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The Mediating Role of Strategic Management Practices

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Agribusiness Firm Resources and Performance: The Mediating Role of Strategic Management Practices

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Abstract

This study investigates the relationship between firm resources, strategic management practices and firm performance of small agribusiness firms. Looking at level of managerial expertise and access to market information as primary resources, this research presents various arguments about their contribution to firm performance. The objective is to demonstrate the role of strategic management practices in facilitating the effective use of these resources to achieve agribusiness firm performance. Results from a structural equation model using a sample of 229 agribusiness firms from Tanzania indicate that the investigated resources alone do not directly contribute to firm performance unless there is application of strategic management as a potential mediator. Further investigation based on multigroup analysis shows contingency effects in the resources-performance relationship but significant influence of application of strategic management practices on performance across all groups of firms. The results imply that managers ought to identify a fit between their resources and strategic actions in order to enhance firm performance. The study provides manifold managerial implications for small firms that seek to improve firm performance.

Keywords: Structural modelling, firm resources, strategic management practices, small firm performance, mediation analysis, Tanzania

JEL classification: Q13, Q18, M31, J24.

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1 Introduction

The relationships between firm resources, corporate and competitive strategies and firm performance are at the focus of strategic management (for instance, Grant, 2013) as well as agribusiness management research (e.g., Theuvsen et al., 2010). Many researchers have also looked at firm resources, strategic management (STM) practices and performance in small agribusiness firms. First, it is because of small firms' challenges in utilizing resources to improve firm performance (Bloom & Van Reenen, 2007; Edelman et al., 2005), for instance due to a lack of sufficient management capabilities (Beaver, 2007; Hatten, 2012). Furthermore, small firms' potential for growth strongly depends on improvement of their strategic behavior (Bakker, 2011).

Performance of small agribusiness firms has also been the focus of developing economies such as Tanzania (Dinh et al., 2013; HODECT, 2010). Development programs in developing countries often make efforts to commercialize the food sector; hence new pathways to enhance firm performance are needed, especially with regard to small and medium-sized firms (Byerlee et al., 2013). But, current practices are often insufficient, especially in African agribusiness firms, in embracing essential management tools (Dinh et al., 2013; IFAMR, 2014) such as strategic management practices as indicated in Beaver (2007)'s study. The truth is that we know very little about STM practices of small agribusiness firms. Due to this lack of knowledge, practices such as setting performance goals and analyzing a firm's environment are wrongly considered to be irrelevant for these firms. Instead, the STM process is thought to be exclusively applicable to large corporate firms. In this regard, lack of strategic practices causes difficulties for small firm managers to market their products (Admassie & Matambalya, 2002; Kinda & Loening, 2010). In Tanzania, for instance, the essence of improved firm competitiveness is not seen even though managerial training for managers of small firms is conducted to improve strategic firm operations. This is evidenced by weak entrepreneurial and workers' skills as well as increasingly unprofitable transactions among agribusinesses in Tanzania (Dinh et al., 2013; Fafchamps & Quinn, 2012). The insufficient focus on STM practices is also evidenced in other African countries by, for instance, production of low quality of food products, selling of products without processing, poor application of value adding activities, lack of good quality packaging materials compared to imported share, and inadequate capacity to secure loans from financial institutions as a result of poor business planning and record keeping (IFAMR, 2014).

In this context the role and importance of resources have been researched extensively (Barney, 1991; Mugera, 2012; Penrose, 1959). Managerial expertise and capabilities are key resources to organizations as long as they are strategically positioned to enhance performance (Ambrosini & Bowman, 2009; Mugera, 2012; Pansiri & Temtime, 2008). They are also considered as primary resources in the development of food value chain structures (Mikkola, 2008). Nevertheless, some studies which analyzed the effect of human capital on performance indicate that the link can be both direct and indirect (Hitt et al., 2001), meaning that a certain level of expertise might not guarantee overall firm performance especially if there is insufficient ability to apply the skills or if the skills are not valuable for firm-specific operations (Barney, 2001). Several cases of agribusiness firms in Africa have shown poor managerial expertise in business operations (IFAMR, 2014) and those that succeeded have indicated different styles of management and strategy. This supports earlier findings from Chan et al. (2006) that small firms are heterogeneous in their strategy as they develop. Hence, the relationship between managerial expertise and firm performance as well as differences in the influence of managerial expertise on performance needs to be examined in more detail.

Access to market information is another resource that is crucial to agribusiness firms because it enhances better positioning in competitive markets (Byerlee et al., 2013; Lwoga et al., 2011). Small firms operating in a competitive environment may be unable to process information to their own advantage due to a lack of preliminary strategic goals and an unwillingness to plan properly (Beaver, 2007). When food processors are unaware of market information, they remain at a mercy of other actors in a value chain who might dictate unfair business terms (HODECT, 2010). In this case, information access such as knowledge about the availability of raw materials, prices, competitors' actions, trade associations, suppliers and amount of demand may have an impact on strategy planning and hence firm performance (Byerlee et al., 2013). Moreover, the style of using information could differ among firms due to the premise that firms' journeys of attaining performance are heterogeneous (Chan et al., 2006). Therefore, the relationship between access to market information and firm performance as well as differences in the influence of the information on performance also need to be examined more thoroughly.

Even though level of managerial expertise and access to market information are key resources to firms, there are variables that intervene in determining firm performance; therefore, as indicated earlier, their direct contribution to performance is not always the case. For example Penrose (2009) in her latest reviewed work argues that resources themselves are not adequate for successful operations, rather it is the way these resources are used. Therefore, we posit that the application of STM practices is among such intervening variables. One of the methods for examining the role of STM practices as an intervening variable is through mediation analysis. The analysis specifies the existence of a significant intervening mechanism between an independent and dependent variable, which might not exist in the absence of a mediator (Baron & Kenny, 1986).

Against this background, our general research objective is to demonstrate the pivotal role of STM practices in facilitating effective use of potential resources to increase firms' performance. More specifically, we want to analyze whether both managerial expertise and access to market information link directly to firm performance or whether this relationship is mediated by application of STM practices. Further analysis will uncover group differences in deployment of firm resources such as managerial skills and access to market information in achieving firm performance through application of strategic management practices. In doing so we take a deeper look into segments of firms that are homogenous in the contribution of STM practices as a mediator. The results could help to motivate small firm managers to utilize essential managerial tools for firm operations.

The remainder of this paper is organized as follows: In Section 2 we present the literature on the concept of strategic management in an agribusiness context, our hypotheses and conceptual framework. In Section 3, we describe the research design and data used for our model estimation. Section 4 presents results of a survey of 229 Tanzanian agribusiness firms using partial least squares methodology to evaluate our structural equation model. Further analyses are conducted to detect the mediating effect of STM practices. A multigroup analysis of our sample reveals differences between different segments of small agribusiness firms with regard to the relationships between firm resources, STM practices and firm performance. Section 5 provides a discussion on managerial implications and some concluding remarks.

