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Diagnostic Control Systems and Overall Firm Performance of Sugar Firms in Western Kenya

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ABSTRACT
Diagnostic control systems are the backbone of traditional management control, designed to ensure predictable goal achievement. Unfortunately, managers typically pay little attention to these feedback systems to improve the implementation of strategic plans and organizational performance. Further, establishing the strategic control-performance relationship has been problematic, suggesting failure by researchers to consider contingent variables. This study used data, collected during the period November 2008 to May 2009 from 109 senior managers in a census survey of 45 firms in the sugar value-chain in western Kenya, to examine the relationship between diagnostic control systems and overall firm performance. Descriptive statistics and bi-variate regression analysis were used to analyze data. The findings revealed diagnostic control systems positively and significantly related to overall firm performance ($\beta = 0.358$, $p < 0.01$). The results of this study suggest that urgent measures are required by the firms in the study to design diagnostic control systems to cope with the changing business environment. The study contributes to validation and upgrade of the existing strategic control theory. For managers, the study sheds light on the design and use of diagnostic control systems and also for public sector managers in guiding the strategic change. It is recommended that future studies focus on the specific firms in sugar value chain and adopt longitudinal case-study designs to establish causal relationships among variables.

INTRODUCTION

Background of the study

Organizational performance and its improvement has been the focus of almost all 'management studies' (Jaeger & Baliga 1985). Current thinking in these management studies is dominated by strategic management paradigm, with widespread practices, in small businesses, multinational corporations, manufacturing and service organizations, public sector, not-for-profit sector, and, professional service sector (Johnson & Scholes, 2002; Kazmi, 2002). According to (Ansoff, 1980) strategic management is the process by which an organization's management guides its adaptation to the external environment. The purpose of strategy and strategic management is to create sustainable competitive advantage for superior performance and long term survival of organizations. The growth of the strategic management paradigm was propelled by concerns of theorists and practioners, since the 1970s seeking to respond to the intense criticism of extant business policy and corporate planning practices. Critics held that there was no credible link between organizational performance and corporate planning practices (Schendel & Hofer, 1979; Johnson & Scholes, 2002; Greenly, 1986). Recognizing the critical role of the environment, the new paradigm of strategic management required top management to assume a creative and directive role to guide the firm's adaptation to a discontinuous and turbulent future (Ansoff, 1980). It is a fact that changes in strategy are inevitable and, therefore, incorporating an attitude of adapativeness and flexibility into strategy design assists to preempt failures at implementation (Higgins & Vincze, 1993). Diagnostic control systems are, therefore, deemed invaluable because of their ability to allow managers to monitor performance and redirect organizational action (Muralidharan, 2004).

Despite emerging economies embracing strategic management concepts (Gimenez, 1999; Aragon-Sanchez & Sanchez-Marin, 2005; O'Regan & Ghobadian, 2006; Hassan, 2010) most studies have focused on Western countries (Hoskisson *et al.,* 2000). Few studies have been done in Kenya (Ogollah & Bolo, n.d; Ogollah *et al.,* n.d) which is rather surprising in view of the widespread practice of business entities preparing strategic plans. Consequently, there are hardly any studies focusing on the sugar industry in Kenya. This lacuna extends to the

concepts of diagnostic control systems and overall firm performance, both pivotal factors that influence the implementation of strategic plans.

1.1.1 Diagnostic Control Systems

According to Simons (1995), diagnostic control systems refer to the traditional view of the control system as a vehicle for strategy implementation. Diagnostic control systems, serving mainly as management by exception tools, are used to monitor organizational outputs and compare them to the preset standards, in order to correct possible deviations and keep the intended strategy (see Mintzberg 1978) on track. The critical performance variables monitored by diagnostic control systems can be both financial and non-financial by nature, depending on the factors that the management sees as crucial for the success in the current intended strategy. Examples of controls that can be used as diagnostic controls are profit plans and budgets, goals and objective systems, balanced scorecards, project monitoring systems and strategic planning systems. (Simons 2000) Diagnostic controls do not receive attention from top management, unless in case of substantial deviations from the targets. In practice, staff accountants draw periodic exception reports from the diagnostic control systems to senior management. If everything is on track, these reports will be reviewed very quickly – after which the scarce management attention will be moved into other issues. Diagnostic controls are a way of ensuring that the company achieves its goals, without the management having to engage in constant monitoring. Diagnostic controls thus have the purpose of saving management time. They offer a self-regulating system, which needs top management's personal attention only if there's substantial deviation between the preset standards and the organization's performance. (Simons 1995, 2000). However, with limited research in strategic management in emerging economies (Hoskisson et al., 2000) little is known about either diagnostic control system or their performance consequences in Kenyan sugar firms. It is, therefore, important to study diagnostic control system and their performance consequences in the sugar industry in Kenya.

1.1.2 Overall firm Performance

Overall firm performance and its improvement has been a dominant theme in strategic management and practice. Venkatraman and Ramanujam (1986) viewed overall firm performance as a complex and multidimensional phenomenon asserting that no single performance measure is inadequate to represent overall firm performance. In support, Walker and Ruekert (1987) assert that appropriate overall firm performance dimensions must include effectiveness, efficiency and adaptability, suggesting existence of vital linkages between diagnostic control systems and overall firm performance.

The measurement of the performance impact of strategies has, however, been reported to be problematic in emerging economies, Kenya included (Hoskisson *et al.,* 2000). Such researchers attribute the situation to unconventional financial reporting that make comparisons over time and across firms difficult. This problem is compounded unethical financial reporting practices (EBRD, 1998; Shama & Merrell, 1997). Previous research that focused on organizational performance of sugar firms in Kenya is limited. All these issues underline the need and challenge of researching on overall firm performance in sugar firms in Kenya.

