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The Role of Product Innovation and Entrepreneurial Passion on Performance of Manufacturing Pharmaceutical Companies in Kenya

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Abstract: *Research on the influence of entrepreneurial passion on production innovation and firm performance based on the contingencytheory is rare. This is highly unusual given that the origin of firm-level entrepreneurial behavior demonstrable in decision-making styles, methods, process and practices isnormally traced from the upper echelons (the CEO/Management) of the firm. This research aims to investigate the moderating effect of entrepreneurial passion in the connection between product innovation and performance of pharmaceutical manufacturing firms in Kenya.A survey of 150 firm owners/managers from different parts of Kenya was conducted. A pilot study was conducted to verify reliability and validity of the questionnaire through statistical description and analysis. Then exploratory factor analysis and confirmatory factor analysis (CFA) were conducted to test the correlation between variables. Finally, partial least squares structural equation modeling (PLS-SEM) technique was run in R-studio using R packages plspm, and semPLS to verify the correctness of the proposed hypothesis and model. The results show that the designed questionnaire had good reliability [the correction item total correlation coefficients (CITC) of all scales are greater than 0.3, values of Cronbach's α are higher than 0.6], the validity (all inventory accumulation explanation degree are higher than 50%) and the fitting, normed fit index (NFI) greater than 0.9, goodness of fit (GoF), and Standardized Root Mean Square Residual (SRMR) less than 0.08, dULS and dG< than the 95% bootstrapped quantile (HI 95% of dULS and HI 95% of dG).The results suggest that product innovation has a significant positive effect on performance. The study also suggest that entrepreneurial passion is a significant moderator of the relationship between product innovation and performance. The moderation {R^2 change of 0.098, [$F(1, 113) = 2.576$, $p < 0.05$]}, is such that firms with higher levels of entrepreneurial passion tend to achieve greater performance from implementing product innovation and vice versa.Thismeans pharmaceutical manufacturing firms in Kenya that invest in product innovation, particularly in areas such as new product formulation, materials and design are more likely to experience new levels of high performance in the market place.The study recommends that, the Government of Kenya should establish an industrial innovation hub only for pharmaceutical manufacturing firms. This will promote Kenya as a pharmaceutical innovation hub where affordable medicinal drugs are produced.Nonetheless, this research study was cross-sectional and based only on pharmaceutical industry in Kenya. Future research is expected to be comparative, consider use of longitudinal data and establishoptimal points for these constructs.*

Keywords: ***Innovation, production innovation, firm performance, manufacturing pharmaceutical companies***

I. Introduction

Pharmaceutical industry is a good subject for studying innovation. The industry is research and development (R&D) intensive with pharmaceutical firms in OECD countries spending on average nearly 12% of their gross value added on firms' R&D and registering high patenting rate of about 80% of all pharmaceutical products

(Zhai & Ghosal, 2022). This makes the industry a good candidate for exploring product innovation constructs. According to Unsal and Rayfield (2019), despite the progress in the pharmaceutical industry, the rate of product innovation is still slower than the global needs. Therefore, additional studies on understanding the industry's innovation strategies and their impacts are necessary and meaningful (Zhai & Ghosal, 2022). Pharmaceutical manufacturing in Kenya is anindustry the Kenyan Government is interested in and committed to making successful.Kenya exports a significant percentage of its pharmaceutical products to its immediate neighbors, such as Tanzania, Uganda, and Rwanda.Despite the promising and enormous growth in Kenya's pharmaceutical business, the sector still faces numerous issues and difficulties. The industry is mostly focused on creating medications in the dosage form. Only a few pharmaceutical companies in Kenya have made the necessary investments in facilities and machinery to comply with World Health Organization (WHO) Good Manufacturing Practice (GMP) requirements, which is one of the key concerns.

Entrepreneurial passion is at the heart of entrepreneurship and can foster creativity, draw attention to new patterns of information, and promote the discovery and exploitation of promising opportunities(Kiani, Yang, Ghani & Hughes, 2021).Entrepreneurial passion is the whole or part of intense feelings with various differentiated and complicated feelings, which aim at or around a specific goal, and have motivational effects (Cardon, Zietsma&Saparito, 2005). Entrepreneurially passionate owner-CEOs 'live' their passion which resonates with the logic of upper echelon theory that, in time, the firm will come to reflect its senior management (Kiani, Yang, Ghani & Hughes, 2021).Entrepreneurs who love their work with passion indirectly leads to sales and employment growth through communicated vision, goals, and self-efficacy (Lee & Herrmann, 2021).

Empirical evidence is mounting that passion is an important part of entrepreneurship, contributing to behavior and outcomes for entrepreneurs, employees, and ventures.Passion is important in entrepreneurship because it can "fuel motivation, enhance mental activity, and provide meaning to everyday work" (Chebo& Kute, 2018). Entrepreneurial passion is a powerful driving force behind product innovation, revolutionizing manufacturing firms. Passionate entrepreneurs possess an unwavering enthusiasm for their ventures, and this fervor plays a crucial role in propelling them towards creative and groundbreaking solutions.This boldness allows them to explore uncharted territories, embrace emerging technologies, and disrupt established norms, resulting in innovative products that stand out in the market (Agustia, Haryanto, Permatasari, & Midiantari, 2022).

