Knowledge management and competitive advantage: The interaction effect of market orientation

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This paper examines the relationship between knowledge management and competitive advantage, in a developing country, Uganda; with a particular focus on the interacting influence of market orientation. A sample size of 718 organizations was selected from a population of 11,153 organizations using a simple random sampling method. Primary data were collected through a self-administered questionnaire. Descriptive and inferential statistics were used in the analysis. The findings show that there is a positive correlation between knowledge management and competitive advantage; which relationship is greatly enhanced by the interaction impact of market orientation. When market-based knowledge is appropriately responded to, it augments the competitiveness of the organization. In addition, this is an indication that competitive advantage is best achieved through a combination of knowledge-based resources. Based on the results, a number of managerial implications were identified such as: creating a balance between knowledge management and market orientation. Among the advanced recommendations is the need for the development of proactive market-oriented organization.

Key words: Knowledge management, competitive advantage, market orientation.

INTRODUCTION

The ability of an organization to harness knowledge management and continuous learning from the external environment is now believed to be a major source for achieving a sustainable competitive advantage (Waddell and Stewart, 2008; Werr et al., 2009; Zack et al., 2009). As products and services become more similar, it is the intangible nature of knowledge, its rareness, valuable and non-imitable characteristics that can create a differential satisfaction in the market place (Barney, 2007, 1991; Sharkie, 2003). This shift from less emphasis on tangible assets to more emphasis on intangible assets contributes to the foundation of the knowledge revolution (Ambos and Schlegelmilch, 2009). Hussi (2004) refers to this knowledge revolution as a source of “new” organizational wealth responding to the growing dominance of knowledgeable consumers in the market place. Cantner et al. (2009) argue that the performance of knowledge organizations in the market is expected to be more superior to that of the traditional organizations. An organization must develop the appropriate capabilities in order to tap market-based knowledge that resides in customers, competitors, channel members and suppliers in order to obtain the full benefits of knowledge management (Werr et al., 2009). In this respect, an organization has to continuously adapt to the market environment which requires a market orientation approach. Market orientation is explained in the context of implementing the marketing concept that focuses on satisfying customer needs better than competitors (Racel et al., 2007; Mason and Harris, 2006; Zhou, et al., 2009). This means that there is need to examine the interacting influence of market orientation in the relationship between knowledge management and competitive advantage which seem to be empirically under-researched in the literature. For example in their review of the research paradigms of contemporary knowledge management

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studies (1998-2007), Ma and Yu (2010 p.182) assert that “current research in knowledge management is concentrating on the interactions of the essentials of knowledge management, organizational learning, strategy of knowledge management and knowledge-based theory on organizational and innovation”; with no reference to the interaction of market orientation, yet it explores the indirect impact of knowledge management on competitive advantage through market orientation. The purpose of this study is to examine the interacting influence of market orientation in the relationship between knowledge management and competitive advantage.

Market orientation is much more than just being orientated towards your customers and competitors, it is also about possessing knowledge about them and effectively managing that knowledge. The marketing function expects knowledge management to create sustainable superior customer value by leveraging intangible assets (Sveiby, 1997), fostering the acquisition and dissemination of tacit and explicit knowledge (Nonaka and Takeuchi, 1995; Polyani, 1958).

Tacit knowledge is said to reside in the human mind, behavior and perceptions and cannot be easily expressed. It is developed through experience and only understood through participation and observation (Wei et al., 2009; Duffy, 2000; Nonaka, 1991). Nonaka and Takeuchi (1995) aver that tacit knowledge is hidden and therefore evolves through interactions of skills and practice. On the other hand explicit knowledge is said to be easily codified. It is articulated and stored in different forms (Nonaka, 1991). Literature review has it that these two types of knowledge complement each other (Sharma and Goswami, 2009). Knowledge is moved from the level of an individual to that of the group and ultimately to the organizational level when there is conversion between tacit and explicit knowledge (McAdam et al., 2007).

