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DYNAMIC CAPABILITIES, FIRM INNOVATION AND COMPETITIVE ADVANTAGE OF COMPANIES LISTED AT NAIROBI SECURITES EXCHANGE

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Abstract

Recent studies show that dynamic capabilities as high order organizational capabilities enable firms to attain a competitive advantage. Additionally, firm innovation which entails the creation of products, processes as well markets result in competitive advantage. However, dynamic capabilities have an influence on firm innovation which in turn results in a competitive advantage. The purpose of this study was to examine the effect of firm innovation on the relationship between dynamic capabilities and competitive advantage of companies listed at Nairobi Securities Exchange. The study applied cross sectional descriptive survey as its research design and all the sixty-three firms listed at the NSE formed the study population. In order to ascertain the mediation, the hypothesis was tested by following Baron and Kenny four steps. The study established that firm innovation partially mediates the relationship between dynamic capabilities and competitive advantage of companies listed at Nairobi Securities Exchange. The study recommends that the listed firms should not only emphasize on the development of dynamic capabilities for combating environmental challenges but also invest in firm innovation as it will result in the achievement of a competitive advantage. The results contribute to theory development, policy and management practice from the importance of dynamic capabilities and firm innovation in achieving competitive advantage. The study points out room for more research using a larger population, more organizational factors and incorporating other companies that are not listed at Nairobi Securities Exchange.

Key Words: Dynamic Capabilities, Competitive Advantage, Firm Innovation, Nairobi Securities Exchange

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Introduction

The essentiality of dynamic capabilities in boosting organizational competitiveness and advantage has become an important topic among management scholars. Dynamic capabilities enable firms to orderly, efficiently and systematically update their processes and routines in order to curb the adverse effects of environmental changes (Karman & Savaneviciene, 2021; Schilke, 2014). However, dynamic capabilities as organizational processes shaping resources and competences are not directly producing goods or services but create value by triggering and fueling firm innovation (Tresna & Raharja, 2019). This will result in the gaining and attainment of competitive advantage (Duan, 2013). Dynamic capabilities comprise of sensing, seizing and integration capabilities (Teece, 2007).

Sensing capabilities enable a firm to identify favorable opportunities and potential threats with the aim of coming up with strategies for dealing with these external factors (Li & Liu, 2014; Sivusuo, 2019). Seizing capabilities on the other hand enable a firm to make strategic choices and investment decisions on externally sensed opportunities (Teece, 2012) while integration capabilities help in the combination and synchronization of information, assets, routines, processes and operations in order to attain a competitive advantage (Pavlou & El Sawy, 2011). Firm innovation can be delineated in terms of product, process and market innovations (Sandor *et al.*, 2019) will consequently lead to a competitive advantage.

Literature Review

Dynamic Capabilities Theory

This theory is relevant to this study as it recognizes the importance of management capabilities in coordinating and reconfiguring internal and newly

The role of firm innovation in survival of firms is essential. Organizations that do not invest in the creation and introduction of products or use improved processes lose their competitive positions in the industry (Klingebiel & Rammer, 2014). It is apparent that there is need for organizations to integrate both externally sourced and internally available information so as to realize the success of an innovation output (Lichtenthaler, 2011; Sandor et al., 2019). There have been conflicting findings on the role of firm innovation in the relationship between dynamic capabilities and competitive advantage. For example, Nieves, Quintana and Osorio (2016) established those dynamic capabilities influence firm innovation but not competitive advantage while Jiménez and Fuentes (2013) ascertained the mediating role of firm innovation in the aforementioned relationship.

Listed companies are blue chip companies and represent key sectors of the Kenyan economy (Nganga, 2013). The declining competitiveness of listed firms could be attributed to the turbulent environment which can be seen from the extensive and intense technological changes, shortening of the product lives, intense competition, changing customer preferences as well as industry structure (Karman & Savaneviciene, 2021). This implies that the listed firms can reverse the adverse environmental effects by developing dynamic capabilities that will enable them to come up with new products, processes and markets and consequently lead to the attainment of a competitive advantage.

externally sourced competences (Teece & Pisano, 1994). According to this theory, creation, modification, transformation and redeployment of resources that are of high value enable an organization obtain competitive advantage in the industry. These resources are tradable, not easily

found and cannot be easily substituted (Augier & Teece, 2007).

