



Personality characteristics influencing food processing innovativeness in Arusha, Tanzania

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ABSTRACT

In Tanzania, Arusha Region is one of the hubs of numerous food processing firms, and despite the intentional efforts by the government in insuring that the manufacturing sector becomes innovative, the food processing sub-sector still lags behind. The specific objectives of this study were to determine the relationship between socio-economic characteristics of firm owners/managers and economic factors of food processing firms; and examine the influence of socio-economic factors of firm owners/managers on innovativeness. The Upper Echelon Theory was used to guide this study. A cross-section survey research design was used. The study involved 224 respondents selected through proportionate stratified sampling in Arusha City and Arusha District Council. Data were analyzed using ordered logistic regression and Pearson correlation using Smart PLS software version 4. Sex had significant positive effect on innovativeness (coefficient = 0.8177, $p = 0.006$); older age (above 60 years) demonstrated a significant positive effect on innovativeness (coefficient = 2.5497, $p = 0.001$). Being a widow/widower had a significant negative effect on innovativeness (coefficient = -2.0171, $p = 0.018$). Education had no significant influence on innovativeness. Firms being in the registration process with quality authority had a significant positive effect on innovativeness (coefficient = 1.1468, $p = 0.001$). It is concluded that personality characteristics influences firm innovativeness. Also, a firm being in the process of being registered with quality regulatory authority and the number of employees the firms had significantly influenced firm innovativeness, it is concluded that the innovativeness of a firm depends not only on the personality of the firm owner/manager, but it is also a function of a number of components which are related. Education did not have significant influence on firm innovativeness; it is concluded that innovativeness is not a function of intelligence, but entrepreneurial skills and knowledge such as importance of quality regulation, backed by willingness and desire to have relevant support system/team. Food processing firms should ensure they balance growth on all the units to maintain their stability and survival. Education policy makers should ensure that education provided is based on entrepreneurial skills and knowledge that will enable graduates to have innovative behavior to support them compete in the market at all angles. This paper is unique because it is the first in Tanzania to study about the subject matter and has revealed interesting results about firm innovativeness. It has also provided insights on the triggers of innovation in low tech firms in developing nations.

Keywords: Demographic Characteristics, Entrepreneurship, Food-Processing, Innovativeness, Socio-Economic Factors

I. INTRODUCTION

In this highly competitive environment today, innovation is considered as an important driver for survival and success of enterprises in any nation because sustainable development of firms ultimately depends on their ability to innovate and differentiate themselves from competitors (Koo & Kim, 2019; Dutta & Snehvrat, 2020). In the food sector, innovativeness is considered as one of the most important factors for a firm to challenge major competitors, both on national and international markets through effective investments that could revitalize corporate funds, increase profit margins, enhance corporate value, and promote economic growth (Wang *et al.*, 2022).

However, corporate strategic decision makers, normally owners'/managers', have a significant impact on the firm's outcomes (Overmeyer 2020; Kashmiri & Mahajan, 2017) whereas innovation is one of the important outcomes in any small or large firm (Overmeyer 2020). This is because the firm's owner/manager determines most of the strategic decisions made by the firm such as market entry and exit, adoption or generation of innovation and allocation of resources (Kashmiri & Mahajan, 2017). Sufficient results from management scholars have shown that the dissection and focus of any organization is influenced by the actions of their executive leaders. This argument stands on the basis of the upper echelon theory (Hambrick, 2007, Hambric & Mason, 1984) which argues that organizations are a reflection



of owner's/manager's cognitive, value and personality, and complemented by the strategic leadership model (Finkelstein & Hambrick, 1996; Finkelstein *et al.*, 2009) which contends that the organization's outcome is a result of decisions made by the top management (Cannella & Monroe, 1997). The argument behind this stream of research is that the way owners/managers of food processing firms view innovation and make strategic decisions towards it is shaped by their values, personalities, and cognitions (Cannella & Monroe, 1997).

Therefore, this research is crucial because innovation not only drives firm performance and competitiveness but also leads to technological progress and economic growth on a larger scale (Arunachalam *et al.*, 2018). The researcher chose the food processing sector because it is one of prominent sectors in Tanzania due to economic growth and urbanization. Also, several enterprises have mushroomed in this sector every year. In Tanzania, food processing is in the manufacturing sector which generated 7.1% of the Gross Domestic Product (GDP) in 2022 whereby food processing contributed 24% out of it (Avenyo & Kraemer-Mbula, 2021).