This conversion is at the core of the relationship between knowledge management and competitive advantage as being the continuous synergistic relationship and interaction of tacit and explicit knowledge. Nonaka (1994) contends that organizations and societies are the best forum for activating what he calls the “spiral of knowledge” creation. While some scholars argue that tacit knowledge cannot be transferred, it has been noted that socialization is about sharing with others the experiences, technical skills, mental models and other forms of tacit knowledge (Rhodes et al., 2008). Papows (1998) claims that storing of employees’ knowledge and making information accessible to other employees within the organization is a conversion of tacit knowledge into explicit knowledge. In the same way Nonaka et al. (2000) assert that new knowledge from the customers’ usage of the product may be inherently tacit, therefore it must be shared with the firms’ representatives through intense collaboration with customers and it must be made explicit and justified. In this way, insights are created through the synthesizing of different reactions from the marketplace (Nonaka et al., 2000). As customers respond to the options that are available they generate knowledge that suppliers respond to by adopting their offers.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Knowledge management and competitive advantage

Competitive advantage is increasingly considered to be one of the key drivers of long-term success of an organization in today’s competitive markets. As a result the influence of competitive advantage on performance has attracted a number of empirical studies providing evidence of a positive effect. Therefore, given the importance of competitive advantage in relation to the competitive position of the firm, a number of studies have tried to identify the main determinants and consequences of a firm’s competitive advantage. The resource-based view of the firm (RBV) provides a framework to help in understanding the potential sources of competitive advantage. In the parlance of the RBV, resources internal to the firm are sources of competitive advantage to the extent that they are valuable, rare, inimitable and difficult to substitute (Barney, 2007; 1991). In this case, competitive advantage is interpreted as deriving from the development and deployment of resources that create value for customers. Various researchers indicate that intangible assets such as knowledge management, organizational learning and market orientation allow an organization to develop those abilities that enhance competitive advantage leading to superior market performance (Day, 1984; Porter, 1985). These intangibles enable an organization to continuously develop existing resources and new resources are needed to be created (Enz, 2008) leading to superior performance as the main outcome.

Furthermore, in this era of ‘knowledge revolution’ (shifting from the traditional industrial society to a knowledge society), knowledge has become increasingly associated with superior competitiveness because of its invisibility and inimitability making it a valuable asset. In this respect, knowledge-oriented organizations continuously look for new knowledge which must be effectively managed and utilized in order to deliver better customer value than their competitors. This means that when an organization develops knowledge management into a distinctive competence, it is expected to work as an antecedent to superior competitive advantage in the marketplace. It is this competence that will unlock personalized knowledge and be able to codify it for organizational utilization. This is in line with Hlupic et al. (2002, p. 94) who contend that “knowledge management is seen as the vehicle for organizational effectiveness and competitiveness.” Grandy and Wicks (2008) infer that
competitive advantage originates from the development and deployment of resources that create customer value. Based on the above discussion the following hypothesis is proposed:

\[ H_1: \text{Knowledge management is positively related to competitive advantage.} \]

**Knowledge management constructs and competitive advantage**

According to Darroch (2003, p.41) "knowledge acquisition relates to the location, creation or discovery of knowledge". There are many sources of knowledge both internal and external for an organization to tap from (Werr et al., 2009). Employees’ individual capabilities, skills and experiences need to be discovered and exploited. Analyzing and understanding of various internal data and information are vital sources of knowledge that can be exploited. In the same way customers and channel members have knowledge that needs to be acquired by the organization for decision-making. Knowledge can also be acquired from other members in the external environment like competitors and the public (Petruzzelli et al., 2009). This information is required if an organization has to develop a sustainable competitive advantage leading to superior market performance. Hence there is a relationship between knowledge acquisition and competitive advantage. The knowledge acquired becomes useful when it is disseminated among employees and decision-makers in the organization. Knowledge dissemination is critical to the success of any organization as it enables members of the organization to share knowledge (Al-Alawi et al., 2007). Rosa and Spanjol (2005) observed that consumers and producers share knowledge through interactions and conversations around product offerings. Dissemination of knowledge enables the existing knowledge to be accessible and exploited in order to apply it to solve specific tasks cheaply, faster, much better and finally perform better than rivals in the market place. Nonaka and Takeuchi (1995) offer a spiral of four modes: socialization, externalization, combination and internalization (SECI model) to explain knowledge dissemination in an organization. A focus on disseminating knowledge in an organization is expected to enhance the organization’s competitive advantage and improve market performance. We contend that there is a relationship between knowledge dissemination and competitive advantage. Once knowledge is disseminated it is expected that the organization will respond by utilizing that knowledge.