1.1.3 The Sugar Industry in Kenya

According to Kenyan sugar industry reports (GOK, 2008, KSB, 2010) the dominant firms in the sugar-value chain comprise the sugar manufacturing companies, the molassess processor companies, farmers' outgrower firms and the fixed-crusher artisanal jaggeries. The nine sugar manufacturing firms are: Chemelil, Mumias, Miwani, Nzoia, South Nyanza, Muhoroni, West Kenya, Kibos and Soin. Proposed sugar manufacturing firms are: Butali, Kwale, Transmara and Tana. There are two molassess processor companies: Agro-Chemical Food Company and Spectre International. The twelve farmers' outgrower firms comprise the following: Busia, Butali, Chemelil, Kibos, Miwani, Mumias, Nandi Escarpment, Nzoia, Soin, South Nyanza, West Kenya and Muhroni. In addition, there exists over 300 fixed-crusher artisanal jaggeries.

Besides the government, other stakeholders include private investors, farmers, millers, employees and tax payers. Oversight in the industry is undertaken by Kenya Sugar Board (KSB), a public body under the Ministry of Agriculture set up by the Sugar Act of 2001, the Kenya Sugar Research Foundations (KESREF), and the Sugar Arbitration Tribunal (SAT). Other influential players are the Kenya Bureau of Standards (KEBS), the Kenya Society of Sugarcane Technologists (KSSCT), the foremost forum for research dissemination. The various advocacy groups include Kenya Sugar Growers Association (KESGA), Kenya Association of Sugar Manufacturers (KESMA), Kenya Parliamentary Group on Sugar (SUPAC), Sugar Campaign for Change (SUCAM) and Kenya Sugar Plantation Workers Union (KSPWU).

The Kenyan sugar industry was chosen as a context of the study for several reasons. First, the sugar sub-sector has a great potential for impacting the overall economy of Kenya. It is one of the largest contributors to the agricultural Gross Domestic Product (GDP), supporting at least 25% of the Kenyans population, produces over 520,000 metric tonnes of sugar for domestic consumption (saving the economy in excess of US$ 250 million or Kshs 20 billion in foreign exchange annually, (GOK, 2008, KSB, 2010). Secondly, the sugar sub-sector has is currently undergoing fundamental change occasioned by liberalization and deregulation in the operating environment. Thirdly, with the substantial state holdings, Government of Kenya has spearheaded key policy initiatives by formulating the National Policy on Sugar Industry (2001), Agriculture Sector Development Strategy (2009-2020), Kenya Sugar Industry Strategic Plan 2004-2009 and Kenya Sugar Board Strategic Plan 2010-2014. These inititives have seen most of the sugar firms adopt strategic plans and performance contracting. Some researchers (Ojera, 2001; Mutua *et al.,* 2009) have, however, pointed out that these policies have not elicited the positive outcomes intended of lowering cost of production and attaining higher efficiency and global competitiveness. On the contrary, the Sessional Paper No, 4 paints a gloomy scenario of unsatisfactory performance by firms in the sugar industry: Nzoia sugar has debts estimated at Kshs 16 billion (technically insolvent); South Nyanza Sugar owes Kshs 2.9 billion; Chemelil, Kshs 1.3 billion; Busia Sugar, Kshs 373 million (with no factory); Miwani Sugar, Kshs 8.1 billion (in receivership); Muhoroni sugar, Kshs. 11.1 billion (in receivership). Mumias Sugar, Agro-Chemical Company, the privately owned East African Spetre and West Kenya Sugar, though with varying debts, are considered financially stable. The outgrower firms and, to a lesser extent, the jaggeries, are also indebted to the government.

A fourth reason for choosing the Kenyan sugar industry is that some resesearchers (Wanyande, 2001; Mireri *et al*., 2009; Odek, *et al.,* 2003) have attributed the poor performance in the sugar industry on poor management, corruption and vested political interest. Finally, there is an impending threat arising from the free trade Common Market for Eastern and Southern Africa (COMESA) arrangement which has hitherto shielded Kenya from regional competition.

It is not all gloom, however, since business commentators in the press have depicted some positive developments in the sugar industry. Mumias sugar has consistently reported profits, has modernized equipment and processes and built the strongest brands in East Africa. Now largely privatized, the firm has diversified into power production and has expanded to the Tana Delta, and has also won the best prize for environment management at Company of the Year Award (COYA), (Mogusu, 2006; Mireri *et al.,* 2008). The other sugar firms are depicted with mixed financial performance. Nevertheless, most firms are reported to be undertaking various strategic projects relating to plant expansion and diversification. It is significant to note that since the mid-nineties there has been no donor involvement in the Kenyan sugar sector.

Despite such significant strategic activity, the industry still faces several challenges as evidenced by incessant court litigation, workforce strikes and resultant factory shutdowns and widespread opportunistic behaviours relating to corruption and bribery, suggesting weak institutional infrastructures to support a market-based system (KACC, 2010). All these concerns highlight the importance of effectively managing the internal firm and external environmental interfaces. In such situations, Muralidharan (1997, 2004) called for diagnostic control systems to focus on strategy implementation, allow managers to monitor performance and redirect organizational action.

Diagnostic control systems and overall firm performance, both concepts in strategic management, are tools that can be useful to management in such situations (Muralidharan 1997, 2004; Preble, 1992, 1997; Miles & Snow, 1978). However, studies focusing on strategic management in general and diagnostic control system and overall firm performance, in particular are scarce in emerging economy context. (Hoskisson et al, 2000). Consequently, little is known about diagnostic control systems or their performance of Kenyan sugar firms.

1.2 Statement of the Research Problem

Prescriptive theory asserts that adoption of diagnostic control system will improve implementation of strategic plans and overall firm performance, even for Kenyan sugar firms. Despite this assertion, the perennial poor performance of firms in the Kenyan industry suggests that their applicability or suitability to Kenyan sugar firms is doubtful. Apart from some limited studies on diagnostic control system in different sectors in Kenya, no known studies have been reported relating to Kenyan sugar firms with regard to the extent of adoption of diagnostic control systems or their respective overall firm performance consequences.

Furthermore, previous researchers in western countries have acknowledged that establishing the diagnostic control systems - overall firm performance relationship has been problematic, with research findings from such

studies revealing mixed results and low statistical power. In consequence of lack of prior studies that have focused on diagnostic control system in the Kenyan sugar industry, there has been, inevitably, no research on the diagnostic control systems- overall firm performance link. Meanwhile, scholars in western countries have posited that this tenuous link suggests that failure to consider contextual variables in previous studies, for example diagnostic control systems, may have masked this linkage, resulting in low explanatory power.