2 Literature Review and Conceptual Model

Based on earlier writings in the 1950s and 1960s, the field of strategic management (STM) emerged mainly during the 1970s and early 1980s from the social and administrative sciences because of a growing interest to understand the principles driving organizations to sustainable performance (for an excellent review, see Hoskisson et al., 1999). The field is distinguished from other managerial activities which are concerned with day-to-day, short term and tactical activities. The STM process of a firm starts by the definition of clear vision, mission and objectives, defined by using information from environmental analysis and a thorough analysis of firm resources. The process is followed by strategy planning, strategy implementation, strategy evaluation and control (Grant, 2013; Hitt et al., 2009). STM practices bring a long-term and big picture perspective and give a clear purpose of an organization and the direction it intends to go (Andrews, Boyne, & Walker, 2006; Stacey, 2011). The targeted audiences are managers, managers-to-be and policy-makers whom should be reached for influence, while shaping both training institutions and markets (Mahoney & McGahan, 2007). However, the users, mostly of small firms often view STM as being unnecessarily theoretical and refrain from engaging in STM practices because it is either a complex or a demanding process considering the firms' limited capital and other resources (Beaver, 2007).

With the development of the resource-based view in strategic management (RBV) (Barney, 1991; Wernerfelt, 1984), the STM field has increased its emphasis on identifying valuable firm resources in achieving sustainable competitive advantage and above-average financial returns. Since firms have a bundle of specialized resources that wait to be utilized effectively, the view posits that with well managed resources, firms will have the potential to create economic value. The potential is realized when the resources are aligned with the overall firm strategy (Barney & Hesterly, 2010; Mugera, 2012; Wernerfelt, 1984). Its framework is adopted for analyzing performance because RBV emphasizes strategic actions for managers to plan and deploy these resources to maximize returns. Also, Edelman et al. (2005) imply that the theory incorporates application of strategic actions as a mediating variable between resources and firm performance. The aim of the RBV is to enable firms to leverage those rare, valuable, non-imitable, non-substitutable and durable resources that only contribute to firm performance (Barney, 2001).

In the process of leveraging the resources, depending much on tangible resources such as machinery and equipment is not as beneficial to firm's survival. Ability and knowledge to use it are more decisive. Therefore, we include managerial expertise and access to information as critical resources in our conceptual model (see Figure 1) because they guarantee a firm's survival. For example, a firm that has lost its tangible resources but kept the skills and knowledge of its workforce could continue its operations relatively quickly (Becker et al., 2001). Thus, the strategic management field calls for competency based competition in order for small firms to respond to existing challenges and opportunities. The view calls for firm managers to expand their skills, competences and information base in order to face competition (Prahalad & Hamel, 1990; Sanchez, 2004); after all, these resources are more difficult for competitors to detect or copy (Gorman & Thomas, 1997).

Penrose (2009) indicates that resources themselves are not enough inputs for firm operations but it is the way that these resources are used. Regarding managerial skills as a primary resource for firms (Wright et al., 2001) and a target area of development in food sector policy reforms (Dinh et al., 2013; HODECT, 2010), the skills can contribute to firm performance as long as they are in line with a firm's strategy (Edelman et al., 2005) and adequately used for designing and implementing firm strategies that properly reflect a firm's external situation and its internal resources (Grant, 2013). Therefore, we argue that direct relationship is not plausible unless there are strategic practices that play a key role in ensuring better utilization of resources to achieve performance. Therefore, we hypothesize:

H_1*: Application of STM practices positively mediates the relationship between level of managerial expertise and firm performance.*

As the firms operate in a dynamic competitive environment, there is more focus on developing human capital because it can sustain growth of the firm over time (McWilliams et al., 2001; Wright & McMahan, 2011). Thus, there is a significant contribution to firm performance. In the agribusiness value chain, research shows that effect of manager/owners' level of skills is a crucial resource for firms (Boehlje et al., 2011) as well as for firm performance (Cooper et al., 1994). Moreover, Hatten (2012) indicated that one of the factors causing a business failure is a lack of expertise of the owner and mostly in firm management. And in small firms, the managers are usually generalists because they have limited specialized management. He also explained, "…they (i.e. the managers) may not be able to afford to hire full-time experts who could help avert costly mistakes. On the other hand, their limited resources will not permit them to make mistakes and stay in business" (p. 16). Due to the fact that there is a considerable amount of literature that shows similar situations in small firm performance, there are strategies that call for management training programmes suitable for the needs of food processors (see HODECT, 2010).

H_2*: In small firms, level of managerial skills is positively associated with firm performance.*

There is a growing acceptance that people are strategically important among internal resources of firms (Wright et al., 2001). This is because their level of skills and expertise plays an important role in the achievement of firms' strategies (Barney, 1991; Díaz-Fernández et al., 2014). In small firms with a low number of employees, the manager's level of skills is crucial to the achievement of firms strategies

(Boehlje et al., 2011; Dominic & Theuvsen, 2015). As top managers, they are solely responsible for the strategic direction of the firms (Grant, 2013). However, research indicates that managers from small food processing firms have poor ability to engage in strategic actions such as to calculate and anticipate cost of production, to analyze the market conditions and consumer needs, to set strategic prices etc. (Dietz et al., 2000). Some managers do not engage in the strategic management practices due to lack of skills and knowledge to engage themselves in the STM process (Beaver, 2007). Thus, if the managers receive more training in general firm operations, the firms are likely to increase the application of STM practices and improve the precondition for achieving their strategic objectives.

> H_3*: An increase in managers' expertise is associated with an increase in the application of STM practices.*

Access to market information in terms of data and knowledge can allow firms to understand competitors' actions, learn about customers' preferences and react effectively in order to have a smooth flow of their products (Hough & White, 2004). However, access to information does not guarantee firm success; again, the ability to use it is crucial. The reason is that, even though human beings are intendedly rational, there are some limits to their abilities to process and use the information (Simon, 1957). Strategic behavior is also needed to improve the systematic use of information for decision making within a firm (Lieberman & Asaba, 2006). In this case, we argue that the application of strategic management practices has a role in explaining the relationship between access to market information and firm performance.

> H_4*: Application of STM practices positively mediates the relationship between access to market information and firm performance.*

Contrary to that, other studies establish a direct link between access to information and agribusiness firm performance (Lwoga et al., 2011; Shepherd & Sharfman, 2011). The findings also indicate that quick and easy access to information satisfies the needs of the actors in the food supply chain. Other studies added that firms can improve their performance by just exploiting relevant information for the concerned market (Siyao, 2012). On the other side, poor access to information has been referred to as a potential constraint in agribusiness sector development (Elly & Silayo, 2013; Siyao, 2012) particularly in small firms which are vulnerable to large competitors' actions. Therefore, firms that have more access to information can obtain competitive advantage over firms that do not (Nichter & Goldmark, 2009).

> H_5*: In small firms, access to market information is positively associated with firm performance.*

Furthermore, firms are in a good position to understand the environment when they acquire information about raw materials, prices, competitors, customers, etc. As a result the firms may formulate strategies to buffer themselves against any threat that could cause trouble for the business (Hitt et al., 2009). Also the information can help firms to seek ways to respond to new opportunities (Nichter & Goldmark, 2009). Through the information firms are more likely to be aware of existing products from other firms and come up with effective strategies to avoid falling behind their rivals (Lieberman & Asaba, 2006).

