INNOVATIVENESS AND ITS EFFECTS ON THE SURVIVAL OF FAMILY OWNED MANUFACTURING COMPANIES IN KIGALI CITY

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ABSTRACT

In the majority of developing nations, family-owned manufacturing enterprises (FOMCs) are the primary forces behind the creation of jobs and the alleviation of poverty. Most global corporations began as family-owned businesses. Family-owned manufacturing enterprises (FOMCs) sector currently accounts for more than 50% of Rwanda's GDP. This is true despite the numerous problems surrounding this important industry, such as inferior performance compared to non-family businesses, a high death rate, particularly after the founder retires, and a shortage of funding, among other things. The goal of the study was to determine the effect of innovativeness on the survival of Rwandan family-owned manufacturing companies. Resource-based view theory and entrepreneurial orientation theory provided the theoretical foundation for this study. The focus of the study was on manufacturing family-owned businesses operating in Kigali City and registered with the Rwanda Standard Board (RSB) . The CEOs, directors, managers, and owned managers of the company were the responders. The quantitative data were analyzed using descriptive statistics including mean, median, statistical deviation, and proportion using IMB software Statistical Packages for Social Scientists (SPSS) version 21.0 and Microsoft Excel. Data was acquired using a questionnaire. The correlational quantitative research design was employed. Content validity and construct validity were done, factor analysis was done using principal components analysis, and the alpha was between .565 and .854 with the thresholds of 0.5 indicating construct validity. Correlation analysis and regression analysis were used in inferential data analysis to evaluate the magnitude and direction of the link between the dependent and independent variables. Multiple regression analysis, along with the common normality testing ,experimental using extreme values, linearity testing ,homoscedasticity testing , reliability testing and multi colinearity testing were used to verify the validity of the hypotheses after fitting regression models

Key words: Innovativeness, Manufacturing, Family owned companies, Survival,

1. Introduction

The word "innovation" comes from the Latin word innovate, which means, "to create something new" (Stenberg, 2017). Doing something new is the most basic definition of innovation (Farniha, Ferreira & Gouveia, 2016). Innovation may also be defined as a method and technology for identifying new client groups, new markets, and new manufacturing processes (Nwankwo & Kanyangale, 2020; Mehta, 2016). This requires companies of all sizes to innovate, adapt swiftly to changing client preferences and market conditions, and embrace opportunities as they come (Baregheh *et al*. 2009). They also noted that the company's innovation covers a broad variety of products, services, processes, operations, and people. Marketing innovation is a vital component of sustaining a competitive advantage in the marketplace (Sardana, 2016)."Entrepreneurs promote innovative ways to market segmentation, pricing, brand management, packaging, customer relationship and communication management, service level, and operational operations constantly" (Mayasari *et al.,* 2009).

Therefore, the objective of this study examined the effect of innovativeness on the survival of FOMCs in Kigali City. As several studies indicated innovation is referred to as the firm’s strategy that encourages and supports new ideas, novelty and creative processes that may end in new products or services or new technological processes (Lumpkin & Dess, 1996). Thus, innovativeness is a strategy used by companies to seek out new prospects. Taylor‘s work (2013), and Schumpeter's (1934; 1942) were one of the first to emphasize the importance of innovations in the entrepreneurial process. The willingness of a corporation to consistently integrate new methods and techniques into its work processes, find

new ways to complete tasks and produce new products, processes, and services are referred to as the innovativeness dimension. Furthermore, innovativeness also refers to SMEs' tendency to generate and support new ideas, experiment, and develop new procedures that can result in new and/or improved products, services, or markets (Kropp & Zolin, 2005; Li, 2012 stated in Taylor, 2013). Innovativeness discloses a business's propensity to employ in withstand novel ideas, newness, loud-out valuations, and resourceful processes that might upshot in novel products or services, or technological processes(Lumpkin & Dess, 1996). Empirical evidence approves a positive relationship between EO and product or service innovativeness (Miller, 1983; Lumpkin & Dess, 1996; Rauch *et al.,* 2009; Soares & Perin, 2019; Hernández-Perlines & Rung-Hoch, 2017). In family companies, innovativeness is considered a highly important dimension of entrepreneurial orientation for longevity survival combined with proactiveness and autonomy (Hall & Nordqvist, 2008; Cruz, *et al.*, 2012). Innovation is a vital driver in the longstanding survival of family companies (Kellermanns *et al.,* 2008; Kellermanns *et al.,* 2012).