The lack of theory development has led to the concern that practicing managers in general, and managers in Kenyan sugar firms in particular, have little in terms of guidelines by which to design and manage their diagnostic control systems that may be viable for overall firm performance. This is particularly harmful in turbulent business environment of Kenyan sugar firms brought about by industry deregulation and characterized by increasing competition brought about by globalization leading to saturated markets, changes in custormer needs, shorter product life cycle, competition, both price-based and non-price-based. This study seeks to examine the relationship between diagnostic control systems and overall firm performance of sugar firms in western Kenya.

1.3 Objectives of the Study

The purpose of this study is to establish the relationship between diagnostic control system and overall firm performance in the sugar firms in western Kenya.

1.4 Research Hypothesis

The following hypothesis was tested during the study.

H_{1A}: There is a positive relationship between diagnostic control practices and overall firm performance.

1.5 Scope of the Study

This study focuses on the firms in the industry value-chain involved in the production and marketing of sugar and sugar by-products in western Kenya. This common involvement in the value chain makes all the players exposed to common business environment and management challenges. The firms in the industry comprise a total of 52 firms including 9 sugar manufacturing firms, 2 molasses processing firms, 12 outgrower companies and 29 jaggeries with a fixed crusher capacity of 20 tonnes of cane per day (TCD). The study examines the relationship between diagnostic control system and overall firm performance of these firms.

1.6 Justification

Kenya is widely acclaimed as an emerging economy (Hoskisson *et. al.,* 2000). The sugar industry is an important sub-sector in the Kenyan economy. This industry was chosen because it constitutes the largest manufacture operations in western Kenya. It makes a substantial contribution to the country's GDP and has the potential to positively impact at least 25% of the Kenyan population by improving national food security as well as livelihood among resident rural communities. Furthermore, sugar is a widely traded basic commodity internationally, thus effective management through diagnostic control systemand viable strategic orienation, can enhance positive returns to both developed and developing countries (Awino *et al.*, 2011; Kenya Sugar Board, 2008). The importance of the industry together with the fast changing business environment of the sugar industry makes it a choice for context study due to calls by researchers for such phenomena in emerging economies like Kenya (Hoskisson *et al.,* 2001)

The existing literature reveals that no study has been done on the diagnostic control system of firms in this industry. First, this study will provide an exposition of the relationship between diagnostic control system and overall firm performance of these firms. Secondly, tertiary and higher learning institutions undertake management education programmes. This study will contribute to knowledge specific to business enterprises in Kenya and this will make training programmes more relevant. Third, various studies on strategic management in general have been undertaken in Africa and other parts of the world. Fourth, managers in sugar companies in western Kenya will be guided to undertake diagnostic control systems reforms to improve overall firm performance. Finally, the sugar industry is located in a region characterized by high levels of poverty and therefore its revitalization will be central for the Government's strategy of poverty reduction and wealth creation, as well as achieving the Millennium Development Goals (MDGs).

1.7 Conceptual Framework

Strategies and related strategic processes are executed in anticipation of some type of expected outcome. Diagnostic control systems have been hailed as tools for improving the implementation of strategic plans and overall firm performance. This study examines the direct relationship between diagnostic control systems and

overall firm performance. This is based on research that indicates that performance can be improved when key variables are correctly aligned (Chenhall, 2003). The basic premise of this contingency theory is that there is no universal system applicable to all organizations and all circumstances and, therefore, suggests that the effectiveness of organizations is a function of the fit between their structures and the environment in which they operate (Galbraith, 1973; Donaldson, 2001).

Consequently, the conceptual framework includes a set of hypothesized relationships. The first set of hypotheses posits a direct relationship where the greater use of diagnostic control systems (independent variable) will lead to greater overall firm performance (dependent variable). Using Simons' Levers of Control (1995), this positive relationship is further proposed for both individual lever of diagnostic control systems and overall firm performance.

RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

The study describes the methods and procedures used to address the research problem relating to the tenuous link between diagnostic control systems and overall firm performance. In this regard, the overall objective of the study which was to establish the relationship between diagnostic control systems and overall firm performance in the sugar firms in western Kenya.

Research Design

This study used a cross-sectional survey design to acquire relevant data in order to engage a correlational and analytical approach. This approach facilitated the development of a broad industry-based understanding, rather than a study of individual firms, of the diagnostic control system- overall firm performance relationship.

Study Area

This study focused on the firms in the sugar industry value-chain involved in the production and marketing of sugar and sugar by-products in western Kenya, comprising the administrative provinces of Nyanza, Western and part of Rift Valley.

Target Population

The unit of analysis is the firm. The study population was 45 firms comprised a total of 9 sugar manufacturing firms, 2 molasses processing firms, 10 outgrower companies and 24, jaggeries each of which has a fixed crushing capacity of at least 20 tons of cane per day (TCD). Seven firms were eliminated from the study because, though they were listed as registered by the Kenya Sugar Board, there were no operational activities evident on the ground.

The studies adopted a census, since the units of study are not too many, are concentrated in Western Kenya and, therefore, accessible, and not prohibitive in terms of cost, time and other resources (Saunders *et. al.,* 2007; Sekaran, 2000). Furthermore, a census survey is suited to the research objectives of establishing the hitherto enigmatic diagnostic control system- overall firm performance relationship in an industry perenially beset with challenges has been problematic.

Data Collection

Primary data was collected using a self-administered questionnaire on the firms' diagnostic control systems and overall firm performance. Published reports from the Kenya Sugar Board and the business press were also reviewed to extract secondary data.

Data Collection Procedure

The researcher and research assistants personally made visits to the firms. This procedure was preferred due to the geographical dispersion of the units of study, being scattered throughout western Kenya.

Instrument for Data Collection

The instrument for data collection was the questionnaire.

Methods of Data Analysis

Data analysis involved correlation and regression analysis. Pearson correlation analysis was conducted to determine the direction, strength, and significance of the bivariate relationship between diagnostic control systems and overall firm performance. Regression analysis was used to determine the strength of the relationship (Sharma, Durand & Gur-Arie, 1981).