1.1 Statement of the Problem

Despite Tanzania's efforts in insuring that the manufacturing sector becomes innovative, the food processing sub-sector still lags behind. Arusha Region is one of the regions in Tanzania where food processing is a prominent economic activity, given that Arusha is a tourism region but also the speed of urbanization is high (Ijumba *et al.*, 2015). It also has about as many semi-national and nationally representative companies overall, which is impressive, given that its population is much lower than that of other big cities in Tanzania (Ijumba *et al.*, 2015). However, the level of innovativeness in these food processing firms is low. This inadequate innovativeness in food processing subsector is associated with socio-economic factors. According to literature, some studies which examined impact of socio-economic factors on innovativeness found inconsistent results. For example, Nastis *et al.* (2019) found that older firm owners/managers and years of experience of the firm were important factors affecting the individuals' innovation adoption strategies. On the contrary, Barnes *et al.* (2019) found that younger owners/managers were more likely to adopt innovations due to a greater adaptive capacity to new technologies. Similarly, regarding sex, Aznar-Sánchez *et al.* (2020) found that being female encouraged the adoption of innovative practices since women are more predisposed to collaboration with the farm team and/or other farms and companies of the same sector. On the other hand, Thorsøe *et al.* (2019) found that men are more favorable to the adoption of innovations. Furthermore, many of the studies reviewed to inform this paper highlighted that educational background is a significant predictor of innovation adoption (Nastis *et al.* 2019) as it contributes to increasing self-confidence. In contrast with these findings, Barnes *et al.* (2019) found that educational status has no effect on innovation adoption. These conflicting results do not depict a clear picture of the influence of socio-economic characteristics on innovativeness in firms. Therefore, to fill in this gap in literature, the research on which this paper is based investigated whether age, sex, education, and marital status affect innovativeness in firms, particularly food processing firms.

1.2 Research Objectives

The specific objectives of the paper were:

- i. To determine the relationship between socio-economic characteristics of firm owners/managers and economic factors of food processing firms,
- ii. To examine the influence of socio-economic factors of firm owners/managers on innovativeness.

1.3 Research Hypotheses

H_{01} : Sex of a firm's owner/manager does not have significant effect on the firm's innovativeness in food processing.

H_{02} : The age of the firm owner/manager does not significantly affect innovativeness of a food processing firm.

H_{03} : Education of the firm owner/manager does not have significant effect on the innovativeness of food processing firms.

H_{04} : Marital status does not have significant effect on innovativeness in food processing firms.

II. LITERATURE REVIEW

2.1 Theoretical Review

The theory that underpins this paper is the Upper Echelon Theory which states that the managerial traits of the strategic leaders affect firm performance. This is the most popular theory that explains the social concerns and how they affect firm's performance. The theory, as proposed by Hambrick and Mason in 1984, posits that the characteristics and backgrounds of top executives significantly shape the strategic decisions and performance outcomes of organizations. This theory suggests that the personal attributes of senior management; such as their values, experiences, and personalities; heavily influence their perceptions of strategic challenges and opportunities, thereby affecting their



strategic choices (Hambrick, 2007).

The theory has been expanded since its inception, with further research underscoring the importance of understanding the biases and dispositions of these key organizational figures. It is built on the concept of bounded rationality, which acknowledges that complex and uncertain situations are subject to interpretation rather than being objectively knowable (Bekos & Chari, 2023). This means that the decisions made by top executives are not solely based on objective data but are also colored by their personal experiences and cognitive biases.

Moreover, the theory highlights that the demographic characteristics of owners/managers (such as age, sex, and marital status) and socio-economic backgrounds, are reflected in the strategies and decisions they make for the organization (Carpenter *et al.*, 2016). These factors contribute to a personalized approach to decision-making, which could have a direct or indirect impact on the firm's performance (Saidu, 2019).

In essence, the Upper Echelon Theory underscores the critical role of top executives' characteristics in shaping organizational outcomes. It provides a lens through which we can understand how the psychological makeup and social and economic backgrounds of these individuals influence the strategic direction and success of the firms they lead. This perspective is vital for stakeholders, as it sheds light on the potential control points within an organization that could be influenced by the motives and actions of its Chief Executive Officer [CEO] (Saidu, 2019).