Given such an essential role, it is astonishing that through concern for innovation involvements and yields, the facts about innovation in family companies are still inadequate and questionable. Kellermanns *et al.(* 2012) asserted that Innovation acts as a key driver and influences family firm performance, as well as is responsible for the longstanding survival of the family companies (Schumpeter, 1934). However, the success of a family firm is measured by its continuing survival. Innovativeness is consequently anticipated to be positively correlated to

the family firm's performance, given that it turns well-using family companies' continuing orientation and their longing to relocate a vigorous firm to the subsequent generation (Hatak *et al.*, 2016).

Indeed, except for the non-significance found in the work of Kallmuenzer *et al*.(2018) the empirical investigation approves the positive relationship between innovativeness and a family firm's performance (Cruz *et al.,* 2012).

2. Literature review

2.1 Theoretical review

2.1.1 Entrepreneurial orientation theory

Entrepreneurial orientation theory was first proposed by Miller (1983) and Covin and Slevin(1991) with the path of unidimensional and was developed by Lumpkin and Dess (1996) they extended it by introducing two new additional dimensions that are autonomy and competitive aggressiveness, later on, it was extended by Covin and Lumpkin (2011). The unidimensional and multidimensional conceptualisations of the construct are represented by two parallel routes in EO theory and study. EO, according to some experts, can have a favourable impact on the performance of family companies since companies with a higher EO are more likely to be entrepreneurially successful than companies with a lower EO (Rauch, Wiklund, Lumpkin, & Frese, 2009; Oblog & Pratt, 2010; Covin & Lumpkin, 2011; Santos & Marinho, 2018). Aziz *et al*. (2014) asserted that the entrepreneurial attitude of SME owners/managers has an impact on their success and survival. Entrepreneurial orientation is important for SMEs to survive, based on Aziz *et al*. (2014), since their study on entrepreneurial orientation development provides

owner/managers with knowledge of what type of development is required to enhance entrepreneurship skills and attributes to maintain firm performance and survival.

Furthermore, the EO construct represents, at its most fundamental level, what it means for a corporation to be entrepreneurial (Lumpkin, 2011). Indeed, EO began as a theoretical concept that encapsulates the factors that are either essential (Miller, 1983) or important (Lumpkin & Dess, 1996) for a business to be defined as entrepreneurial. Significantly, the EO construct considers entrepreneurship as a feature of organizations rather than a distinct act that may or may not take place inside them.

Therefore , Innovativeness is a business's proclivity to engage in and care for novel business ideas, and original processes that may result in new services or new technology (Hage, 1980). It is the willingness to abandon old technology or actions and take risks outside the current state of the practices (Hage, 1980). (Kimberly, 1998). Many activities show signs of industrial innovation. In its broadest sense, innovation may take many forms, from a timid willingness to try a new service line or test a new marketing site to a zealous commitment to dominate the innovation into new services or technology advancements. To imprisonment this variety of movements, plentiful approaches have been hired to quantify innovativeness. The glassy of costs and amount of assets devoted to investigation and expansion similarly signifies a business's participation in innovation goings-on. Concerning human assets, Hage (1980) supposed that the additional specialists and experts in a business, such as engineers and scientists, the higher the level of innovation. The

higher the level of innovativeness, the greater the trained specialists (Miller & Friesen,1982).In whichever event; innovativeness is a vital constituent of entrepreneurial orientation, for it replicates a significant way via which companies monitor first-hand chances and it enhances the firm's performance and survival when it is well practices from the top management to the lowest level and train the successor about it in the early age, as it was previously discussed by several researchers.

2.1.2 Resources Based View Theory

The RBT is founded on the idea that a company's internal resources and skills may be a direct source of its long-term competitive advantage (SCA) and better performance (Penrose, 1959; Barney, 1991; Wernerfelt, 1984; Davis&Simpson, 2017). If the firm (Barney 1991; Davis & Simpson, 2017; Selznick, 1957) intangible internal resources and capabilities that should be built and how they should be built, deployed, and relate to superior performance and survival of FOMCs from one generation to the next, Barney (1991) extended the RBVT and SCA works if the firm (Barney 1991; Davis & Simpson, 2017; Selznick, 1957) intangible internal resources and capabilities that should be built and how they should be built. RBT, on the other hand, mentions successor training as one of the intangible internal resources and competencies that should be established to ensure SCA and higher performance of FOMCs from generation to generation.