However, Entrepreneurial Passion at best represents a willingness to engage in innovative endeavours and entrepreneurship but the ability of the firm to do so depends on an organisation-wide set of methods, process and practices to enable entrepreneurship. This study therefore seeks to establish the influence of entrepreneurial passion on product innovation and firm performance.

A growing volume of research indicates that entrepreneurial passion, which involves intense positive emotionsand a meaningful identity connection is central to the entrepreneurial experience andventure-related outcomes (Huyghe, Knockaert, &Obschonka, 2016). But, passion alone will not makeowner/managers to engage on entrepreneurial activity.

Schumpeter (1934) defined product innovation as introducing a good new product or service with new/improved quality that consumers are unfamiliar with. While, Wan, Ong, &Lee(2016) define product innovation as introducing new goods or services to meet the needs of either existing or potential customers or markets.Product innovation can take one of three different forms. Creating a new product, enhancing the functionality of an existing productor adding a new feature to an existing product. Product innovation may be sparked by changes in client demands, technical breakthroughs, or outmoded product designs. Product innovation results from innovation activities or research and development processes carried out by firms resulting in changes in a product (Agustia et al., 2022).

Product innovation is manifested at various levels of production, which according to Maier (2018) may include the change of concept, which is based on a new idea, whether or not supported by a new technology. Making the product using other materials and components with better characteristics than the previous one. A new design, which often means more than just a change of shape or appearance and may involve ergonomic aspects or manufacturing changes. And new services that accompany the product or find new uses of the product, as such or with minimal changes.

Therefore, this paper adds to the existing knowledge by utilizing some of those factors to evaluate the degree to which individuals who are passionate about founding a businesses are actually intending to do so under certain circumstances.The paper also advances the literature in the field by examining the role entrepreneurial passion plays in the relationship between product innovations and firm performance. In the sections that follow, the authors define key concepts and theoretical background of the paper. Then, through a questionnaire survey, the influence of passion on entrepreneurial behavior and entrepreneurial performance was discussed. Then, hypotheses are formulated and integrated into a conceptual model. Finally, the empirical study is presented with results of the proposed model, followed by a discussion of the findings and conclusions.

II. Theoretical Background and Hypotheses Development

Contigency Theory

Child (1977) proposed the contingency theory method of researching organizational behavior, citing that explanations are provided for how contingent elements like technology, culture, and the surrounding environment affect the structure and operation of organizations. Contingency theory is predicated on the idea that not all organizations require the same organizational structure. Organizational effectiveness is based on how well the organization's size, structure, information system, and technology match the environment's volatility and other factors (Reid & Smith, 2000).

Contingency Theory supports entrepreneurial passion studies and pharmaceutical manufacturing firm performance because it holds that organizational effectiveness in fostering innovation is reliant on a fit or match between the kind of innovations, new tech, environmental variability, the size of the organization, the features of the organizational structure, and its information system. A company can achieve its objectives, such as greater profitability, by increasing the performance and success rate of any innovative activity carried out by its senior management and employees.

Product Innovation and Performance

Schumpeter (1934) defined product innovation as introducing a good new product or service with new/improved quality that consumers are unfamiliar with. Product innovation can take one of three different forms: creating a new product, like the Fitbit or Amazon's Kindle; enhancing the functionality of an existing product, like the iPhone 11's digital camera; or adding a new feature to an existing product, like power windows. Product innovation may be sparked by changes in client demands, technical breakthroughs, or outmoded product designs.

In their research, Sidek&Rosli (2017) found that product innovation is one of the drivers of firm performance that may be used to raise product quality, which raises firm competitiveness. Belderbos, Duvivier, &Wyne (2009) discovered a significant positive association between the diffusion of innovations, particularly product innovations, and the export intensity of enterprises in their study on innovation and export competitiveness in Flemish firms. In SMEs in Turkish Science and Technology parks, Ar&Baki (2016) performed a study on the drivers and performance consequences of product innovation. The results showed that product innovation has a

positive and substantial influence on firm performance. In their study on the impact of innovation on the performance of small and medium manufacturing firms in Malaysia, Sidek&Rosli (2017) used a sample of 284 SMEs. Product innovation favorably affects firm performance, according to research findings.These researchers discovered solid proof that productivity is increased through product innovation.

Therefore, the hypothesis about the relationship between product innovation and firm performance is:

H_1: Product innovation has a positive and significant influence on firm perfomance

Entrepreneurial Passion Concept

The capability and effectiveness of innovation depend on entrepreneurial passion.Entrepreneurial passion is defined as "consciously accessible intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful for the self-identity of the entrepreneur" (Cardon, Wincent, Singh, and Drnovsek 2009: 515).Cardon, Zietsma&Saparito (2005) found that after carefully examining the literature that has already been written, scholars' understanding of the concept of entrepreneurial passion can be summed up as follows: passion is the whole or part of intense feelings with various differentiated and complicated feelings, which aim at or around a specific goal, and have motivational effects. Based on the precise perspective Cardon advanced, passion is not only an intensely positive feeling but also a positive feeling conveyed by something significant to a person's sense of self.

