multi-dimensional concept, as a consequence an 18-item measure was used to establish the multi-dimensional nature of the organisational performance concept. These items were extracted from the literature (e.g. Govindarajan and Fisher, 1990; Hoque and James, 2000) and covered a broad range of performance items. (A copy of the survey questionnaire is given as Appendix A).

Data Collection

The questionnaire survey is the core method used to collect data from the industry. A pilot test of the questionnaire was first conducted through a series of 45-minute interviews with 30 senior executives employed by Sri Lankan textile and apparel manufacturing firms in the Western Province[2] with companies selected from the Directory of the Board of Investment (BOI), Sri Lanka using stratified random sampling. The response received from the respondents to the pilot study was used to improve the final questionnaire. Table 2 indicates the summarised results from the distribution of the final questionnaire.

The overall response rate for the first wave, second wave, and reminder administration was 14.04 per cent, i.e., 117 out of 833 questionnaires were returned as valid responses. This figure is comparable to that anticipated for an external survey conducted in Sri Lanka; Weeraratne (2005) suggests that the average response rate for the studies conducted in the Sri Lankan textile apparel industry is around 12% .

Results

Data Analysis

Quantitative data analysis includes preliminary analyses, confirmatory factory analysis (CFA) using structural equation modeling (SEM) and multiple regression analysis. The preliminary analyses include correlation matrix, Bartlett's test of sphericity, KMO measure of sampling adequacy, reliability estimates and exploratory factor analysis (EFA). Hair et al (2006) suggest that data is appropriate for factor analysis when Bartlett's test value is significant (sig.<.05) and the KMO measure value is above 0.5.

Reliability (internal consistency) is tested by Cronbach's alpha based on standardised items. Hair et al (2006) suggest levels of .60 and .70 for exploratory research and previously used measurements respectively. EFA is used to reduce a large number of variables to a few interpretable dimensions (Zikmund, 2003). The minimum required factor loadings are $\pm$ .30 to $\pm$ .40; nevertheless, values greater than $\pm$ .50 are necessary for practical significance (Hair et al, 2006). Overall, as presented in Table 3, the preliminary analyses resulted in 15 measurement items being omitted leaving 52 items. The remaining measurement items appear to be valid and reliable for the analyses described in the subsequent sections.

CFA is performed through SEM using Linear Structural Relationship (LISREL) software (8.80), to verify the construct validity and the overall goodness of fit of the proposed

[1] Executive Support System (ESS) is a reporting tool that allows a manager to turn an organization's data into useful summarized reports. These reports are generally used by executive level managers for quick access to reports coming from all company levels and departments such as billing, cost accounting, staffing, scheduling, and to control such aspects (Hoven, 1996).

[2] According to Weeraratne (2005) more than 50% of textile and apparel producing firms in Sri Lanka are located in the Western Province. Also as stated by Kelegama and Epparachchi (2005) the majority of firms located in other provinces of the country have their head offices located in the Western Province.

Table 2: Results of Questionnaire Administration

Administration Stage	No. of Questionnaires Sent	No. of Valid Responses	No. of Returns to the Sender	No. of Rejections
First Wave	833	89	38	9
Reminder	727	15	0	0
Second Wave	699	13	7	0

Table 3: Summary of Preliminary Analyses

Constructs	No. of original items	No. of items deleted	No. of items remaining
Cost leadership strategy	8	0	8
Differentiation strategy	10	4	6
Diagnostic use of MC	8	0	8
Interactive use of MCS	6	1	5
Organisational performance	18	5	13
Total	67	15	52

measurement models. Nevertheless, the elements relating to the uses of MCS are not included in the CFA as they are still at its early stage of measurement development (Henri, 2005; Sands, 2006; Webster, 2006). Hair et al (2006) suggest that CFA should be mainly used to assess convergent validity and the overall goodness of fit of the measurement models. The proposed measurement models with their loadings are illustrated in Figure 2 (cost leadership strategy), Figure 3 (differentiation strategy) and Figure 4 (organisational performance) with circles used to represent latent variables, and rectangles to represent measured variables. Maximum likelihood estimation (MLE) is employed to estimate all measurement models and all variables defined in Table 4.