Despite the fact that firms are continuously developing new combinations of competences, resources and capabilities, rivals in the market place are similarly improving their resources or imitating processes that are perceived as profitable by the market leaders. There is need, therefore to focus on internal processes like sensing, seizing and integration while improving the capabilities of management in coordinating routines and other processes (Teece, 2018).

This theory, as the anchor theory, describes how dynamic capabilities relate with competitive advantage. Firm's ability to thrive in an environment characterized by stiff competition can be estimated by looking at its resource reconfiguration strength. The dynamic capabilities theory vastly identifies, characterizes and analyses the rate of change of resources that enable organizations avoid the development of core rigidities and consequently organizational inertia (Augier & Teece, 2007).

Innovation Theory

The role of technological firm innovation in industries was first written by Joseph Schumpeter in 1934. He viewed innovation to be the integration of both tangible and intangible resources to produce a final product that is of value. Innovation theory considers organization-level efficiencies and the ability to create unique valuable products that satisfy consumers to be the genesis of superior competitiveness to firms in a particular industry. The theory has since been elaborated in Keynesian economics by including efficiency in resource utilization. In this study, it explained the role of firm innovation in achieving competitive advantage (Schumpeter, 1934).

Firm innovation implies the founding of an idea and using that idea to make new products, processes or services thereby making super-normal profits by firms (Cross, 2013). Sharma and Rai (2015) views innovation as a new idea and know-how that is used during the making of new and improved products, processes as well improved services. Drucker (2002) emphasized an enormous need of a firm to integrate externally sourced and internally generated information for the realization of successful innovation. Here, innovation is a platform through which change is coined.

Superior goods and services are be created through firm innovation. Firm innovation which is characterized by the invention and adopting improved technologies, new products and services, new customer experiences, improved processes, creation of markets, effective channels and business models is paramount in the growth of a firm (Jon-Arild, 2013). This theory, however fails to show the imminent interaction between organizational assets and the external environment particularly the legal aspects of patent ownership. A firm can only undertake meaningful innovation by identifying and extensively analyzing external opportunities.

Dynamic Capabilities, Firm Innovation and Competitive advantage

The extent to which firm innovation contributes to resource modification and reconfiguration is important in analyzing the sources of competitive advantage (Kyläheiko, 2011). Prior studies have showed that firm innovation is continuous and developmental in nature thereby leading to sustained competitive advantage (Cross, 2013). Similarly, dynamic capabilities encourage firm innovation through the development of products as

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well as improvement of processes (Bogers *et al.*, 2019). The same conclusion had been reached by Drnevich and Kriauciunas, (2011). A study by Pratono (2021) on 782 Indonesian SMEs and using structural equation modelling for its analysis observed that product and market innovations help the firms realize a sustained competitive advantage.

Pundziene, Nikou and Bouwman (2021) found that innovation partially mediates the relationship between dynamic capabilities and competitive advantage of 465 Lithuanian technological firms. By use of structural equation modelling, the study recommended tremendous investments in innovation as well as involving customers in the process of innovation. Wang and Feng (2019), using regression analysis, equally established that dynamic capabilities affect breakthrough innovation and at the same time innovation affects the performance of 204 Chinese firms in manufacturing industry. The study failed to test the mediation effect of innovation despite the three variables being in their study. Nieves *et al.* (2016) established that dynamic capabilities influence firm innovation of 109 Spanish firms in the hotel industry and after analyzing data using structural equation modelling. The study emphasized the importance of sensing capabilities in product development as well as in the revamping of processes. The study, however, failed to test the influence of firm innovation on competitive advantage.

A study by Jiménez and Fuentes (2013) established that product as well as process innovation are mediators in the relationship between dynamic capabilities, specifically knowledge combining capability and profitability of technology-based SMEs in Spain. The study employed structural equation modeling in analyzing data obtained from 224 firms. Jiao, Alon and Cui, (2011) used hierarchical regression to establish the correlation of

innovation with dynamic capabilities. The data was collected from 400 high-tech firms of Yantz River Delta region of China conducted. The study established that innovation build dynamic capabilities in stable as well as extensively turbulent conditions.