2.2 Empirical Review

Innovativeness in this study refers to the ability of a firm to demonstrate innovation capabilities to formulate strategies, improve process, organize the production system, formulate linkages, or learn and adopt new ways of doing things. Innovativeness is equal to the capacity for innovation or innovation capability (Adler & Shenbar, 1990). Kogut & Zander (1992) define a firm's innovative capability as its ability to mobilize knowledge accrued to its employees and combine it to create new knowledge resulting in product or process innovation. This capability is dynamic as stipulated by United Nations [UN] in 2002 in that it involves interaction between firm's internal knowledge and demands of the external market. Therefore, innovative capability relates to the organizational knowledge and other competencies that are needed to improve current products and processes, and to develop new products (Romijn & Albaladejo, 2002).

In the context of the food processing industry, innovation plays a crucial role in improving firms' competitiveness, productivity, and market performance. Several studies have been conducted to examine the level of innovativeness in food processing firms as well as the factors influencing their innovation capabilities (Voytovych & Polyak, 2019). For example, studies by Asnimar *et al.* (2022) found that process innovation significantly affected product innovation in restaurants and cafés. In the specific context of Arusha City and Arusha District Council in Tanzania, there was a need to assess the extent of innovativeness in the food processing firms operating in these areas, mainly because limited research of such kind had been conducted in the area.

To start with, sex is among the determinants of innovation. There are several studies which have reported mixed findings regarding sex such as Ullah *et al.* (2020), and Expósito *et al.* (2023) whose findings show that sex has a positive influence on innovation while others disagree with this finding and reported that there was a negative relationship between sex and innovation, e.g. a study by Strohmeyer *et al.* (2017). Other studies gave neutral results reporting that there is no relationship between sex and innovativeness (Avenyo & Kraemer-Mbula, 2021). Other studies; such as ones by Naveed *et al.* (2023), Nadeem *et al.* (2020), and Griffin *et al.* (2021) looked into gender diversity in boards of directors. However, Jadiyahappa *et al.* (2019) obtained contrasting findings; they observed a significant adverse effect of owner/manager sex on firm performance. Additionally, other studies by Baloyi and Ngwakwe (2017), Fujianti (2018), Quintana-García *et al.* (2022) and Rahman and Chen (2023) found no substantial impact of owner's/manager's sex on overall firm performance. This paper looked into the sex of the owners/managers of food processing firms with an understanding that it could affect firm innovation.

Moreover, there is agreement that owners/managers typically possess a broad range of work experience, both internal to the company and externally. Saidu (2019) suggest that the owners/managers get experience from practical learning in similar challenges of a working environment. As stated by Emestine and Setyaningrum (2019), experience, measured by age, was a significant factor for firm innovativeness. Nonetheless, Liu and Jiang (2022) also showed that the age of an owner/manager does not have any impact on the performance of a firm. Yim and Kang (2024), from their research findings, disagree with that argument; they suggest that firm's innovation productivity or innovation scope decreases with increasing age of the Chief Executive Officer (CEO), which means that younger owners/managers are more likely to engage in firm's innovation activities. Loukil and Yousfi (2022) further argued that a CEO who is older has a lower cognitive capacity and is less proactive, hence lower innovation outcomes. Setiawan and Gestanti (2019) suggest that the age of an owner/manager could have a significant negative influence on firm's performance. For the purpose of this paper, the influence of age on innovativeness forms a part of suggestions for the body of knowledge in the food processing sector. Based on this explanation, it was assumed that age of the firm's owner/manager could have negative effect on the firm's innovativeness.

Furthermore, education is regarded to play an important role in improving the performance of a firm. Thus, improvement of education is worth considering as it makes things easier for individuals to favor the introduction of and desire for innovations and to make more efficient uses of different instruments and tools necessary to carry out their firm management activities. The argument has also earned support of current scholars (Portuguez Castro *et al.*, 2019; Rashid, 2019 and Shao *et al.*, 2020) who add that education helps in creating synergies between actors of the innovation ecosystem that strengthen social and economic growth and affect innovation output. Furthermore, educational background of the owner/manager of a firm is of great potential to the firm's innovative capabilities (Saidu, 2019; Setiawan & Gestanti, 2019). On the other hand, there are notions that education does not have impact on innovation, for example Loukil and Yousfi (2022) assert that owners/managers who graduated from business schools are less likely to introduce new products as compared to those who graduated from science schools. Nonetheless, Altuwaijri and Kalyanaraman (2020) observed that the educational level of the owner/manager does not influence the performance of a firm. Thus, this paper adds to the previously existing knowledge on how education of the firm owners/managers affects innovativeness, based on schooling as a proxy variable for education.