The passion to create value and make an impact is fundamental to the nature of the entrepreneur (Ma and Tan, 2006: 711). In other words, entrepreneurial passion can lead to a narrower focus on the actual venture creation, without necessarily considering any contingencies or obstacles attached to it. Cardon et al. (2009) assert that individuals who experience entrepreneurial passion have positive intense feelings in relation to the entrepreneuring activities they are involved in and a strong motivational drive to follow those feelings.

Therefore, passion driven entrepreneurs have intensely positive feelings for desired goals and will not stop thinking and discussing their ideas, and are active, inspiring resources and others to turn their ideas into reality (Chen, Yao &Kotha, 2009). The current study argues that innovation being the primary function of an entrepreneur, its success can either be driven or derailed by the extent of enthusiasm exhibited by the entrepreneur. Meaning, product innovation is expected to be moderated by entrepreneurial passion.

In this way, Entrepreneurial passion becomes a major trigger and maintaining factor for product innovation. Based on the discussion above, the second hypothesis is as follows:

H_2: Entrepreneurial passion has a positive and significant moderation in the relationship between product innovation and performance of pharmaceutical manufacturing firms in Kenya.

III. Model Construction

The relationship model of production innovation, entrepreneurial passion and performance was contructed as shown in figure1:

Wan et al. (2016) define product innovation as introducing new goods or services to meet the needs of either existing or potential customers or markets.In their research, Sidek&Rosli (2017) found that product innovation is one of the drivers of firm performance that may be used to raise product quality, which raises firm competitiveness.Product innovation results from innovation activities or research and development processes carried out by firms resulting in changes in a product (Agustia *et al.*, 2022). Product innovation is manifested at various levels of production, which according to Maier (2018) may include the change of concept, which is

based on a new idea, whether or not supported by a new technology. Making the product using other materials and components with better characteristics than the previous one. A new design, which often means more than just a change of shape or appearance and may involve ergonomic aspects or manufacturing changes. And new services that accompany the product or find new uses of the product, as such or with minimal changes.

Performance management must include performance measurement. People use measurement to translate complex reality into streamlined numerical notions that are simple enough to convey and act upon (Mangos & Arnold, 2016). Mangos & Arnold (2008) assert that the foundation of effective management is simplifying reality through measurement. Similarly to this, Frese (2018) contends that performance measurement is fundamental to the performance management process and is important for its effective and efficient operation. It is possible to describe performance measurement (PM) from a processual, technological, and business standpoint (Chenhall&Langfield-Smith, 2007; Grafton, Lillis, & Widener, 2010).

In an organization, there are three ways to assess firm performance. The first is the goal approach, which asserts that a company pursues specific, measurable objectives. According to this method, performance is measured by how well these objectives were achieved. The second strategy is the systems resource strategy, which characterizes performance as the interaction between a company's environment and itself. This idea gauges an organization's performance by how well it can protect the environment's scarce and priceless resources. The process view is the third strategy, and it defines performance in terms of how an organization's human resources behave (Waiganjo, Mukulu, &Khariri, 2016).The study used a composite of efficiency, profitability and growth measures index to assess performance. Efficiency measures were critical in establishing the functional units' ability to quickly and cost effectively convert resources into goods and services of value to the customers. Secondly, profitability measured how good are the strategic business units in creating shareholder value (profitability). Finally, growth measured the level of top leadership and management in creating overall firm growth and economic benefits.

Baron & Hannan (2002) indicate that entrepreneurial passion is the sense of self-identity and belonging that people have in new companies. Passionate entrepreneurs consciously engage in entrepreneurial activities because of that intense feeling, which is closely related to self-identity (Breugst, Domurath, Patzelt, &Klaukien, 2012).

Successful entrepreneurs' entrepreneurial passion is especially evident and drives them to approach their daily tasks with passion, much like "a fire of desire." (Cardon, Gregoire, Stevens, and Patel 2013). Chen, Yao, &Kotha (2009) suggested that Passion driven entrepreneurs have intensely positive feelings for desired goals, will not stop thinking and discussing their ideas, and are active, inspiring resources to turn their ideas into reality. Entrepreneurs passionate about what they do typically exhibit "cartoon-like" faces, energizing body language, and an abundance of it (Huyghe et al., 2016).

Cardon and colleagues operationalized this construct into passion for inventing- searching for a new business opportunity in new markets, founding- establishing a new business, and developing an already existing one (Cardon, Gregoire, Stevens, and Patel 2013).

