Linking Uses of Management Control Systems with Strategy-Performance Relationship

ABSTRACT *In this study, the moderating effects created by diagnostic use and interactive use of management control systems (MCS) 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: Strategy, Business Level Strategies, Strategic Decision Making, Organizational Performance

1: DECISION MAKING CONTEXT AND MOTIVATION FOR THE STUDY

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 organizational performance in different organizational 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 organizations achieving performance breakthroughs by implementing and using MCS in congruence with organizational 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 organization. Case studies, on the other hand, have tended to investigate the role of MCS in supporting and influencing the strategic processes within organizations (Langfield-Smith, 1997). In spite of the growing interest in the relationship between MCS, strategy and organizational 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.

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 organizational performance. Accordingly, this study examines the influence of diagnostic and interactive uses of MCS on the relationship between strategy and organizational performance. In this context, this research aims to examine the problem of "how do the uses of MCS influence the relationship between business strategies and organizational performance". In order to extend the current understanding of MCS-strategy-performance relationships, this research is expected to realize 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 organizational performance

(ii) To recognize the effect of each business strategy on organizational performance

(iii) To recognize the interrelationships between cost leadership and differentiation strategies

2. CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Understanding sources of organizational 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 organizational 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 recognized 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 (Table 1 illustrates the differences between diagnostic use and interactive use) with strategies for better organizational 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 emphasized by Porter (1980, 1985) organizations 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 organizational 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 organizational 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 organizations can charge a price

premium by offering unique products and that enables organizations to earn more revenue and profits (Porter, 1985; Wright, 1987). Accordingly, the following hypotheses are suggested.

H1: Cost leadership strategy positively affects organizational performance.

H2: Differentiation strategy positively affects organizational performance.

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 organizational 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 organization (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 organizational 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 organizations (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 organizational performance.

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

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

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

3. RESEARCH METHOD

3.1 Measurement

The key concepts relating to the current study are conceptualized 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. Organizational performance is recognized as being a multi-dimensional concept, as a consequence an 18-item measure was used to establish the multi-dimensional nature of the organizational 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 available from the authors on request).

3.2 Data Collection

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 organizations which are operating in less developed countries (LDCs). Thus, in this research data was collected from Sri Lankan Textile and Apparel Industry, which is the key source of export income in the country. The questionnaire survey is the core method used to collect data from the industry. 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%.

[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).

3.3. Data 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 standardized 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 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 (organizational 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.

Table 4 shows that all standardized 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 recognize 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.

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.

3.4 Regression Analyses

H1 and H2 are tested using multiple regression analysis. The summarized 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 organizational 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 characterized 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 organizational performance (outcome variable) as both predictor and moderator variables are 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 organizational 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 organizational performance. It is important to note that, when diagnostic use was introduced as a moderator an additional 28.9% variance was added to organizational 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 organizational performance over and above the 36.1% explained by the first order effects of business level strategies and interactive use alone. The summarized 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 organizational performance is more significant than the effect created by the interactive use over the relationship between business level strategies and organizational 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.

4. 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 organizational

performance (Kaplan and Norton, 2001; Langfield-Smith, 1997; Simons, 1995; 2000; Tucker et al, 2009). 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 organizational 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).

In the meantime, 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 organizations 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 organizational 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),

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Figure 1: Theoretical Framework and Study Hypotheses