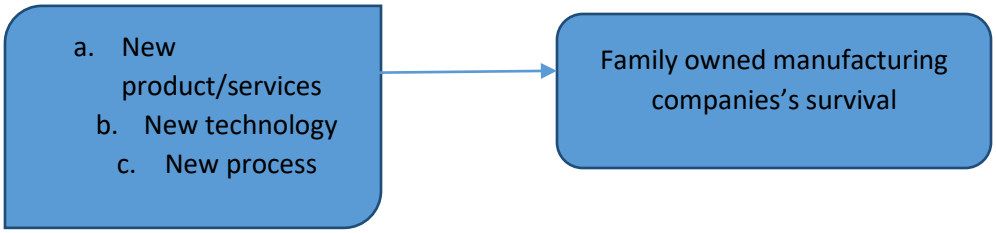
Furthermore, studies show that a lack of entrepreneurial skills such as innovativeness, risk-taking, pro-activity, and successor training is one of the reasons why only a few FOMCs survive beyond the first generation (Cho & Lee, 2018; Elmo *et al.*, 2020; Shirokova *et al.*, 2016; Simph & Studies, 2014; Elmo *et al.*, 2020; Sanyal *et al.*, 2020). Therefore, for innovativeness to succeed, the organization should have sufficient capital to innovate. The firm to be proactive is that there is sufficient capital to be the fast mover instead of being an imitator.An examination of the collected works on family companies discloses that numerous family companies are unwilling to present any modifications to their products, and decide on an alternative to preserving the legacy created through their forefathers (Kellermanns *et al.*, 2012). Though, some scholars found that companies possessed by families are extra innovative than other companies (Ayyagari *et al.*, 2011). Subsequently, family memberships play an important in the management of the firm, they are more dominant when making decisions concerning companies' innovative undertakings (Kellermanns et al., 2012). However, innovativeness has an important effect on the survival of a firm and it is believed to have a significant contribution to the survival of SMEs (Nwankwo & Kanyangale, 2020). Kallmuenzer (2018) carried out a study in Western Austria, to explore the kind of actors and drive of innovation in hospitability family companies. The study used narrative interviews of 22 hospitality family companies, data were analyzed using qualitative software, The results demonstrate that, as internal players, the entrepreneurial family and workers are essential drivers of innovation, but that external actor such as visitors and regional rivals also

contribute significantly to innovation. These attempts at innovation are thought to promote growth and corporate development. When the family business is innovative, it away encourage new ideas from its siblings and employees then exploit those ideas, this lead the firm to maximize profit through selling those new products or offer those new services and make the firm to growth and survive to the subsequent generation ,since the siblings are also involved in innovation. Furthermore, several studies such as those (Nwankwo & Kanyangale, 2020) were carried out in Nigeria to evaluate the entrepreneurial orientation (EO) of the integrated EM model to find out its contribution to SMEs' survival in Nigeria. The study was a quantitative one and it adopted a positivism paradigm.it used a sample size of 364 owner-managers of manufacturing SMEs selected using simple random sampling. The findings show that innovativeness contributes to the survival of manufacturing SMEs in Nigeria .It has also been highlighted as a crucial predictor of SME survival in Nigeria and beyond by Duru et al. (2018) and Aroyeun et al. (2019). This study also discovered that while innovation is critical to the survival of manufacturing SMEs in Nigeria, the way EO aspects are implemented in company operations in Nigeria has a detrimental impact on survival, leading to the failure of manufacturing SMEs in Nigeria (Gwadabe & Amirah, 2017). Therefore, this study hypothesised that:

$H0_1$: Innovativeness has no significant effect on the survival of family-owned manufacturing companies in Kigali city

Ha_1: Innovativeness has significant effects on the survival of family-owned manufacturing companies in Kigali city