Responsiveness to knowledge means that the organization must be seen to be utilizing the knowledge acquired and disseminated by deriving decisions and actions that create superior performance internally and in the marketplace. Internally the organization can make improvements in areas such as improving employees’ skills, improving core business processes, decreasing operation costs, decreasing product cycle time, increasing productivity and externally increasing sales volume, market share, develop customer relationships and develop supplier relationships (Chen and Chen, 2006). Therefore the more responsive to knowledge an organization is the more likely it is to achieve sustainable competitive advantage. With few studies linking each of the constructs of knowledge management to competitive advantage, the relevant hypotheses are:

\[ H_2: \text{There is a positive relationship between each construct of knowledge management and competitive advantage.} \]

\[ H_{2a}: \text{Knowledge acquisition is positively related to competitive advantage.} \]

\[ H_{2b}: \text{Knowledge dissemination is positively related to competitive advantage.} \]

\[ H_{2c}: \text{There is a positive relationship between responsiveness to knowledge and competitive advantage.} \]

**Market orientation and its interaction role**

Literature review shows that market orientation has been conceptualized from five different perspectives developed by Shapiro (1988); Kohli and Jaworski (1990); Narver and Slater (1990); Ruekert (1992) and Deshpande et al. (1993). Recently the capability perspective has been proposed by Foley and Fahy (2009; 2004). These perspectives focus on market orientation as a source for both market-based knowledge and competitive advantage as it enables an organization to develop capabilities to perform at higher levels than its competitors (Kohli and Jaworski 1990; Kolar, 2006; Narver and Slater, 1990; Lafferty and Hult 2001; Ramaseshan et al., 2002; Tay and Morgan, 2002). However, the most distinguished perspectives in marketing literature are those of Narver and Slater, (1990) and Kohli and Jaworski (1990). The culturally - based perspective by Narver and Slater (1990) defined market orientation as the organizational culture that most effectively and efficiently creates the necessary behaviour for the creation of superior value for buyers and thus, continuous superior performance for the business. According to them, market orientation consists of the three components of customer orientation, competitor orientation and inter-functional coordination. From this perspective, there must be a sufficient understanding of market elements: customers, competitors, channel members and suppliers to be able to create continuous superior value. This means that for a seller to have a competitive edge, the seller must understand the current and anticipate the future market-value chain as dictated by the market dynamics. Kohli and Jaworski (1990) developed the intelligence perspective of market orientation.
orientation with a mixture of three activities: organization of market intelligence pertaining to current and future needs of the customer, dissemination of intelligence within the organization and also responsiveness to market intelligence. Rodriguez-Cano et al. (2004) contend that these two perspectives focus on interacting with customers; understanding customers better than competitors; the ability to manage and share this knowledge internally; and the will to respond appropriately. In developing the cultural and behavioural perspectives of market orientation, the firm enriches its knowledge management in manner that is more competitive. From the discussion we hypothesize as follows:

H₃: There is a positive interaction effect of market orientation in the relationship between knowledge management and competitive advantage.

METHODOLOGY

Research setting and procedure

A cross-sectional survey design was carried out so as to generate data to test the research hypotheses. A questionnaire was developed on the three study constructs of knowledge management, competitive advantage and market orientation using measurement scales derived from previous empirical studies which were modified to suit the study location. This is in harmony with Bigne et al. (2003) and Vazquez et al. (2002) who support adapting previous scales considering their wide item scales reliability and validity (Osuagwu, 2006). Consistent with Hurmerinta-Peltomaki and Nummela (1998), the questionnaire was screened by 10 experts/professionals and the pool of items for each construct edited through a pilot test. The content of this questionnaire was validated by four practitioners and two professionals from each of the Departments of Marketing and International Business and Management Science at Makerere University Business School. A series of personal interviews were undertaken with the identified experts/professionals to whom the purpose and objective of the study were explained and basing on their expert comments, some items were removed due to lack of conceptual relevance. After this step, a second version of the questionnaire was presented to the experts/professionals who were requested to rate the relevance of each measurement item. All item scales were anchored on a four point scale ranging from 4 = ‘very relevant’, 3 = ‘relevant’, 2 = ‘somehow relevant’ and 1 = ‘not relevant’. Taking into consideration the comments of the experts/professionals the instrument was further refined and a pilot study conducted to evaluate the reliability and validity of the measurement scales (Polit et al., 2001; Prescott and Soken, 1989; Teijlingen et al., 2001).