Figure 2: Proposed Measurement Model for Cost Leadership Strategy

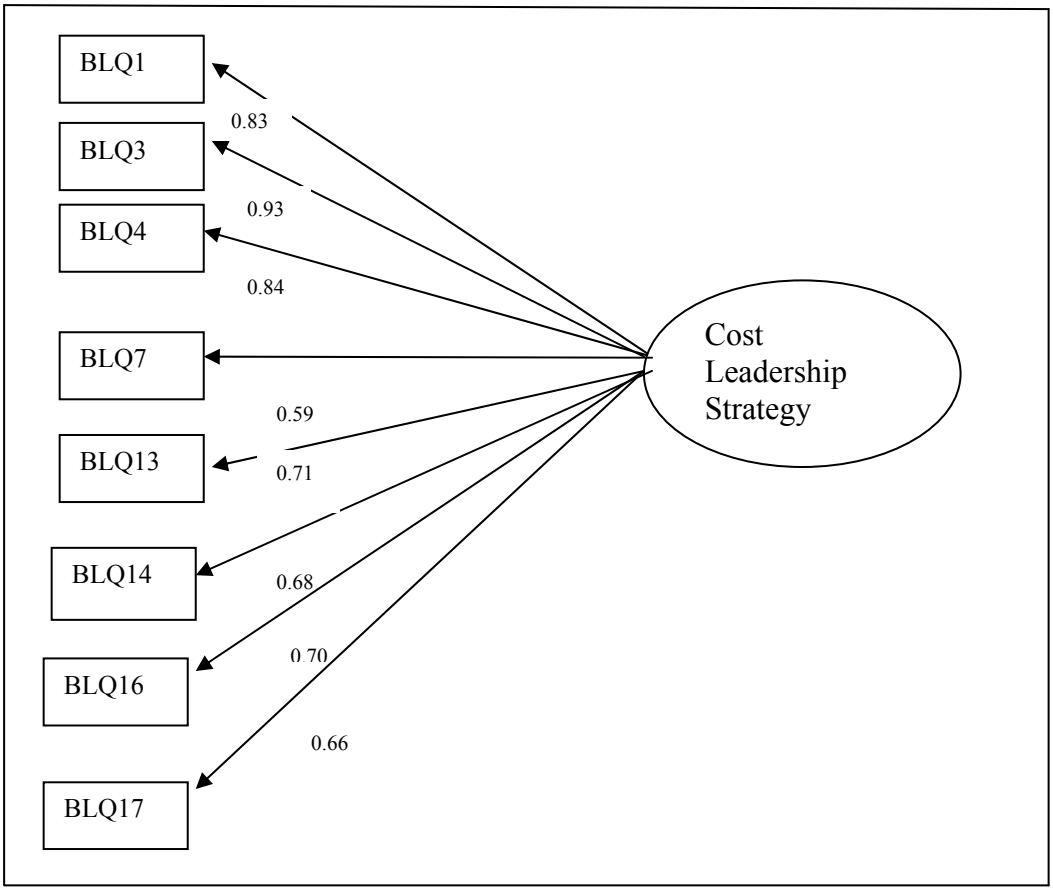


Figure 3: Proposed Measurement Model for Differentiation Strategy

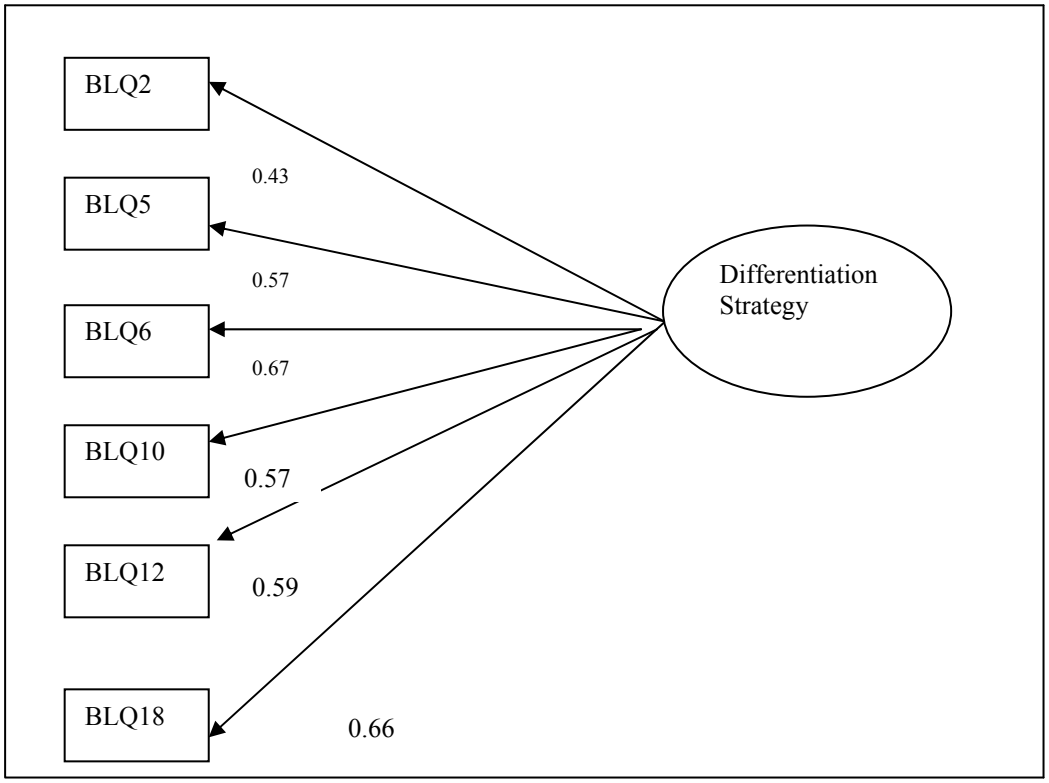


Figure 4: Proposed Measurement Model for Organisational Performance

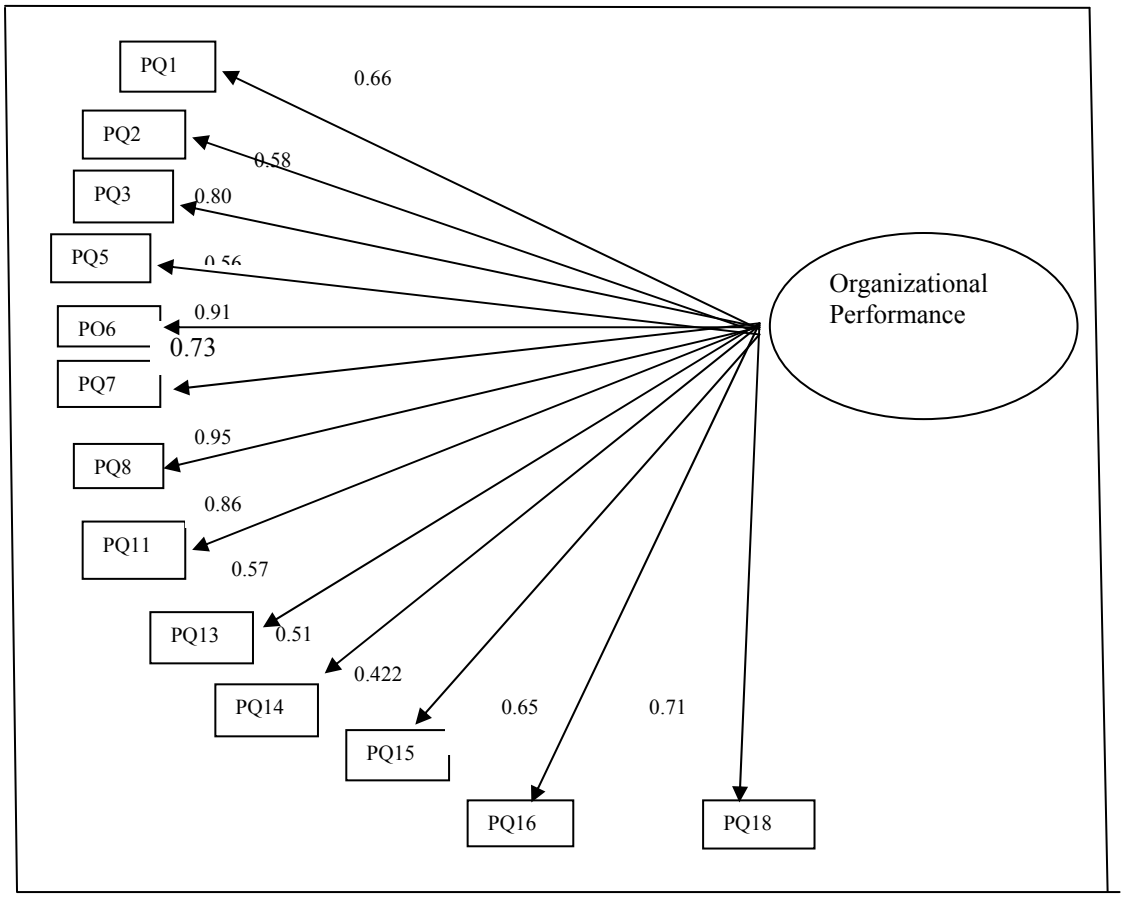


Table 4 shows that all standardised factor loading estimates (λ) were higher than 0.5 except for two measured variables (BLQ2 = 0.43 and PQ15 = 0.42). Nevertheless, the t-values were all larger than 2 which indicated that all loadings were significant at a 95% confidence interval.
The overall goodness of fit indices for the proposed measurement models were satisfactory subject to minor exceptions confirming the appropriateness of measured variables to recognise the impact of latent variables.

'Construct reliability' denotes a "measure of reliability and internal consistency of the measured variables representing a latent construct" (Hair et al, 2006, p. 771). As Table 5 shows, good construct reliability was established as the reliabilities were all above the accepted level of 0.7 ranging from 0.85 to 0.98. 