> H_6*: The more firms have access to market information, the more they apply STM practices.*

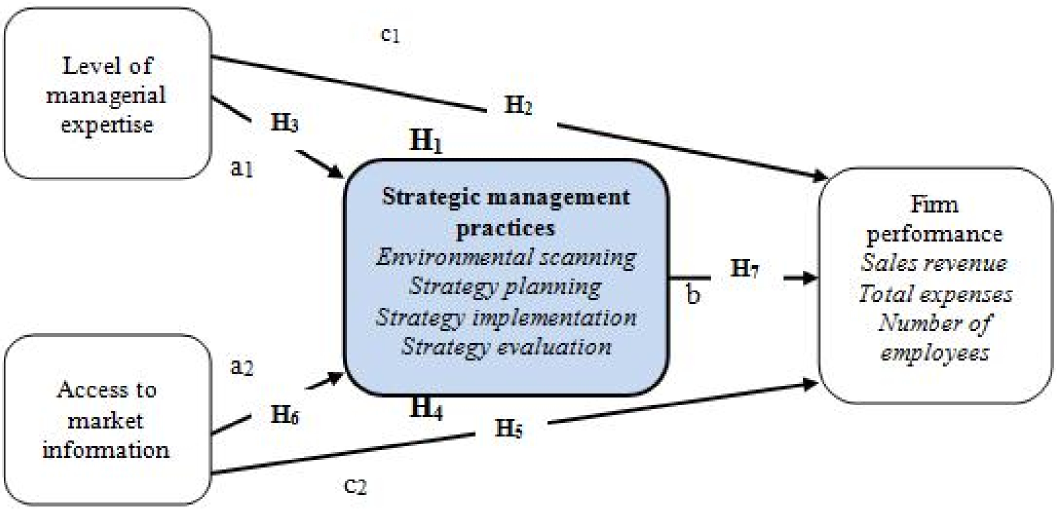
Firms have a chance of improving their performance levels through application of STM practices, for example through engaging in formulation of strategic plans, strategy implementation (Rudd et al., 2008) and environmental scanning (Bakar et al., 2011), just to mention a few. Other studies indicated that firms using STM tools achieved rapid growth in performance (Woods & Joyce, 2003) and increase in sales and revenue (Andrews et al., 2009; Andrews et al., 2006; Beaver, 2002; Bracker & Pearson, 1986; Georgellis et al., 2000). Hence including STM process in day to day business activities can help ensure firm survival and success (Stacey, 2011).

H_7: *The greater the extent of strategic management practices, the better the firm's performance.*

Unfortunately, small firms have a tendency to avoid engaging in strategic planning due to their limited capital and poor knowledge of the process (Beaver, 2002). For example reports concerning agribusiness challenges have indicated that agribusiness firms in Tanzania fail to perform well in food markets due to poor utilization of market information, limited entrepreneurial capabilities and technical and managerial knowledge on manufacturing, low worker skills, poor operations logistics (Dinh et al., 2013) and a lack of ability to attract investors (Katera, 2009). Therefore, the reports imply that there is poor engagement in planning, implementation and control of firm strategies.

Our model as demonstrated in Figure 1 summarizes our review and discussion of the existing literature.

Figure 1: Conceptual Model



a_x, b_x and c denote path coefficients for assessing structural model; **H_X** denotes research hypotheses

Source; Authors' Illustration

The food processing sector includes a large fraction of small businesses (NBS, 2012) which are quite different as they grow and develop. Chan et al. (2006) indicated that small firms have a tendency of developing their own managerial style and strategy as they seek to grow. In the process of achieving performance, the firms do not follow a single progression of development (Delmar et al., 2003). From a dynamic capability perspective, a firm may alter or renew its resources in order to increase its capacity in a rapidly changing environment (Teece, 2007). Therefore, some firms may utilize a resource that fits its needs at the particular time. For example, a firm may either utilize external information in order to strategize according to competitors' actions; or utilize its skills and expertise in order to strategize against competitors' actions. This reflects the basic idea of equifinality. It says that firms can reach the same final state from different initial conditions and by a variety of paths (Gresov & Drazin, 1997; Sinha & Van de Ven, 2005). Therefore, we expect firms to behave differently regarding their management style, and the study will seek to uncover differences among firms to understand which ones behave differently in the use of firm resources.

3 Methodology

3.1 Data Collection and Sample Description

The study is a cross sectional survey conducted between May and August 2013. Data was collected through interviews with firm owner-managers with an aid of a structured questionnaire. The sample consists of firms dealing with food processing of cereals, vegetables and fruits, located in Arusha, Dodoma and Tanga regions in Tanzania. The selection of firms followed a random sampling technique from a list of processors from *Small Industries Development Organization* (SIDO). The organization deals with improving the effectiveness of small industries in the country. Over 331 firms were contacted and agreed to participate in the interviews; 229 questionnaires were qualified for analysis after excluding half-filled questionnaires. In general, the firms had a mean capital investment of 26.94 million TZS (≈ 16,600 US$[1]) and an average of $7^{1}/_{2}$ years of business operations. In the firms surveyed, there were three major types of products which are sold in processed forms; these were cereal products (65.9%), followed by fruit products (16.4%), vegetable products (11.5%) and other (6.2%). Almost all firms (98.5%) buy farm produce from local farmers and only very few firms (1.5%) import from neighboring countries. The respondents of this study were knowledgeable about general overview of the firm and cornerstones of their strategies. Their ages ranged from 18 to 78 years (average: 43 years), with an average of 11.05 years of school education. Table 1 shows additional details about the sample.

Table 1. Descriptive Information about the Sample (N=229)

Variables	Mean	Std. Dev	Min	Max
Information on Firms				
Firm Age (yrs.)	7.50	5.03	3	28.58
Full time employees	5.00	3.41	3	20
Capital investment in million TZS	26.94	51.81	0.3	350
Self-financed firms (d)	0.27	0.40	0	1
Non-perishable products (d)	0.66	0.48	0	1
Family business (d)	0.26	0.44	0	1
Information on Respondents				
Age	43.00	10.70	18	78
Years of education (yrs.)	11.05	3.51	1	22
Gender (1=male, 0=female)	0.39	0.49	1	0

(d) Dummy variable

3.2 Measurement of Variables

The study uses the primary data collection questionnaire survey technique to achieve its objective. Four constructs are used for the model estimation and they were measured using five point Likert scales to determine the extent to which respondents agree or disagree to each of the statements in the questionnaire.

[1] 1USD=1,623TZS exchange rate prevailing on 1st August 2013 www.bot-tz.org

First, level of managers' expertise (EXP) was represented by 9 items. Second, access to market information (INFO) by 8 items and third, strategic management practices (STM) by 17 items divided into four dimensions, i.e. (a) environmental scanning, (b) strategic planning, (c) strategy implementation and (d) strategy evaluation. The STM measure was adopted from Wheelen and Hunger (2006)'s work. Fourthly, firm performance (PERF) was represented by 9 items in three dimensions, i.e. trends in revenue, total expenses and number of employees as adopted from the work of Remaud and Courdec (2006).

A descriptive analysis of the constructs used for our model estimation is presented in Appendix 1, which shows list of items, mean and standard deviation values. The data were analyzed using a second generation analysis technique referred as partial least square structural equation modelling (PLS-SEM) through *smartPLS 2.0 M3* software (Ringle et al., 2005). It is a variance based SEM technique, non-parametric and appropriate for complex structural models. The technique analyses relationships represented in path diagrams that include a web of observed and unobserved variables, whereby a dependent variable in one path can become an independent variable in another path (Hair et al., 2014), whilst in regression models, there exists a clear distinction between dependent and independent variable.