Model Specification

The regression analysis used to test data is mathematically presented below:

$Y = a + b_1X + e$ (1)… **1**

Where Y is the dependent variable (overall firm performance), X is the theoretically-defined independent variable (diagnostic control systems), b_i is the regression coefficient while *e*, is the error term.

RESULTS AND DISCUSSION

Characteristics of Sugar Firms in Western Kenya

Out of the 135 expected respondents for the 45 surveyed firms, 109 questionnaires were completed, a response rate of 82%.

Diagnostic Control Systems

Table below illustrates the responses to the measures of diagnostic control system. Respondents were asked to consider to what extent the budget system and profit plans were linked to operations and strategic plan, to what extent top managers use the budget systems and profit plans to review performance and to what extent management use feedback processes across management levels in the budget process. The responses were on a 5-point scale and revealed that all the variables measuring diagnostic control system have mean values slightly below the mean point of three. The overall mean of 2.84 suggests diagnostic control system is moderately used in sugar firms in western Kenya.

Table 4.11
Measures of diagnostic control system

	Response scale									
	1	2	3	4	5	Min	Max	Mean	Std Dev	N
The budget system and profit plans tied operations and strategic plan	4.4%	33.3%	40.0%	17.8%	4.5%	1.00	5.00	2.84	0.93	45
Top managers use the budget systems and profit plans to review performance	6.7%	28.9%	40.0%	22.2%	2.2%	1.00	5.00	2.84	0.93	45
There is pervasive feedback processes across management levels in the budget process	6.7%	28.9%	44.4%	13.3%	6.7%	1.00	5.00	2.84	0.96	45
Overall mean						**1.33**	**4.67**	**2.84**	**0.87**	**45**

Scale: 1-**Not at all, 2- To a little extent, 3- To a moderate extent, 4- To a great extent, 5- To a very great extent**

Source: Survey data (2008)

Overall firm performance of Sugar Firms in Western Kenya

In order to measure overall firm performance of the sugar firms, the respondents were asked to rate the performance of their organization's relative performance on a five-point Likert-scale , anchored by "1" Lowest 20% to "5" Top 20%. The results of the responses are in Table 4.14. Most of the respondents perceived their organizations to be performing moderately well as indicated by the overall mean of 2.99.

Table 1
Measures of overall firm performance

	Response scale									
	1	2	3	4	5	Min	Max	Mean	Std Dev	N
After-tax return on total assets	4.4%	35.6%	44.4%	8.9%	6.7%	1.00	5.00	2.78	0.93	45
After-tax return on total sales	0.0%	26.7%	42.2%	24.4%	6.7%	2.00	5.00	3.11	0.89	45
Firm total sales growth over past 5 years	0.0%	28.9%	48.9%	13.3%	8.9%	2.00	5.00	3.02	0.89	45
Overall firm performance and success	6.7%	20.0%	53.3%	11.1%	8.9%	1.00	5.00	2.96	0.98	45
Our competitive position	0.0%	26.7%	46.7%	20.0%	6.6%	2.00	5.00	3.07	0.86	45
Overall mean						**1.60**	**5.00**	**2.99**	**0.81**	**45**

Scale: 1-Lowest 20%, 2-Lower 20%, 3- Middle 20% , 4- Next 20%, 5- Top 20%

Source: Survey data (2008)

Testing of Research Hypothesis

Diagnostic Control Systems and Overall firm Performance

In order to test H_{1A}, the main effect of diagnostic control system was entered in Model 1 shown in Table 2. After entry of diagnostic control system scale at step 2, the total variance explained by the model as a whole was 33.9 %, Adjusted R^2= 0.308, F (2,42) = 10.781, p< 0.001. Diagnostic control explained an additional 9.2 % of the variance in organizational performance, after controlling for firm size, R squared change = 0.092, F change (1,42) = 5.839, p< 0.01. In support of H_{1A}, diagnostic control system was positively and significantly related to overall firm performance (B = 0.335, p < 0.01). The results indicate that 33.9% of the variance in overall firm performance was explained by the model. According to Cohen (1988), this is a large effect.

Table 2
The Effect of Diagnostic Control System on Overall firm Performance

Variables	Model 1			Model 2		
	B	SE_b	β	*B*	SE_b	β
Constant	-0.575	0.953	-	-0.164	0.920	-
Step 1						
Firm size	0.615	0.164	0.497[d]	0.380	0.183	0.307[b]
Step 2						
Main Effect						
Diagnostic control system				0.335 [b]	0.139	0.358
R^2			0.247[d]			0.339[c]
Adjusted R^2			0.230 [d]			0.308 [c]
Change in R^2			0.247 [d]			0.092 [c]
F change (ANOVA)			14.133 [d]			10.781[d]
Df (ANOVA)			(1,43)			(2,42)
F value for model			1.4133 [d]			5.839[c]
Df (Model summary)			(1,43)			(1,42)

The significance levels shown are one-tailed for hypothesis testing and two tailed for control variable testing
[a]p< 0.1; [b] p<0.05; [c]p< 0.01; [d]p< 0.001

Source: Survey data (2008)

Discussion of Findings

The overall objective of this study was to establish the relationship between diagnostic control system and overall firm performance in the sugar firms in western Kenya. Based on extant concepts from the literature on diagnostic control systems and overall firm performance, a conceptual framework was developed and used to investigate these variables.

The hypothesis of the study diagnostic control systems and overall firm performance was supported, the results are significant indicating support for hypothesis. The results indicated large effect sizes for individual diagnostic control systems lever.

Extent of Practice of Diagnostic Control Systems

The study reported an overall mean 2.84 suggesting a somewhat less than moderate use of diagnostic control systems in firms in the sugar industry in western Kenya. This finding of modest use is not consistent with the literature since diagnostic control systems tend to be the most prevalent, being the backbone of traditional management control systems (Iwaarden, *et. al.,* 2006). Diagnostic control systems are used by managers to monitor critical performance variables, both financial and non-financial. Together with incentive schemes, such targets motivate managers and employees. Because of this, they are popular for tracking strategy implementation (Widener, 2007), and therefore, are single-loop learning systems.

The moderate level of use of diagnostic systems could indicate the presence of systemic, behavioral and political barriers that may constrain implementation of diagnostic control systems, Lorange and Murphy (1984).