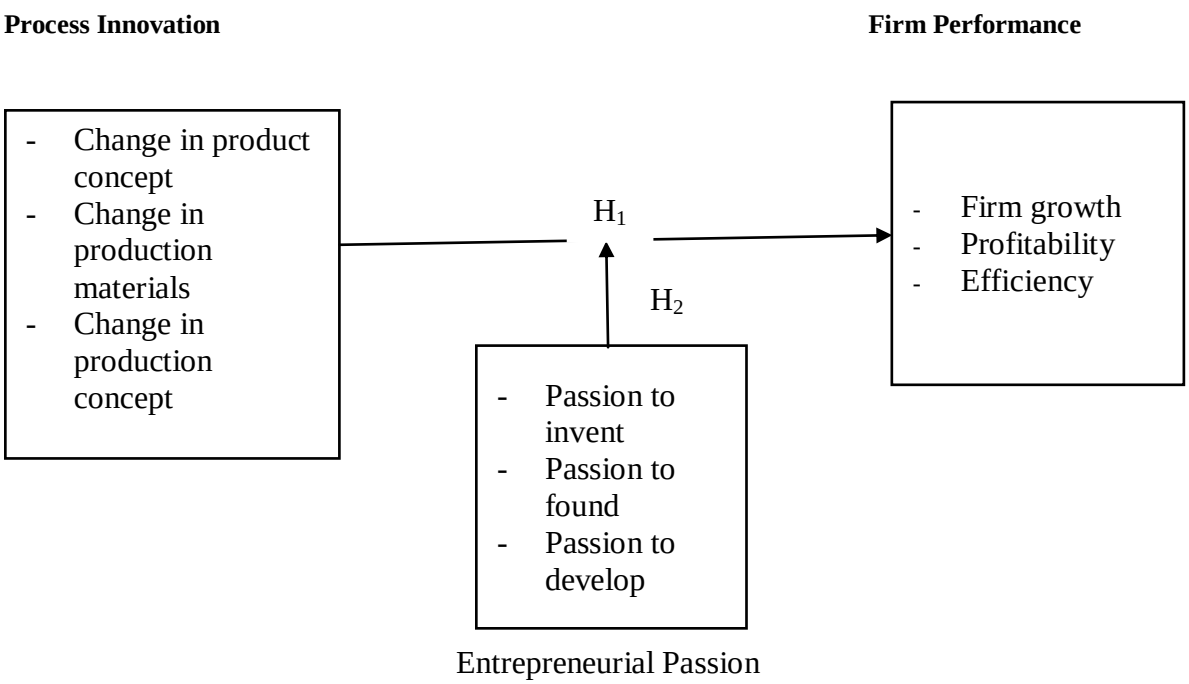


Fig. 1 Integrated Research Model

IV. Methodology

This study, therefore, adopted convergent parallel mixed methods (Creswell, & Creswell, 2018).This was preferred because it allowed the researcher to collect quantitative and qualitative data concurrently and integrate the information while interpreting the results.

To address the research hypotheses, a tailored designed survey with a structured questionnaire targeting top management staff of the pharmaceutical manufacturing firms in Kenya. The study was a census of all the 30 registered pharmaceutical manufacturing firms in Kenya. The unit of analysis was the 30 pharmaceutical manufacturing firms in Kenya, with the unit of observation being 150 employees. Thus, the units of observation were more than one in each entity forming a two-level hierarchical structure.The unit of analysis was the manufacturing pharmaceutical companies while the units of observations were the top-level management.

Data was collected using semi-structured questionnaires with both closed and open-ended questions. The questionnaire was self- administered to top level managers of the companies. Five departmental heads were purposively selected from 27 pharmaceutical firms resulting in135 participants.

Prior to the full-scale survey launch, the survey instrument was pretested among 3 pharmaceutical manufacturing firms. They were asked to assess the questionnaire evaluating both grammatical and stylistic aspects, as well as face validity and the appropriateness of the scales. This resulted in some minor corrections that were implemented accordingly in the questionnaire.

Empirical data was collected from the respondents using a semi-structured questionnaire which had both closed- and open-ended questions. The closed ended questions comprised of a 5-point Likert scale restricting the responses to options provided (Jarvenpaa, Tractinsky, & Vitale, 2000). Use of closed ended questions was preferred to reduce answer variability and boost response rate. Open-ended questions were used to provide room for respondents' comments and suggestions (Cooper & Schindler, 2003).The questionnaires were administered through the drop-and-pick later method to give the respondents time to go through them and appropriately respond to the questions therein.

In this study, IBM Statistical Package for Social Sciences (SPSS) for windows 10 software was used for data cleaning, specifically, for variable and case screening, missing data analysis and imputation for missing cases where applicable and software R-Gui (R 4.1.2 version) which is an open-source programming language for statistical calculations and graphic visualization were used for data analysis.

The data analysis technique used was a variance-base partial least squares structural equation modeling (PLS-SEM) technique with R packages *plspm*, and *semPLS*run in *R*-studio, an Integrated Development Environment (IDE) for R-Gui. PLS-SEM was considered better than the regression analysis because it shows the direct and indirect impact of the independent variables (Ramli *et al*., 2019). Moreover, variants-based SEM or PLS was chosen because the research purpose was prediction and explanation of target constructs (Hair *et al*., 2017).

