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Innovation as a Means of Improving Competitiveness in the Food-processing Industry of Cameroon

Baninla Nicholas[1], Prof. Molem C. Sama[2], Prof. Nwahanye Emmanuel[3], and Dr. Neba Noela[4]

[1]Instructor of Management, University of Buea, Cameroon

[2]Professor of Economics, University of Buea- Cameroon

[3]Associate Professor of Management Sciences, University of Buea- Cameroon

[4]Senior Lecturer of Management, University of Buea- Cameroon

Abstract— In today's global landscape, maintaining competitiveness is paramount, and embracing innovative initiatives is recognized as a strategy for enhancing business competitiveness. With this in mind, the present study aimed to explore the role of innovation in improving competitiveness within Cameroon's food processing industry. Employing a cross-sectional survey research design, this investigation relied exclusively on primary data sources, deemed current and suitable for the study's objectives. Data collection occurred through self-administered questionnaires distributed among food processing companies in Cameroon. From a larger pool of 2564 companies, a total of 335 were selected using a stratified sampling method, dividing the population into seven sub-groups across various towns such as Douala, Yaounde, Ngaoundere, Buea, Bafoussam, Maroua, and Bertoua. Data analysis employed inferential techniques, specifically Ordinary Least Squares (OLS) regression, to examine multiple regression relationships. The findings underscored the positive and significant impacts of product, process, market, and organisational innovations on competitiveness. Furthermore, when controlling for the number of workers and company's age, it was found that company's age had a significant effect on competitiveness, while the number of workers did not. As a result, the study recommends that food processing companies in Cameroon capitalize on innovation to bolster their competitive edge.

Keywords— Innovation and Competitiveness.

I. INTRODUCTION

In the dynamic environment of the food processing sector in the world and in Cameroon, the pursuit of innovation plays a central role in driving competitiveness, providing businesses with the chance to distinguish themselves in a highly competitive market. Innovation, as described by Schumpeter (1934), goes beyond mere invention to encompass the effective implementation of fresh ideas, technologies, and processes that generate value and contribute to sustainable development.

As per the findings of Oleksandr and Kumanova (2021), engaging in innovative endeavors serves as a method to enhance the competitiveness of businesses. In their study, Khyareh and Rostami (2021) confirmed that the primary focus of policymakers in both developed and developing nations currently revolves around national competitiveness and strategies for enhancing it.

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The significance of innovation in bolstering competitiveness cannot be emphasized enough. According to Porter (1990), innovation plays a vital role in gaining a competitive edge, allowing organisations to set themselves apart and secure a share of the market. As outlined by OECD (2005), innovation can be categorized into four main groups: product innovation, process innovation, organizational innovation, and marketing innovation. In the food processing industry, characterized by rapidly changing consumer preferences and increasingly intricate market conditions, innovative approaches are fundamental in achieving business prosperity.

Within the Cameroonian food processing sector, the impact of innovation on competitiveness is profound. By embracing innovation, companies have the potential to revolutionize their production processes, enhance product quality, and introduce novel offerings that resonate with consumer demands. As highlighted by Efendi et al. (2020), the significant influence of fast-paced technological advancements, coupled with growing uncertainties in global business and market globalization over the past decade, has profoundly affected the competitive business landscape

In the dynamic and evolving environment of the food processing sector in Cameroon, the convergence of innovation and competitiveness has emerged as a significant challenge for companies aspiring towards sustainable growth and success in the market. While innovation is widely acknowledged as a fundamental driver of competitiveness across industries (Heira et al., 2020; Shilei et al., 2020; Mohsen & Nasrin, 2021), the specific implications of innovative strategies on the competitive positioning of food processing enterprises in Cameroon remain a critical area of interest and investigation.

Despite the increasing importance of innovation as a catalyst for business achievement, Cameroonian food processing firms encounter a pressing obstacle in fully harnessing innovation to improve their competitive standing. The industry faces the challenge of swiftly changing consumer preferences and increasingly intricate market requirements, highlighting the imperative for companies to innovate and distinguish their products and processes to excel in a competitive landscape (SavorEat, 2022).

Cameroon is confronted with significant structural obstacles and adverse impacts, such as a concerning poverty rate, the government serving as the largest employer, escalating security issues in the Nord West and South West Regions, challenges posed by the conflict with Boko Haram in the North Region, and a recent currency crisis stemming from excessive imports, as highlighted by Nkafu Team (2020).

