

The Influence of Firm Characteristics on the Relationship Between Operational Innovation and Performance of Manufacturing Firms in Kenya

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With a marketplace characterized by increased competition globally and constant changes in customer needs and wants, there is a need to adopt operational innovations while complying with the business environment (internal capabilities) and the firm characteristics, influencing factors in the innovation adoption and implementation. For this reason, this study aimed to investigate the influence of firm characteristics on the relationship between operational innovation and the performance of manufacturing firms in Kenya. The positivism approach was used to increase the reliability of investigation findings for generalization. Further, a descriptive research design was adopted, equally to increase the reliability of the survey. Sample of 182 firms with strong affiliations to Kenya Association of Manufacturers (KAM) was used. The firms had 14 subcategories based on the products they manufactured. Statistical Package for the Social Sciences (SPSS) and smart PLS4 were used for data analysis, and regression analysis was used for conclusive results. The findings reveal that firm characteristics have a sizable impact on the association between innovation and firm performance.

Keywords: firm characteristics, operational innovation, firm performance, manufacturing firms

INTRODUCTION

Kenya's manufacturing industry is propelled by manufacturing firms serving both the local and regional market, that is, East Africa. The performance of these firms has been attributed to many factors, including the need to satisfy the growing domestic demand and the need to sustain projects involved in the achievement of Vision 2030 (Kamau, 2016). Consequently, these factors highlight a gradual increase in innovation capabilities by the manufacturing sector to boost effectiveness and efficiency, otherwise called operational innovation, albeit slow (Okafor, 2023). While the good performance of firms and their operational innovation go hand in hand, it is important to investigate the influences of certain factors on this relationship. This study calls attention to firm characteristics and sets out to investigate their influence on the relationship.

The study applied various theories, including Schumpeter's theory of innovation, agency, and stakeholder theories to explain how firm characteristics influence the relationship between operational innovation and the performance of manufacturing firms in Kenya. The resource-based theory (RBV) presents the many patterns of relationships between the study variables. Firm resources in right combinations generate distinct competitive edge in market and directly affect the company's desire to innovate, and ultimately, its performance. This brought question whether firm characteristics mediate how Kenyan manufacturing firms' operational innovation is associated with their performance.

LITERATURE REVIEW

Firm Characteristics

Firm characteristics are considered drivers that inform the inner workings of an organization and its objectives (Porfírio, Carrilho, Felício, & Jardim, 2021). These include ownership, firm age structure of employees, and internal organization. The firm's CEO can easily control and manipulate them to the firm's advantage. Also, they are constantly reviewed, change frequently, and are unique to each firm. With the study's premise in sight, this implies that the firm's internal organization could be a barrier to the realization of advantage over rivals as it influences the degree of economic undertakings (Ahmed, Feeny & Posso, 2016). Innovation is considerably simpler in firms that operate under some standard, for instance, ISO certification, than in those that do not. As a result, gaining numerous competitive advantages from innovation more quickly. Besides the cost of implementing research and development (R&D), the firm's internal structure, meaning enterprises with suitable organizational structures, do better in terms of R&D programs as opposed to poorly organized firms due to lower efficiency of operations (Zhang & Sun, 2023). This addresses the aspect of operational efficiency, which cannot be achieved without a deeper focus on innovations and the business environment.

Operational Innovation

Due to inconsistencies in past research findings on the concept of innovation, this study considered four methods by which an organization can innovate: market, product technological, and process innovation. This was linked to operational innovation, which can be defined as developing new ways of performing the various activities that enable a firm to operate and perform efficiently (Ghasemaghaei & Calic, 2020). Like innovation, operational innovation has several aspects: product, technology, process, and market. To begin with, product innovation is a type of innovation to supply new or better-performing products, product features, or services that satisfy customer needs by commercializing them with improved performance attributes. On the other hand, process innovation involves adopting new or improved production methods to make the process more efficient. This can include the techniques and tools used in manufacturing and changes in Human Resource Management (HRM) practices. The next dimension of operational innovation is marketing innovation, which is the adoption of new marketing strategies reflected in changes in the 4Ps of marketing, in response to changes in consumer behavior (OECD, 2005). Lastly, technological innovation is the process by which organizations adopt a technological approach in their operations (Chen, Wang & Huang, 2021). This type of innovation aims to reduce costs and risks in the production process, improve processes, improve productivity and performance of employees, and ultimately improve customer satisfaction (Chen et al, 2021). Despite these forms of innovation, Fellnohefer (2019) contends that innovation alone does not warrant success. This has prompted several studies into the concept of operational innovation in a bid to improve current business activities.