The study used the R packages to analyze the data measurement model.Tests were conducted to first to check composite reliability (CR), average variance extracted (AVE), heterotrait–monotrait (HTMT) ratio and Cronbach's alpha (CA). Second , this study analysed the theoretical model by testing correlation and discriminant validity(DV). Moreover , this study tested common method bias (variance inflation factor (VIF), F2, R2 (coefficient of determination) and model fits (standardized root means square residual (SRMR), Normed Fit Index (NFI), squared Euclidean distance(d_LS) and the Geodesic distance (d_G) and Goodness-of-Fit (GoF). Lastly, PLS-SEM was performed in this study to test the proposed hypothesis.

V. Results

The study received 113 dully filled questionnaires from 23 companies. This translated into 76.6% response rate, which was considered adequate (Lund, 2021).

Measurement Model

Cronbach's alpha: CA was used to determine the reliability of the scales adopted in this study. The measurement scales' validity was significant, with values of 0.787 for Product innovation, 0.773 for Entrepreneurial Passion and 0.815 for performance (Table 1).The study met the CA threshold ranged from0.7 to 0.9.

Composite reliability (CR) was presented using rhoC. The study found that CR (rhoC) values for construct were above the threshold 0.7 (Hair et al., 2019),with values of 0.783 for Product innovation, 0.868 for Entrepreneurial Passion and 0.889 for performance (Table 1).

Convergent validity (AVE): (Hair et al., 2019),suggested a convergent validity threshold of at least 0.50. AVE for the present study was significant, with values of 0.55 for product innovation, 0.687 for Entrepreneurial Passion and 0.727 for performance
ranged from 0.55 to 0.727 (Table 1).

Table 1 Measurement Model

Second order Construct	First order construct	Items	Loadings	Alpha (CA)	rhoC (CR)	AVE	rhoA
Product Innovation				***0.787***	***0.783***	***0.55***	***0.627***
	Change in Concept	CIC1	0.857	0.863	0.857	0.551	0.875
		CIC2	0.802				
		CIC3	0.625				
		CIC4	0.546				
		CIC5	0.83				
	Change in Materials	CIM1	0.853	0.87	0.863	0.561	0.872
		CIM2	0.637				
		CIM3	0.811				
		CIM4	0.759				
		CIM5	0.664				
	Change in Design	CID1	0.637	0.84	0.84	0.515	0.848
		CID2	0.702				
		CID3	0.836				
		CID4	0.661				
		CID5	0.742				
Entrepreneurial Passion				***0.773***	***0.868***	***0.687***	***0.776***
	Inventing	INV2	0.902	0.903	0.904	0.758	0.908
		INV3	0.915				
		INV4	0.789				
	Founding	FOU1	0.748	0.87	0.871	0.628	0.874
		FOU2	0.83				
		FOU3	0.727				
		FOU4	0.856				
	Development	DEV1	0.829	0.932	0.922	0.696	0.933
		DEV2	0.804				
		DEV3	0.879				
		DEV4	0.788				
		DEV5	0.844				
		DEV6	0.858				
Performance				***0.815***	***0.889***	***0.727***	***0.839***
	Efficiency	EFF1	0.845	0.938	0.937	0.714	0.938
		EFF2	0.801				
		EFF3	0.818				
		EFF4	0.911				
		EFF5	0.846				

Growth	GR1	0.847	0.884	0.88	0.599	0.892
	GR2	0.656				
	GR3	0.828				
	GR4	0.767				
Profitability	PR1	0.87	0.893	0.893	0.679	0.905
	PR2	0.848				
	PR3	0.761				
	PR4	0.809				

Discriminant validity was assessed using Heterotrait–monotrait (HRMR) ratio: Scholars suggest using HTMT to assess the multicollinearity issue in the data, which should not be higher than 0.9 (Hair et al., 2010). This study met the threshold, as exhibited in Table 2.

Table 2 Discriminant Validity

Performance	**Product**	**Entrepreneurial Passion**
Performance		
Product Innovation	0.494	
Entrepreneurial Passion	0.495	0.265

Assessment of Structural Model

Model's predictive power (R2): Sarstedt et al. (2014) suggested that the R2 measures model's predictive power. Effect size (F2): Aiken & West's (1991) suggested values of 0, 0.02, 0.15, and 0.35 depicting none, small, medium, and large effect sizes of moderation, respectively. As suggested, if the value of F2 is less than 0.02.

Variance inflation factor (VIF): the present study dealt with collinearity and standard method bias through VIF, which is defined as the reciprocal of tolerance. This study was considered bias-free with no values equal to or greater than 3.3. As suggested by the scholars Kock (2015) , this study was considered bias-free with no values equal to or lower than 3.3 (Table 3).