The challenge lies in the necessity for a comprehensive comprehension of how innovation impacts competitiveness in Cameroon's food processing industry. While existing literature stresses the significance of innovation in attaining a competitive edge (Kiveu et al., 2019; Hendayana et al., 2019), there exists a research gap concerning the specific strategies, hurdles, and results linked to innovation-led competitiveness within the Cameroonian food processing realm (Khyareh and Rostami, 2021)

Therefore, this research endeavors to bridge this gap by investigating the influence of innovation on competitiveness within Cameroon's food processing industry, scrutinizing the critical drivers and barriers to

innovation adoption, and examining the transformative effects of innovative practices on companies' ability to effectively compete in the market."

II. THEORETICAL FOUNDATION (DYNAMIC CAPABILITY THEORY)

When investigating how innovation influences competitiveness in Cameroon's food processing industry, the Dynamic Capability Theory presents itself as a pertinent and resilient theoretical framework. Crafted by Teece, Pisano, and Shuen (1997), dynamic capabilities involve an organisation's ability to effectively integrate, develop, and reconfigure internal and external competencies to navigate swiftly changing environments. This theory holds particular relevance in comprehending how companies within Cameroon's food processing sector adjust, innovate, and position themselves competitively in reaction to market shifts and evolving consumer inclinations.

Within the food processing sector in Cameroon, utilizing dynamic capability theory as a theoretical framework can clarify how organisations utilize their capacities to promote innovation and improve competitiveness. By cultivating the aptitude to perceive market trends, capitalize on innovation opportunities, and adjust internal structures to bolster innovative projects, companies can navigate the swiftly evolving industry environment and secure a competitive advantage.

Dynamic Capability Theory offers a useful perspective for analysing how innovation, competitiveness, and organisational adaptation interact within the food processing industry in Cameroon. By developing dynamic capabilities that allow companies to detect, seize, and adjust to market shifts, organisations can establish themselves as frontrunners in the industry. This can help drive innovation and maintain a competitive edge in a constantly changing market landscape.

III. STUDY HYPOTHESES

Based on the reviewed problem and in line with the Dynamic Capability Theory, the following hypotheses were formulated for this study.

Table 1: Hypotheses of the Study

Form	Hypothesis
H_1	Product Innovation has a significant effect on competitiveness in the food-processing industry in Cameroon
H_2	Process Innovation has a significant effect on competitiveness in the food-processing industry in Cameroon
H_3	Market Innovation has a significant effect on competitiveness in the food-processing industry in Cameroon
H_4	Organisational Innovation has a significant effect on competitiveness in the food-processing industry in Cameroon

Source: Author's Conception (2024) Adapted from Baninla, Molem and Nwahanye (2023)