Firm Performance

This is the other variable in this study. According to definition by Guo, and Xu, (2021) firm performance is a concept that equates to organizational efficiency, that is, the degree of success in achieving set objectives. Important to note is that organizational goals and objectives change over time in response to changes in the business environment. Thus, this implies that the organization's goal today is to ensure continuous performance (Taouab & Issor, 2019), which can be achieved by adopting different criteria for

assessing performance. As noted by Baumüller and Sopp (2022) firms choose between financial and non-financial approaches depending on a range of considerations. These yields result in the form of effectiveness, efficiency, and competitiveness, which can be in the form of financial and non-financial performance indicators.

A deduction from this is that a performance measurement system is necessary to gauge the measures, standards, and performance criteria. Financial performance is easily measurable while non-financial performance is difficult (Kim, Kim, & Qian, 2018). Determining the most suitable performance measurement system for firms creates challenges, however balance scorecard approach is acceptable it focuses on monetary and non-monetary matrices. Some of the reasons attributed to the non-financial approach include invalid measurement modes, lack of right goal setting, and lack of agreement between set goals and strategy, and lastly, the use of metrics that lack statistical validity (Taouab & Issor, 2019).

Nevertheless, the measurement metrics consist of client satisfaction, progress, effectiveness, worker satisfaction, corporate investment responsibility level, price on the market, and environmental performance (De Mendonca & Zhou, 2019). Financial performance has been employed to evaluate the effectiveness of a company's main revenue generation activities. The quantity of earnings or revenues generated after a given period served as the basis for the computation, taking ratios of finances into account. Huang and Yen (2019) exhibited three financial performance criteria; levels of profitability, aggregate portfolio returns, and multiplier for securities. Nevertheless, it is susceptible to various drawbacks due to the presumptions of accuracy and impartiality triggered by the delay in the accounting period and the bulkiness of information. Since monetary performance metrics are not associated with the organizational functional divisions, this leads to discrepancies in detail (Okafor, Adeleye, & Adusei, 2021).

Manufacturing Firms in Kenya

To categorize manufacturing enterprises, previous researchers have utilized factors like total number of employees (Yong et al., 2020), capitalization capacity (Revathy & Santhi, 2016), revenues from sales (Lee, Wang, & Ho 2020), and combination of each variable (Blichfeldt & Faullant 2021). For this study, the classification remains product-based. Manufacturing firms, particularly from developing countries like Kenya, are integral to unemployment reduction, economic expansion for an extended period, and earnings in foreign currencies (Kenya National Bureau Statistics, 2019). Despite this, many Kenyans remain employed in the sector due to high tariffs and operational costs, significantly decreasing Kenya's manufacturing industry output by almost 900 percent throughout the previous 30 years (World Bank, 2019).

Still, the sector's rehabilitation remains paramount to the country's government administrations, especially the last two. This is because it serves as a major market for agricultural produce and several other products from other industries, such as textile, food processing, and material industries. The rehabilitation efforts are manifested by the increase of credit value in billions of Kenya shillings, 275.8, 315.8, 335.8, and 366.9 in 2016, 2017, 2018, and 2019, respectively. Despite this showing an upward trend, there has not been much industrial development as anticipated, and the economy is incomparable to those of other similar countries (KNBS, 2019). According to Kenya Vision 2030, the manufacturing industry should contribute twenty percent (20%) of the gross domestic product (KNBS, 2015). Still, it has never attained this level and has been declining steadily since 2011.