Table 3 Variance Inflation Factor (VIF)

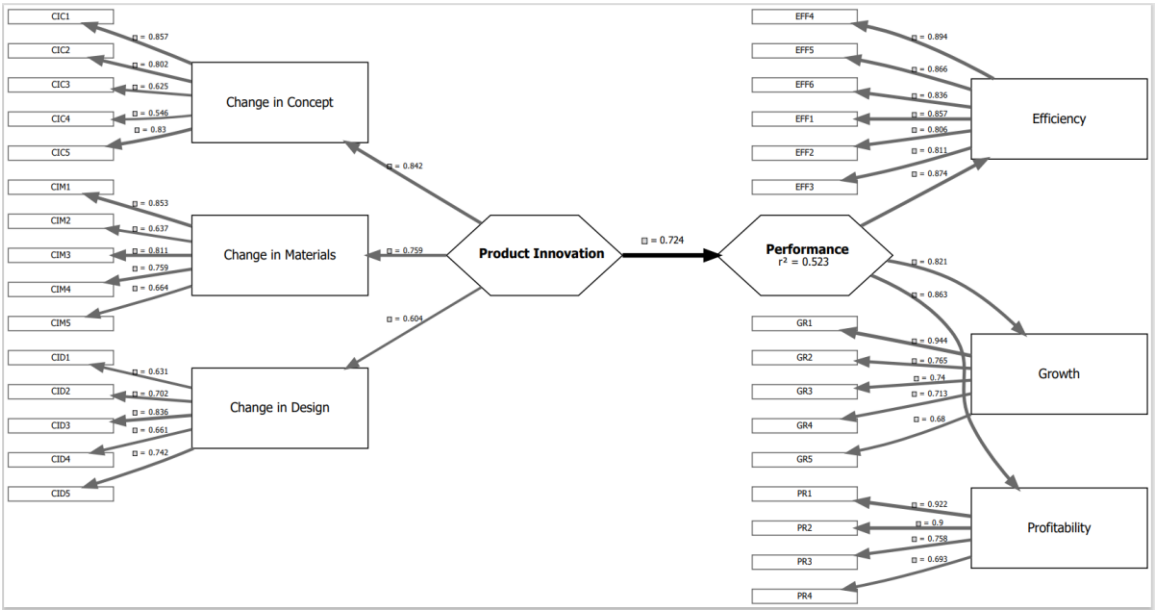
Second order constructs	**First order construct**	**VIF Values**
Product Innovation		1.852
	Change in Concept	1.856
	Change in Materials	1.939
	Change in Design	1.281
Entrepreneurial Passion		1.227
	Inventing	1.219

	Founding	2.174	
	Development	1.56	
Performance			2.009
	Efficiency	1.484	
	Growth	2.085	
	Profitability	1.707	

Model Fits :The study employed the following model fitness indices, normed fit index (NFI) whose threshold should be greater than 0.9, goodness of fit (GoF), and Standardized Root Mean Square Residual (SRMR) which should be less than 0.08, dULS and dG< than the 95% bootstrapped quantile (HI 95% of dULS and HI 95% of dG)(Henseler et al., 2016).

Hypothesis Testing

PLS-SEM results showed the R^2 was 0.523, stipulating that Product innovation explained 52.3% of the variance in performance as shown in figure 4.3. The SRMR value was 0.028 (< 0.08) and the NFI was 0.912(> 0.90) and the dULS< bootstrapped HI 95% of dULS and dG< bootstrapped HI 95% of dG indicating the data fits the model well. The GoF of the model was 0.512, which shows that empirical data fits the model satisfactory and has substantial predictive power in comparison with baseline value. This is seen in figure 2.



$\chi^2 = \mathbf{1980}.12$; NFI = .912; SRMR = .028; $d_{ULS} = 1.125$; $d_G = .765$; GOF=.512

Figure 2 Sigificance Test result of the Effect of Product Innovation on Performance

As shown in table 4, product innovation (β = 0.724, p< 0.05), was positively related to performance. The beta coefficient of 0.724 indicates that there is a moderate-to-strong effect of product innovation on performance, and the p-value of less than 0.05 indicates that the relationship is statistically significant at a 95% confidence level. Thus, $H_{01}$was rejected.

Table 4 Regression Coefficients for Product Innovation

Hypothesis	Path	Std Beta	Std Error	t-values	P values	2.5% CI	97.5% CI
H1	Product innovation -> Performance	0.724	0.153	4.729	0.000	0.462	1.029

Moderation of Entrepreneurial Passion on Product Innovation and Firm Performance.

The study then sought to assess the effect of product innovation as well as the moderating effect of entrepreneurial passionon the relationship between product innovation and firm performance. The study showed that the effect of product innovation on performance was 0.651. The SRMR value was 0.035 (< 0.08) and the NFI was 0.937 (> 0.90) and the dULS< bootstrapped HI 95% of dULS and dG< bootstrapped HI 95% of dG indicating the data fits the model well. The GOF of the model was 0.510, which shows that empirical data fits the model satisfactory and has substantial predictive power in comparison with baseline value.