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IV. CONCEPTUAL FRAMEWORK

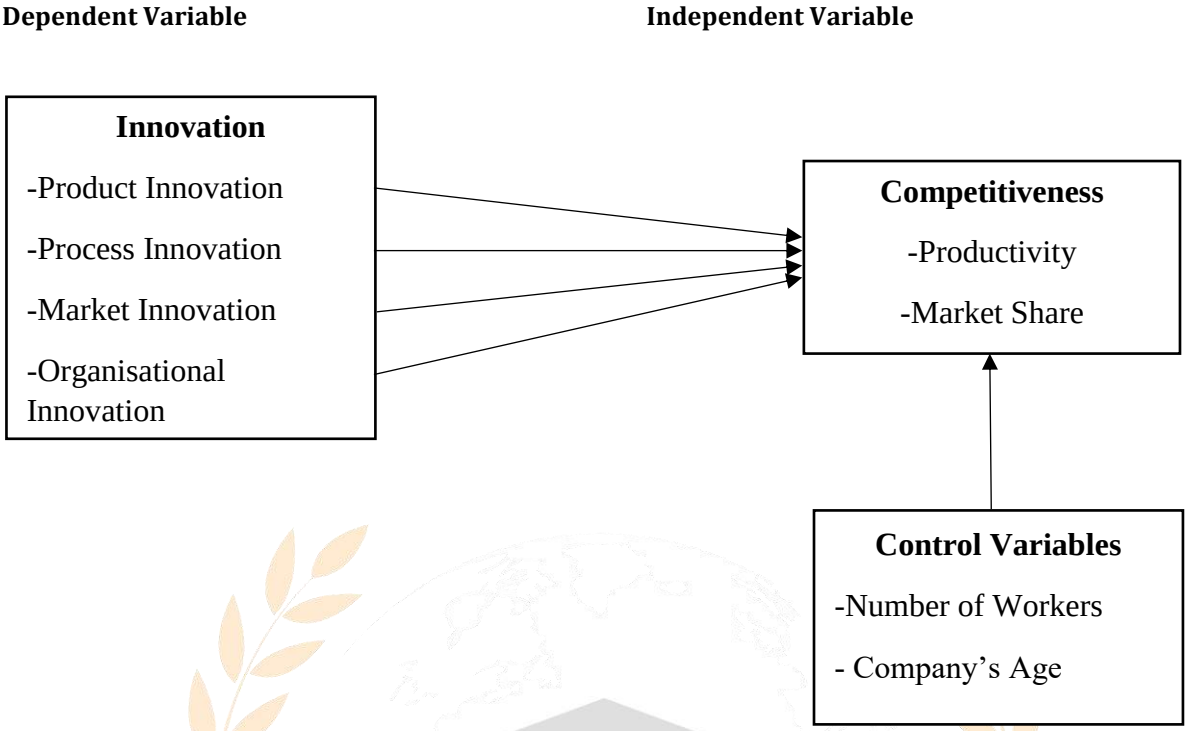

Figure 1: Conceptual Framework Showing the Link Between Innovation and Competitiveness

Source: Author's Conception (2024)

Figure 1 shows the link between innovation and competitiveness. This figure tries to illustrate the link that exist between product, process, market and organizational innovations on competitiveness. This framework also takes I n to consideration variables that were not earlier considered in the study but might have an effect on the results such as; number of workers in the company as well as company's age.

V. METHODOLOGY OF THE STUDY

Research Design: As a blueprint, this study adopted a cross-sectional survey methodology. This approach was chosen to collect data from a diverse range of food-processing companies within the Cameroon food processing industry during a single time period in 2024.

Data: This research exclusively relied on primary data sources as it was current in nature and obtained in a format suitable for the study. The data was gathered through self-administered questionnaires distributed to managers of food processing firms in Cameroon, as they were deemed best positioned to provide the necessary information.

Sampling: A total of 335 food-processing companies were selected from a pool of 2564 using a stratified sampling method with focus on the Krejcie and Morgan's (1970) Table. This approach involved dividing the population into seven sub-groups located in different areas such as Douala, Yaounde, Ngaoundere, Buea, Bafoussam, Maroua, and Bertoua. The sample sizes for these sub-groups were determined as follows: 201, 40, 34, 3, 30, 17, and 10 respectively. Random sampling was then employed within each sub-group to select the specified proportions according to the calculated figures.

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Estimation: The study's data was analyzed using inferential methods, specifically the Ordinary Least Squares (OLS) technique with a focus on multiple regression. In this study's linear regression model, OLS calculated the coefficients of innovation that most effectively account for the variations in competitiveness. The purpose of employing this technique was to identify coefficients that reduce the sum of squared differences between observed and predicted values.

Model Specification: The linear model of the study is specified as follows with model (2) being without Control variables while model (4) is with control variables.

$Comp_i = f$ (PIN, PROS, MIN & OIN)… ……..(1)

$Comp_i = \beta_0 + \beta_1 PIN_i + \beta_2 PROS_i + \beta_3 MIN_i + \beta_4 OIN_i + \mu_i$……..(2)

Compi = f (PIN, PROS, MIN, OIN, KWS & Ag)… ……..(3)

$Comp_i = \beta_0 + \beta_1 PIN_i + \beta_2 PROS_i + \beta_3 MIN_i + \beta_4 OIN_i + \beta_5 WKS_i + \beta_6 Agi + \mu_i$……..(4)

In this model:

- Competitiveness (Comp) is the dependent variable.

- Product Innovation (PIN), Process Innovation (PROS), Market Innovation (MIN) and Organisational Innovation (OIN) are the independent variables related to innovation. Number of Workers (WKS) and Company's Age (Ag) are the control variables.

- β_0 is the intercept term. β_1, β_2, β_3, and β_4 represent the coefficients for product innovation, process innovation, market innovation and organisational innovation, respectively. β_5 and β_6 are the coefficients for number of workers and company's age respectively.

- ε is the error term representing the unexplained variance.

VI. RESULTS

Table 2: Multicolinearity Test on Innovation and Competitiveness

Variables	Tolerance	VIF
Product Innovation	0.401	2.493
Process Innovation	0.370	2.700
Market Innovation	0.463	2.161
Organisational Innovation	0.545	1.834
Number of Workers	0.435	2.301
Company's Age	0.424	2.359

Source: Researcher's Computation (2024)

$Yi = \beta_0 + \beta_1 PIN_i + \beta_2 PROS_i + \beta_3 MIN_i + \beta_4 OIN_i + \beta_5 WKS_i + \beta_6 Ag_i + \mu_i$……..(4)

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Table 2 presents the findings of a collinearity diagnosis test conducted on innovation and competitiveness, as indicated by equation (4). The purpose of this test was to examine the relationships between the dependent variable and the various independent variables, as well as the relationships among the independent variables themselves. In this study, Variance Inflation Factor (VIF) was utilized, as it assesses the extent to which the variance of the estimated regression coefficients is inflated when predictor variables are linearly related. The results indicate that the variables under investigation exhibit moderate correlation. It is established that VIF values falling between 1 and 5 indicate moderate correlation among variables. In the present study, the VIF values range from 1.8 to 2.7, indicating a correlation among variables, albeit a very moderate one.