3.3 Model Estimation

In estimating the PLS path models, a two-step analysis is carried out to assess the quality of model results: measurement model analysis and structural model analysis. The measurement model is used to assess the relationships between indicators and constructs, while the structural model measures the relationships between the constructs. From the measurement model analysis, we assess the validity and reliability of the items of each construct (see Table 2). Regarding the reliability of items, all standardized loadings were significant at the 0.01 level and exceeded the threshold level of 0.708 (Hulland, 1999); however the rule is not rigidly applied to early stages of research hence two items in the 'INFO' construct which were above 0.588 were retained (Hair et al., 2010). Items with low loading below 0.5 were deleted because they were regarded as unreliable.

To check for convergent validity, almost all Average Variance Extracted (AVE) values were above the threshold of 0.5 (Fornell & Larcker, 1981; Hair et al., 2010). The AVE value for INFO variable was kept because it was close to the threshold value. To check for the internal consistency reliability of the items, each latent variable's Composite Reliability (CR) and Cronbach's alpha (α) values were evaluated (see Table 2); the values were above their thresholds of 0.6 and 0.7 respectively (Nunnally, 1978). In PLS structural equation models CR values provides more robust measures of reliability than the alpha values, however the difference is inconsequential (see the comparison in Peterson & Kim, 2013). Therefore, the measures have adequate levels of convergent validity and internal consistency reliability.

Table 2. PLS Model Quality Criteria

	Loadings	AVE	CR	Cronbach α
EXP (Level of expertise of the manager)		0.642	0.899	0.860
EXP_1	0.749			
EXP_2	0.833			
EXP_3	0.846			
EXP_6	0.787			
EXP_8	0.786			
INFO (Information access)		0.497	0.830	0.741
INFO_2	0.655			
INFO_4	0.800			

INFO_5	0.794			
INFO_6	0.665			
INFO_7	0.588			
PERF (Firm performance)		0.680	0.864	0.763
REV_1a	0.770			
REV_1b	0.875			
REV_1c	0.826			
STM (Strategic management practices)		0.867	0.963	0.949
STM_A	0.926			
STM_B	0.930			
STM_C	0.933			
STM_D	0.936			

AVE; Average Variance Extracted, *CR*; Composite Reliability

In addition, in Table 3 discriminant validity is confirmed through the application of the Fornell-Larcker criterion (Fornell & Larcker, 1981). The criterion is met when the square root of the AVE of each construct is higher than the construct's highest correlation with any other construct in the model. The cross loadings report is presented in Appendix 2. Moving across the rows reveals that each item loads higher on its respective construct than on any other construct. The report further verifies discriminant validity.

Table 3. Fornell-Larcker Criteria

	EXP	INFO	PERF	STM
EXP	**0.801**			
INFO	0.494	**0.705**		
PERF	0.384	0.377	**0.825**	
STM	0.538	0.478	0.581	**0.931**

From the structural model analysis, we check if there is a multicollinearity problem. SPSS software is used to run this test to check for the Variance Inflation Factor (VIF) values. Results show that the values are below the threshold value of 5.0 hence indicating no multicollinearity problem among predictor variables (see Appendix 3). The variance explained by the model (R^2) is also a criterion for evaluating the structural model. The R^2 for STM and PERF constructs are 34.9 and 35.3 per cent respectively, meaning that the independent variables in the model explain 34.9 percent of the variation in STM and 35.3 percent of the variation in PERF. Moreover, results from f^2 and q^2 values (see Appendix 4) indicate that all values are above zero hence there is an impact of the predictor variables on their target variables, as well as predictive relevance.

After the two-step analysis for verifying reliability and validity of our measures, we present results of path relationships in the structural model. Thereafter, the results from the structural model are used to conduct mediation analysis for testing hypotheses H_1 and H_4. Finally, a multigroup analysis is conducted to uncover heterogeneity within our sample, with the application of FIMIX-PLS technique (Hahn et al., 2002; Sarstedt et al., 2011).

4 Results

4.1 PLS Structural Equation Model Analysis

Figure 2 shows the visual results while Table 4 shows detailed results of the relationships between variables, path coefficients, R-squared, *t*-values and *p*-values. Significance of the path coefficients was determined via a bootstrapping procedure, where the sample size was increased to 5,000. The results show that level of managerial skills and access to market information are positively associated with an application of STM practices (H_3; 0.399*** and H_6; 0.281***) and both explain 34.9 percent of the variation in the application of STM practices. In turn, the greater the extent of STM application the better the firm performance (H_7; 0.495***).

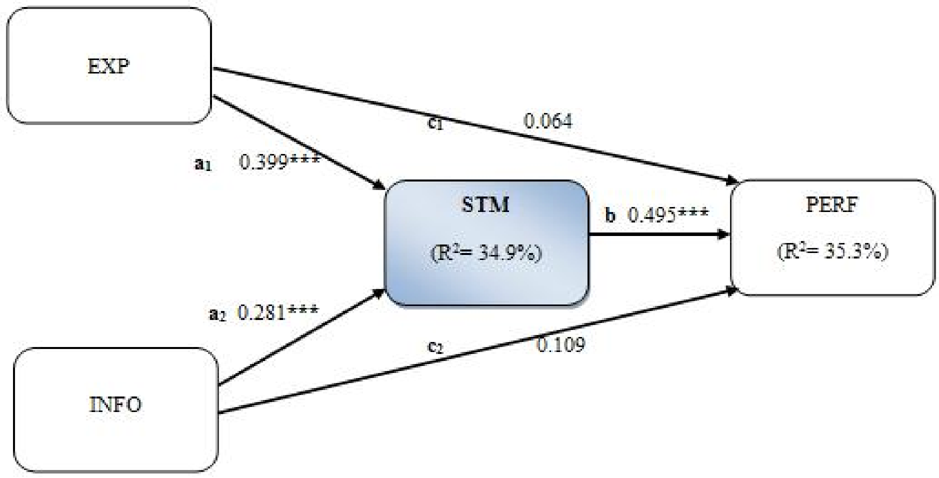
Table 4. Path Coefficients and Significance Testing

Path Relationships	Path	Path Coeff.	t-Values	p-Values	Sig.	Hypothesis	Decision
EXP → PERF	$\mathbf{c_1}$	0.064	0.570	0.284		H_2	Not supported
EXP → STM	$\mathbf{a_1}$	0.399	4.139	0.000	***	H_3	Supported
INFO → PERF	$\mathbf{c_2}$	0.109	1.115	0.132		H_5	Not supported
INFO → STM	$\mathbf{a_2}$	0.281	2.917	0.002	***	H_6	Supported
STM → PERF	**b**	0.495	5.097	0.000	***	H_7	Supported
Relationship without STM as a mediator			(Ringle et al., 2012)				
EXP → PERF	$\mathbf{c_{1x}}$	0.399	5.118	0.000	***		
INFO → PERF	$\mathbf{c_{2x}}$	0.382	7.130	0.000	***		

*** p< 0.01, t value > 2.327; **p < 0.05, t value > 1.645; and *p < 0.1, t value > 1.282

Figure 2 summarizes the findings from applying the PLS structural equation model analysis so far.

Figure 2: Results of the PLS Model



Source: Authors' calculations

Significance *** p< 0.01, t value > 2.327; **p < 0.05, t value > 1.645; *p < 0.1 and t value > 1.282.