In contrast to the finding of moderate use of diagnostic control systems in this study, other studies report a greater extent. For example, Mohamed *et. al.,* (2008) report mean of 4.3 on a five-point scale, Widener (2007) reports a mean of 5.21 on a scale of 1 to 7. Case study findings also report prevalence of use of diagnostic control systems (Altinay & Altinay, 2004; Bruining *et. al.,* 2004 and McCartney & Rouse. 2004; Anderson *et al.,* 2006; Peljhan & Tekavcic, 2008). The findings of this depicting moderate prevalence, however, have some support from (Moulang, 2007) who reported moderate use with a mean of 4.3 on a scale of 1 to 7. Bobe and Taylor (2010) reported similar findings in a higher education setting. In an interesting finding, Thoren and Brown (2004) reported that diagnostic systems were initiated early in the firm's history and widened as the business grew but their use reduced when in favour of interactive control systems when business complexities increased with growth.

The finding of moderate prevalence in this study could be attributed to concerns raised regarding the applicability of western strategic control concepts to contexts in emerging economies particularly given the diffirence in cultural, political and socio-economic spheres (Hoskisson *et. al.,* 2001). This study, being focused in Kenya which constitutes a novel context, can be affected by problems of contextualizing concept definitions, particularly with regard to the ontological realm, and this may affect construct measurement (Hopper *e.t al.,* (2004).

Overall firm performance of Sugar Firms in Western Kenya

The study reported an overall mean 2.99 suggesting that most firms in the sugar industry in western Kenya are in the middle 20%, that is, average performers. This finding is viable due to the considerable challenges faced in production and marketing of sugar and sugar related products being experienced in the industry.

Although published comparative studies that focus specifically on overall firm performance of firms in the sugar industry in Kenya are virtually non-existent, extant literature on operational benchmarks or assessment of performance based on rates of change in consumption and sales, provide some insight. But even these studies exhibit mixed results. Odek, *et. al.,* (2003) reported that the operational benchmarks in the sub-sector revealed below competitive levels in terms of optimal factory capacity and milling efficiency. Obange (2008) analysed the performance of the Kenyan local sugar manufacturing firms, based on rates of change in consumption and sales during the period 1996-2005 and found that sugar production fell below local market demand, leading to sugar importations, thus worsening the performance of the local industry due to lack of product uncompetitiveness. Mulwa *et. al.,* (2009) in a case study, examined efficiency level and productivity trend at Mumias sugar factory for the period 1980-2000, with the aim of comparing efficiency performance pre- and post-liberalization. The findings indicate decline in efficiency levels from 1992, with 1998 featuring the lowest levels. However, from 1998 efficiency levels began to increase, the positive impact being atttributed to the firm's successful adjustment to the competitive international production and marketing standards. Wanyande (2001) lamented worsening performance in sugar manufacturing firms despite the involvement of factories in sugar-cane production through nucleaus farms, noting that it was only in 1979 that the national goal of self-sufficiency in sugar production was achieved. He blamed poor management, corruption and vested political interest.

The situation is not any different elswhere in Africa. Masuku and Kirsten (2003), in a study of 124 smallholder cane growers in Swaziland found average performance results, again attributed to lack of efficiency in the

production process. Besides production inefficiencies, external factors have also been blamed, particularly instability in world prices, trade barriers to accessing the United States of America and European Union, wild swings in free market sugar prices (Odek *et. al.,* 2003). The removal of price controls and tariffs, concomittant with market liberalization has additionally been blamed in Kenya for ushering in competition from low cost sugar producers within COMESA (Odek *et. al.,* 2003).

The Relationship between Diagnostic Control Practices and Overall firm Performance of Sugar Firms in Western Kenya.

In support of H_{1C}, diagnostic control system was found, in section 4.6.1.3, to be positively and significantly related to overall firm performance ($B = 0.335$, $p < 0.01$). This finding is likely due to popularity of diagnostic control systems that focus on key performance indicators in tracking progress in implementation of strategy. They are similarly used to conserve managerial attention through management by exception. Such practices engender organizational learning and enhance chances for better performance (Tippins & Soha, 2003).

The finding of this study is consistent with Simons (1995b, 2000) and also Widener (2007) who found that diagnostic control systems can improve overall firm performance, both directly and indirectly through managerial attention and learning. Moreover, case-based research provide some support that concerted use of all levers will lead to improved performance (Peljhan & Tekavcic, 2008; Sheehan, 2006). Furthermore, Thoren and Brown (2004) reported that owner-managers started using diagnostic copntrol system early in a firm's history, and broadened them to enhance performance and at a latter stage extended attention to cover quality aspects like the delivery processes. On the contrary, Moulang (2007) reported that the diagnostic use of performance measurement systems (PMS) is expected to negatively influence feelings associated with psychological empowerment and individual creativity, due to lack of involvement in goal-setting, decision making activity. In such situations, individual would be reluctant to take responsibility for their actions (Amabile, 1998).

The potential of diagnostic control systems to inhibit innovation and opportunity seeking has been highlighted by other scholars (Simons, 1995; Davila, 2000). Whereas the literature depicts diagnostic control as inhibiting creativity and innovation and individual performance, some studies report that in situations where there occurs both diagnostic and interactive use occur in combination, a beneficial dynamic tension arises (English, 2001; Henri, 2006; Lewis, 2000; Moulang, 2007) and this is expected to positively impact feelings associated with psychological empowerment, creativity and, thereby, result in improved performance.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents summary, conclusions and recommendations of the study. The problem of this study was to examine the hitherto tenuous relationship between diagnostic control system and overall firm performance, a situation which has impeded the implementation of strategic plans and organizational performance. Research relating to studying the direct relationship has hitherto yielded low statistical power due inappropriate modeling of the relationship between these constructs. Such previous studies have only focused on correlating contingency or contextual variable with design of strategic control systems with few attempts to relate the interaction effect of strategic control and the contextual variable directly to organizational performance. The result has been theory impoverishment exemplified by lack of consensus over the conceptualization and dimensionality of the key construct of diagnostic control system leading to use of crude measurement instruments with low reliability power to operationalize constructs.