Even though Kenya's manufacturing industry has been one of the fastest-growing in East Africa, other East African states have expanded their economies relatively rapidly. The food processing subsector, which makes up most of the industry, and many other industries, such as agronomy, which has a significant opportunity for greater employment development, benefit greatly from this synergy (KNBS, 2014). Still, the majority of manufacturing firms have not been doing well due to the failure of the key stakeholders in the industry to focus on the innovation needs and the need to link operational innovation and firm characteristics.

Theoretical Foundation

This study is founded on one major theory, Schumpeter's innovation theory, and supported by several other theories; agency, the resource-based view (RBV), and stakeholder theory. To begin, Schumpeter's

theory, coined in 1934, postulates that economic and market processes are continuous. Schumpeter demonstrated that an entrepreneur is an extremely helpful and essential participant in organizational revolutions (Schumpeter, 1934). Similarly, he believes that entrepreneurship generates innovation, in which new factors of production combination ratio are constantly tested.

From these beliefs advocacy for dramatic policy changes and creative reorganization inside manufacturing and processing enterprises. This is because the theory highlights the significance of transition in how manufacturing firms process their output (Schumpeter, 1934). The theory advocates for the implementation of new technology innovation. It also emphasizes the entrepreneurial opportunities that drive acts of innovation and details the role of the entrepreneurs by offering them a chance to explore new products and design superior services corresponding to the changing consumers' needs for effective economic development. Still, it is not without several criticisms; it overemphasized the role and functions of the innovator and has since declared it as the fundamental force behind the economy. Additionally, it has been considered useful in developing and extending capitalism through its entrepreneurial innovation analysis (Schumpeter, 1942). This is considered to be in favor of neocolonialism in the nations that were colonized.

On the other hand, the agency concept explains how a principal and an agent are related. This highlights the aspects of supplies and distributions that the current study addresses. The principle grants the agent the right to act as his representative and a right to enter into business with other legal entities. However, this affiliation creates complicated operation issues (the agency problem) since the principal finds it difficult to monitor the agent's conduct (Voorn, Van Genugten & Van Thiel, 2019). This brings about the two premises of the agency theory; the ability of an agent to select from a range of options and the agent's actions, which explain the circumstances that could cause this to persist in the manufacturing chain

However, some criticisms of the theory posit that it focuses on scenarios whereby two entities have an association and employ a reciprocal connection when working together and that there are conflicting interests among the agents and the principals, as each one prioritizes their interests first (Voorn, Van Genugten & Van Thiel, 2019). As a result, an agency setback occurs when the agents' goals deviate from the principals', and it is difficult to evaluate the proper fullness of the performance. This assumption may not apply to all organizational structures due to the varied amounts and forms of information flow in different areas of the organization. Still, the theory emphasizes the firms' characteristics in which several core elements are supported by indicators linked to the ownership of the firm, employee age structure, ISO certification, and internal organization. As a result, the theory supports the role of mediating factors and how they lead to firm performance. It shows that for the organization to meet the performance goal, there must be mutual relations among its stakeholders, highlighting the stakeholder theory discussed below.

The stakeholder theory, associated with Freeman's writings, proposes that within an organization, there is a special faction of individuals committed to it who can affect whether the firm's objectives are met. These individuals (stakeholders) can influence the financial policy, structure, and reporting of an organization (Freeman, 1984). Their aspirations and beliefs are considered during the development of strategic goals and objectives. A firm does not exist in a vacuum; there are external agencies and society, each with a specific goal for the firm. To ensure that all their objectives are attained, interconnectivity through implementing innovations is essential (Freeman, 1984). This theory has been useful in the current investigation since the theory endeavors to emphasize the coordination and performance of the stakeholders participating in the firm's overall performance. The theory thus provides a comprehensive view of the necessary relationship between the various subsystems within the firm that influence overall sustainability and emphasizes the creation of a new path to success and performance.