Table 3: Innovation on Competitiveness Without Control Variables

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	3.841*	.656		5.851	.000
Product Innovation	.337*	.064	.272	5.234	.000
Process Innovation	.370*	.074	.279	5.022	.000
Market Innovation	.176*	.066	.134	2.670	.008
Organisational Innovation	.361*	.054	.295	6.659	.000
R	.786				
R-square	.618				
Adjusted R^2	.613				
F(4, 326)	131.628				
Sig	.000[b]				

(*) 1% Level of Significance

a. Dependent Variable: Competitiveness

b. Predictors: (Constant), Product Innovation (PIN), Process Innovation (PROS), Market Innovation (MIN) and Organisational Innovation (OIN)

Source: Researcher's Computation (2024)

$$Comp_i = \beta_0 + \beta_1 PIN_i + \beta_2 PROS_i + \beta_3 MIN_i + \beta_4 OIN_i + \mu_i \quad \ldots\ldots(2)$$

The results from the ANOVA analysis demonstrate that the regression equation within the model adequately corresponds to the dataset. Specifically, the F-statistic (4, 326) yields a significant result of 131.628, with a corresponding p-value of 0.000, indicating statistical significance at 1% level. This suggests that the overall regression model effectively predicts the outcome variable, indicating a strong fit with the data. Moreover, the adjusted R-square value, standing at 0.613, implies that approximately 61.3% of the variability in competitiveness can be explained by the incorporated variables (including product, process, market, and organisational innovations), leaving only 38.7% of variability unexplained by the model. In conclusion, these findings suggest that the model is well-specified, as careful consideration was given to the selection of variables included within it.

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Product Innovation on Competitiveness

Table 3 displays the outcomes of an analysis investigating the impact of innovation on competitiveness, as depicted by equation (2). According to these findings, the coefficient associated with product innovation (product innovation = 0.337) is positive, indicating a beneficial effect of product innovation on competitiveness. These results suggest that a one-unit increase in product innovation corresponds to a 0.337-unit increase in competitiveness. Furthermore, product innovation exhibits statistical significance at the 1% level ($P < 0.01$). Consequently, these findings support the hypothesis that innovation, specifically product innovation, significantly influences competitiveness within the food processing industry of Cameroon. To enhance competitiveness, companies operating in this sector could focus on innovating their products. The observed effects of product innovation align with the research conducted by Oleksandr and Kumanova (2021), who investigated the role of innovative activities in enhancing the competitiveness of enterprises' products. Similarly, these findings are consistent with the study conducted by Hendayana et al. (2019), which explored the impact of innovation on the business competitiveness of Small and Medium Enterprises (SMEs) in Indonesia.

Process Innovation on Competitiveness

These findings also indicate that the coefficient associated with process innovation (process innovation = 0.370) is similarly positive, suggesting a favorable impact of process innovation on competitiveness. This implies that a one-unit increase in process innovation corresponds to a corresponding 0.370-unit increase in competitiveness. The significance of the results pertaining to process innovation is observed at the 1% level ($P < 0.01$). Consequently, the hypothesis that innovation, specifically in terms of process, significantly influences competitiveness within the food processing industry of Cameroon, is supported. This suggests that companies in this industry aiming to enhance competitiveness should leverage innovations in their processes. These outcomes regarding process innovation are consistent with the research conducted by Efend (2020), who investigated the relationship between innovation and competitiveness for low-technology manufacturing SMEs by emphasizing imitating capability and learning, with a focus on Indonesia.

Market Innovation on Competitiveness

In this same light, the coefficient of market innovation (market innovation = 0.176) is similarly positive which suggests a positive effect of market innovation on competitiveness. These results reveal that a unit increase in market innovation will lead to an equivalent 0.176 units increase in competitiveness. The results of market innovation are equally significant at 1% level of significance ($P < 0.01$).