The model explains 35.3 percent of the variation in firm performance. However, the influences of managers' level of expertise and access to information on firm performance were not significant (H_2; 0.064 and H_5; 0.109) which is contrary to what is frequently indicated in the literature. The influence might be brought by mediation effect hence we proceed with H_1 and H_4 testing in Section 4.2.

4.2 Mediator Analysis

Mediation in path models can be assessed by examining the relationship of the direct link between two latent variables and the indirect link via the potential mediator variable. From our model, two paths are assessed: first, EXP→PERF relationship via STM and second, INFO→PERF relationship via STM (see Figure 2). In the first case mediation can be assumed if the following conditions are met (see Baron & Kenny, 1986; Hayes, 2012):

(a) Variations in EXP levels significantly account for variations in the mediator STM, i.e. path a_1.
(b) Variations in STM as a mediator significantly account for variations in PERF, i.e. path b.
(c) When paths a_1 and b are controlled, path c_1 is no longer significant.

All the conditions in the first case are met because with reference to Table 4, path a_1 and path b are significant. When the STM variable is removed from the model, path c_1 has a value of β=0.399, t-value=5.118. Oppositely, when it is included in the model, path c_1 is not significant (β=0.064, t-value=0.570). Next, we test for significance of the mediation to find support for H_1. Indirect effect of the relationship between EXP and PERF is 0.198, which is a product of paths a_1 and b (i.e. 0.399 x 0.495). Thereafter, the t-value is determined by running a nonparametric bootstrapping procedure (Preacher & Hayes, 2008). The results show that the t-value is 2.955; thus, the mediation effect is significant at the 0.01 level. Therefore, H_1 is supported.

In the second case, all conditions are met because path a_2 and path b are significant but when the STM variable is removed from the model, path c_2 has a value of β=0.382, t-value= 7.130. Oppositely, when STM is included again in the model, path c_2 is no longer significant (β=0.109, t-value=1.115). Next, we test for significance of the mediation in order to test for H_4. The indirect effect of the relationship between INFO and PERF is 0.139, which is a product of paths a_2 and b (0.281 x 0.495). Next the t-value is determined by again running a nonparametric bootstrapping procedure (Preacher & Hayes, 2008). The results reveal that the t-value is 2.473, p=0.013, hence that the mediation effect is significant at p=0.05 level. Therefore, H_4 is supported indicating the role of STM as a mediator.

The next step is to check for the strength of mediation in the two relationships in order to convey its practical significance. VAF (Variance Accounted For) is an index that measures the strength by calculating the ratio of an indirect effect through a mediator to a total effect (Shrout & Bolger, 2002). With reference to path coefficients indicated in Figure 2 and Table 4, the following formula is used:

$$\mathrm{VAF} = (a_x + b)/(a_x b + c_x)$$

Table 5. Strength of Mediation

Path Relationships (Hypotheses H_1 and H_4)	VAF		Result
EXP → PERF path via STM	$= \frac{a_1.b}{a_1.b + c_1}$ $= \frac{0.399 \text{ X } 0.495}{0.399 \text{ X } 0.495 + 0.064}$	**75.4%**	Partial mediation
INFO → PERF path via STM	$= \frac{a_2.b}{a_2.b + c_2}$ $= \frac{0.281 \text{ X } 0.495}{0.281 \text{ X } 0.495 + 0.109}$	**56.0%**	Partial mediation

VAF > 80% = Full Mediation, 20% ≤ VAF ≤ 80% = Partial Mediation and VAF <20% = No Mediation

Table 5 indicates that there is a partial mediation effect, i.e. STM mediates the relationships between EXP and PERF by 75.4 percent and between INFO and PERF by 56 percent. The STM would have to be above 80 percent value to qualify as a full mediator between the relationships. Full mediation would have suggested that the application of STM practices is the only tool or method that helps managers align their resources to achieve firm performance. Since there are several variables (not included in this study) that can help firms to increase performance it is unrealistic to expect that a single mediator would completely explain the effect of firm resources on firm performance.

4.3 Multigroup Analysis

Our next step is to investigate unobserved differences among firms to see whether different variable estimates occur for each group. Our approach is to apply a latent class analysis technique known as finite mixture PLS technique (FIMIX-PLS) from the *smartPLS 2.0 M3* software (Hahn et al., 2002; Sarstedt et al., 2011). The technique is ideal for PLS path models and used to identify unobserved heterogeneity in our sample by producing homogenous segments according to the significant relationships that exist within a segment. FIMIX-PLS algorithm is run sequentially for several models, i.e. K= 2, 3, and 4; the results are presented in Table 6

Table 6. FIMIX-PLS evaluation criteria and relative segment sizes

Models	AIC	BIC	CAIC	EN	Segments / sample sizes (n_x)
K=2	1946.135	2045.712	2045.839	0.396	n_1= 66% n_2 = 34%
K=3	**1868.781**	**1934.022**	**1934.104**	**0.504**	**n_1= 27% n_2 = 22% n_3 = 51%**
K=4	2020.399	2154.314	2154.484	0.444	n_1 = 24% n_2 = 19% n_3 = 25% n_4 = 32%

K= Number of sub-groups or segments.
Criteria: Akaike's information criterion (AIC); Consistent AIC (CAIC); and Bayesian information criterion (BIC).

The results in Table 6 justify a selection of 'K=3' model. Evaluation criteria for this selection involve lowest values of Akaike's information criterion (AIC), consistent AIC (CAIC), Bayesian information criterion (BIC) and highest values of entropy measure (EN) (Ringle et al., 2010; Sarstedt et al., 2011). The selected three segment model (i.e. K=3) indicates segment sizes of n_1=27%, n_2= 22% and n_3= 51%. However, ex-post analysis is carried out and the segment sizes are redistributed to n_1=22%,

n_2=22% and n_3=56% according to best probabilities of segment membership. Thereafter, PLS algorithm is run separately for segments 1, 2 and 3and the results of estimates for each path are presented in Table 7.

Table 7. Path Coefficients for each Segment

	Overall (full model)	**Classes/segments K=3**		
		Segment 1	Segment 2	Segment3
EXP→PERF	0.064	0.685***	-0.573***	0.096 *
EXP→STM	0.400***	-0.177 **	0.314***	0.519***
INFO →PERF	0.109	-0.797***	0.604***	0.219***
INFO →STM	0.281***	0.876***	0.682***	-0.073
STM →PERF	**0.495*** **	**0.552 *** **	**0.716*** **	**0.706*** **
R^2 (STM)	0.349	0.565	0.822	0.257
R^2 (PERF)	0.353	0.299	0.944	0.649
Sample size	N=229	n_1=50	n_2=50	n_3=129
	100%	22%	22%	56%

N=Full model, n= segment size; Path coefficient significant at *** p< 0.01; **p < 0.05 and *p < 0.1
Discriminant validity and reliability measures are verified for each segment (see Appendix 5)
Test for significant differences between segments are indicated in Appendix 7

Table 7 shows that while level of managers' expertise emerges as the main driver to increasing firm performance in the first segment (n_1=50), access to market information looms as the key driver in the second segment (n_2=50). However, in the third segment (n_3=129), application of STM practices has a stronger effect on firm performance than access to market information and level of managers' expertise. Furthermore, in segment 3 level of managers' expertise and market information are weak drivers of firm performance. Again, mediation analysis was conducted for each sub-group (or segment). Results show that STM was neither a potential mediator in segment 1 nor in segment 2. The mediation effect was only detected in segment 3, with a VAF value of 0.792 ≈ 79% (t= 6.395). Therefore, the value provides evidence for a (strong) partial mediation in segment 3 (significant at the 0.01 level). Appendix 7 presents details for significance test for groups' differences between the paths coefficients.