Lastly, the resource-based view (RBV) theory suggests that businesses that possess valuable, immovable, distinctive, and rare resources enjoy a competitive edge (Annarelli, Battistella, & Nonino, 2020). The resources must be varied and immovable, whether physical or intangible (Barney, 1991). Overall, utilizing current assets and resources to take advantage of current possibilities protects a company's level of competition in the future and ensures its continued economic viability. Ombaka et al. (2015) believed that through innovation, distinctive assets are created in many sectors, such as operations and marketing, which provide the company with some competitiveness that rivals cannot match. This has a

trickle-down effect whereby low operational costs result from the resources gained, improving close ties with participants in supply chains and efficient operational procedures. This benefits customers by making goods and services more affordable. Ultimately, this results in a reduction in the cash transformation cycle and a digital-economic revolution. This leads to the increase of revenue of the firms. With this, the funds allocated for research and development also increase, and they can do more research. Therefore, the theory strongly emphasizes competitive advantages that seek to link different resources that are fully under the management of manufacturing businesses and thereby ensure the mobility of internal resources within the firm. For instance, managing human resources by enhancing their efficacy in the supply chain is one of the internal elements.

RESEARCH PROBLEM

Manufacturing firms globally face challenges associated with the limited resources at their disposal, problems related to marketing, and the changing and dynamic competitive environment where the firm operates. Environmental forces make firms to acquire resources at different rates, making them grow differently. Employee recruitment, innovation practices implementation, and marketing of their products are all activities that need resources. The attractiveness of the firm to top-notch personnel is vital for the innovation activity. The type of employees recruited also influences the features of the firm. Therefore, with the complexities of the marketplace, which is characterized by increased competition globally and the constant changes in customer needs and wants, there is a need to adopt operational innovations while complying with the business environment (internal capabilities) and the firm characteristics, and high level of understanding how they relate to the innovation practices and performance.

Another reason for adopting operational innovations is that manufacturing firms in Kenya are facing significant competition from those in Asian countries such as Bangladesh, Cambodia, and Vietnam due to government subsidies in these countries that encourage production and export. Due to the increased consumption of goods from these countries, and other issues, the Kenya Association of Manufacturers (2018) reports that the sector has experienced a stagnation dating back to 1963. This indicates that despite government efforts to revolutionize the sector through the Standard Gauge Railway (SGR) project, the situation has only worsened. While transportation of products to the remote parts of the country has become significantly cheaper due to this project, there has been an influx of more low-cost goods from the Asian nations to offset this development. This has further hindered the sector's growth, manifested in a decline in the total trade in goods post-COVID-19 (East African Community). For this reason, Kenyan manufacturing firms must look into how they can improve their performance in light of new developments in the business environment.

Again, there is limited literature on the operational innovation of manufacturing firms despite the various developments in the manufacturing field. Specifically, there exists a window to explore the different aspects of successfully innovative firms as related to how specific firm characteristics encourage operational innovation and, thus, good performance. Some studies around the same have been done, but they do not quite capture the essence of the current study. For instance, Arkolakis, Ramondo, Rodríguez-Clare, and Yeaple, (2018) explored how firm innovation affects firm production globally but failed to consider the effects of firm characteristics. Similarly, Nafula (2017) investigated the impact of innovation on the competitiveness of firms in Nairobi country, isolating the identified variables and limiting the findings to only a small region of the country. Again, several scholars in Africa, including Barasa et al. (2019) and Ukpabio and Oyebisi (2019) have investigated the phenomenon, that is, in South Africa and Nigeria, respectively. However, these results cannot be used to interpret the situation in Kenya. Other studies on the same focus on only large manufacturing firms in developed countries, ignoring the valuable insights that might be gained from investigating small and medium-sized enterprises from both emerging and developing countries, which form the majority of companies in the global manufacturing sector (Nudurupati et al., (2022). Therefore, a more favorable study for the results the researcher seeks would be one whose target population is focused and its parameters specific, that is, one that addresses specific performance measures and one that targets the whole country of Kenya.