The census study surveyed 45 firms in the sugar industry value-chain comprising 9 sugar manufacturing firms, 2 molasses processing firms, 10 outgrower companies and 24 jaggeries. A structured questionnaire was used to collect data from a total of 109 senior managers comprising 42 chief executive officers, 33 chief financial officers, 25 sales and marketing managers and 9 other managers. The comprehensive analysis undertaken during this study resulted in various findings: some arise from the literature surveyed, some are due to the study methodologies adopted whereas other results emanate from data analysis. The purpose of this chapter is to elucidate the summary, conclusions and recommendations of this study, as well as implications for theory, policy and practice. A discussion on the limitations of the study and suggestions for future research concludes the chapter.

Summary of Findings

In respect of diagnostic control systems, the study found that the extent of practice is at best moderately prevalent in firms in the sugar industry in western Kenya. With regards to diagnostic control systems, it was found that most of the firms in the sugar industry in western Kenya adopt the reactor strategic orientation, followed by defenders; prospectors, with the least prevalent being analyzers. The conclusion from this finding is that firms in the sugar industry do not have discernible or viable long-term strategies (Miles & Snow, 1978). This has been variously attributed; to failure or unwillingness of top managers to articulate a clear strategic direction (Rajagopalan, 1997).

The study further revealed that most of the sugar firms were average performers. This finding suggests the sugar firms are faced with considerable challenges that have constrained efficient production and marketing of sugar and sugar related products. The implies the need to revitalize management systems and strteies to mitigate corruption and vested political interest.

Concerning the relationship between diagnostic control systems and overall firm performance, it was found that diagnostic control systems were positively and significantly related to overall firm performance. The conclusion from this finding is that the Levers of Control (LOC) framework is an important determinant of organizational performance. In addition, it was found that most firms in the sugar industry in western Kenya are average performers.

Diagnostic Control Practices and Organizational Performance of Sugar Firms in Western Kenya.

The study found that diagnostic control systems are positively and significantly related to organizational performance. It can be concluded from this result that diagnostic control system elements of critical performance variables and incentive schemes, continue to be the backbone of control systems for ensuring predictable goal achievement and tracking strategy implementation.

Recommendation

Organizational Performance of Sugar Firms in Western Kenya

The finding that most sugar firms are average performers led to the conclusion that their ineffectiveness may derive from failure to manage in the new deregulated environment. It is recommended that management address the drivers of organizational performance such as investing in strategic control systems and viable strategic orientations. This will include investment in performance management systems to establish competitive benchmarks in all areas of production, operations and marketing.

Diagnostic Control Practices and Overall firm Performance of Sugar Firms in Western Kenya

Based on the conclusion that effective diagnostic control systems are vital for improved organizational performance, it is important for management to design better mechanisms for monitoring critical performance variables, both financial and non-financial. Similar care should be extended in formulating effective performance incentives, to avoid the pitfalls of gaming behaviours by management, for example, building slack into budgets. Further, milestone review techniques need to be designed to improve the tracking strategy implementation. Diagnostic control are meant to manage predictable goal achievement and their effective use free managers to focus on monitoring strategic uncertainties.

Times of rapid changes and increasing competition call for diagnostic systems that seek leadership in operational quality and productivity (Pock, 2007; Daniel & Reitsperger, 1994). Competitive benchmarks can be formulated to monitor efficiencies in the value-chain of cane production, factory performance, technical and management performance, and marketing. In-bound logistics for cane could be improved by changing current tractor mode of transport to bigger tonnage trucks with covered sides for efficient cane haulage. Efficiency could also be enhanced by and the positioning of cane crushers at the farm gate so that only the juice is transported to the factories for final processing (Odek *et. al.,* 2003). It also recommended that management investigate and address possible barriers to implementation of diagnostic controls such as measuring wrong variables or employees engaging in building slack into budgets.

Contributions of the Study

This study makes several important contributions to both theory and practice. It is a particularly a significant response to calls by researchers for studies focusing on emerging economy contexts (Hoskisson *et. al.,* 2000). Specific contributions of the study are elucidated in the following sections.

Contribution of the Study to Theory

The first theoretical contribution of this study is the wide ranging review of extant studies. This has enabled the screening and structuring of the different studies so that both perspectives of strategic control systems in a facilitation role and as an enabler of business strategy are clearly delineated. This exercise has allowed the study to clearly point out the gaps in literature and offer avenues for future research. Given the hitherto fragmented reviews, this study makes a significant contribution in synthesis of strategic control frameworks.

The second theoretical contribution is that the study satisfies a cardinal aim of theory-based quantitative research, that is, to elucidate robust theoretical and conceptual foundations (Bisbe *et. al.,* 2007). In this respect, the study presents a plausible explanation for the hitherto enigmatic relationship between diagnostic control systems and overall firm performance. In the same vein, as a general effort to enhance reliability, this study has utilized multi-item scales. A salutary contribution of the study is the validation of the the Miles and Snow (1978) strategy typology in a Kenyan context. This has been uniquely achieved by adapting and validating the Miles and Snow (1978) typology by operationalizing scale by Conant e*t. al.,* (1990), which was, however, modified to suit the objectives of this study. This modification entailed converting the resulting strategic classifications to an interval-type scale as developed by Shortell and Zajac (1990), who subsumed the Miles and Snow (1978) strategy types into a continuum of low versus high orientation toward change. Hoffman (2007) further refined this approach to provide a measure of the firm's strategic orientation (1 = Reactor, 3 = Defender, 5 = Analyzer, and 7 = Prospector). Hoffman (2007) notable contribution is the inclusion of reactor strategic type, previously ignored by researchers. Furthermore, the present study also validates the Dess and Robinson (1984) organizational performance scale in an emerging economy context.

Another contribution of this study relates to construct development. Prior studies have traditionally modeled strategic control as an accounting- based unidimensional construct and called for a multi-dimensional construct (Fisher, 1995). This study depicts strategic control as a multidimensional construct. As already elucidated, the Conant *et. al.,* (1990) scale is another multidimensional scale operationalizing the strategic orientation construct.