The effect of managers' expertise on firm performance is positive (0.685***) in segment 1 but negative in segment 2 (-0.573***) and weak in segment 3 (0.096*). The results reveal mixed effects of expertise on firm performance as argued earlier in the literature (see Boehlje et al., 2011 and Edelman et al., 2005). Also, the effect of market information on firm performance in segment 1 is strongly negative (-0.797***), whereas it is strongly positive in segment 2 (0.604***). In segment 3 there is a weak relationship between access to market information and firm performance (0.219***). Similar to the findings regarding managerial expertise, the results reveal mixed effects of market information on firm performance. Interestingly, there were no mixed effects regarding the effect of STM application on firm performance, i.e. the application of strategic management practices was strongly positive in segments 1, 2 and 3.

Table 8. Summary of Path Relationships for each Segment

Path Relationships	Path Coefficients		
	Segment 1 *Human capital oriented firms*	Segment 2 *Information dependent firms*	Segment 3 *Strategic-oriented firms*
Level of managers' expertise → performance	Strong positive	Strong negative	Weak
Access to market information → performance	Strong negative	Strong positive	Weak
Strategic management practices → performance	**Strong positive**	**Strong positive**	**Strong positive**

Table 8 shows a summary of characteristics of each segment. The three segments can be depicted as follows:

(a) Segment 1 consists of agribusiness firms that are characterized by a strong positive relationship between level of managers' expertise and firm performance and a negative relationship between access to market information and firm performance. Since the variable "level of managerial expertise (EXP)" is the major driver of firm performance among the exogenous variables, we name this segment as *human capital oriented firms*. Further details from descriptive statistics indicate that these firms have more years of experience in food processing than firms in segments 2 and 3. Also, the firms are able to make more use of business management tools such as balance sheet, profit and loss statement, cash flow, performance appraisal, risk analysis and SWOT analysis than the firms in segments 2 and 3 (Appendix 8).

(b) Segment 2 consists of agribusiness firms that are characterized by, on the one hand, a strong positive relationship between access to market information and firm performance and, on the other hand, a negative relationship between level of managerial expertise and firm performance. Such firms function best with the collection of information from external sources, such as information on raw materials, sales channels, prices and customers' preferences. The negative link between managerial expertise and performance may imply that firms' revenues decrease as they spend much either on training costs or on hiring skilled labour, hence the firms put more efforts in collecting market information and work best using information databases. In this group, "access to market information" is the major resource that contributes to firm performance; hence we denote this segment as *information dependent firms*. Appendix 8 indicates further details on descriptive statistics.

(c) Segment 3 consists of agribusiness firms that reveal a weak relationship between level of managers' expertise and firm performance as well as a weak relationship between access to market information and firm performance. The application of STM practices has the strongest effect on firm performance and the contribution from managerial skills to firm performance is mediated by strategic management practices (unlike in segments 1 and 2). These firms rely primarily on long term planning with a clear purpose and direction they intend to go. The firms constantly engage in strategy planning, implementation and evaluation activities to ensure that their objectives are achieved (for example, increase in revenues, sales, etc.). Since the variance in firm performance is explained best through the application of STM, this segment is named as *strategic-oriented firms*. Appendix 8 gives further details on descriptive statistics.

In general, there were no significant differences found between segments in relation to socio-demographic characteristics such as age of the firm manager, gender of the firm owner, education level, etc. (see Appendix 8).

5 Discussion and Conclusions

Most firms competing within a similar environment are assumed to possess similar types of resources, hence they are challenged to compete with other firms in their pursuit of increasing performance. This study shows that engaging in strategic management practices enables firms to perform better and strengthen its competitive position and financial performance. The findings were established by including an intervening variable in a model by using the mediating analysis procedure suggested by Baron and Kenny (1986). This is because the relationship between access to resources and firm performance could be better justified via the consideration of STM as a mediating variable.

The resources such as level of managerial skills and access to market information are not necessarily directly associated with firm performance (H_2 and H_5 are not supported) but related to firm performance via the application of STM practices (H_1 and H_4 are supported). The results support and explain further the previous studies by Penrose (1959, 2009) that resources are not enough as inputs for firm operations but that it is rather the way that these resources are used. It is even more advantageous when the resources, for instance the capabilities of managers, are in line with a firm's strategy (Edelman et al., 2005). Moreover, we suggest that the skills achieved from formal education are not essentially translated into practical use on business management tools. It is about going extra miles to create effective strategies. One of the incidences is that the agro-processing sector in the country under analysis, i.e. Tanzania, has been characterized by its inability to gain sustained revenues by constant selling of primary products and its inability to attract venture capitalists as a result of poor plans and poor record keeping (Dinh et al., 2013). A number of firms have been operating without proper business plans and workers literally operate blindly with poor knowledge on future business directions. This situation should alert policy makers to focus more on improving managerial style and capabilities particularly through promoting STM training.

Results also indicate that access to market information as such is not necessarily helpful for firm performance, because human beings have different abilities to process information. The results support Simon's (1957) work on humans' limited ability to process information but differ from other studies such as Lwoga et al. (2011) and Elly and Silayo (2013) which discussed importance of information for farmers while making implications for all actors in the agricultural sector and offered no explanation on what to do with the information. In our study, we involve food processors who are mostly closer to the final consumer and suggest that the information alone might not be significant for a firm's survival, but that information is better utilized if it is aligned with a firm's strategy. In some cases, firms can receive timely information about overall market conditions but the managers require an analytic mind to link the information to their firms' strategic actions. Without doing so, the access to market information alone might not be relevant to achieve firm performance and sustainable competitive advantage, as suggested by Barney & Hesterly (2010). Transforming the agribusiness sector commercially is very complex; managers need to have access to information to cope with rapidly changing markets. The study results show that the information should be brought in line with strategic actions to enhance performance, and that is when the role of STM practices comes in.

Furthermore, our findings show the importance of identifying a fit between resources and strategic management practices in the context of small firms. Since small firms operate in a dynamic environment and are faced with severe constraints regarding economic and technical resources (Dinh et al., 2013), the firm managers should keep in mind that strategic orientation matters. Incorporating strategic management tools is considered as a building block to managerial decisions and actions, which is also consistent with Porter's (1985) view on firm growth and strategy and Barney's (2001) work on finding a relationship between resources and strategies. Managers have to carefully utilize the strengths of their firms' resources and develop related strategies to gain high returns. Our recommendation takes into account recent structural reforms in promoting the agribusiness sector (IFAMR, 2014) and Tanzania's specific initiatives in enhancing specialized managerial training (see Tanzania Integrated Industrial Development Strategy 2025) in MOIT (2011). The reason is that small firms which engage in strategic management practices outperform those that do not. In this case, policy makers should take the engagement into consideration while developing an action plan that includes capacity building initiatives on strategic planning and management.