In other words, the contextual skewness associated with research on operational innovation, firm characteristics, and the resultant performance makes this current study all the more necessary. Therefore, the current study aims to illuminate the atmosphere of operational innovation in Kenyan manufacturing firms by focusing on the concept of innovation intrinsically (single variable) and the four identified aspects of innovation. Additionally, it assessed the effect of firm characteristics on the relationship between innovation and firm performance. This is contrary to what has been investigated before, presenting a research gap, that will answer the research question: What is the influence of firm characteristics on the relationship between operational innovation and the performance of Kenyan manufacturing companies in Kenya?

OBJECTIVES OF THE STUDY

The objective of this study was to;

- i. Investigate the influence of firm characteristics on the relationship between operational innovation and the performance of manufacturing firms in Kenya.

RESEARCH METHODOLOGY

This investigation implemented a descriptive cross-sectional assessment plan. The cross-sectional survey design suitability enhances uniform data collection and analyzes several respondents simultaneously. Consequently, the researcher also gets the chance to evaluate population characteristics and test hypotheses quantitatively and qualitatively (Christine et al., 2016). A cross-sectional orientation focuses on the credibility of the outcome by simultaneously stating conclusions based on data. Again, the descriptive research design is proper for this inquiry as it detaches the researcher from the study's outcome (Ospina, Esteve, & Lee, 2018).

The population of this work comprises all firms registered with the Kenya Association of Manufacturers (KAM) with active membership in Kenya in 2018. The association keeps the most updated data on manufacturers in Kenya. It indicated that there were 1,313 members in the country. The target population encompasses all these small, medium, and large manufacturing firms in Kenya, which cuts across the entire sector within Kenya.

The investigation used a random sampling approach to configure 298 firms out of 1313 available. The sample size determination was based on Krejcie Morgan's (1970) Table. The population of 1313 does not give direct sample size directly from the table; therefore, interpolation process aided the arrival at the figure of 298. This was further weighted on 14 manufacturing sector categories to know exactly how many firms were to be involved in the investigation from each sub-group.

The drop-off and pick-up method using a structured questionnaire approach guided information gathering from either middle or top-level managers. One respondent per firm was the target. This involved the researcher and specialized research assistants. These respondents were regarded as wealthy with strategic and tactical information on innovation and successes of their firm. The pilot survey approach ensured the respondents interpreted questions similarly and minimized ambiguity and compound questions (Hong, Gonzalez-Reyes, & Pluye, 2018). Each variable examination was based on a five-point Likert scale. The close involvement of the lead person in the investigation was to safeguard the accuracy of data and enhance the response rate.

After scrutiny of the returned questionnaire for completeness, the number was reduced to 182. This reflected a response rate of 62%, regarded as adequate (Vasileiou, Bernett, Thorpe, & Young, 2018). Using Statistical Package for the Social Sciences (SPSS) software, coding, descriptive and inferential statistics was used as data examination approach. Further analysis was done to ensure scientific rigor, reliability, and validity. Based on the Kaiser Olkin and Bartlett test of sphericity, all the items met the minimum threshold of 0.3 (Byrne, 2010) and were subjected to other tests. Construct validity examination reflected most items scored a minimum threshold of 0.4. The model error term of normality was more than 0.05, reflecting that the model was acceptable. Multicollinearity assessment based on Variance Inflation Factor (VIF) to indicate

the level of correlation among the independent variables with an acceptable value pegged at below 10 (Hair, Black, Babin & Anderson, 2019). Most items scored below 10; hence collinearity was confirmed, minimum, and within acceptable levels. Again, the regression analysis approach was used to conclude the data further.

FINDINGS AND DISCUSSIONS

Findings

The research was conducted in three phases; data collection, validation, and analysis. First, out of the administered questionnaires, one hundred eighty-two (182) qualified for further analysis. This represented a 60% response rate attributed to the close involvement of the lead researcher and trained research assistants, who were able to convince the respondents of the security of their information and other confidential data. Further, SPSS application software aided the analysis based on regression, which covered the summary model, goodness of fit test, ANOVA, and coefficient of determination (R^2) involving standardized and unstandardized coefficients. The coefficient values range between 0 and 1, where being closer to 1 indicates a stronger relationship while closer to 0 indicates a weak relationship. SPSS was preferred since it can be used in both qualitative and quantitative data analysis (Eyisi, 2016).