2.2.Conceptual framework



3. METHODOLOGY

3.1.Description of the study area

Rwanda has five provinces, Kigali City is one of five provinces of Rwanda, located in Rwanda's middle region (Manirakiza *et al.*, 2019). Kigali is Rwanda's capital and largest city, having been founded in 1907 as a German colonial outpost and trading hub. It evolved into a commercial centre throughout time. Kigali is currently regarded as Africa's cleanest metropolis and the country's largest urban agglomeration. Over the last decade, the population has risen from 1,132,686 to 1,631,657 people, covering an area of 730 km2 (NISR, 2012, 2018). In terms of economic potential and infrastructure development, Kigali is one of Africa's fastest-growing cities (The World Bank, 2018). This economic transformation has resulted from structural changes in business policies that contributed to the vibrant Public-Private Partnerships (PPPs) development. Apart from many economic activities such as infrastructure booming for instance many hotels have been built such as Marriot Hotel, and Kigali convention centre. In only one decade over 700 investors have invested in Kigali. To attract more new investors and boost the manufacturing sector, Kigali has established a specific site for manufacturing companies, currently known as the Special Economic Zone (SEZ) (Good fellow, 2017; MINICOM, 2018; Trade, 2020).

Kigali City being the centre of trade contains the highest percentages of all established companies including FOMCs, it contains over (23.1%) of all established companies and more than 50% of manufacturing companies in Rwanda. The study was conducted in Kigali city province since it has the highest percentages of companies including FOMCs and is the only province that has an operating Special Economic Zone in the country (NISR, 2017, 2018). The province is also the biggest cause of foreigner exchange to finance, leading to the importation of manufacturing inputs and exporting manufactured products through Kigali international airport, MAGERWA were house and NAEB (Technology, 2014; MINICOM, 2018, 2020). Following the national administrative system established in 2005, the city is today divided into various administrative bodies. The entities are organized from the national level down to the province, district, sector, cell, and village (Rwanda, Organic Law No. 29/2005). Kigali is divided into three districts at the provincial level: Gasabo, Kicukiro, and Nyarugenge. These three districts are divided into 35 sectors and subdivided into 161 cells and 1,061 villages. All three districts of Kigali city were included in this study to give all

FOMCs an equal chance to participate in the study to have reliable information.