Lastly, previous research agrees that marital status of a firm owner/manager has key importance in the firm's success and on innovative capabilities. For instance, Cho *et al.* (2022) reported that firms led by married CEOs produced 8% more innovativeness. They explained that it was because married CEOs create a culture of tolerance among their employees that is conducive to risk taking, and their firms produce more efficient innovation whereby social capital and favorable employee treatment are valued. On the other hand, married owners/managers bear some responsibilities such as children's education, spouse consensus, and household expenses which may affect the ability of the owners/managers to make investment decisions such as innovation. This explanation is in line with findings of studies by Chebii (2015), Peter and Munyithya (2015) and Soomro *et al.* (2019) who reported that there was a negative relationship between marital status and firm performance. In line with this explanation, Zhang *et al.* (2022) suggest that there is a strong connection between unmarried owners/managers and elevated levels of corporate innovation efficiency. Therefore, since marital status has a close association with ethnicity and cultural values of various settings, it was included in the traits of the firm owner /manager that could affect innovativeness in food processing firms. This means that being married has a relationship with the firm's innovativeness.

III. METHODOLOGY

3.1 Study Area

The research was conducted in Arusha District Council and Arusha City Council at Arusha region. This area was selected because Arusha Region is one of the most prominent regions in Tanzania which led in tourism and has a significant urbanization shift originating from strong cultural settings of the Maasai and Meru ethnic groups' people. The population of the region is 2,356,255 out of which 941,838 are in urban settings. The consumption pattern of the people in Arusha has also changed due to urbanization. Thus, it was an appropriate place to study food processing innovativeness, given the paradigm shift and the tourism.

3.2 Research Design

A cross-section survey research design was used to collect data from Arusha Region, Tanzania because it describes the situation, as it exists at present in a study time which was November 2023 to March 2023.

3.3 Study Population

The data used in this study were collected from owners/managers of food processing firms. These were the leaders of 284 food processing firms which had been registered and had Taxpayers Identification Numbers (TIN) and business licenses renewed in the year 2021/2022 and/or 2022/2023.

3.4 Sample Size

A sample of 224 food processing firms was obtained by using hyper-geometric formula that is for calculation of statistically realistic sample sizes from small sampling frames. The formula is as follows:

$$n = (NZ^2pq) / [E^2(N - 1) + Z^2pq]$$

Where:

n is the required sample size; N is the population size; p and q are the population proportions (If they are not known they are each set at 0.5); z is the value that specifies the level of confidence the researcher wants (Typical levels of confidence for surveys are 95%, in which case z is set at 1.96), and E sets the accuracy of the sample proportions (If you want to know what proportion of individuals are in favour of some policy, with an accuracy of plus or minus 3%, then E is set to 0.03). Therefore, the sample size will be

$$n = [284 \times 1.96^2 \times 0.5 \times 0.5] / [0.03^2 \times (284 - 1) + 1.96^2 \times 0.5 \times 0.5] \approx 224$$



3.5 Data Collection and Analysis

Primary data were collected from the field using copies of a structured questionnaire which included five-point Likert scales. The questionnaire was self-administered through a google form, which enabled the research team to ensure accuracy, safety and avoid missing items.

Descriptive and inferential statistics were computed using Smart PLS software Version 4. Ordered logistic regression was run as the main analysis to address the objectives of this paper, and the proportion odds assumption was met for this analysis. Bivariate Pearson's correlation was also conducted to determine relationships between the control variables. In doing the analysis, all the assumptions were met including multicollinearity, and normality.

3.6 Measurement of Variables

Dependent variable. Firm innovativeness was measured using five dimensions which are strategy, process, learning, organization, and linkage (Gamal *et al.*, 2011). Five-point Likert scale questions with ranks starting from 1 (strongly disagree) up to 5 (strongly agree) were used. The questions aimed to test whether the firms practiced these elements of innovativeness and the extent to which they did so (Calik *et al.*, 2020; Tiddy *et al.*, 2005).