Contribution of the Study to Managerial Practice

The current study came about as a result of the need for managerial reforms to ensure effective contribution of firms in the sugar industry in Kenya towards attainment of sectoral objectives. The challenges facing the sugar industry, emanating from both firm-level and macro-level factors are well documented by SUCAM (2003). These are: weak representative farmers institutions, poor and patronage based management systems at all levels resulting in low levels of professional management of the industry, lack of accountability and transparency, excessive deductions and taxation of farmers' income, delayed payments to farmers, huge industry debts, inefficiency in service provision and payments to farmers, poor accountability systems within state-owned mills, ad-hoc privatization systems, lack of a clear institutional policy framework for the sugar industry, poor marketing and distribution systems, negative effects of imported dumped sugar, lack of political will to enforce effective sugar import monitoring systems, a weak information database on the industry and negative effects of regional trading systems. In order to manage this plethora of ineffective management, this study has documented the prevailing industry practice and suggested diagnostic control system and adoption of viable strategic orientation towards managing strategic change. Such turbulent change may cause fatal damage if not well managed (Daft & Lewin, 1993). Managers need to be aware about the benefits of strategic control systems and the need to align them with strategic orientation for improving organizational performance. The contribution of this study to both managers of the sugar firms and policy managers are next highlighted.

Contribution of the Study to Managers of Sugar Firms in Western Kenya

The finding in this study of moderate prevalence of strategic control has direct implications for managers of the sugar firms in Kenya. It indicates that not enough is being done to have robust strategic control systems to steer the industry through turbulent change. Towards addressing the design of strategic control systems, this study has highlighted that a place to begin such reform is to examine possible barriers to implementing strategic control system, which were identified as emanating from firm-level systemic, behavioral and political interactions. In the evolving competitive environment, newly privatized firms are expected to upgrade their core values and mission statements promptly for greater goal orientation. Management can achieve these through initiating strategy reformulation.

The design and management of interactive control systems gives top management perhaps the greatest opportunity to exert an influence on the search for opportunities through follow-up with organizationwide dialogue regarding threats and opportunities that can put strategy at risk. This approach can activate

organizational learning and emergent strategy to facilitate innovative behavior by employees. The implication is that managers should embrace frequent, for example weekly, meetings that are conditioned on discussion of strategic priorities, concomittant with a participative style of leadership and task-based teams.

The business commentaries in the media are inundated by reports that there will be no further extension of the preferential trade terms extended to Kenya by COMESA. This constitutes a significant strategic uncertainty requiring formulation of an appropriate response. In this regard, the finding of moderate prevalence of the practice of interactive controls is, therefore, a wake-up call to managers to embrace employee participation in decision making through organization wide debates and dialogue to tap information for effective management of the strategic uncertainties.

As part of addressing strategic uncertainties, liaison arrangements with Kenya Sugar Research Foundation (KESREF) need to be actively managed to tap viable alternative technologies in cane production processes and factory operations, (Odek *et al.,* 2003). On the cane production auch research should target new early- maturing seed varieties that are disease resistant and posses high sucrose content. Coupled with adoption of irrigation technology, these iniatives have potential for cost reduction and may replicate the success experienced in Sudan and Mauritius.

External strategic uncertainties can be managed by lobbying the state and stakeholders such as SUPAC, KSB, SUCAM, for favourable policies relating to Government divestiture, better trade policy at regional and international levels, removal of value added tax on locally produced sugar, debt restructuring, full implementation of Sugar Act 2001. For example (Kober, 2010) reported that political intervention can result in a change in a firm's strategic direction

Lack of effective corporate governance structures has also been identified as a problem in the sugar industry, exemplified by lack of public information and accurate data on costs of production and sugar importation administration (Odek *et. al.,* 2003). Such malpractices can be ameliorated by institutional surveillance programs, an aspect of interactive control systems, organized by the sugar firms. For better governance, public-private sector partnerships can be enhanced by, for example, outsourcing the management of the Sugar Development Fund (SDF) to a financial institution.

This study, by identifying the prevalent reactor strategic orientation as not viable, has pointed out the need for managers to engage in the search for viable alternatives. This is necessary in light of environmental turbulence heralded by deregulation of industry. A most potent threat is the expiry of the COMESA safeguard which has hitherto shielded the local firms from regional competition. There is, thus, an urgent need to adopt more responsive and viable strategic orientations to facilitate lower cost of sugar production. This may be achieved through prospector or analyzer strategic types that are responsive to changing environmental conditions to embrace cost-reduction through diversification in both agricultural and production technologies by sugar firms. In this regard the product value-addition strategies being pursued by Mumias sugar through co-generation, sale of power to the national grid and fortification of sugar with vitamins should be encouraged (GTZ, 2008). Other avenues for venturing include: power alcohol, use of biogases and molasses to make feed block; use of bagasse as fuel supplement to provide energy for the factories; use of bagasse to produce newsprint, paper, building hardboard and briquettes and putting filter cake in economic use as an organic fertilizer or soil.

The search for viable strategic types will require that managers develop strategic elements necessary for effective competition including the necessary distinctive competencies, organizational structures, and management processes. These elements are linked to choice of business strategy (Conant *e.t al.,* 1990) and have profound implications for human resource training and development since people are at the heart of strategy (Anzaya, 2007).

Contribution of the Study to Policy Managers

Kenya is widely acclaimed as an emerging economy (Hoskisson *et. al.,* 2000). In this regard, the sugar firms in western Kenya an important sub-sector as it constitutes the largest manufacturing operations in the region. Policy managers have the responsibility to create a conducive environment for the sugar firms to thrive.

The study found that diagnostic control systems are not entrenched in the sugar firms in western Kenya. The study found a positive relationship between strategic control and organizational performance, suggesting that greater use of diagnostic control system would lead to improved organization performance. It is therefore desirable that sugar subsector policy managers initiate an environment that is conducive to deepening strategic

control practices. Whereas the slow pace of privatization has been lamented (OECD, 2010), the situation provides an opportunity for strategic change to be facilitated by policy managers. Greater autonomy for state-owned firms through privatization would grant top management greater latitude to engage employees in organizational-wide debates, by means of interactive control systems, that are concomitant with innovative practices. To cope in the competitive environment, newly privatized firms are expected to promptly upgrade their core values and mission statements promptly for greater goal orientation.