'Variance extracted' is "a summary measure of convergence among a set of items representing a latent construct. It is the average percentage of variance explained among the items" (Hair et al, 2006, p. 773); it is calculated by the Fornell and Larcker (1981). As Table 5 shows, variance extracted by each construct supported adequate convergence as they were all above the accepted level of 0.5, ranging from 0.68 to 0.91.

Table 4: Loadings (λ), R Squares (R^2), Standard Errors and t-values for each Variable in the Proposed Measurement Models

Variable	λ	R^2	Std Error	t-values
Cost Leadership Strategy				
BLQ1 Lower cost per unit than competitors	0.83	0.69	0.057	12.57
BLQ3 Pricing the products below competitors	0.93	0.86	0.051	14.97
BLQ4 Extremely strict cost controls	0.84	0.71	0.054	12.89
BLQ7 Producing standardised products	0.59	0.35	0.066	7.91
BLQ13 Outsource functions to control costs	0.71	0.51	0.060	10.06
BLQ14 Technology to lower costs	0.68	0.47	0.070	9.63
BLQ16 Cost analysis associated with activities	0.70	0.49	0.066	10.01
BLQ17 Rewards for employees on cost reduction suggestions	0.66	0.43	0.076	8.44
Differentiation Strategy				
BLQ2 Differentiate product attributes	0.43	0.19	0.10	4.89
BLQ5 Brand identification is a priority	0.57	0.33	0.092	6.68
BLQ6 Unique features emphasised in promotion	0.67	0.45	0.081	8.02
BLQ10 Fostering innovation is a priority	0.57	0.33	0.091	6.67
BLQ12 Technology used to differentiate products	0.59	0.35	0.089	7.89
BLQ18 Rewards for employees on unique product suggestions	0.66	0.43	0.083	8.42
Organisational Performance				
PQ1 Market share	0.66	0.43	0.083	8.43
PQ2 Sales growth	0.58	0.34	0.088	6.98
PQ3 Net profit margin	0.80	0.62	0.054	11.99
PQ5 Cost per unit	0.56	0.34	0.090	6.42
PQ6 Return on Investment	0.91	0.83	0.054	14.35
PQ7 Number of rejects/rework	0.73	0.55	0.059	10.09
PQ8 Product processing time	0.95	0.89	0.049	15.01
PQ11Number of customer complaints	0.86	0.73	0.057	13.16
PQ13 Customer dropout rate	0.57	0.33	0.090	6.67
PQ14 Employee turnover	0.51	0.24	0.094	5.43
PQ15 Employee absenteeism	0.42	0.18	0.11	4.87
PQ16 New products introduced to the market	0.65	0.42	0.084	8.40
PQ18 New production techniques and processes used	0.71	0.51	0.060	10.06