Following the objective to examine the impact of company characteristics on the link between the innovation and performance of Kenya's manufacturing firms, this investigation considered controllable and uncontrollable firm characteristics that generate a firm's competitive advantage. According to the matching null hypothesis (H_2), company characteristics have no appreciable mediation impact on the association between firm innovation practices and the performance of manufacturing firms in Kenya. Firm characteristics were treated as the mediating variable in the study and were categorized under four sub-constructs; resources, internal organization, level of education/training, and employee age structure.

To test for the mediating effect of firm characteristics in the relationship between firm innovation and firm performance, the Baron and Kenny (1986) procedure for testing for mediating effect was employed. The method consisted of determining the link between independent (firm innovation) and dependent (firm performance) variables, including their power and trajectory. If the relationship is significant, then mediation analysis of each sub-variables (resources, internal organization, training, and employee mean age) is done. It employed the Sobel test to determine whether there was a full or partial intervening influence. If the Z value is reasonably above or equal to 1.96, the mediating effect becomes significant at a p-value threshold of 0.05. If there is a mediation effect, if the regression model incorporates M, the influence of X on Y diminishes or at least weakens. If the impact of X on Y is full mediation M disappears; otherwise, partial mediation. This was done initially for the combined firm characteristics, then for each of the firm characteristics sub-constructs and compared the results.

In the first step, the performance of manufacturing firms was regressed against firm innovation (that is $FP = \beta_0 + \beta_1 INN + \epsilon$) to confirm that innovation was a significant predictor. β_1 was confirmed as significant. Table 1 shows that firm innovation influenced how well Kenyan manufacturing firms performed. This indicated that it was possible to proceed to step two.

**TABLE 1
MULTICOLLINEARITY TEST**

Variables	Collinearity Test	
	Tolerance	Variance Inflation Factor
Firm innovation and firm performance	1.000	1.000
Firm innovation, firm characteristics and firm performance	0.580	1.723
Firm innovation, external environment and firm performance	0.155	6.462
Firm innovation, firm characteristics, external environment and firm performance	0.150	6.650

Source: Research Data 2022

In step two, firm characteristics were regressed against the performance of manufacturing firms (that is $FC = \beta_0 + \beta_1FP + \varepsilon$) to confirm that the performance of manufacturing firms was a highly reliable predictor of mediating variable according to Table 2. Table 2 reflects that the performance of manufacturing firms was significant; firm efficiency of manufacturing companies in step two became crucial since p value was below 0.05, β_0 , was 1.763 while β_1 0.419. The unstandardized coefficient standard error was .037.

**TABLE 2
REGRESSION MODEL SUMMARY FOR FIRM CHARACTERISTICS AGAINST
FIRM-PERFORMANCE**

Model-Summary ^b						
Model	R	R-Square	Adjusted Square			
1	.646	.417	.414			
Goodness of Fit ANOVA						
-Model4-		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5366.751	21	5366.751	128.751	.000 ^b
	Residual	7492.744	180	.41.626		
	Total	12859.495	181			
a. Dependent Variable1: FirmChar						
b. Predictors: (Constant), Perf.						
Coefficients ^a						
1Model		Unstandardized		Standardized	T value	Sig.
		B	Std-Error	Beta		
1	(Constant)	1.763	.127		13.834	.000
	Perf	.419	.037	.646	11.355	.000
a. Dependent Variable: FirmChar						

Source: Research Data 2022

The next step was undertaken by regressing performance of manufacturing firms against firm innovation and firm characteristics (that is $FP = \beta_0 + \beta_1INN + \beta_2FC + \varepsilon$) and the results indicated within Table 3.