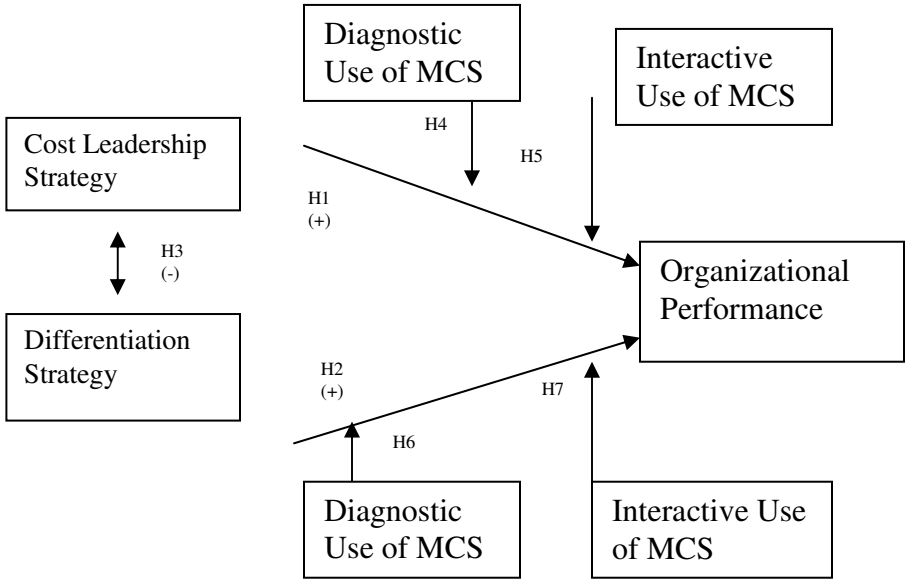

Figure 2: Proposed Measurement Model for Cost Leadership Strategy

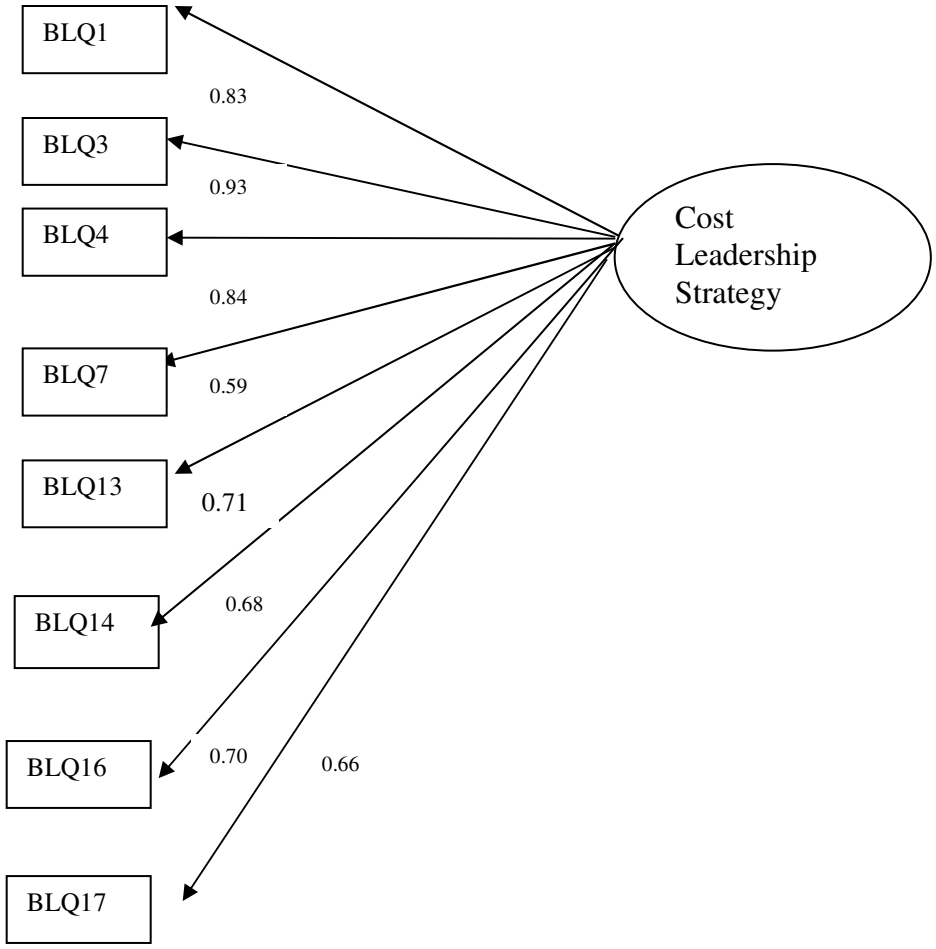

Figure 3: Proposed Measurement Model for Differentiation Strategy

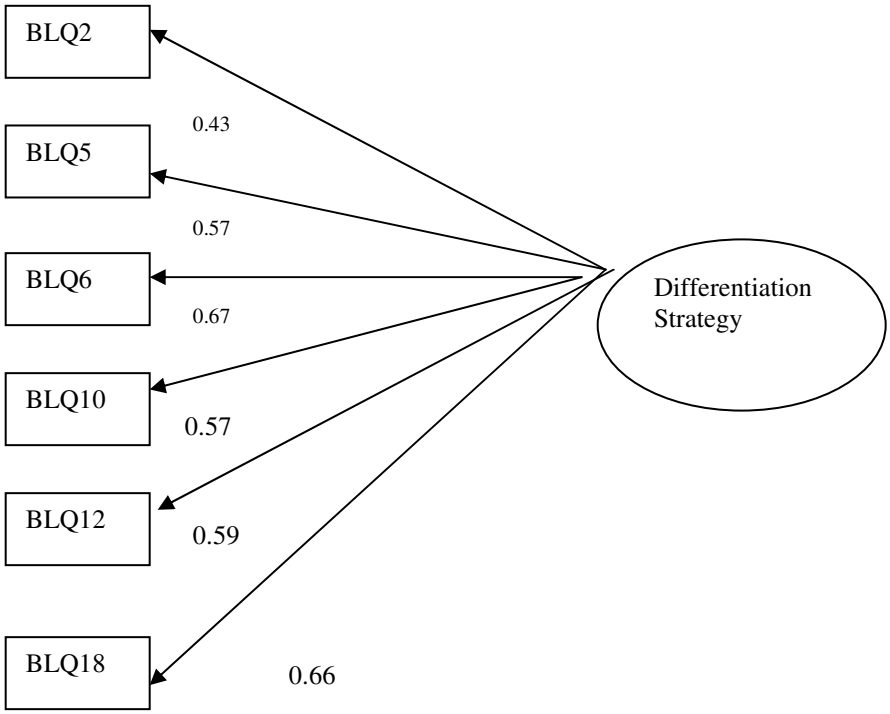

Figure 4: Proposed Measurement Model for Organizational Performance

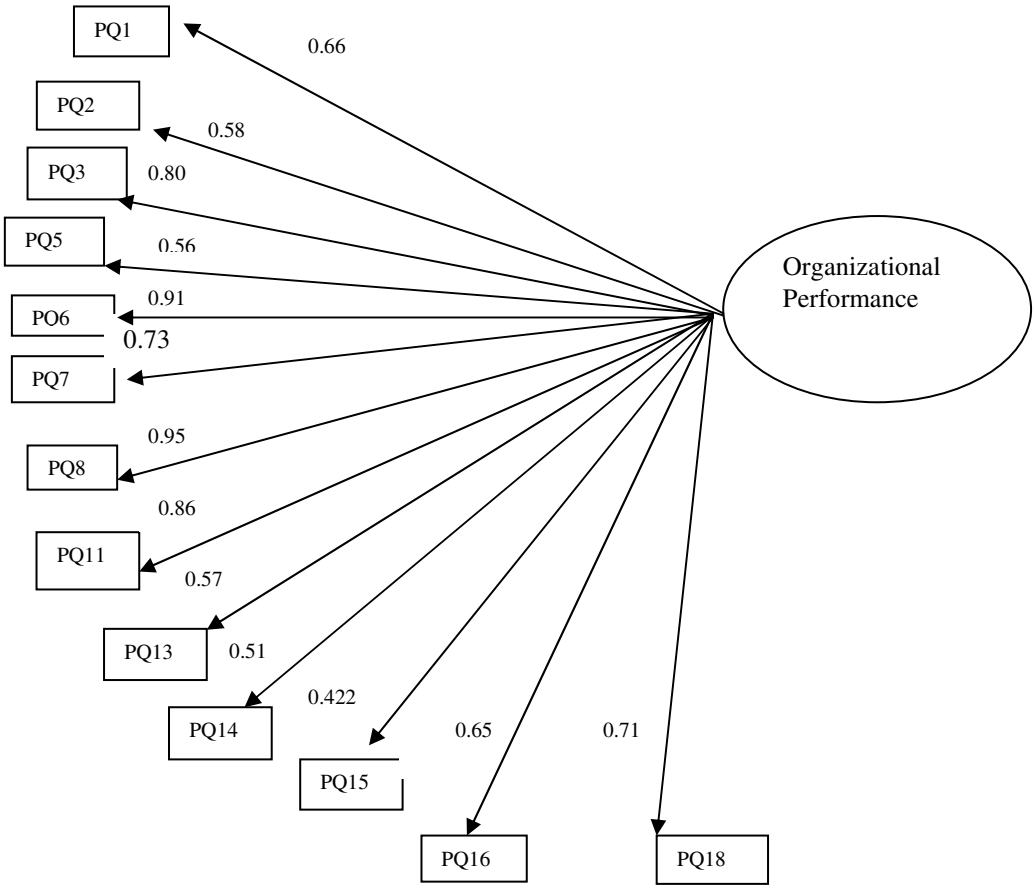

Table 1: A Comparison of Diagnostic Use and Interactive Use

	Diagnostic Use of Controls	Interactive Use of Controls
Purpose	Provide motivation and direction to achieve goals.	Stimulate dialogue and organizational 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.

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
Organizational performance	18	5	13
Total	67	15	52

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 emphasized 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
Organizational 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
Organizational performance	0.98	0.91

Table 6: Overall Goodness of Fit Statistics for Measurement Models

Goodness of Fit Indices	Cost Leadership Strategy	Differentiation Strategy	Organizational 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).			

Table7: Multiple Regression Analysis: Business Strategies and Organizational Performance

	Organizational 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)	

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

Step and Variable	**B**[2]	**β**[3]	**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[4]			

[2] 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.

[3] β= Standardised beta

Cost Leadership Strategy x Differentiation Strategy x Diagnostic Use of MCS	.461	.501*	.289*
*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			
Cost Leadership Strategy x Differentiation Strategy x Interactive Use of MCS	.431	.495 *	.265*
*p<.01, **p<.001,***p<.001 (one-tailed)			

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

Table 11: Summarized Results of Hypotheses Testing

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

Linking Uses of Management Control Systems with Strategy-Performance Relationship