Research Methodology

This study was grounded on positivist philosophical approach as it is based on theory before research, hypotheses testing and conclusions from statistical justification (Cooper & Schindler, 2014). Positivism emphasizes on knowledge being based on real facts and not abstractions. This would enable predictions based on existing theory. The observer in this case is independent from the phenomenon/phenomena being observed (Cooper & Schindler, 2014). This study utilized a descriptive cross-sectional survey research design since the study sought to not only describe relationships among key study variables but also establish the extent of these relationships. The study's target population comprised all firms listed at the NSE which were sixty- three (63) in number at the time of the study. These firms were preferred for the study as they are diverse in nature, operations and by sector. This study employed the use of primary data which was obtained through a structured questionnaire. The study targeted the top management (Chief Executive Officers) as well as key managers in charge of departments (operations, marketing, manufacturing and finance).

Kaiser- Meyer- Olkin (KMO) as well as Barlett's Test of Sphericity was used in establishing validity of results. Field (2009) points out that data having a KMO value greater than 0.5 and Barlett's Test of Sphericity statistically significant is good for statistical analysis. KMO statistic ranges from 0 to 1. This study employed the use of Cronbach's alpha (α) that

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indicates a group of test items measuring one latent variable (Cronbach & Shavelson, 2004). Cronbach's coefficient alpha measures actual variance in respective variable. The coefficient alpha of 0.7 and above indicated an acceptable internal consistency as pointed out by Creswell and Clark (2017). For construct and criterion validity, five questionnaires filled by five managers of selected firms were used for pilot study. The firms that took part in this pilot tests did not take part in the main survey.

Dynamic capabilities construct was the independent variable in the study and was measured using its three dimensions, namely Sensing capabilities, Seizing Capabilities and Integration capabilities as put forth by Teece (2014). Firm innovation as the mediating variable was operationalized as Product innovation, process innovation and market innovation as used by Sandor *et al.* (2019), Darawong (2018) and Sharma & Rai (2015). Competitive advantage as the dependent variable was measured in terms of the ability of the firms to have low costs of operation, differentiate their products, delivering value to the customer, efficient systems and structures and a higher market share as compared to their competitors as used by Fereeira *et al.* (2019) and Purkayastha & Sharma (2016).

Data results and analysis

Response Rate

The study's target comprised of all the 63 companied listed at NSE companies listed at NSE. The total number of questionnaires distributed amongst the respondents was 58. Forty (40) questionnaires were filled correctly and later returned by the respondents and formed 68.9% response rate. Karman & Savaneviciene (2021) pointed out that a 50% response rate is adequate, 60% good and above 70% very good.

Test of Hypothesis

The study's regression analysis utilized four-step approach as put forth by Baron and Kenny (1986) to test the hypothesis. The first step was achieved by regressing dynamic capabilities on competitive advantage. According to Baron and Kenny (1986), the second step can only be taken statistically significant results have been found in the first step. In the event that the results are not statistically significant, the regression process is terminated. This step involves regressing dynamic capabilities on firm innovation. Similar to the first condition, the next step (step three) can only be taken when the hypothesis-testing results are significant. A simple linear regression of firm innovation and competitive advantage is done to test the hypothesis in the third step. The effect of firm innovation on competitive advantage must be significant in order to test the intervening effect in the model. The last step entails testing the influence of dynamic capabilities on competitive advantage when the effect of firm innovation is controlled.

Step One: Dynamic capabilities construct was regressed against competitive advantage.

Table 1: Regression Results for the Effect of Dynamic capabilities on Competitive advantage

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.646[a]	.417	.407	.30240	.417	41.497	1	38	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.795	1	3.795	27.302	.000[b]
	Residual	5.304	38	.139		
	Total	9.099	39			

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.758	.485		1.563	.123	-.213	1.729
	Dynamic capabilities	.798	.124	.646	6.442	.000	.550	1.046

a. Predictors: (Constant), Dynamic capabilities

b. Dependent Variable: competitive advantage

Source: Research Data (2021)

The findings from Table 1 indicates that a strong and positive relationship that is statistically significant exists between dynamic capabilities and competitive advantage (R = 0.646). The resulting coefficient of determination (R^2 = 0.417) shows that those dynamic capabilities explain 41.7% variations in competitive advantage. The robust F-value of 27.302 shows that the model is appropriate and significant because the p - value of 0.00 is also less than 0.05. These findings of the first step meet the requirements of testing for the mediating effect of firm innovation. The second step involved testing the effect of dynamic capabilities on firm innovation.