Independent variables. The leading independent variables were firm owners'/managers' characteristics which had been used in related previous research by Suherman *et al.* (2021) and Jادیappa *et al.* (2019). Gender was included as a dummy variable which was measured in terms of sex, coded as 0 if the firm owner/manager was a male and 1 if the firm owner/manager a female. The second independent variable was age, which was a continuous variable, measured in terms of years since the firm owner/manager had been born (Setiawan & Gestanti, 2019). The third independent variable was education level, which was a categorical variable, measured in terms of 1 (Primary education), 2 (Secondary education), 3 (Certificate), 4 (Diploma), 5 (Bachelor's Degree), 6 (Master's Degree), and 7 (PhD) (Camelo-Ordaz *et al.*, 2005). The fourth independent variable was marital status, which was a categorical variable, measured in terms of 1 (Married), 2 (Divorced), 3 (Widowed), and 4 (Never married) (Alene, 2020).

Control variables. Since the selected empirical model of the study is not immune to various endogenous problems, control variables were carefully selected with the help of literature such as Buallay *et al.* (2017), Kaur and Singh (2018), and Avenyo and Kremea-Mbula (2021). The control variables were firm size which was determined in terms of number of employees and amount of capital invested, firm age which was measured by number of years since firm had been established, and status of registration with the Tanzania Bureau of Standards (TBS) (Zhu *et al.*, 2015).

IV. FINDINGS & DISCUSSION

4.1 Socio-Economic Characteristics of Food Processors involved in the Study

The demographic profiles of the respondents revealed a balanced sex distribution, with slightly more females (27.2%) than males (21.0%) in Arusha City, while the opposite trend was observed in Arusha District Council, with 25.9% males and females each. Regarding age, the respondents in both areas fell within the 28-45 age group, constituting 28.1% in Arusha City and 25.9% in Arusha District Council. The age distribution implies that those who participated in food processing were mostly young because it involves activities that demand a lot of networking with suppliers, providers of production technologies, marketing, and movements. Educationally, educational attainment was notably higher among the respondents in Arusha District Council, where 51.8% held Bachelor's Degrees, compared to 45.5% in Arusha City. This high educational attainment reflects that the food processing sector absorbs a lot of self-employed university graduates, given scarce employment opportunities in Tanzania. In terms of marital status, the majority were married in both areas, with Arusha City having a slightly higher proportion of 39.7% compared to 37.9% in Arusha District Council. Household size varied, with a larger number of households having members being aged 15-60 years in both councils, indicating the productive age group's predominance in food processing activities. These findings provide valuable insights into the socio-economic composition of food processors, which could inform targeted interventions and policies to support this sector in Arusha.



Table 1
Socio-Demographic Characteristics of the Respondents (n = 224)

| Variable | Category | Arusha District Council | | Arusha City Council | |
|-----------------------|---------------|-------------------------|--------------|---------------------|--------------|
| | | Freq. | Per cent (%) | Freq. | Per cent (%) |
| Sex | Male | 58 | 25.9 | 47 | 21.0 |
| | Female | 58 | 25.9 | 61 | 27.2 |
| Age (years) | 1828- | 10 | 4.5 | 2 | 0.9 |
| | 28-45 | 58 | 25.9 | 63 | 28.1 |
| | 45-60 | 36 | 16.1 | 37 | 16.5 |
| | Above 60 | 12 | 5.4 | 6 | 2.7 |
| Education level | Primary | 0 | 0.0 | 2 | 0.9 |
| | Secondary | 0 | 0.0 | 1 | 0.4 |
| | Certificate | 0 | 0.0 | 0 | 0.0 |
| | Diploma | 0 | 0.0 | 3 | 1.3 |
| | Bachelor | 116 | 51.8 | 102 | 45.5 |
| Marital status | Single | 18 | 8.0 | 10 | 4.5 |
| | Married | 85 | 37.9 | 89 | 39.7 |
| | Divorced | 2 | 0.9 | 1 | 0.4 |
| | Widow/widower | 4 | 1.8 | 3 | 1.3 |
| | Cohabiting | 7 | 3.1 | 5 | 2.2 |
| Household size by Age | 0 -14 years | 196 | 17.9 | 175 | 16.0 |
| | 15 - 60 years | 399 | 36.5 | 258 | 23.6 |
| | Above 60 | 52 | 4.8 | 12 | 1.1 |