TABLE 3
REGRESSION MODEL SUMMARY FOR FIRM PERFORMANCE AGAINST INNOVATION
ELEMENTS AND FIRM CHARACTERISTICS

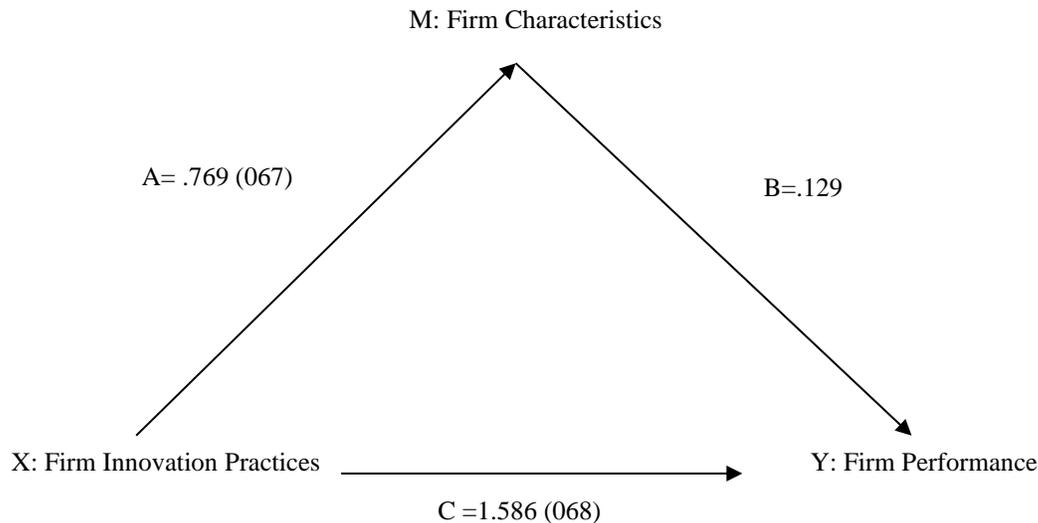
Model Summary ^b						
Model	R	R-Square	Adjusted-R-Square			
1	.925	.855	.853			
Goodness of Fit ANOVA ^{1a}						
Model		Sum-of-Squares	df	Mean-Square	F	Sig.
21	Regression	216.249	21	108.136	527.707	.000 ^b
	Residual	36.680	179	.205		
	Total	252.952	181			
a. Dependent Variable: firmPerf						
b. Predictors: (Constant), fiInnoPr						
Coefficients ^a						
Model		Unstandardized Coefficients	Std Error	Standardized Coefficients	T-value	Sig.
		B		Beta		
1	(Constant)	-2.672	.186		-14.052	.000
	FirmChar	.129	.058	.083	2.235	.027
	FiInnoPr	1.586	.068	.868	23.243	.000
a. Dependent Variable: FirmPerf						
b. Predictors: (Constant), FiInnoPr, FirmChar						

Source: Research Data 2022

According to Table 3, firm innovation practices (technological innovation, market innovation, process innovation, and product innovation) explained 85.5 variations about the firm performance, which was a high explanatory power of firm performance. 14.5 percent of all changes in firm performance were caused by other factors left out of the investigation. Considering the p-figure (0.000) was below the level of significance criterion ($\alpha = 0.05$), the model was significant overall, which means that the null hypothesis (H_2) was disproved and it was determined that firm characteristics significantly influenced the link between firm innovation and firm performance in Kenyan manufacturing firms.

The final test was to determine if the indirect effect was statistically significant. The Sobel test as demonstrated in Figure 1, was done to establish this.

FIGURE 1
SOBEL TEST CONCEPTUAL MEDIATION MODEL



Source: Research Data 2022

The indirect effect analysis for X, M, and Y yielded the following results:

Test statistic	2.18331288
Std. Error	0.04531783
P-value	0.02901278

A single crucial factor, in this case, is the p-figure, which is below 0.05, indicating that using an indirect effect between firm innovation and firm performance through firm characteristics is statistically significant. A deduction that firm characteristics partly mediate the relationship-between-firm innovation and firm performance of manufacturing within Kenya was made, and the null hypothesis H_2 was rejected.