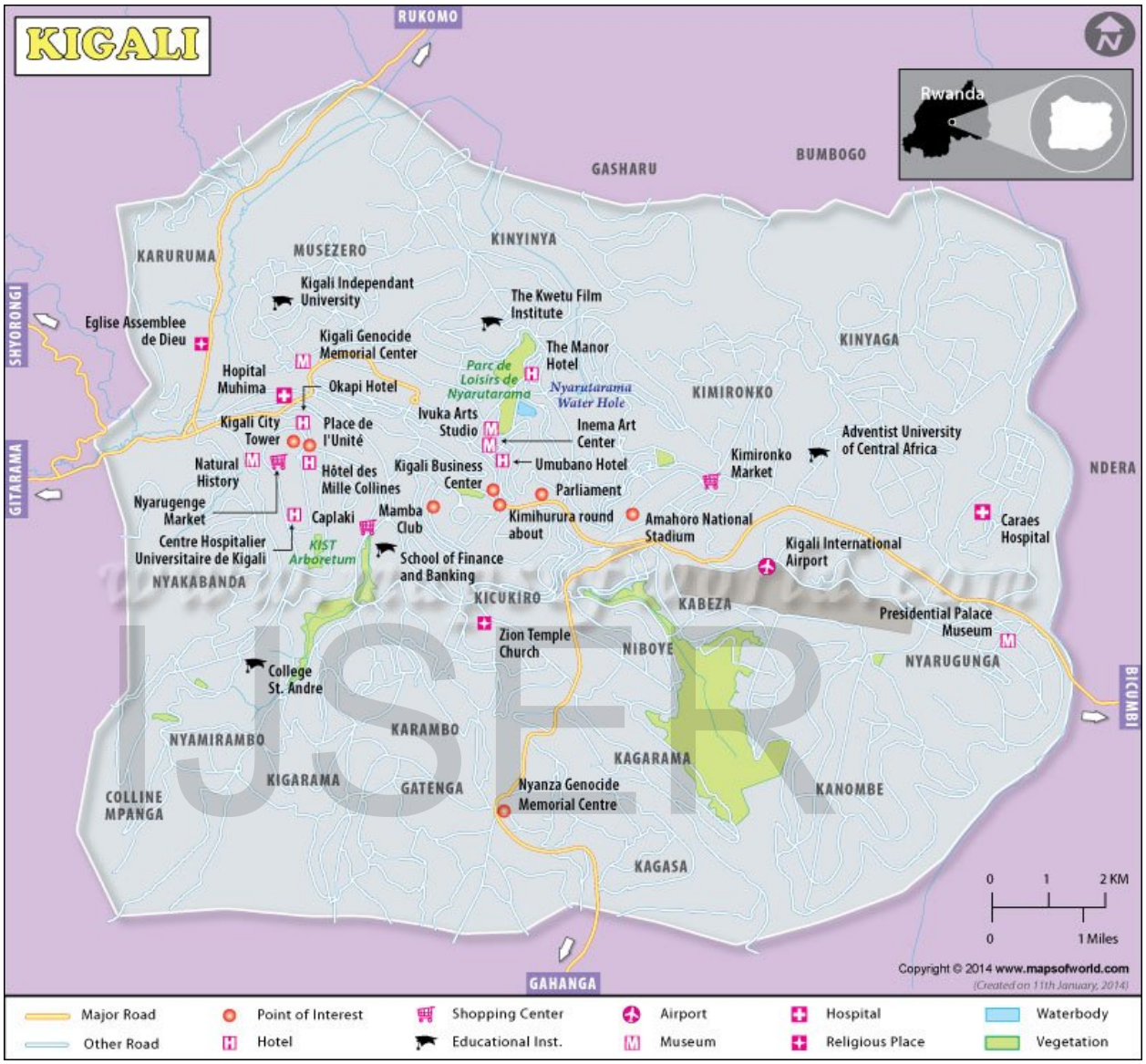


Figure2: Kigali city economic development map

Figure 3: Kigali special economic zone

3.2.Study population

The population of the study were CEOs, directors, managers and family business owners. CEOs operation in Kigali city .

3.3.Sample size

The post-positivist research paradigm was used for this study because it showed a cause-and-effect link between the entrepreneurial approach and successor training on the survival of family-owned manufacturing enterprises in Kigali. Post-positivism is characterized by determinism, reductionism, empirical observation and measurement, and theory verification (Creswell, 2014). EOT and RBVT are

the theories that were discovered and tested to fulfil the research objectives of this study. In the sense that the quantitatively evaluated hypotheses may be wholly or partially rejected, post-positivism systematically employs current theory to build up hypotheses and progress a theory, leading to more study (Lewis & Thornhill, 2019). Similarly, the tested hypotheses resulted in the findings being validated or the basic Because it is linked to positivist philosophy and logical method (Kothari, 2009; Saunders *et al*., 2012), the study employed a correlational research design and survey questionnaire hypothesis being modified, resulting in new knowledge addition.

To determine the sample size from an unknown population, Cochran's (1977) formula is used. While pursuing their PhD degrees, several scholars used the same strategy (Namwata *et al.*,2015; Mashenene,2016, Parret, 2016; Magasi *et al.*, 2020),

$$n = Z2 \frac{}{} * \frac{pq}{e^2} \quad \ldots\ldots (1)$$

Where n denotes sample size, Z denotes critical values of appropriate confidence levels (in this case, 1.96 for a 95% confidence level), P denotes the proportion of the population of interest (in this case, 50%), q denotes 1-p, and e denotes the

acceptable margin of error, which is commonly set at 0.05.Then, n = $\frac{1.96^2}{0.05^2}$ *0.5*0.5 =384respondents

the number of the respondents concerning their positions in the FOMCs 183; 77; 67 and 57 managers, CEOs; FOMCs owners and directors respectively. As is shown by percentages of 47.6%; 20%; 15%; and 17.4% are managers, CEOs; FOMCs owners and directors respectively, which indicates that managers dominated all other the respondents. The sample was drawn from 77 FOMCs. 384 questinnaire were distributed to FOMCs of Kigali City ,only 348 were returned. Simple random sampling approaches were used to choose the sample size of 384 respondents from FOMCs based on theoretical and practical difficulties in this study.

3.4. Variables and measurement procedures

The research needed to know how entrepreneurial orientation and successor's training affected the survival of FOMCs in Kigali City. A 5-point Likert scale derived from previous studies was used to evaluate both dependent and independent variables.

3.4.1. Dependent variable

FOMC survival was judged using a 5-point Likert scale modified from previous research (Saan *et al*., 2018; Vijfvinkel *et al.,* 2011; Vij, S., & Bedi, 2012; Tar *et al.,* 2012; Magasi *et al.*, 2020; Saan, 2020). The scale points ranged from 1 to 5, with 1 denoting significant disagreement and 5 denoting strong agreement and using systematic questions to get an agreement.