A pilot study was carried out on a sample of 60 firms which were selected from the sample frame using a simple random sample method. The questionnaires were distributed in person with a covering letter by the researcher and three research assistants; respondents were encouraged to comment on the item scales. The three research assistants were recruited and trained to participate in the pilot test. The selection of research assistants was based on their previous experience in data collection. The research assistants were frequently checked on in the field, until all entries in the questionnaire were filled. All data collection challenges were discussed with the research assistants on a daily basis. This greatly improved the response rate of the pilot study to 71.7%. 43 questionnaires were returned and based on comments from respondents and the guidance of the item-to-total correlation, item loadings of less than 0.5 coefficient were removed from the survey instrument (Appiah-Adu, 1998a; Douglas and Nijssen, 2003; Raju and Lonial, 2002). The factor analysis results revealed that all the dimensions of knowledge management, competitive advantage and market orientation were reproduced explaining 50% and over of the variance in the study constructs and a content validity index of 0.7 and over was obtained from the pilot study. This position was considered adequate for the main study.

Data of the main study were collected through self-administered questionnaires which were delivered to respondents by the researcher or by the research assistants. The participating firms were approached and requested to participate in the study. One respondent at senior level or middle level management from each of the participating organizations was contacted in person to fill in the questionnaire. We chose to use both senior and middle managers as respondents in this study because they are seen as having a wide breadth of knowledge of all the organization’s functions, activities and operating environment (Frost et al., 2002; Hillman and Keim, 2001). This is consistent with Westphal and Frederickson (2001); Chattopadhyay et al. (1999), and Spanos and Lioukas (2001) who also agree that top management has a significant impact on strategic direction and change.

Sampling and sample characteristics

The sampling frame for the study was based on the Uganda Bureau of Statistics report on the Uganda Business Register 2006/07. With a population of 11,153 organizations combining both manufacturing (1,374) firms of various categories and service (9,779) firms also of various categories, a sample size of 718 firms (manufacturing sector 324 firms and service sector 394 firms) were found appropriate and selected using a simple random sampling method. Prior to the selection of respondent firms, a table of random numbers was generated using the EPITABLE – random number listing. Of the 494 returned questionnaires, 483 were usable questionnaires (67.2%) and were analyzed for the study. 11 questionnaires were unusable (8 were inconsistently answered and 3 were incomplete).

Measurement, validity and reliability

The questionnaire comprised two sections. The first section captured data on the company profile of respondents. This was followed by knowledge management as a function of knowledge acquisition, knowledge dissemination and knowledge responsiveness while competitive advantage covered physical resources, human resources, financial resources and organizational resources/capabilities. Market orientation covered customer orientation, competitor orientation and inter-functional coordination. Measurements scales were based on previous empirical studies. In line with these previous measurements a five-point Likert Scale was adopted for all item scales. All item scales were anchored on a five point scale with 5 = ‘strongly agree’, 4 = ‘agree’, 3 = neither agree nor disagree, 2 = ‘disagree’ and 1 = ‘strongly disagree’. The scale reliability values (Cronbach’s alpha) for all components were greater than 0.7 which is the minimum acceptable level suggested by Neuman (2006) and Nunally (1978; 1967). Knowledge management item scales were derived from the works of Darroch (2003) and Lea and Tsai (2005) yielding an overall Cronbach’s alpha coefficient of 0.894. Competitive advantage measurement scales were based on Barney (2007) and Enz (2008); and market orientation scales were adapted from the empirical research works of Narver and Slater (1990; 2004). Their overall Cronbach’s alpha coefficients were 0.919 and 0.9579 respectively.
RESULTS