Table 5: Construct Reliability and Variance Extracted

Construct	Construct Reliability	Variance Extracted
Cost leadership strategy	0.89	0.72
Differentiation strategy	0.85	0.68
Organisational performance	0.98	0.91

As indicated in Table 6 overall goodness of fit statistics are acceptable for all the constructs except for the cost leadership strategy. Even though the GFI and AGFI of the construct of cost leadership strategy are less than the accepted level of 0.9, it is appropriate to consider the measurement model of the construct as satisfactory provided that RMSR meets the accepted level. Thus, it is considered that the measurement model of cost leadership strategy is appropriate due to the fact that RMSR of the construct (0.498) is only marginally below the widely accepted level of 0.5.

Table 6: Overall Goodness of Fit Statistics for Measurement Models

Goodness of Fit Indices	Cost Leadership Strategy	Differentiation Strategy	Organisational Performance
Probability#	.0110	.1110	.1100
GFI (Goodness of Fit Index)*	.8991	.9740	.9860
AGFI (Adjusted Goodness of Fit Index)*	.8656	.9480	.9300
CFI (Comparative Fit Index)*	.9010	.9190	.9820
RMSR (Root Mean Square Residual)**	0.498	.0486	.0387
#Non-significant probability cannot reject the goodness of fit of the model (Byrne, 2001).			
*Required value of >.9 for each of these indices (Page and Meyer, 2000; Tabachnick and Fidell, 2001)			
**RMSR<.05 represents a well fitting model (Byrne, 2001).			

Regression Analyses

H1 and H2 are tested using multiple regression analysis. The summarised statistical results given in Table 7 support both hypotheses as cost leadership strategy (standardised beta = .466, $p<0.001$) and differentiation strategy (standardised beta = .512, $p<0.001$) are significantly related to organisational performance.

H3 is developed based on Porter's findings (1980, 1985) in relation to generic competitive strategies and tested using simple regression analysis. According to Porter, achieving both cost leadership and differentiation together is usually costly and thus Porter's model has been characterised as presenting discrete (mutually exclusive) alternatives (Wright 1987; Hill, 1988). However, the results found here, and reported in Table 8, do not support Porter's assertion: the statistical results do not support a negative relationship between cost leadership strategy and differentiation strategy (standardised beta .086). On the contraty, the current study supports the view of Hill (1988) who contended that Porter's model is fundamentally flawed in this regard, as a hybrid or combination strategy may exist and be appropriate in certain industries.