3.4.2. Independent variables

The independent variables measured was innovativeness. The variable was measured using an adapted 5-point Likert scale adapted from (Miller, 1983; Lumpkin & Dess, 1996; Covin& Lumpkin, 2011; Zahra SA, 2014; Sanyal *et al*., 2020; Shirokova *et al.*, 2016; Alayo *et al.*,2016; Hernández-Perlines& Rung-Hoch, 2017; Diabate *et al*., 2019). The scale sample points include: starting from =strongly disagree to 5= strongly Agree. Using the structured questionnaire (Covin& Lumpkin, 2011; Zahra SA, 2014; Sanyal *et al*., 2020; Shirokova et al., 2016; Alayo *et al.*,2016), adopted the same approach.

The questionnaire was divided into three sections: A, B, and C. Sex, age, education level, length of service in manufacturing companies, designation, expected years of retirement, operational years of each FOMF, firm industrial sector, estimated capital, number of workers, and top leader generation were all included in Section A. Section B asked questions on the FOMCs' survival, which was the dependent variable. The questions in Section C deal with independent variable which is innovativeness.

Data analysis from the questionnaire was assisted by IMB software and SPSS employing data analysis methods such as Chi-square, correlation analysis, and multiple linear regression analysis. Using econometric models, inferential statistical analysis was used to help determine the link between dependent and independent variables. multiple linear regression analysis proved appropriate for analyzing, testing hypotheses, and drawing conclusions. Nevertheless, before doing multiple

linear regression analysis, a correlational analysis was performed to analyze the test multicollinearity concerns among independent variables.

4. FINDINGS

Gender of the respondents ,Males were 56.5 per cent of the respondents, while females were 43.5 per cent, indicating that males outnumbered females by 12.8 per cent. Age of the respondents 38.2 per cent, 24.4 per cent, 21.3 per cent, and 16.1 per cent of respondents were between the ages of 46 and 54, 36 and 45, 54 and above, and 18 and 35, respectively. This means that senior executives, such as CEOs, directors, and managers, are scattered across the workforce. Education of the respondents ,Bachelor's Degree, Diploma, TVT, High school, Master's, and Basic education levels were held by 32.7 per cent, 30.6 per cent, 19.8 per cent, 12.7%, 4.8 per cent, and 1.5 per cent, respectively. Experience of the respondents , 34.5 per cent of respondents had job experience of more than 17 years, while 26.3 per cent had work experience of 7 to 12 years. 21.4 per cent of respondents had 12-17 years of job experience, while 17.8 per cent had less than 5 years of work experience. Classifications of the respondents: 62.8 %, 21.7%, 10.4% and 8.5%of the respondents were managers, directors, owner-managers and CEOs respectively. The majority of senior leaders in the FOMCs are managers (62.8 per cent) and directors, based on designation data (21.7 per cent).Respondents retirement years: 38.5%, 30.7%, 19. 4%, 12.3% of the respondents will retire in above 17, 12-17, 6-10, and 0-6 years respectively. The study was conducted in different manufacturing sectors. Food, beverage and tobacco carried 24.4%; metal and metal products carried 17.2%; paper, paper products and printing, publishing and

packaging carried 13.2% of the total sector involved in this study. Plastics and rubber products carried 10.3%; timber, wood products and furniture carried 10.3%; leather products, and footwear carried 8.6%; textiles and apparel carried 8.6%; chemicals and fertilizers carried also 6.1 %, and others carried 5.3%of the total sectors involved in this study.Capital invested in FOMCs: major companies (over RWF 500), medium enterprises (over RWF 150-500 million), and small enterprises (over RWF 2 -150 million) accounted for 58.0 per cent, 36.9%, and 6.3 per cent of the FOMCs investigated, respectively.

Age of FOMCs: 38.7% of FOMCs had more than 18 years, 22.7% had 7-12years and 5.7.0% had less than 7 years since their establishment of the particular FOMC s.

Generation of FOMCs : 70.6%, 23.2 %, and 6.2% of the CEOs in the studied FOMCs belonged to the first generation, second generation and the third generations respectively since the establishment of the particular FOMCs. Because the majority of CEOs (70.6 per cent) are from the first generation, many FOMCs in Kigali City are still in their early stages.