Dr Nirosha Dilhani Kapu Arachchilage

School of Accounting Finance and Economics, Edith Cowan University, Joondalup, Australia

Email: niroshak@ads.ecu.edu.au

Professor Malcolm Smith

School of Accounting Finance and Economics, Edith Cowan University, Joondalup, Australia

Email: malcolm.smith@ecu.edu.au

Linking Uses of Management Control Systems with Strategy-Performance Relationship

ABSTRACT *In this study, the moderating effects created by diagnostic use and interactive use of management control systems (MCS) 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: Strategy, Business Level Strategy, Strategic Decision Making, Organizational Performance

1: DECISION MAKING CONTEXT AND MOTIVATION FOR THE STUDY

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 organizational performance in different organizational 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 organizations achieving performance breakthroughs by implementing and using MCS in congruence with organizational 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 organization. Case studies, on the other hand, have tended to investigate the role of MCS in supporting and influencing the strategic processes within organizations (Langfield-Smith, 1997). In spite of the growing interest in the relationship between MCS, strategy and organizational 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.

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 organizational performance. Accordingly, this study examines the influence of diagnostic and interactive uses of MCS on the relationship between strategy and organizational performance. In this context, this research aims to examine the problem of "how do the uses of MCS influence the relationship between business strategies and organizational performance". In order to extend the current understanding of MCS-strategy-performance relationships, this research is expected to realize 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 organizational performance

(ii) To recognize the effect of each business strategy on organizational performance

(iii) To recognize the interrelationships between cost leadership and differentiation strategies

2. CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Understanding sources of organizational 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 organizational 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 recognized 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 (Table 1 illustrates the differences between diagnostic use and interactive use) with strategies for better organizational 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 emphasized by Porter (1980, 1985) organizations 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 organizational 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 organizational 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 organizations can charge a price

premium by offering unique products and that enables organizations to earn more revenue and profits (Porter, 1985; Wright, 1987). Accordingly, the following hypotheses are suggested.

H1: Cost leadership strategy positively affects organizational performance.

H2: Differentiation strategy positively affects organizational performance.

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 organizational 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 organization (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 organizational 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 organizations (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 organizational performance.

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

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

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

3. RESEARCH METHOD

3.1 Measurement

The key concepts relating to the current study are conceptualized 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. Organizational performance is recognized as being a multi-dimensional concept, as a consequence an 18-item measure was used to establish the multi-dimensional nature of the organizational 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 available from the authors on request).