H4-H6 look at the effect of moderator variables, and are tested using hierarchical regression analysis. Hierarchical multiple regression is preferred here, following Frazier et al., (2004), as researchers can use multiple regression to examine the effects created by any type of predictor or moderator variables (either categorical or continuous). Multiple regression analysis is therefore used in the hierarchical manner to examine the moderator effects of uses of MCS (moderator variables) over the relationship between business-level strategies (predictor variables) and organisational performance (outcome variable) as both predictor and moderator variables are

Table7: Multiple Regression Analysis: Business Strategies and Organisational Performance

	Organisational Performance
Cost Leadership Strategy	.466***
Differentiation Strategy	.512***
R^2	.481
Adjusted R^2	.473
F	30.821***
***p<.001 (one-tailed)	

Table 8: Simple Regression Analysis

	Cost Leadership Strategy
Differentiation Strategy	.086
R^2	.025
Adjusted R^2	.019
F	4.064***
***p<.001 (one-tailed)	

continuous. In hierarchical regression analysis variables are entered into the regression equations through a series of specified blocks or steps (Aiken and West, 1991; Cohen et al, 2003). Table 9 illustrates the results of hierarchical regression analyses conducted to test the moderator effect of diagnostic use of MCS over the relationship between business level strategies and organisational performance. Table 10 illustrates the results of hierarchical regression analyses conducted to test the moderator effect of interactive use of MCS over the relationship between business level strategies and organisational performance. It is important to note that, when diagnostic use was introduced as a moderator an additional 28.9% variance was added to organisational performance over and above the 38.9% explained by the first order effects of business level strategies and diagnostic use alone. Similarly, when interactive use was introduced as a moderator an additional 26.5% variance was added to organisational performance over and above the 36.1% explained by the first order effects of business level strategies and interactive use alone. The summarised statistical results given in Table 9 and Table 10 support the four hypotheses (H4-H7) as R^2 change associated with the interaction terms are significant. In addition, the results indicate that the moderation effect created by diagnostic use over the business strategy of cost leadership is more significant than the effect created over the strategy of differentiation (Table 9, Step 2). However, the moderation effect created by interactive use over the business strategy of differentiation is more significant than the effect created over the strategy of cost leadership (Table 10, Step 2). Also it is interesting to establish that the moderation effect created by the diagnostic use over the relationship between business level strategies and organisational performance is more significant than the effect created by the interactive use over the relationship between business level strategies and organisational performance (Table 9 and Table 10, Step 3).

The results of the hypotheses testing are summarised in Table 11 showing the statistical support for the seven study hypotheses.

Conclusions of the Study and its Implications

The study outcomes have significant theoretical and practical implications. Recent developments in the management accounting literature display strong claims about the substantive importance of developing a proper relationship among the uses of MCS, strategy variables and organisational performance (Kaplan and Norton, 2001; Langfield-Smith, 1997; Simons, 1995; 2000; Tucker et al, 2009).

Table 9: Testing Moderator Effects of Diagnostic Use of MCS Using Hierarchical Multiple Regression

Step and Variable	B[3]	β[4]	R^2
(a)			
Step 1			
Cost Leadership strategy	.311	.466***	
Differentiation Strategy	.416	.512***	
Diagnostic Use of MCS	.25	.38	.389**
Step 2			
Cost Leadership Strategy x Differentiation Strategy	.392	.415*	.391**
Cost Leadership Strategy x Diagnostic Use of MCS	.375	.398**	.301**
Differentiation Strategy x Diagnostic Use of MCS	.302	.387*	.211*
Step 3[5]	.461	.501*	.289*
Cost Leadership Strategy x Differentiation Strategy x Diagnostic Use of MCS			
*p<.01, **p<.001, ***p<.001 (one-tailed)			

Table 10: Testing Moderator Effects of Interactive Use of MCS Using Hierarchical Multiple Regression

Step and Variable	B	β	R^2
(a)			
Step 1			
Cost Leadership strategy	.311	.466***	
Differentiation Strategy	.416	.512***	
Interactive Use of MCS	.12	.21	.361**
Step 2			
Cost Leadership Strategy x Differentiation Strategy	.392	..415*	.391**
Cost Leadership Strategy x Interactive Use of MCS	.298	.325**	.285**
Differentiation Strategy x Interactive Use of MCS	.398	.422	.311*
Step 3	.431	.495 *	.265*
Cost Leadership Strategy x Differentiation Strategy x Interactive Use of MCS			
*p<.01, **p<.001,***p<.001 (one-tailed)			

[3] B= Unstandardised beta should be used when interpreting the results of moderation effect as the predictor and moderator variables are properly standardized to provide a meaningful zero point (Frazier et al, 2004). This treatment avoids the problem of multicollinearity (Frazier et al, 2004). Multicollinearity causes "bouncing betas" in which the direction of the beta terms can shift from previously positive to negative relationships or vice versa.