This study has both academic and practical implications. It adds to the academic literature that resources alone are not likely to contribute to firm performance if they are not aligned with firms strategies (Edelman et al., 2005; Edelman & Brush, 2001). The key resources of the firms are effective when balanced with the firms' plans indicated in either mission, vision statement, business plan or firms' objectives. With this regard, managers are encouraged to choose resources that work best for their particular firms. Generally, our work contributes to the development of competency-based competition (Prahalad & Hamel, 1990) which calls for further expansion of specialized knowledge and skills that have 'value' to the firms' objectives. From the practical perspective, the managers can understand in more detail why some firms achieve their objectives while others do not in the presence of the same type of resources and similar business environments. The study implies that promoting strategic behavior is beneficial to small firms as well (Beaver, 2007) and that investing in training programmes for human capital development will have an impact on increase in sales and revenues (Byerlee et al., 2013). It does not mean that the formal class trainings and complex procedures are necessary at all times. The essential element is to develop a strategic plan that is understood and communicated to every worker in the firm. Thus, the firms will be able to employ or develop a person with a desirable skill or collect appropriate information from the external market.

Care must be taken in order to avoid over-generalizing these results because further investigations from multigroup analysis indicate that our recommendations might not fit all types of firms. Small firms are different and their paths to achieve sustainable growth are diverse (Chan et al., 2006). There are firms which depend more on managers' expertise and less on market information to achieve firm performance (human capital oriented firms), whereas other firms rely more heavily on access to relevant information (i.e. information dependent firms). A third type of firms showed that a direct link between resources and performance is weak but the influence of the application of STM practices is strong (strategic-oriented firms). However, in all groups results revealed positive effects of the application of STM on financial performance. This implies that even though the firms are different in their strategies, they end up more similar in the way they achieve performance (equifinality; Gresov & Drazin, 1997; Sinha & Van de Ven, 2005).

Our findings are in line with Chan et al.'s (2006) suggestion that even though there are heterogeneous paths to sustainable growth, firms end up more similar to each other than they were when they started. Therefore, regardless of whether a firm is characterized as human-capital oriented, information-dependent or strategic-oriented (see Table 8), they follow similarly successful paths to performance as they grow. Furthermore, the differences are regardless of age of the firm manager, gender of the firm owner and other firm characteristics (see Appendix 8) which shows that a path of success for one firm might not apply to the other.

This study faced some limitations in terms of scope because it focused mainly on a sample of agribusiness firms dealing with processed food products (cereals, fruits and vegetables) in three regions of Tanzania. An interesting extension would be to include other external resources to examine their influence on firm performance via strategic management practices. For the purpose of generalization, future studies may also want to include both large and small firms in Tanzania and beyond to broaden the scope of the study and improve its representativeness. Finally, the inclusion of resources other than level of managerial expertise and access to information in strategic actions as well as more complex combinations of resources might help to offer a deeper understanding on alternative pathways to improve firm performance.

Appendix 1: Descriptive Statistics of Variable Items

Item	Statement/Question	Mean	Std. Dev
Level of expertise of the manager (EXP) scale from 1=strongly disagree to 5 = strongly agree			
EXP_1	Level of expertise in Bookkeeping and Accounting	3.03	1.094
EXP_2	Level of expertise in Managing employees	3.45	1.053
EXP_3	Level of expertise in Marketing techniques	3.26	1.056
EXP_4	Level of expertise in Financial management	3.21	1.107
EXP_5	Level of expertise in Stock taking & Record keeping	3.36	1.081
EXP_6	Level of expertise in Food quality & Safety standards	3.56	1.056
EXP_7	Level of expertise in Customer care	3.72	1.006
EXP_8	Level of expertise in product presentation	3.37	1.074
EXP_9	Level of expertise in food processing	3.73	1.070
Information access to the firm (INFO) Scale: 1=Completely inaccessible 2=Inaccessible, 3= Average access, 4=Accessible and 5=Highly accessible			
INFO_1	Information on where to get raw materials	4.34	0.941
INFO_2	Information access on changes in product prices	4.04	1.049
INFO_3	Information access on where to sell	3.97	0.993
INFO_4	Information access concerning customers' whereabouts	3.89	1.014
INFO_5	Information access about when to sell	3.92	1.013
INFO_6	Information access on competitors	3.70	1.128
INFO_7	Information access on tax rates	3.38	1.286
INFO_8	Information access on trade associations	3.61	1.177
Strategic Management Practices (STM) practices (scale from 1 = Strongly disagree to 5 = Strongly agree)			
STM_A	Environmental scanning activities (3 items)	3.48	1.196
STM_B	Strategy planning activities (4 items)	3.28	1.195
STM _C	Strategic implementation activities (7 items)	3.19	1.195
STM_D	Evaluation and control activities (3 items)	3.31	1.254
Performance (PERF) 1=Decrease 2=A little decrease 3=Stay the same 4=A little increase 5=Increase			
REV_1a	Sales revenue this year in 2013	3.73	1.082
REV_1b	Sales revenue last year in 2012	3.60	0.971
REV_1c	Sales revenue in 2011	3.50	0.991
Cost_2a	Total expenses this year in 2013	3.95	0.928
Cost_2b	Total expenses last year in 2012	3.73	0.841
Cost_2c	Total expenses in 2011	3.64	0.873
Emp_3a	Number of employees this year in 2013	3.21	0.896
Emp_3b	Number of employees last year in 2012	3.08	0.662
Emp_3c	Number of employees in 2011	3.09	0.623

Appendix 2: Cross Loading

	EXP	INFO	PERF	STM
EXP_1	**0.749**	0.453	0.179	0.375
EXP_2	**0.833**	0.344	0.323	0.445
EXP_3	**0.846**	0.397	0.351	0.463
EXP_6	**0.787**	0.362	0.286	0.453
EXP_8	**0.786**	0.424	0.381	0.415
INFO_2	0.35	**0.655**	0.257	0.316
INFO_4	0.325	**0.800**	0.261	0.333
INFO_5	0.381	**0.794**	0.293	0.361
INFO_6	0.34	**0.665**	0.282	0.329
INFO_7	0.334	**0.588**	0.227	0.337
REV_1a	0.251	0.337	**0.770**	0.476
REV_1b	0.374	0.338	**0.875**	0.503
REV_1c	0.322	0.253	**0.826**	0.456
STM_A	0.510	0.397	0.544	**0.926**
STM_B	0.472	0.441	0.537	**0.930**
STM_C	0.515	0.474	0.544	**0.933**
STM_D	0.506	0.467	0.540	**0.936**

Appendix 3: Collinearity Assessment

Linear regression Model 1:	***Linear regression Model 2:***
Independent variables EXP (1.322) INFO (1.322) (Dependent variable STM)	Independent variables EXP (1.567) INFO (1.442) STM (1.535) (Dependent variable PERF)

VIF values in Parentheses. VIF is a metric for multicollinearity
Multicollinearity among predictor variables represents and important concern in assessing path model, since it can inflate bootstrap standard errors and therefore trigger type II errors

Appendix 4: Effect Sizes (f^2 and q^2 Values)

	STM			PERFORMANCE		
	Path Coefficient	**f^2 effect size**	**q^2 effect size**	**Path Coefficient**	**f^2 effect size**	**q^2 effect size**
EXP → STM	0.399	0.156L	0.1304S			
INFO → STM	0.281	0.082S	0.1217S			
EXP → PERF				0.064	0.003S	0.0018S
INFO → PERF				0.109	1.012S	0.0083S
STM → PERF				0.495	0.196M	0.1228S