The total number of firm respondents involved in this study was 483 of which 45.8% were from the manufacturing sector and 54.2% were from the service sector. As for the annual turnover, 6.2% of the firms had an average annual turnover below Uganda shillings (Ushs) 100 m while 45.7% had an average turnover of Ushs 101 to 1.0 billion. 48.1% of the remaining firms had an average annual turnover of over Ushs 1.0 billion. The numbers of employees for responding firms were as follows: between 1-25, 26-50, 51-75, 76-100, and over 100 employees had 45.5, 28.6, 12.6, 5.2 and 8.1% respectively. Organizational tenure indicated that 46.8% of the firms had operated in Uganda for more than 12 years, 9-12 years were 30.8%, 5-8 years were 15.9%, 1-4 years were 5.6% and firms with less than 1 year tenure were 0.8%. The positions held by firm respondents were as follows: supervisors 8.1%, section heads 18.8%, departmental managers 44.7%, deputy managing directors 14.5% and managing directors 13.9%; and their levels of education were: certificate holders 7.5%, diploma holders 19.9%, degree holders 35.0%, professionals 20.1%, master’s degree holders 16.6%, PhD holders 1.0%. These firms are located in and around Kampala, the capital city of Uganda. The results indicate that they combine large, small and medium enterprises and are all in the private sector which is the country’s “engine of economic growth” (Vision, 2005).

The results of the zero-order correlation (Table 1) indicate a positive significant relationship between knowledge management and competitive advantage ($r = .165, p < .01$) which supports hypothesis H1 and in line with scholars such as Castro et al. (2005); Hilupic, et al. (2002); Lee and Tsai (2005); Subramanian et al. (2009). This suggests that efforts being placed on knowledge management by firms positively influence competitive advantage. It also implies that effective knowledge management enables an organization to improve on the organizational behaviours since more knowledge is created and there is better understanding of market trends that takes place leading to superior competitive advantage.

Furthermore, there are positive and significant relationships between the constructs of knowledge management and competitive advantage, supporting H2. That is for knowledge acquisition $r = .270, p<.01$, knowledge dissemination $r = .004, p<.01$ and responsiveness to knowledge $r = .304, p<.01$; $H_{2a}$, $H_{2b}$ and $H_{2c}$ are supported. These results seem to suggest that although knowledge acquisition and dissemination have an impact on competitive advantage; responsiveness to knowledge plays a crucial outcome role on the magnitude of influence. The responsiveness to knowledge is dependent upon the wisdom of management acquiring the appropriate knowledge, disseminate the knowledge, and make decisions that add value to their offerings. This means that achieving competitive advantage will exist in an environment where knowledge management is encouraged with emphasis on responding to market information. The low impact of knowledge dissemination may be attributed to firms that tend to confine information to a few members of the organization who then make decisions to be implemented with little involvement of other members.

In order to test with more rigor for the interactive effects of market orientation over and above the main effects of the independent variable, four multiple hierarchical regressions were conducted (Cohen and Cohen, 1983) to confirm $H_3$. The resultant models are shown in Table 2. The independent variable was standardized prior to forming the interaction variable to prevent the interaction variable from causing unacceptable levels of multicollinearity (Aiken and West, 1991; Irwin and McClellan, 2001). In Step 1, control variables of type of industry, number of employees, and organizational tenure were entered followed by the independent variable in Step 2. Market orientation was entered in Step 3. The interactive effects of knowledge management with market orientation ($KMxMO$) were entered in Step 4. The results with the standardized beta coefficients are presented in Table 2. The table shows the $R^2$ at each step of the regression as well as the significance of the beta weights for the predictor variable in the final step.

The results of the regression: Model 1 reveal that number of employees and organizational tenure accounted for 3.2% of variance in competitive advantage ($R^2 = .032, \Delta R^2 = .032, p < 0.01$). Model 2: illustrates that knowledge management accounted for 4.8% of the variance in competitive advantage ($R^2 = .048, \Delta R^2 = .016 p < 0.01$) providing further support for $H_1$. More empirical findings have emphasized that knowledge management is a critical competence and a key element for gaining a sustainable competitive advantage (DeNisi et al., 2003; Lei et al., 1996).

Model 3: indicates that market orientation accounted for 5.4% of the variance in competitive advantage ($R^2 = .054, \Delta R^2 = .006 p < 0.01$). It is knowledge that is very much needed by an organization in its efforts to offer value to customers. In addition, the positive relationship sets the base for an organization to gain valuable skills and competences from the marketplace as experience builds-up (Koh et al., 2005). Model 4 shows the interactive effect of knowledge management with market orientation ($KMxMO$) which accounted for 64.7% of the variance in competitive advantage ($R^2 = .647, \Delta R^2 = .593 p < 0.01$) supporting $H_3$. These results indicate that when the interaction between knowledge management and market orientation is introduced in the regression model, their interacting influence increases the predictive power by 59.3%. These results corroborate the positive and significant interactive influence of market orientation providing further support for $H_3$ which is also depicted in Figure 1. This study suggests that firms trying to gain
Table 1. Correlation analysis of knowledge management, knowledge acquisition, knowledge dissemination, responsiveness to knowledge and competitive advantage.