Step 2: Relationship between the Independent Variable and the Mediator

Table 2: Regression Results for the Effect of Dynamic Capabilities on Firm Innovation

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.596[a]	.355	.344	.28169	.355	31.898	1	38	.000

ANOVA[a]					
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.531	1	2.531	20.918	.000[b]
	Residual	4.602	38	.121		
	Total	7.134	39			

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.337	.452		2.958	.004	.432	2.241
	Dynamic capabilities	.652	.115	.596	5.648	.000	.421	.882

a. Dependent Variable: firm innovation

b. Predictors: (Constant), Dynamic capabilities

Source: Research Data (2021)

The results as shown in Table 2 depict that the relationship between dynamic capabilities and firm innovation is not only positive and strong but also statistically significant (R = 0.596). The coefficient of variation (R^2 = 0.355) depicted 35.5% of variations in firm innovation being explained by dynamic capabilities. Moreover, the significant F-value of 20.918 with p value being less than 0.05 shows that the model was appropriate and statistically significant. The aforementioned results enabled the progression of the testing procedure of the mediating effect of firm innovation. The third step involved regressing firm innovation against competitive advantage.

Step 3: Relationship between the Mediator and dependent variable

Table 3:   Regression Results for the Effect of Firm Innovation on Competitive Advantage

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.674[a]	.455	.446	.29899	.455	49.211	1	39	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.399	1	4.399	32.581	.000[b]
	Residual	5.274	39	.135		
	Total	9.673	40			

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.899	.428		2.102	.040	.043	1.754
	firm innovation	.768	.109	.674	7.015	.000	.549	.987

a. Dependent Variable: competitive advantage

b. Predictors: (Constant), firm innovation

Source: Research Data (2021)

The results from Table 3 show that firm innovation has a strong relationship with competitive advantage (R = 0.674) with firm innovation explaining 45.5% of variations in competitive advantage (R^2 = 0.455). Moreover, the significant F-value of 32.581 with p value being less than 0.05 shows that the model was appropriate and statistically significant. The aforementioned results of step three enabled the progression of the testing procedure of the mediating effect of firm innovation since the third condition had been met. Finally, the fourth and last step tested the influence of dynamic capabilities on competitive advantage when the effect of firm innovation is controlled. Simple linear regression analysis was utilized in performing the test. It is expected that the effect of dynamic capabilities on competitive advantage is reduced when firm innovation is controlled.

The results from Table 4 show that when firm innovation is controlled, dynamic capabilities explain only 41.7% of the variation in performance (R^2 = 0.417).

In the second model, firm innovation increases the resultant competitive advantage as depicted by an increase of variation from 0.417 to 0.532 and p-value=.000. Both models were appropriate and significant where the first one had F = 27.302, p-value=0.000 and

the second model had F = 21.052, p-value=.000

Step 4: The relationship between the independent variable and Dependent variable in the presence of the mediator variable.

Table 4: Regression Results Depicting Mediating Effect of Firm Innovation on Dynamic Capabilities and Competitive Advantage

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
1	.646[a]	.417	.407	.30240	.417	41.497	1	38	.000
2	.730[b]	.532	.516	.27325	.115	14.036	1	37	.000

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.795	1	3.795	27.302	.000[b]
	Residual	5.304	38	.139		
	Total	9.099	39			
2	Regression	4.843	2	2.421	21.052	.000[c]
	Residual	4.256	37	.115		
	Total	9.099	39			

Coefficients[a]									
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	.758	.485		1.563	.123	-.213	1.729		
Dynamic capabilities	.798	.124	.646	6.442	.000	.550	1.046	1.000	1.000