[4] β= Standardised beta

[5] Three way interactions are used as there are two predictor variables (cost leadership strategy, differentiation strategy and diagnostic use of MCS).

Table 11: Summarised Results of Hypotheses Testing

Hypothesis	Supported
H1: Cost leadership strategy positively affects organisational performance.	Yes
H2: Differentiation strategy positively affects organisational performance.	Yes No
H3: There is a negative relationship between cost leadership strategy and differentiation strategy.	Yes
H4: Diagnostic use of MCS moderates the relationship between cost leadership strategy and organisational performance.	Yes
H5: Interactive use of MCS moderates the relationship between cost leadership strategy and organisational performance.	Yes
H6: Diagnostic use of MCS moderates the relationship between differentiation strategy and organisational performance.	Yes
H7: Interactive use of MCS moderates the relationship between differentiation strategy and organisational performance.	

As past studies have not considered both diagnostic and interactive uses simultaneously in testing the moderating effects of two uses, the findings of this research are important. This paper has indicated, through the testing of Hypotheses H4 to H7, that two uses of MCS significantly moderate the association between business strategies and organisational performance. It is also possible to conclude that diagnostic use creates more impact over the cost leadership strategy while interactive use creates more intense effect over the differentiation strategy. Further, the study concludes that joint use of MCS is of no harm though the situation creates a tension as per conflict literature (DeDreu, 1991; Nicotera, 1995). This study has also challenged the dominant theory of Porter's generic competitive strategy (1980, 1985) as the assertion of mutual exclusiveness has been refuted (H3).

This research has also brought important implications for management practice. As Epstein (2002) indicates, there is a need for managers to be aware of drivers of performance in organisations and the causal relationships critical to drive that value. This study reflects the importance of business strategies as drivers of performance and also the potential for two uses of MCS in enhancing organisational performance. The study reveals another important practical finding for the design of management control systems, by confirming that diagnostic use is of greater importance to the research setting, since the overall impact of diagnostic use on the strategy-performance relationship is more significant than the effects created by interactive use (as shown in Table 9 and 10).

These findings support the importance of using management controls in an interactive manner as highlighted in relative management literature (Henri, 2005; Simons, 1995; Thoren and Brown, 2004),

However, the reported results may be specific to the Sri Lankan context due to cultural political economy of management accounting controls and strategies (Wickramasinghe and Hopper, 2005), though they could be applicable in more general contexts.

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Appendix A: The Effects of the Diagnostic and Interactive Use of Management Control Systems on the Strategy-Performance Relationship

Section A: Demographic Information

Please provide the following demographic data related to you and to your organization. This data will be used only for the purpose of statistical classification.

1. Name of your organization: …….
2. How many people are employed by your organization: ……..
3. Title of your position: ……
4. Number of years in your current position: ……
5. District in which your organization is located: ……

SECTION B: Uses of Management Control Systems
Please indicate, by circling the appropriate number, the level of emphasis placed on uses of Management Control Systems (MCS).