Based on the results the hypothesis stated that innovation with focus on market significantly affects competitiveness in the food processing industry of Cameroon is accepted. This implies that if food processing companies in the food processing industry of Cameroon aim at a achieving a competitive edge, these companies should embrace innovation in their markets. The results of market innovation are in line with the work of Kipchumba et al. (2021) who conducted a study on the effects of production and market innovations on the level of competitiveness of Sorghum Small Scale Agri-enterprises in Kenya and concluded that there is the presence of a direct effect of market innovation on competitiveness.

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Organisational Innovation on Competitiveness

The positive coefficient associated with organisational innovation (0.361) similarly suggests a beneficial impact of organisational innovation on competitiveness. These findings indicate that a one-unit increase in organisational innovation corresponds to a proportional 0.361-unit increase in competitiveness. Moreover, the significance of these results regarding organisational innovation is observed at the 1% level ($P < 0.01$). Consequently, the hypothesis asserting that innovation, particularly in terms of organizational aspects, significantly influences competitiveness within the food processing industry of Cameroon, is confirmed. Thus, companies in this sector should focus on enhancing their organisational structures to enhance competitiveness relative to their peers. These research findings align with those of Loann (2023), who explored the relationship between Innovation Strategy and Firm Competitiveness, particularly emphasizing a framework supporting the comprehensive integration of eco-innovation.

Table 4: Innovation on Competitiveness With Control Variables

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	Std. Error	Beta		
(Constant)	1.805*	.563		3.208	.001
Product Innovation	.192*	.055	.155	3.484	.001
Process Innovation	.260*	.061	.195	4.227	.000
Market Innovation	.184*	.054	.140	3.394	.001
Organisational Innovation	.193*	.047	.158	4.146	.000
Number of Workers	.161	.147	.047	1.097	.273
Company's Age	1.714*	.178	.415	9.617	.000
R	.862				
R-square	.744				
Adjusted R^2	.739				
F(6, 324)	156.756				
Sig	.000[b]				

(*) 1% Level of Significance

a. Dependent Variable: Competitiveness

b. Predictors: (Constant), Product Innovation (PIN), Process Innovation (PROS), Market Innovation (MIN), Organisational Innovation (OIN), Number of Workers (WKS) and Company's Age (Ag)

Source: Researcher's Computation (2024)

$$Comp_i = \beta_0 + \beta_1 PIN_i + \beta_2 PROS_i + \beta_3 MIN_i + \beta_4 OIN_i + \beta_5 WKS_i + \beta_6 Agi + \mu_i \quad (4)$$

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Based on the outcomes of the analysis examining the relationship between innovation and competitiveness while controlling for the number of workers and the company's age, the following observations were made. Initially, the coefficient associated with the number of workers is 0.161, indicating a positive correlation between the number of workers and competitiveness. However, the effect of the number of workers on competitiveness is deemed insignificant, as the p-value exceeds 0.1 ($P > 0.1$). Conversely, the coefficient related to the company's age (company's age = 1.714) is also positive, suggesting a beneficial impact of the company's age on competitiveness. These results indicate that a one-unit increase in the company's age corresponds to a corresponding 1.714-unit increase in competitiveness. Moreover, the findings regarding the company's age demonstrate statistical significance at the 1% level ($P < 0.01$).

In comparison, the coefficient associated with product innovation has decreased from 0.337 to 0.192, while that of process innovation has similarly decreased from 0.370 to 0.260, and the coefficient related to organizational innovation has decreased from 0.361 to 0.193. Conversely, the coefficient linked to market innovation has increased from 0.176 to 0.184. Moreover, upon considering the intervention of the control variables, it was noted that the values of R, R-Square, and Adjusted R-Squared have risen from 0.786, 0.618, and 0.613 to 0.862, 0.744, and 0.739, respectively. This indicates an enhancement in the collective impact of the inclusive variables on competitiveness, with the value of the error term decreasing from 38.7% to 26.1%. Additionally, there was an increase observed in the value of the F-statistics, rising from 131.628 to 156.756.

VII. CONCLUSION

This study was out to investigate innovation as a means of improving competitiveness in the food-processing industry of Cameroon. Specifically, if product innovation, process innovation, market innovation and organisational innovation could determine the competitiveness of food-processing companies in Cameroon. To this effect, controls variables were considered for the study such as number of workers and company's age. Going by the estimation, OLS was used which calculated the coefficients of innovation that most effectively account for the variations in competitiveness. The results of this study indicated the fact that when innovation was considered without the control variables, all the variables of innovation jointly determined competitiveness as illustrated by the adjusted R square. But with the control variable in place, the joint effect of the variables on competitiveness was stronger than without the control variables. Food-processing companies in Cameroon are advised to prioritize innovation to enhance their competitiveness. Additionally, future researchers are encouraged to expand their investigations by including additional control variables when examining the impact of innovation on competitiveness.

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