4.2 Relationships between Socio-Demographic and Economic Factors of Firm Owners and Innovativeness in Food Processing

After testing normality, the variables which were found to be normally distributed were used to perform Person’s correlation analysis between firm owners’/managers’ age, firm age, capital amount, number of permanent employees, casual employees, and family size. It was found that there were statistically significant relationships between various variables, as shown in Table 2, providing important implications for the food processing industry. Specifically, positive correlation ($r = 0.225$, $p < 0.05$) between age of the firm and the capital amount in 2022/2023 (TZS) was found, indicating that as firms aged, they tended to accumulate more capital, which could be attributed to increased experience, stability, and potentially higher profitability over time. This suggests that older firms might have better access to financial resources for expansion, innovation, and resilience against economic challenges, compared to younger firms.

Furthermore, there was significant positive correlation ($r = 0.267$, $p < 0.05$) between the number of permanent employees and the number of casual employees during the peak season ($r = 0.921$, $p < 0.05$) and lean season ($r = 0.943$, $p < 0.05$), underscoring the employment dynamics within the food processing enterprises involved in the study. Larger firms with a higher permanent workforce tended to hire more casual employees during both busy and lean periods, reflecting their ability to adjust labor resources, based on demand fluctuations. This highlights the role of flexibility in workforce management and potential impact on overall productivity and efficiency.

Moreover, there was positive and significant correlation between family size of the business owner/manager and the age of the firm ($r = 0.265$, $p < 0.05$), which suggests a positive relationship between family members’ involvement in the longevity and stability of food processing businesses. This familial connection might contribute to a sense of continuity, shared values, and dedication to the business's success across generations.



Table 2

Pearson’s Correlation between Socio-Demographic and Economic Variables (n=224)

| Variables | Age | Age of firm | Capital amount in 2022/2023 (TZS) | Permanent employees | Casual employees during the peak season | Casual employees during the lean season | Family size |
|---|--------|-------------|-----------------------------------|---------------------|---|---|-------------|
| Age | -- | | | | | | |
| Age of firm | -0.009 | -- | | | | | |
| Capital amount in 2022/2023 (TZS) | -0.020 | 0.225* | -- | | | | |
| Number of permanent employees | -0.025 | 0.110 | 0.841* | -- | | | |
| Number of casual employees during the peak season | -0.024 | 0.267* | 0.921* | 0.926* | -- | | |
| Number casual employees during the lean season | -0.018 | 0.135* | 0.885* | 0.979* | 0.943* | -- | |
| Family size | 0.000 | 0.265* | 0.000 | 0.062 | 0.122 | 0.060 | -- |

*. Correlation is significant at the 0.05 level (2-tailed).

4.3 Influence of Socio-Demographic and Economic Factors on Innovativeness

Ordered logistic regression analysis was done to determine the impact of socio-demographic and economic factors on innovativeness levels in food processing; the results are presented in Table 3. The first notable finding relates to sex, whereby being a female entrepreneur was associated with a coefficient of 0.8177 (p = 0.006), indicating a statistically significant positive influence on innovativeness. This implies that women in the food processing sector exhibited higher levels of innovation, compared to men. These results are supported by research results by Huang *et al.* (2022) who found that female entrepreneurs’ innovation was significantly and positively related to entrepreneurial performance. The results are also supported by research results by Zastempowski and Cyfert (2021) who reported that sex of the entrepreneur had a positive impact on the product and process innovativeness of small enterprises’ innovativeness. The findings in this paper are contrary to ones by Marvel *et al.* (2015) and Expósito *et al.* (2023) who found that there was no significant difference in the propensity to introduce innovations between male and female firm owners/managers. Hypothesis 1; Sex of a firm’s owner/manager does not have significant effect on the firm’s innovativeness in food processing was rejected; the opposite is true. It was noted that female owners/managers of firms were more innovative when it comes to taste, smell and palatability of food. This is because it is in their area of expertise from the cultural settings that a woman is more involved in cooking and food preparation since childhood.