In addition, barriers to implanting diagnostic control system may be ameliorated through sectoral training policies and programmes to enhance managerial absorptive capacity. Existing top management are mostly bureaucrats and political appointees lacking necessary business management skills and may have to be replaced for effective transition (Wanyande, 2001; Ramaswamy, 2001). It is, therefore, important to plan the change since management control systems can be hampered by lack of qualified accounting staff, lack of effective communication systems and nominal use of computers, national culture, all which may constrain organizational capacity to undertake reforms, (Anonymous, 2007; El-Ebaishi *et. al.,* 2003). Well-planned change could be beneficial through the institutional isomorphism perspective which argues that that organizations tend to become more similar over time by adopting identical organizational practices (DiMaggio & Powell,1983). Such practices can be reinforced by competitive bidding for top management recruitment from the private sector. Further, institutional theory posits that, as belief control systems and related behaviours become institutionalized in an industry, expectations and tacit social pressures force individual firms to refocus more on a strategic mindset (DiMaggio & Powell, 1983). This process can be guided by public sector managers to ensure the concentrating of resources on building organizational capability for effective strategic management.

Limitations of the Study

While this research makes significant contributions to the body of knowledge on strategic control, strategic orientation and organizational performance, it is necessary to evaluate the results in the context of the study limitations. It is generally acknowledged that methodological choice has profound effect on diagnostic control systems research (de Harlez & de Ronge, 2009).

First, scholars have expressed concerns regarding survey designs and associated measurement problems (Ittner & Larcker, 2001; Abernethy *et al,* 2007). Surveys and their cross-sectional nature of data as opposed to longitudinal data mean that conclusions must be limited to those of association as opposed to having conclusions that illuminate causal relationships between the variables of interest (Thoren & Brown, 2004). However, given the research objectives and the importance of illuminating the hitherto equivocal relationship between diagnostic control systems and overall firm performance, it was necessary to collect data from individuals within firms.

The second limitation, therefore, relates to the use of self-report measures for the study variables. This study reflects the perceptions of the chief executive and senior managers. Although this is a prevalent practice in contingency-based research, their objectivity has raised concern (Chenhall, 2003; Abernethy & Brownell, 1999). Nonetheless, subjective measures have been advanced as consistent and based on those aspects that are most appropriate to respondents and that are most prone to shape their behaviours and guide their actions (Van der Stede *et. al.,* 2005). In addition, upper echelons, agency, stewardship and institutional theories all assert that organizational control and organizational performance assessments as perceived by the CEO and top management team are the relevant variables (Link & Oldendick, 2000). A related limitation is the futility of checking of non-response bias in situations involving senior executives who are notoriously difficult to access (Moulang, 2007). The use of multiple respondents helped to limit measurement error relating to common method bias with due care taken in the administration of the questionnaire. The questionnaire was self-administered and psychometric properties were tested to ensure reliability and validity. However, it is possible that an organization-wide survey would afford a better insight into the study variables.

The other limitation relates to the measurement of the constructs in this study. Concerns have been raised about the applicability of western strategic control concepts to contexts in emerging economies particularly given the differences in cultural, political and socio-economic spheres (Hoskisson *et. al.,* 2001). This problem particularly besets the ontological realm (Hopper *e.t al.,* 2004). For example, it is claimed that managers in emerging economies are not familiar with the concept of involving lower levels of the organization in decision making, generally lack managerial skills and knowledge of market-based management (Li *et. al.,* 2006). This situation is compounded by dominance of significant state holdings in the sugar industry in Kenya, (Anonymous, 2007). Specifically, a raft of criticisms have been leveled at Simon's Levers of Control (LOC) framework with social constructivists claiming that it overstates both the managerial perspective and managerial objectivity in the

strategic process, and also ignores the role of political maneuverings (Thoren & Brown, 2004). Others assert that Simons' framework is limited in application to different kinds of organizations, such as small and entrepreneurial companies (SMEs), where social and cultural forms of control, and not formal controls, tend to dominate (Collier, 2005; Ferreira & Otley 2005). In SMEs, for example, it has been reported that requirement for implementation of strategic control increase in proportion to firm size (Churchil & Lewis, 1983). Additionally, it has been claimed that LOC tends to ignore the mundane control tools such as internal control (Anderson *et. al.,* (2006), a paradox, in view of contemporary stringent global reporting requirements occasioned by increased corporate fraud and perceived failure of agency relationships, a situation that resulted in the promulgation of Sarbanes Oxley Act (SOX) of 2002. Although all these present opportunities for research on context-specific variables, the results of this study should be assesed with these limitations in mind.

A final limitation encountered during the field survey was that respondents did not complete the open-ended sections of the questionnaire. The verbal reasons advanced were that they found the closed-ended questions adequate. The researcher deems this issue as not adversely affecting the results of the study.

Suggestions for Further Research

Directions for future research are consequent to the study findings on strategic control practices, strategic orientation and organizational performance in sugar firms in western Kenya. There are also implication for further research emanating from missed opportunities in using the selected rather than alternative research methodologies and techniques.

The interesting study findings depicting insignificant effects of strategic orientation on the relationship between diagnostic control systems and overall firm performance is an avenue for further research in the sugar firms in western Kenya. It has potent implications for strategic control theory.

The study identified possible existence of barriers to implementing diagnostic control systems in the sugar firms in western Kenya. Future researches could explore the specific systemic, cultural and political barriers. Another intriguing finding of the study was the dominance of reactor strategic orientation, in contradiction with the wider literature. Future studies could establish if this applies to other industrial contexts in the country. There is need for testing of the interrelationships among strategic orientation, strategic control systems and organizational performance in other industrial contexts of sugar firms in western Kenya.

This study employed as survey design. Future studies could adopt more fine-grained methodologies such as field research and case studies using qualitative designs or even combine case-study with survey methods. Such diversity in studies may provide deeper insights into the strategic control-strategic orientation-organizational performance interrelationships. Furthermore, the adoption of a longitudinal design could be useful to explain how strategy and control are affected over time by political, cultural and general economic conditions, and this could shed light better on the cause-and-effect relationships between strategic control and strategic orientations. Such a robust approach, could best 'tease out' the two-way relationship between strategic control systems and strategy (Kober *e.t al.,* 2007; Bruining *et. al.,* 2004; Berry *et al.,* 2009).

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