<table>
<thead>
<tr>
<th></th>
<th>Means</th>
<th>St. dev</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge management (1)</td>
<td>3.64</td>
<td>.569</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge acquisition (2)</td>
<td>3.51</td>
<td>.478</td>
<td>.595*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge dissemination (3)</td>
<td>2.14</td>
<td>.397</td>
<td>.661*</td>
<td>.295*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsiveness to knowledge (4)</td>
<td>3.73</td>
<td>.557</td>
<td>.541*</td>
<td>.152*</td>
<td>.215*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive advantage (5)</td>
<td>2.39</td>
<td>.549</td>
<td>.165*</td>
<td>.270*</td>
<td>.004</td>
<td>.304*</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed): N=483. Source: Primary data.**

Table 2. Hierarchical regression analysis with competitive advantage as the dependent variable.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Collinearity statistics</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>4.291**</td>
<td>3.587**</td>
<td>3.038**</td>
<td>2.601**</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>Type of industry</td>
<td>-.040</td>
<td>-.047</td>
<td>-.046</td>
<td>-.0289</td>
<td>.971 1.030</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>-.155*</td>
<td>-.128*</td>
<td>-.119*</td>
<td>-.002</td>
<td>.877 1.141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational tenure</td>
<td>.119*</td>
<td>.098**</td>
<td>.104**</td>
<td>-.019</td>
<td>.875 1.142</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge management</td>
<td>.130**</td>
<td>.107**</td>
<td>-.364**</td>
<td>.658 1.523</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Market orientation</td>
<td>.182**</td>
<td>-.066**</td>
<td>.836 1.159</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMxMO</td>
<td>.966**</td>
<td>.636 1.573</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>.179</td>
<td>.220</td>
<td>.233</td>
<td>.804</td>
<td>na</td>
<td>na</td>
<td></td>
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<tr>
<td>R²</td>
<td>.032</td>
<td>.048</td>
<td>.054</td>
<td>.647</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.026</td>
<td>.040</td>
<td>.044</td>
<td>.642</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>F – statistics</td>
<td>5.297</td>
<td>6.050</td>
<td>5.465</td>
<td>145.34</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>R Square Change</td>
<td>.032</td>
<td>.016</td>
<td>.006</td>
<td>.593</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>F change-statistics</td>
<td>5.297</td>
<td>8.077</td>
<td>3.020</td>
<td>799.01</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>Sig</td>
<td>.001</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>Sig F Change</td>
<td>.001</td>
<td>.005</td>
<td>.003</td>
<td>.000</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
</tbody>
</table>

Note: n = 438 Standardized regression coefficients are reported. Regression is significant at the **0.01 and *0.05 levels.

To gain sustainable competitive advantage have to continuously be involved in market orientation activities and make appropriate and timely responses. The basic assumption here is that organizations that are market-driven are also likely to develop the capability to understand market changes and offer better products at the right time than their competitors. In addition, the results affirm that competitive advantage is not a single resource outcome but a multiple combination of resources (Enz, 2008).

Additional Analysis on the interactive effect of market orientation

In order to avoid spurious results concerning interaction effects of market orientation arising from the nature of data transformation technique used and underlying quadratic effects not captured in Model 4, interaction graphs were used. This helped to shed further light on the specific nature of interaction effects. Specifically, we conducted the graphical and statistical analysis recommended by Aiken and West (1991). First, we calculated the median scores for knowledge management and market orientation. We then split the entire sample into groups of respondents who were either above or below the median values of the two variables and compared the mean for competitive advantages of these groups. Finally we plotted these means and tested whether they were statistically different. Figure 1 shows the interaction graph between knowledge management and moderating variable. This is the extent to which market orientation interacts with knowledge management and competitive advantage. The legends for these constructs are as follows; 1= firms which score low while 2= firms that score high on knowledge management and market orientation.

Figure 1 shows the extent to which market orientation interacts positively with knowledge management and competitive advantage. This shows that market orientation...
orientation improves the competitive advantage of those firms that practice knowledge management.