Moving on to age categories, the results showed a significant positive relationship between being above 60 years old and innovativeness, with a coefficient of 2.5497 and a p-value of 0.001). This suggests that older individuals in this industry tended to be more innovative than younger ones. However, the age groups between 28-45 and 45-60 years did not show statistically significant relationships with innovativeness. This result concurs with the findings by Ricotta *et al.* (2021) that mature CEOs in Russia were more innovative. However, these results are different from the ones by Kotsev and Stoycheva (2024) who found that the innovativeness of firm decreased as the age of the owner/manager increased. Hypothesis 2: The age of firm owner/manager does not significantly affect innovativeness of a food processing firm was not supported. It was observed that elderly owners/managers of firms were more likely to innovate than younger ones. The reason could be because the older owners/managers have stronger networks, are more experienced with the market, and have a strong capital base that allows them to make such demanding investment decisions.

When considering marital status, being a widow/widower showed a significant negative coefficient of -2.0171 (p = 0.018), implying lower innovativeness, compared to other marital statuses. This could be due to various factors such as personal circumstances or fewer resources available for innovation post-loss. These findings conflict with those by Zhang *et al.* (2022) who found that unmarried CEOs generated higher impact innovation and exhibited a greater tolerance for failure. On the other hand, the findings of this paper concur with those reported by Cho *et al.* (2022) that firms led by married CEOs create a culture of tolerance among employees that is conducive for risk taking, and hence that their firms finally produce more innovations. Hypothesis 4; Marital status does not significant effect on innovativeness of food processing was confirmed. It was found that widowed owners/manager were less likely to introduce innovative decisions than the rest in the group. This might be due to the reason that spouses are culturally direct or indirect partners in business. The advice, encouragement and the second eye are sometimes internal auditors



of the firm’s products. So, when they are not there, their absence is highly noticeable, and hence it affects the other partner’s innovativeness.

Registration type with the Tanzania Bureau of Standards (TBS) showed positive results. Being in the process of registering with TBS was associated with a higher level of innovativeness (coefficient = 1.1468, $p = 0.001$), possibly indicating a regulatory compliance or quality assurance-driven innovation trend among registered entities. The paper suggests to the food processing firms to formalize their business which could enable them to accumulate more capital but also become more innovative. It was found in this study that enterprises which were in the process of being registered with Tanzania Bureau of Standards (TBS) were more innovative. This could be due to the reason that, as the regulator-controlled quality, the food processors kept on improving the products accordingly; hence, they became more innovative.

The number of permanent employees showed a significant impact on innovativeness levels in the food processing sector. The coefficient for this variable was 0.0591 ($p = 0.044$), indicating that a higher number of permanent employees was associated with increased innovativeness. This finding suggests that having a larger workforce might contribute to greater capacity for innovation within firms.

Table 3

Ordered Logistic Regression Results on Influence of Socio-Demographic and Economic Factors on Innovativeness Levels in Food Processing (n = 224)

| Variables | Coeff. | St. Err | z | P> z | [95% conf. interval] | |
|--|---------|-----------|---------|--------|----------------------|---------|
| Female | 0.8177 | 0.2960 | 2.7600 | 0.006* | 0.2375 | 1.3979 |
| Age category | | | | | | |
| 28-45 | 0.4005 | 0.5393 | 0.7400 | 0.458 | -0.6564 | 1.4574 |
| 45-60 | 0.7440 | 0.5948 | 1.2500 | 0.211 | -0.4218 | 1.9097 |
| Above 60 | 2.5497 | 0.8007 | 3.1800 | 0.001* | 0.9804 | 4.1190 |
| Education | | | | | | |
| Secondary | 2.5298 | 1938.2610 | 0.0000 | 0.999 | -3796.30 | 3801.45 |
| Diploma | 15.9962 | 947.8547 | 0.0200 | 0.987 | -1841.76 | 1873.75 |
| Bachelor | 17.6109 | 947.8538 | 0.0200 | 0.985 | -1840.14 | 1875.37 |
| Marital status | | | | | | |
| Marriage | -0.5720 | 0.4270 | -1.3400 | 0.180 | -1.4089 | 0.2649 |
| Divorced | -0.6593 | 1.0282 | -0.6400 | 0.521 | -2.6745 | 1.3558 |
| Widow/widower | -2.0171 | 0.8524 | -2.3700 | 0.018* | -3.6877 | -0.3465 |
| Cohabit | -1.0125 | 0.6891 | -1.4700 | 0.142 | -2.3630 | 0.3380 |
| Registration type | | | | | | |
| Not registered with TBS | 0.6998 | 0.4185 | 1.6700 | 0.094 | -0.1203 | 1.5200 |
| In the process of registering with TBS | 1.1468 | 0.3505 | 3.2700 | 0.001* | 0.4597 | 1.8338 |
| Designation | | | | | | |
| Employee | -0.3268 | 0.2836 | -1.1500 | 0.249 | -0.8826 | 0.2290 |
| Spouse of the owner | -0.1734 | 0.6915 | -0.2500 | 0.802 | -1.5287 | 1.1819 |
| Capital | 0.0000 | 0.0000 | -0.7100 | 0.478 | 0.0000 | 0.0000 |
| Age of firm | 0.0145 | 0.0253 | 0.5700 | 0.566 | -0.0351 | 0.0641 |
| Permanent employees | 0.0591 | 0.0294 | 2.0100 | 0.044* | 0.0015 | 0.1167 |
| Mean dependent var | | 2.326 | | | SD dependent var | 0.881 |
| Pseudo r-squared | | 0.095 | | | Number of obs. | 224 |
| Chi-square | | 52.699 | | | Prob > chi2 | 0 |
| Akaike crit. (AIC) | | 544.757 | | | Bayesian crit. (BIC) | 616.402 |