3.2 Data Collection

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 organizations which are operating in less developed countries (LDCs). Thus, in this research data was collected from Sri Lankan Textile and Apparel Industry, which is the key source of export income in the country. The questionnaire survey is the core method used to collect data from the industry. 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%.

[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).

3.3. Data 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 standardized 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 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 (organizational 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.

Table 4 shows that all standardized 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 recognize 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.

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.

3.4 Regression Analyses

H1 and H2 are tested using multiple regression analysis. The summarized 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 organizational 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 characterized 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 organizational performance (outcome variable) as both predictor and moderator variables are 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 organizational 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

organizational performance. It is important to note that, when diagnostic use was introduced as a moderator an additional 28.9% variance was added to organizational 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 organizational performance over and above the 36.1% explained by the first order effects of business level strategies and interactive use alone. The summarized 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 organizational performance is more significant than the effect created by the interactive use over the relationship between business level strategies and organizational 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.

4. 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 organizational performance (Kaplan and Norton, 2001; Langfield-Smith, 1997; Simons, 1995; 2000; Tucker et al, 2009). 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 organizational 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).

In the meantime, 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 organizations 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 organizational 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 future researchers have the possibility to further develop this study by incorporating strategic capabilities as a study variable based on the resource based view of the strategy and measuring firm performance as a lagged dependent variable to establish a strong causal relationship. It is important to note that in the current research, the researchers have measured

both dependent and independent variables simultaneously as the intention of the study is not to measure effects of any strategies/ management control systems newly introduced.

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Figure 1: Theoretical Framework and Study Hypotheses