**DISCUSSION**

Two major research issues were the focus of this study; first, the relationship between knowledge management, its constructs and competitive advantage (H\textsubscript{1}, H\textsubscript{2}). Secondly, the interacting effect of market orientation in the relationship between knowledge management and competitive advantage (H\textsubscript{3}).

H\textsubscript{1} proposed that there is a positive relationship between knowledge management and competitive advantage and the results indicated a positively significant relationship. The findings are supported by earlier studies of scholars such as Castro et al. (2005); Hlupic et al. (2002); Lee and Tsai (2005); Subramanian et al. (2009). The results demonstrate that firms achieve superior competitive advantage when they apply knowledge management. The current major topic regarding a shift from the industrial revolution to the knowledge revolution in dynamic competitive environments is also justified by the findings. This is an indication that it is no longer sufficient to have only the traditional mix of tangible assets to cause a competitive advantage without intangible assets of which knowledge is a major contributing source to wealth in modern economies. In this regard, it has been long noted that there is an increasing number of prominence of knowledge organizations in post-industrial economies (OECD, 2000, 1996) where knowledge is playing a key role in the competitiveness of organizations (Drucker, 1993). With this development in mind, organizations need to continuously learn appropriate capabilities that can derive competitive advantage from knowledge. The higher the capabilities the higher the level at which this knowledge is turned into higher levels of customer value.

In addition, positive relationships were proposed between the following: knowledge acquisition and competitive advantage (H\textsubscript{2a}); knowledge dissemination and competitive advantage (H\textsubscript{2b}); responsiveness to knowledge and competitive advantage (H\textsubscript{2c}). The empirical results indicate that each one of the constructs of knowledge management positively and significantly correlates with competitive advantage. This is a sign that an effective management of these three constructs of knowledge management can lead to superior competitive advantage. A firm that gathers knowledge; disseminates the knowledge acquired and responds appropriately to that knowledge is expected to build a competitive advantage. The conversion of knowledge acquired into competitive advantage is essentially a function of how best knowledge is disseminated in the organization and the corresponding responsiveness to that knowledge (Pemberton and Stonehouse, 2000).

H\textsubscript{3} proposed a positive interaction of market orientation between the relationship of knowledge management and competitive advantage. The results showed that the interaction is positive meaning that a combination of knowledge management and market orientation is critical for enhancing the achievement of competitive advantage (O’Regan and Ghobadian, 2004; Teece et al., 1997). Knowledge management interacts positively with market orientation through the conversion of market information into knowledge that creates competitive advantage. This interaction offers further evidence that competitive advantage is not entirely an outcome of a firm’s internal

![Figure 1. Interaction graph between knowledge management and market orientation.](image)
Managerial implications

The study findings have established valuable lessons to practitioners and academicians in the respect of combining knowledge management and market orientation in achieving competitive advantage. Therefore, success of knowledge management in achieving a competitive advantage is highly enhanced by market orientation and requires that management looks for a balance between these two intangible resources. Market orientation is expected to be developed when management emphasizes its importance for the benefit of the organization. Management is expected to make continuous follow up of market changes, disseminate market information to others in the organization, be pro-active to market needs and encourage taking risks; create awareness and make small adjustments. Management has also to facilitate dissemination/sharing of information by removing most of the possible hindrances. It is important for management to encourage the development of proactive market orientation in order to stand a chance of keeping up-to-date with current and future customer needs which have a strong relationship with the development of sustainable competitive advantage.

Conclusion

Firms will achieve higher levels of competitive advantage when they practice a combination of knowledge management, which implies acquisition, dissemination and responsiveness to knowledge and market orientation that has the customer and competitor as the center of attention. This intrinsic linkage in developing a competitive advantage requires appropriate capabilities and a fair balance of these two resources. The quality and type of market information acquired and disseminated in the organization determine the level of knowledge management and the ability to build a competitive advantage. The results further depict the direct and indirect influential path on competitive advantage by knowledge management.

Limitations and areas for further research

Like any other research study this study has some limitations to consider. A cross-sectional design was used with only subjective performance measures. An improvement can be done by using longitudinal studies with objective performance measures. Also, most of the measures were based on studies done in developed countries which are totally different environments. Future research ought to examine the need to develop capabilities in knowledge management and market orientation, as according to Walker et al. (2002), capabilities and resources must interact positively with the requirements of the firm’s markets.

REFERENCES