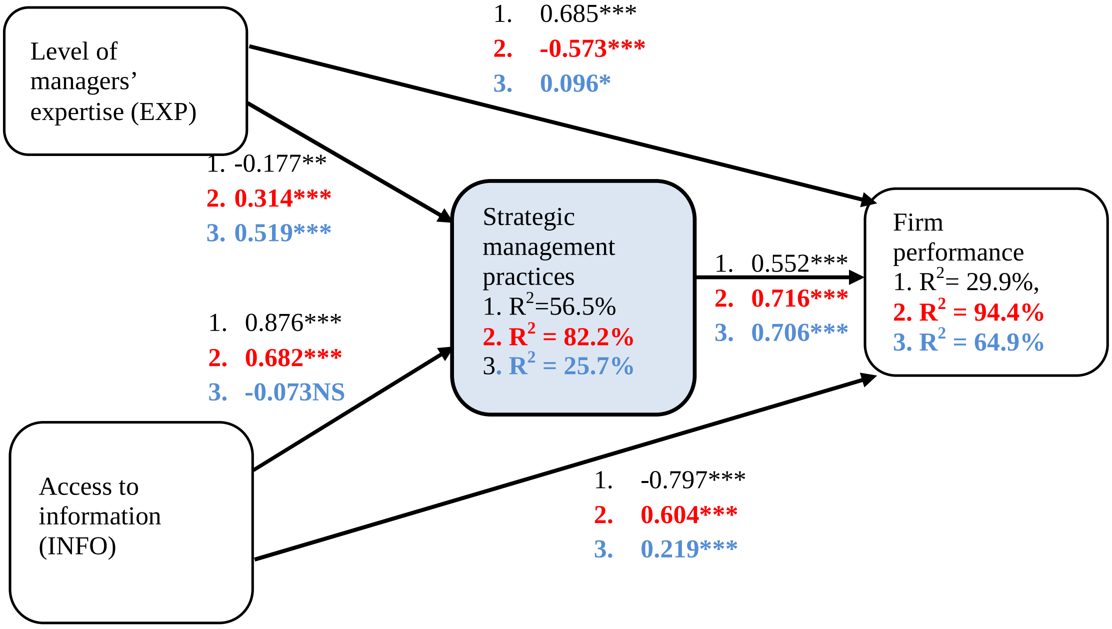
Note: f^2 is a measure of the impact of a specific predictor construct on an endogenous construct. q^2 As a relative measure of predictive relevance. The values of **0.02, 0.15** and **0.35** indicate that an exogenous latent variable has a small (S), medium (M) and large (L) effect respectively.

Appendix 5: Validity and Reliability Measures (Multigroup analysis)

	Measure	Aggregate (Full Sample)	n = 1	n = 2	n=3
Convergent validity measure	AVE(EXP)	0.642	0.694	0.670	0.614
	AVE (INFO)	0.497	0.517	0.737	0.507
	AVE (STM)	0.867	0.664	0.879	0.902
	AVE (PERF)	0.680	0.808	0.565	0.610
Internal consistency reliability measure	CR (EXP)	0.899	0.919	0.910	0.888
	CR (INFO)	0.830	0.841	0.933	0.835
	CR (STM)	0.963	0.887	0.967	0.974
	CR (PERF)	0.864	0.926	0.794	0.823
Discriminant validity measure	Ɛ EXP	0.801	0.833	0.819	0.784
	Ɛ INFO	0.705	0.719	0.858	0.712
	Ɛ STM	0.825	0.815	0.938	0.950
	Ɛ PERF	0.925	0.899	0.752	0.781
	N	229			
	n		50	50	129

CR, Composite reliability Ɛ, measure for criterion by Fornell and Larcker (Fornell & Larcker, 1981), n size of segment, N size of full sample

Appendix 6: PLS Model Multigroup Analysis



Appendix 7: Three-Segments PLS Analysis (Differences between Path Relationships)

	Segment 1: N=50	Segment 2: N=50	Segment 3 N=129	Segment 1 Vs Segment 2	Segment 1 Vs Segment 3	Segment 2 Vs Segment 3
	path coefficient (std errors)			path coefficients (t values)		
	$p^{(1)}$	$p^{(2)}$	$p^{(3)}$	$\lvert p^{(1)}-p^{(2)}\rvert$	$\lvert p^{(1)}-p^{(3)}\rvert$	$\lvert p^{(2)}-p^{(3)}\rvert$
EXP → PERF	0.685*** (0.090)	-0.573*** (0.077)	0.096* (0.074)	1.258*** (10.729)	0.589*** (5.094)	0.669*** (6.309)
EXP → STM	-0.177** (0.082)	0.314*** (0.082)	0.519*** (0.081)	0.49*** (4.277)	0.696*** (6.081)	0.205*** (3.364)
INFO → PERF	-0.797*** (0.152)	0.604*** (0.103)	0.219*** (0.089)	1.401*** (7.708)	1.016*** (5.433)	0.385*** (2.849)
INFO → STM	0.876*** (0.072)	0.682*** (0.077)	-0.073 (0.092)	0.194* (1.859)	0.949 (8.206)	0.755*** (6.334)
STM → PERF	0.552*** (0.140)	0.716*** (0.146)	0.706*** (0.059)	0.614 (0.819)	0.154 (1.023)	0.010 (0.064)

Note: $p^{(1)}$, $p^{(2)}$ and $p^{(3)}$ are path coefficients for segment 1, 2 and 3 respectively
Significance at *** p< 0.01; **p < 0.05 and *p < 0.1

Appendix 8: Characteristics of the Three Segments

Variable	**Segment 1**	**Segment 2**	**Segment 3**	**Full sample**	**F score**	**sig. difference**
	Mean (std. dev.)					
Gender of firm manager Male	0.42 (0.499)	0.34 (0.479)	0.40 (0.491)	0.39 (0.489)	0.361	
Female	0.58 (0.499)	0.66 (0.479)	0.60 (0.491)	0.61 (0.489)	0.361	
Age of the manager (years)	41.91 (10.84)	44.33 (9.942)	42.4 (10.943)	42.72 (10.97)	0.74	
Age of the firm (yrs.)	9.75^{1} (6.44)	6.96 (4.02)	6.89^{3} (4.53)	7.54 (5.04)	6.478	***
Years of working experience in the firm (yrs.)	9.07^{1} (6.40)	6.54 (3.79)	6.12^{3} (4.39)	6.86 (4.91)	6.87	***
Education Secondary schooling	0.44 (0.501)	0.42 (0.499)	0.40 (0.491)	0.41 (0.493)	0.159	
College certificate	0.20 (0.404)	0.16 (0.370)	0.16 (0.363)	0.17 (0.373)	0.268	
University	0.08 (0.274)	0.14 (0.351)	0.11 (0.312)	0.11 (0.313)	0.459	
Asset management (are you familiar with 'Balance sheet'?)	0.74 (0.443)	0.84^{2} (0.37)	0.61^{3} (0.489)	0.69 (0.464)	4.877	***
Uses at least 5 other STM tools[d]	0.80^{1} (0.4)	0.64 (0.48)	0.63^{3} (0.48)	0.66 (0.47)	2.543	*

Note: Superscript numbers 1, 2 and 3 indicate significant different groups based on Scheffe's test where the latter represents a set of group differences. d; other tools listed are profit and loss statement, cash flow, sales trend, cost benefit ratio analysis, performance appraisal, risk analysis, net present values, brainstorming, and SWOT analysis

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