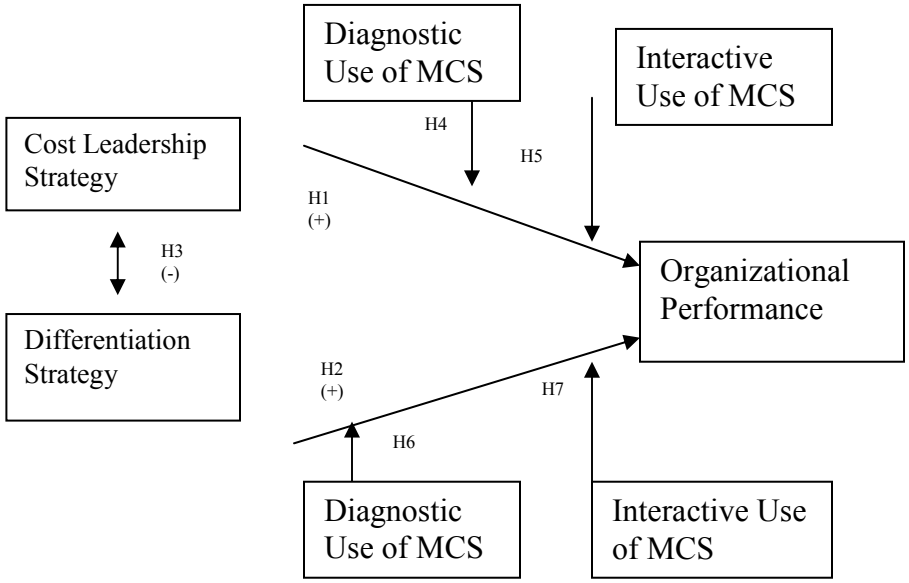

Figure 2: Proposed Measurement Model for Cost Leadership Strategy

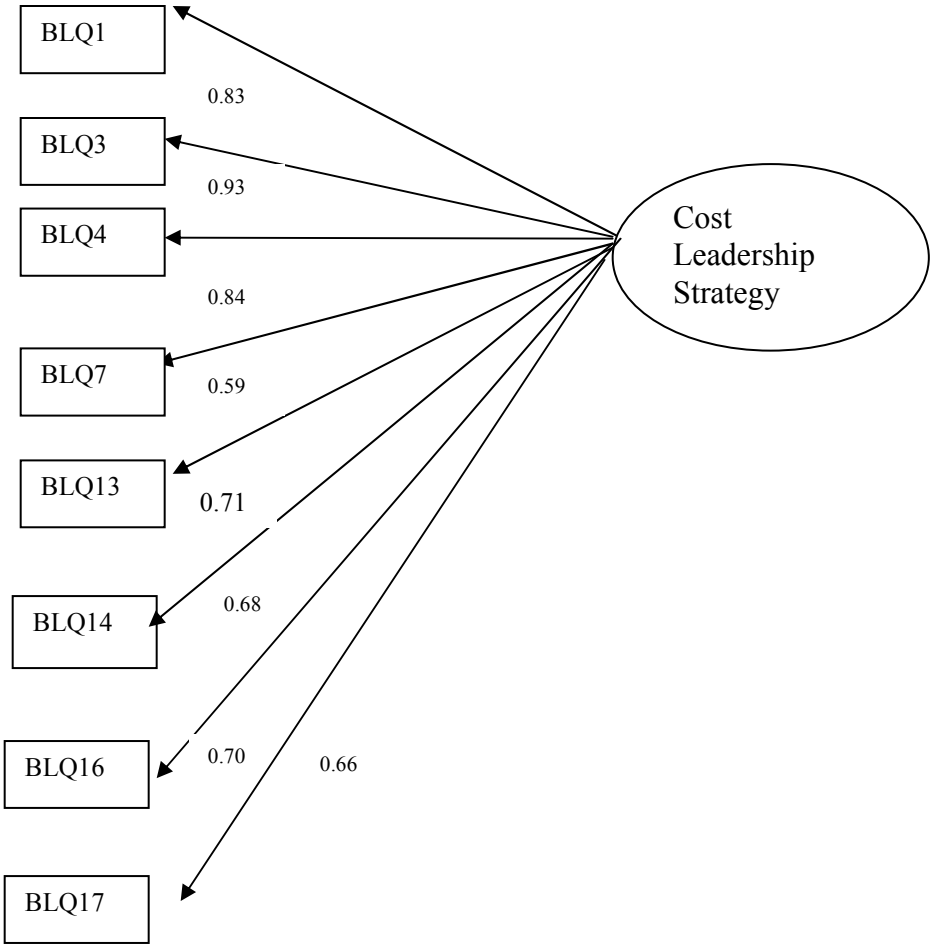

Figure 3: Proposed Measurement Model for Differentiation Strategy

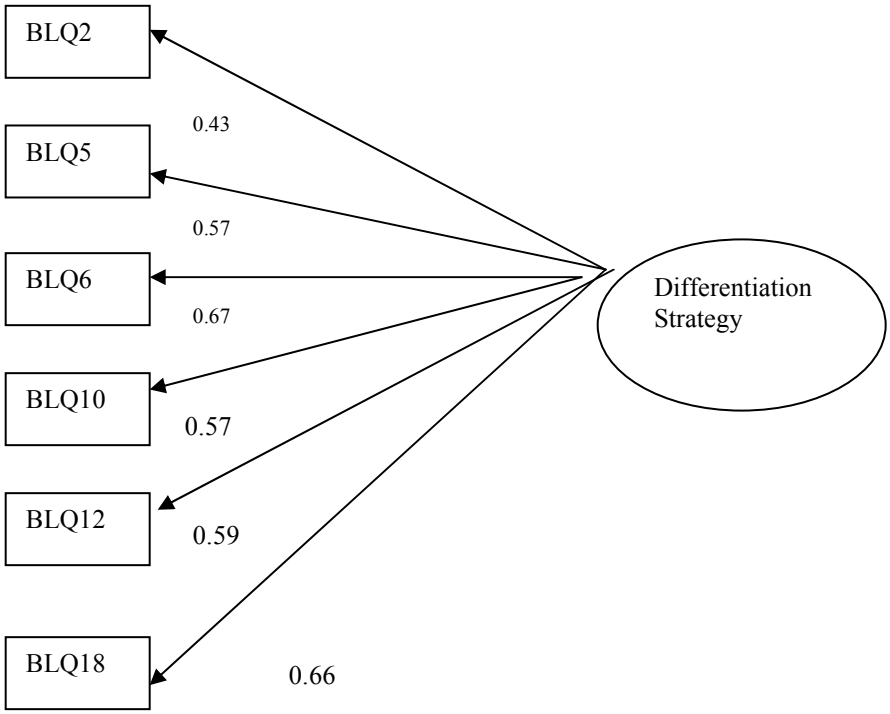

Figure 4: Proposed Measurement Model for Organizational Performance

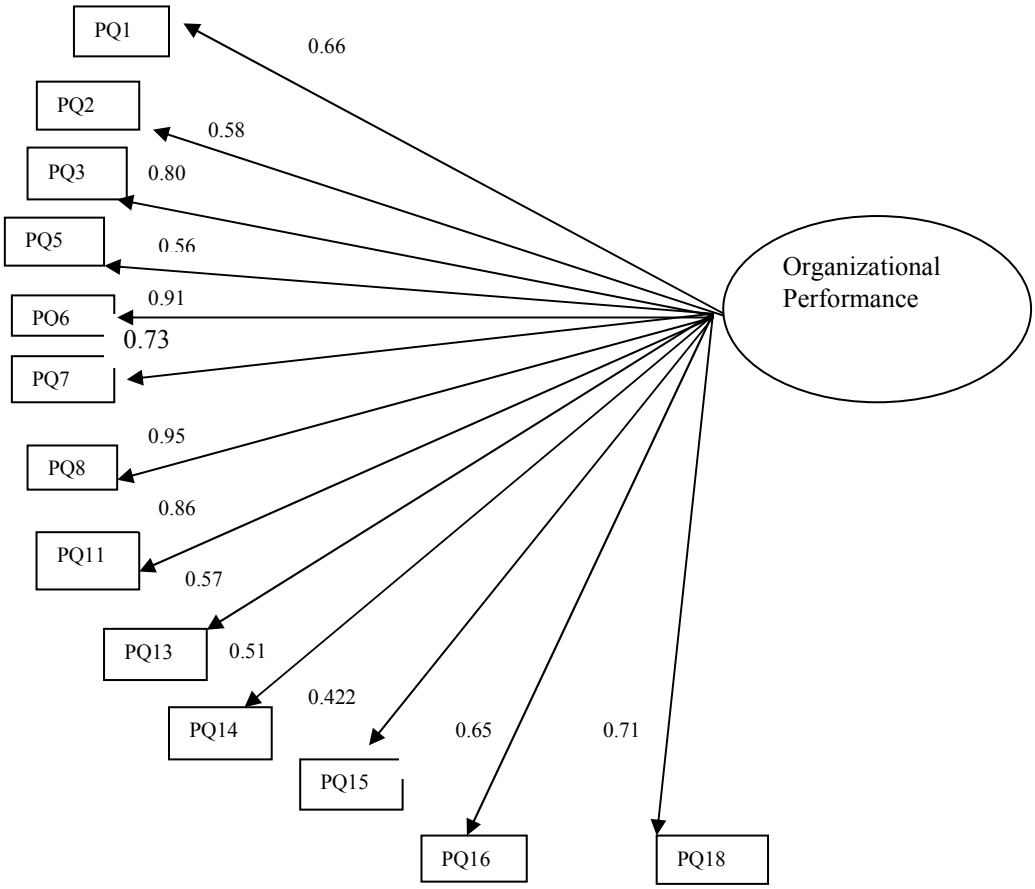

Table 1: A Comparison of Diagnostic Use and Interactive Use

	Diagnostic Use of Controls	Interactive Use of Controls
Purpose	Provide motivation and direction to achieve goals.	Stimulate dialogue and organizational 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.

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
Organizational performance	18	5	13
Total	67	15	52

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 emphasized 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
Organizational 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
Organizational performance	0.98	0.91

Table 6: Overall Goodness of Fit Statistics for Measurement Models

Goodness of Fit Indices	Cost Leadership Strategy	Differentiation Strategy	Organizational 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).			

Table7: Multiple Regression Analysis: Business Strategies and Organizational Performance

	Organizational 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)	

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

Step and Variable	**B**[2]	**β**[3]	**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[4]			

[2] 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.

[3] β= Standardised beta

Cost Leadership Strategy x Differentiation Strategy x Diagnostic Use of MCS	.461	.501*	.289*
*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			
Cost Leadership Strategy x Differentiation Strategy x Interactive Use of MCS	.431	.495 *	.265*
*p<.01, **p<.001,***p<.001 (one-tailed)			

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

Table 11: Summarized Results of Hypotheses Testing

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