(Constant)	.121	.470		.256	.799	-.821	1.062		
Dynamic capabilities	.487	.139	.394	3.495	.001	.208	.766	.645	1.550
firm innovation	.477	.127	.423	3.747	.000	.222	.732	.645	1.550

a. Dependent Variable: competitive advantage

b. Predictors: (Constant), Dynamic capabilities

b. Predictors: (Constant), Dynamic capabilities, firm innovation

Source: Research Data (2021)

The results from Table 4 showed a strong correlation of dynamic capabilities, firm innovation and competitive advantage where the correlation coefficient was R = 0.730. The $R^2 = 0.532$ meant that 53.2% of variations in competitive advantage could be as a result of dynamic capabilities and firm innovation. The mediation test show that Indirect effect with beta coefficient of [0.487] and Total effect with beta coefficient of [0.798] exist. This implies that there is a partial intervening effect of firm innovation on dynamic capabilities-competitive advantage relationship of companies listed at NSE. Firm innovation is a partial intervening variable because the total effect beta coefficient [0.798] in the relationship between dynamic capabilities and competitive advantage is higher than beta coefficient [0.487] of indirect effect when the intervening variable (firm innovation) is introduced in the relationship between dynamic capabilities and competitive advantage. Acceptance of the hypothesis that firm innovation mediates the relationship between dynamic capabilities and competitive advantage was reached. This conclusion is similar to that reached by Pundziene, Nikou and Bouwman (2021) where firm innovation partially mediated the relationship between dynamic capabilities and competitive advantage of 465 Lithuanian technological firms. The findings are equally similar to those established by Ferreira and Coelho (2019) on387 Portugal's Small and Medium Enterprises.

Conclusion, Implications of the study and Recommendation

The findings partially supported the hypothesis that firm innovation is a mediator in this aforementioned relationship of companies listed at NSE. This study advances research and literature on dynamic capabilities and firm innovation in realizing competitive advantage. The study observes that firms should not only deploy dynamic capabilities but also invest in firm innovations that will enhance the products or services they are offering as well as process efficiency for a competitive advantage (Schön, 2012). The study adds into the empirically tested research findings on dynamic capabilities, firm innovation and competitive advantage relationship, thus contributes to knowledge. Also, the findings of the study enhance the replication of similar studies in a different context, thus fostering comparative study. The research contributes to Dynamic Capabilities Theory by establishing that dynamic capabilities influences competitive advantage as well as Innovation theory on the role of firm innovation in the attainment of a competitive advantage. The research thus supports dynamic capabilities theory and innovation theory.

The study outcomes are significant in influencing government policy. The government will benefit in formulating policy on the listed firms from the understanding of dynamic capabilities effects on competitive advantage. The various sectors represented by these companies are important to economic

development of the country and contributes significantly to the gross domestic product. The Government of Kenya, in its Vision 2030 development policy, endeavors to transform the country into a middle-income economy. Dynamic Capabilities influence on competitive advantage is evidenced by the large number of listed companied using their sensing, seizing and integration capabilities in their operations and thereby lower their costs while producing high quality and differentiated products.

The results of this study demonstrate that although dynamic capabilities significantly influence competitive advantage of companies listed at NSE, firm innovation, mediates this relationship. This implies that dynamic capabilities enable a firm to create new products, adopt new processes and venture into new markets which will consequently enable it to gain a competitive advantage. Firm managers and owners, should therefore recognize this interaction and formulate firm policies and procedures accordingly. Managers should not only acquire dynamic capabilities but also invest in the creation of new products, processes as well as expand their market reach. Firm innovation had a significant relationship with competitive advantage showing that managers should focus on creating products and coming up with new processes and markets in order to gain a competitive advantage. The study therefore recommends that policymakers should advocate the development of dynamic capabilities and firm innovation for the attainment of Kenya's Vision 2030.

Suggestions for Further Study

Cross sectional research design was used as the research design. Longitudinal studies could be carried out to test causal effects in future studies and to show whether the findings vary over time. Prospective research studies should focus on organizations outside the companies listed at the NSE in order to ascertain the applicability of this study's conclusions to other contexts of Kenya's economic units. For instance, future research

should include coverage of firms operating in various sectors, both listed and non- listed. Additionally, a replica of this study in a big population extending to many industries should be considered.

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