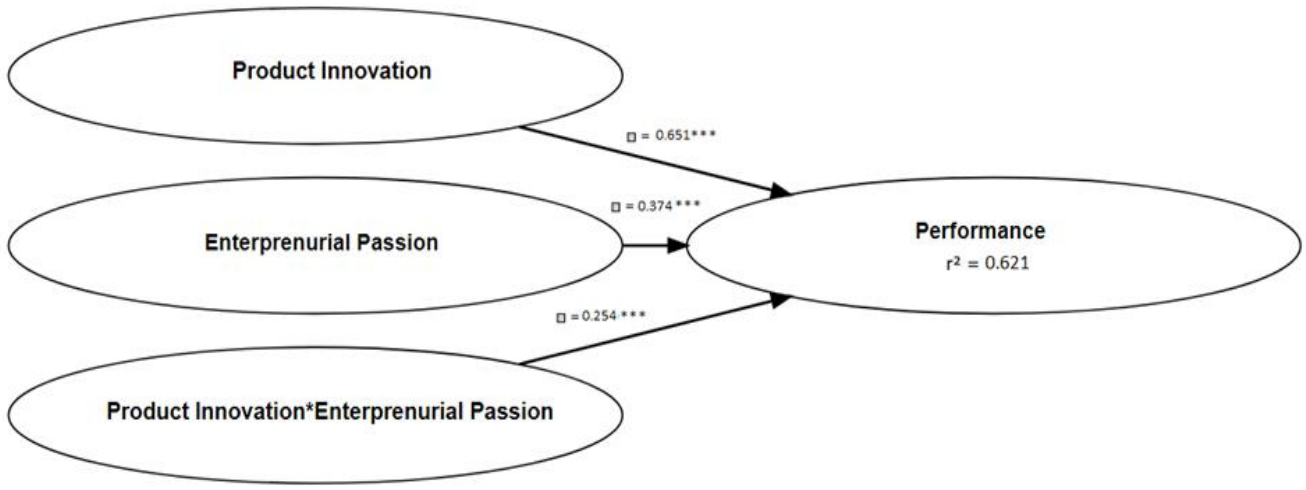


Figure 3 Model Fit for the Effect of Product Innovation and the Moderating Effect of Entrepreneurial Passion

Table 5 shows that the interaction term (Product Innovation*Entrepreneurial Passion) has a positive and significant effect on firm performance of 0.254 (p<0.05). Further, the effect of product innovation had a significant positive effect on firm performance (0.651, p<0.05). The confidence interval of 95% also did not show any intervals straddling a 0, thus confirming our findings.

Table 5 Regression Weights of Moderation of Entrepreneurial Passion on the Relationship Between Product Innovation and Performance

Path	Std Beta	Std Error	t-values	P values	2.5% CI	97.5% CI
Product innovation -> Performance	0.651	0.078	8.346	0.000	0.423	0.737

Entrepreneurial Passion -> Performance	0.374	0.052	7.192	0.000	0.152	0.422
E. Passion*Product -> Performance	0.254	0.079	3.215	0.002	0.115	0. 328

Table 6 shows the testing of goodness of fit. The findings indicate that the inclusion of the interaction term resulted into an $\boldsymbol{R^2}$ change of 0.098, [$\boldsymbol{F}$ (1, 113) = 2.576, $\boldsymbol{p}$< 0.05], showing presence of significant moderating effect. That is, the moderating effect of Entrepreneurial Passion gained 9.8% variance in Performance, above and beyond the variance by process innovation. The R-Square excluded comprises the effect of product innovation on Performance. Based on Aiken & West's (1991) proposition, 0, 0.02, 0.15, and 0.35, respectively, constitute none, small, medium, and large effect sizes of moderation. The results indicate a medium effect size.

Table 6 Goodness of Fit-Regression of Moderated Product Innovation on Performance

Measure	Included	Excluded	F-squared	Effect size
R-squared	0.651	0.523	0.2586	**Medium**
R-squared change	*0.098*			
F-squared change	*2.576*			
P value	*0.011*			

The findings suggest that entrepreneurial passion has a significant moderating effect on the relationship between product innovation and performance, with a medium effect size of 9.8%, therefore the null hypothesis of no effect was rejected. The results indicate that for an average level of entrepreneurial passion, the relationship between product innovation and performance is 0.651. However, when considering the moderating effect of entrepreneurial passion, the positive and significant effect on performance is increased to 0.905 (0.651 + 0.254). This suggests that firms with higher levels of entrepreneurial passion may experience even greater benefits from implementing product innovation strategies.

Figure 4 shows that for higher levels of Entrepreneurial passion (i.e., for every standard deviation unit increase of Entrepreneurial passion), the relationship between product innovation and performance increases by the size of the interaction term (i.e., 0.651 + (+0.254) = 0.905). On the contrary, for lower levels of Entrepreneurial passion (i.e., for every standard deviation unit decrease of Entrepreneurial passion), the relationship between product innovation and performance decreases the size of the interaction term (i.e., 0.651 − (+0.254) = 0.397).