DISCUSSION OF FINDINGS

The findings revealed that combined firm characteristics partially mediated the relationship between firm innovation and performance. This means that firm performance is not only influenced by firm innovation but also by firm characteristics. More specifically, the evaluation of firm characteristics based on its sub-constructs, resources, leverage level of education of CEOs (training), internal organization, and employees' mean age structure revealed mixed results where internal organization and employees' mean age significantly affected the relationship between firm innovation and firm performance while resources and training failed the test. Notably, internal organization and employee mean age in terms of time frame and action ability are simpler than the rest. This is supported by Kim and Lee (2018) who analysed how the characteristics of a firm are related to absorptive capacity and firm performance in SMEs. They held that some firm-specific characteristics inherently influenced the growth of absorptive capacity, which directly affected the firm performance, and they particularly considered the firm size and age of the firm. However, this contradicts the current study, where both holistic and part analysis of firm characteristics was embraced.

Research by Nkundabanyanga, Mugumya, Nalukenge, Muhwezi, and Najjemba (2020) and Ahmed, Feeny, and Posso (2016) also looked at the interconnection between firm characteristics and firm performance to some degree but failed to look at the influence of firm characteristics and the relevant elements on this relationship. The findings of this study, however, explain the influence of firm characteristics using the RBV theory in that, since the goal of operational innovation in a firm is to boost

organizational efficiency and effectiveness and ultimately lead to customer satisfaction, it is in the best interest of the firm to ensure its resources are competitive. According to this theory, competitiveness ensures resources such as human resources, financial resources, and know-how are valuable, rare, inimitable, and immovable (Penrose, 1959). Collectively, these influence the firm's characteristics (Nantee & Sureeyatanapas, 2021), which, as highlighted above, are the drivers that inform the inner workings of an organization and its objectives, a result of which are new and improved products, technology, and processes that boost firm performance.

Additionally, the significance of the firm characteristics on the level of innovation and firm performance in Kenyan manufacturing firms was investigated by looking at the mediating influence of resources, internal organization, training, and employee mean age on innovation. These present non-financial factors, whose implications can be explained using Schumpeter's innovation theory that advocates for policy changes and creative reorganization in these manufacturing firms. Through training and organizational learning, for example, the capabilities of human resources can be enhanced, making them more innovative (Amarakoon, Weerawardena, & Verreynne (2018). This also highlights the stakeholder theory, whereby internal support for the firm's needs exists. Contrarily, through strategic steps such as continuous performance reviews as a way to address the financial metrics of firm performance, production costs end up falling and revenues rise, further highlighting the overarching impact of firm characteristics on the relationship between innovation and performance.

CONCLUSION

This research assessed the influence of firm characteristics on the relationship between firm innovation and the performance of manufacturing firms in Kenya. This was related to the hypothesis (H₂), which explored the influence firm characteristics have on the relationship between firm innovation and firm performance for Kenyan manufacturing firms. The study's findings showed that firm characteristics have a sizable impact on the association between innovation and firm performance as these characteristics act as the driving force of operating activities, and ultimately, the results yielded.

The results accent existing bodies of literature in management studies that look at the relationship between firm characteristics, performance, and innovation, albeit focusing on Kenyan manufacturing firms. Aside from implications for academia, industry stakeholders can utilize these findings to address challenges and improve industry performance, especially since the manufacturing sector is currently on a downward slope. For instance, a takeaway for regulators would be that exploiting the various variables of firm characteristics is necessary to promote innovation and, hence, firm performance. Important to note is that this may be unique to every organization, as each organization's characteristics have varying levels of resources and capabilities.

AREAS FOR FURTHER RESEARCH

Since innovation is a long-term process based on risk and reward, a suggestion for further research would be to investigate the influence of firm characteristics on operational innovation and firm performance in the face of changes in the business environment; case in point, the Covid-19 pandemic. The results of such a study would be more impactful for academia, policy, theory, and practice as they will address the current and likely future. Besides, with the advent of different strategies for enhancing firm characteristics, the study will highlight the risks and opportunities of using competitive strategies for firm performance. Again, using variations of sample sizes would likely yield different results, which might provide more conclusive results for the study.

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