* Indicates significant at the 95% confidence level as $p < 0.05$

Furthermore, the results in Table 3 show that variables such as education level, designation within the firm, capital, and age of the firm did not have statistically significant effects on innovativeness levels in food processing. Hypothesis 3, Education of firm owner/manager does not have significant effect on the innovativeness of food processing firms was accepted. The level of education the owner/manager had did not show significant impact on the level of innovativeness of the firm (coefficient = 17.6109, $p = 0.985$). This could be due to the nature of innovation that it is not driven by intelligence but by other forces such as pro-activeness, ability to integrate the knowledge acquired from the environment, market demand, risk taking propensity and the like. This is an important finding from this study; it was expected that the more educated a person is, the more innovative they would be.



4.4 Theoretical Implication

Building on insights from the upper echelon theory, there is a relationship between socio-economic characteristics of the owner/manager and firm innovativeness. Based on literature, some scholars agree that age, sex, marital status and education of the firm owner/manager promote firm innovativeness (Ullah *et al.*, 2020; Expósito *et al.*, (2023); Emestine and Setyaningrum, 2019); Rashid, 2019; Shao *et al.*, 2020; and Zhang *et al.*, 2022), whilst other scholars suggest that socio-economic factors do not impact innovativeness (Loukil and Yousfi, 2022). Thus, the positive and significant relationships that was found between socio-economic characteristics; particularly sex, age and marital status; of the owner/manager and firm innovativeness confirm the applicability of the upper echelon theory in Tanzania. Additionally, this study expands the upper echelon theory by contributing sex, age, and marital status as characteristics of the owner manager that impact innovativeness controlled by number of permanent employees in the firm and registration type with the quality monitoring authorities.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

From the findings which showed that sex, age, and marital status of food processing firms' owners/managers had significant influence on firm innovativeness, it is concluded that personality influences firm innovativeness as these are personality characteristics. On the basis of the findings that a firm being in the process of being registered with Tanzania Bureau of Standards and the number of employees the firms had significantly influenced firm innovativeness, it is concluded that the innovativeness of a firm depends not only on the personality of the firm owner/manager, but it is also a function of a number of components which are related.

Based on the same findings that sex, age and marital status had a significant influence on innovativeness, it is also concluded that older female firm owners/managers are more innovative in food processing due to continuous improvement influenced by nutrition knowledge they continually acquire on food processing as they also process food for their families and for communities in general. Unlike older female firm owners/managers, processors who have lost their spouses tend to be less innovative, implying either loss of interest or lack of motivation to innovate. Education did not have significant influence on firm innovativeness; it is concluded that innovativeness is not a function of intelligence, but entrepreneurial skills and knowledge such as importance of quality regulation, backed by willingness and desire to have relevant support system/team.

5.2 Recommendations

From the findings of this study, it is recommended to food processing firms that; in order to maintain growth, stability and survival of their firms; they should ensure a good balance in all their firms' units. It is also recommended to support organizations such as Small Industries Development Organization (SIDO) and community health/nutrition officers to provide forums for learning among the food processors; this could expand their innovativeness. Finally, it is recommended to the education policy makers that all kinds of education provided at all levels should contain relevant entrepreneurial skills and knowledge that could enable graduates to have innovative behavior to support them compete in the market at all angles

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