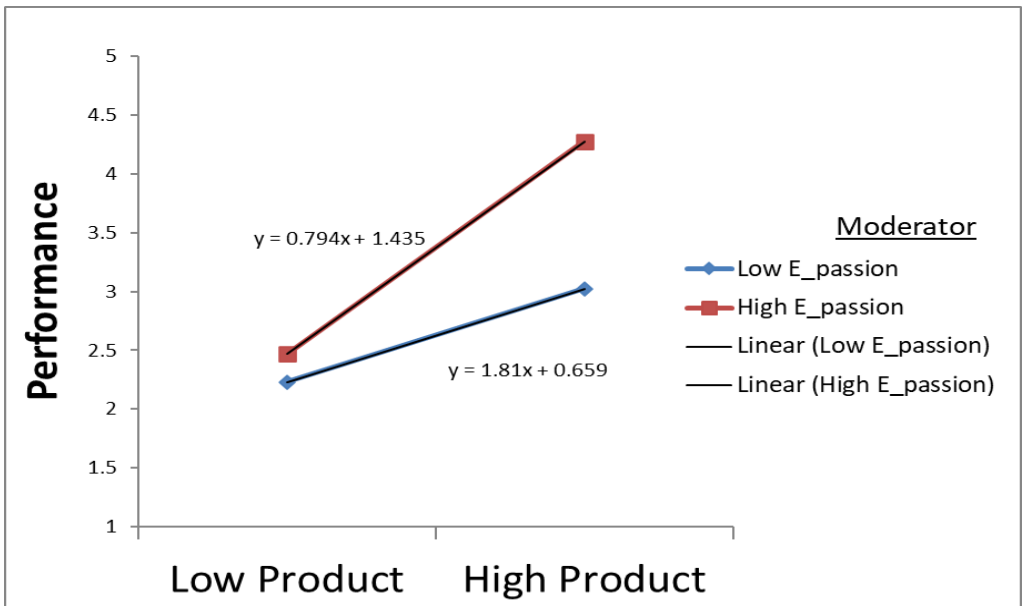


Figure 4 **Slope Analysis for Moderation of Entrepreneurial Passion on the Relationship Between Product Innovation and Performance**

The findings concur with other findings in literature. Ahsan *et al*. (2022) studied the role of entrepreneurial passion and product innovation intensity in new ventures. The study showed that an indirect positive relationship between the intensity of product innovation in new ventures and the inventors' and developers' zeal. They also discovered that the intensity of product innovation is neither directly nor indirectly related to the founder's passion. Thus, entrepreneurial passion is expected to strengthens the relationships between product innovation and performance. Since the entrepreneurial passion of invention, founding, and development have diverse consequences on the actions and outcomes of new ventures, it is necessary that for manufacturing firms to succeed, they need to consider passion.

Conclusions

The study established a significant positive effect of product innovation on performance of manufacturing pharmaceutical companies in Kenya. That, as the level of product innovation increases, so does the level of performance. Secondly, the study established a significant moderating effect of entrepreneurial passion on the relationship between product innovation and firm performance. The relationship is such that for higher levels of entrepreneurial passion the effect of products innovation on performances positively increases in size and for lower levels of entrepreneurial passion, the effect of product innovation on performance decreases in size.

The results suggest thus provide evidence that even in a mature industry like manufacturing pharmaceutical, where innovation is critical to success, the passion and drive of individual entrepreneurs can have a significant impact on firm performance. Meaning institutionalization of entrepreneurial passion becomes a key factor of driving performance of innovative initiatives. Firms should prioritize building of this trait among its employees for development of firm competitive advantages. A strategy for promoting innovativeness, creativity, continuous improvement, resilience building and adaptability in a dynamic business environment.

Implications and Recommendations

Theory

Entrepreneurial passion is often cited as a key factor in the success of new ventures, but its importance in established firms is less clear. This study provides evidence that even in a mature industry like pharmaceutical

manufacturing, where innovation is critical to success, the passion and drive of individual entrepreneurs can have a significant impact on firm performance.

The study also contributes to our understanding of the complex relationship between individual characteristics of entrepreneurial passion, product innovation, and firm performance. The study suggests that entrepreneurial passion plays a crucial role in moderating the relationship between product innovation and firm performance, and that firms that can harness this passion are more likely to succeed in the competitive marketplace.

Practice

The results of this analysis have important implications for manufacturing pharmaceutical firms in Kenya. By demonstrating the significant moderating effect of entrepreneurial passion on the relationship between product innovation and performance, the findings suggest that firms should pay closer attention to the role of individual entrepreneurial characteristics in driving business success. Management should invest in programs which promote independent thinking, allow room for creativity and experimentation of ideas as well as constructive team work. Moreover, the finding of a large effect size for the moderating effect of entrepreneurial passion suggests that firms should actively seek to cultivate and foster this trait among their leaders and employees. This could be done through training programs, mentorship opportunities, or other initiatives designed to encourage and support entrepreneurial behavior.

Further, the study recommends that manufacturing pharmaceutical firms in Kenya should constantly endeavor to invest in different new product designs and improve on the existing products so as to attain a competitive advantage against competitors. Such new innovations can bring more sales to the business as they are attractive and are perceived to have higher value. Additionally, the new products should be designed in a way that meets customer needs in the dynamic market environment.

Limitations and Future Research

The study hassome limitations that may provide opportunities for future research. First, the study was cross-sectional, which may limit ability to test causal relationships and track relationships over time. Data from the same population at different time period would be useful in validating the findings. Comparative studies from other sectors of the economy are also welcome.

Even though the study elaborated the positive effects of product innovation and entrepreneurial passion on performance, the optimal points have not been established. Studies investigating or seeking to establish the point beyond which passion may be counterproductive are welcome. Further, abrupt changes due to innovation may lead to undesirable turbulence. Additional studies should be done to establish these critical points.

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