	Not at all	To a limited extent	To some extent	To a consider-able extent	To a great extent
(i).Performance targets are set in advance.	1	2	3	4	5
(ii)MCS are often used as means of questioning and debating ongoing assumptions, decisions and action plans.	1	2	3	4	5
(iii)Performance targets are set by top managers without considering subordinates' viewpoints.	1	2	3	4	5
(iv)MCS evaluate and control subordinates tightly.	1	2	3	4	5
(v)MCS are used to challenge new ideas and ways of doing tasks.	1	2	3	4	5
(vi)MCS are used to align performance measures with strategic goals.	1	2	3	4	5
(vii)MCS are used to follow up present plans and goals.	1	2	3	4	5
(viii)MCS are considered as tools available for learning.	1	2	3	4	5
(ix)MCS are used to follow up significant exceptions and deviations.	1	2	3	4	5
(x)MCS are discussed regularly and frequently in face-to-face meetings between superiors and subordinates.	1	2	3	4	5
(xi)Rewards for employees are determined by a formula based on the achievement of predetermined targets.	1	2	3	4	5
(xii)MCS demand frequent and regular attention from operating managers and subordinates at all levels of the organization.	1	2	3	4	5
(xiii)MCS generate information that forms an important and recurring agenda in discussions between operational and senior managers.	1	2	3	4	5
(xiv)MCS for employees are determined by employees' contribution towards innovation.	1	2	3	4	5

Section C: Business Level Strategies

Please indicate, by circling the appropriate number, the extent to which the following items describe your organization.

	Not at all	To a limited extent	To some extent	To a considerable extent	To a great extent
(i)Achieving lower cost per unit than competitors is a strategic priority.	1	2	3	4	5
(ii)Attempts being made to differentiate product attributes from competitors.	1	2	3	4	5
(iii)Pricing the products below competitors is a strategic priority.	1	2	3	4	5
(iv)Employs extremely strict cost controls.	1	2	3	4	5
(v)Building brand identification is recognized as a strategic priority.	1	2	3	4	5
(vi)Unique features of products (compared to competitors) are emphasized in promotional activities.	1	2	3	4	5
(vii)Produce standardised products.	1	2	3	4	5
(viii)Produce customised products (specialty products).	1	2	3	4	5
(ix)Innovation takes place in marketing technology and methods.	1	2	3	4	5
(x)Fostering innovation and creativity in the production process is a strategic priority.	1	2	3	4	5
(xi)Providing outstanding customer service is given priority.	1	2	3	4	5
(xii)Major expenditure on technology being incurred to differentiate products.	1	2	3	4	5
(xiii)Outsource organizational functions to control costs.	1	2	3	4	5
(xiv)Major expenditure on technology being incurred to lower costs.	1	2	3	4	5
(xv)Extremely strict product/service quality control procedures are employed.	1	2	3	4	5
(xvi)Performs an analysis of costs associated with various activities.	1	2	3	4	5
(xvii)Rewards are given to those employees who suggest ways of reducing costs of organizational functions.	1	2	3	4	5
(xviii)Rewards are given to those employees who suggest ways of making organizational products/services unique ones.	1	2	3	4	5

Section D: Organizational Performance

Please indicate, by circling the appropriate number, your organization's overall performance over the past **three years** (2005-2007) in the following areas relevant to performance targets. If you are not aware of any of the following indicators please indicate by selecting the option 'Not Known'.

	Not known	Very Low	Low	Moderate	High	Very High
(i)Market share	0	1	2	3	4	5
(ii)Sales growth	0	1	2	3	4	5
(iii)Net profit margin (net profit after tax as a percentage of revenue)	0	1	2	3	4	5
(iv)Cost of goods sold to sales revenue	0	1	2	3	4	5
(v)Cost per unit						
(vi)Return on Investment	0	1	2	3	4	5
(vii) Number of rejects/rework	0	1	2	3	4	5
(viii)Product processing time	0	1	2	3	4	5
(ix)Delivery performance to customers (by date)	0	1	2	3	4	5
(x)Delivery performance to customers (by quantity)	0	1	2	3	4	5
(xi)Number of customer complaints	0	1	2	3	4	5
(xii)Sales returns as a percentage of gross sales	0	1	2	3	4	5
(xiii)Customer drop out rate	0	1	2	3	4	5
(xiv)Employee turnover	0	1	2	3	4	5
(xv)Employee absenteeism						
(xvi)New products introduced to the market	0	1	2	3	4	5
(xvii)Percentage of sales from new products	0	1	2	3	4	5
(xviii)New production techniques and processes used	0	1	2	3	4	5