4.2. Reliability testing

The Cronbach's alpha coefficient value was calculated using all six items for IN (IN1, IN2, IN3, IN4, IN5, IN6) that assess innovativeness in the family-held manufacturing enterprises. The Cronbach's alpha coefficient value of IN, as shown in Table 4.16, is 0.854, which is greater than the threshold value of 0.7 (Saunders et al., 2012), suggesting that the measuring instrument employed to assess the variable innovativeness is reliable.

Table 4.1: Reliability statistic

Variables	Cronbach's alpha	N of items
IN	0.854	6

Source: Researcher calculation 2022

Although dependability is an important aspect of research quality, it is not sufficient in and of itself to produce high-quality research. As noted in the previous section, validity is also critical in guaranteeing high-quality research.

4.2.1 Testing for content validity

For guaranteeing content validity, practitioners and management experts were contacted for a critical analysis of the questions, to make required adjustments to the structure, representativeness, and applicability of the set questions before pilot testing (Saunders *et al.*, 2012). The pilot research was conducted with a sample size of 30 respondents to see whether the questionnaires would perform well since Saunders *et al.* (2012) claim that a sample size of 30 is sufficient for statistical analysis. Furthermore, the questionnaire was translated into Kinyarwanda to help the respondents who did not know English.

4.2.2 Testing for construct validity

The questions used to measure the constructs were from the measurement scales of prior empirical investigations on the subject. The pre-testing instrument was done on a small scale to meet the construct validity . Principal Component Analysis (PCA) was used to establish the component loading for the measures of each study concept to ensure construct validity. Factor analysis was performed on the IN. The

KaiserMeyer-Olkin sampling adequacy value was 0.912, which is higher than the threshold value of 0.5, and Bartlett's test of sphericity exhibited statistical significance (p=.004), indicating that the variables under consideration are factorable.

Table 4.2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.912
Bartlett's Test of Sphericity	Approx. Chi-Square	15855.767
	Df	1275
	Sig.	.004

***Source**: Research calculation (2022)*

Factor Analysis for the indipendant variable (innovativeness), which is innovativenessIN (IN1, IN2, IN3, IN4, IN5,IN6)

Innovativeness

On this component, all six items evaluating the innovativeness construct (IN1, IN2, IN3, IN4, IN5, and IN6) were loaded simultaneously. The results demonstrate that the factor loadings for innovativeness construct components ranged from.594 to.894, all of which are higher than the threshold value of 0.5, as shown in table 4.3, indicating construct validity.

Table 4.3: Factor Analysis Pattern Matrix for IN

Item	Item statement	Component

		1	2
IN1	My organization places a great focus on research and development, technological advancement, and innovation.		.879
IN2	My company has created new operations or offered new goods in the previous five years.		.595
IN3	My firm has made several significant adjustments to its products and services.		.823
IN4	Our company is always looking for innovative ways to accomplish things.		.720
IN5	In every scenario, we aim to take the initiative.		.786
IN6	We're great at seeing opportunities.		.854

***Source**: Research calculation (2022)*

4.3 Inferential Analysis

The data from the completed surveys were coded and analyzed using the appropriate statistical. Correlational analysisis and regression analysis were used as its in the folowing section

4.3.1 Correlational analysis

As shown in Table 4.4, correlation analysis was used to analyze the connection between and among variables without inferring cause and effect (Creswell, 2014). The fundamental hypothesis was that innovativeness could be linked to FOMCs survival. Correlational research is used to examine if there is a link between the variables under investigation. Correlations illustrate the link between variables and whether they move in the same or distinct directions (Creswell, 2014; Westhuizen, 2014). However, correlation does not imply causation.

Table 4.4 Correlational Analysis

	IN1	IN2	IN3	IN4	IN5	IN6	FOMCs

IN	Pearson Correlation	.169** (.000)	.195** (.000)	-.082 (.170)	.179* (.000)	.421** (.000)	1.000	
FOMCs	Pearson Correlation	.229* (.000)	.527** (.000)	-.089 (.175)	.596 (.000)	.432** (.000)	.452** (.000)	1.000
	N=337							

*P≤0.05, **P≤0.01

***Source**: Researcher calculation (2022)*

The association between independent variables and FOMCs survival is shown in Table 4.21. At the 1% and 5% levels, the symbols ** and * signify statistical significance, respectively. In parentheses, the relevant P-values were listed. Based on data analysis for Pearson correlations, **p 0.01 correlation was significant at the 0.01 level, while *p 0.05 correlation was significant at the 0.05 level. Equation (3-2) shows a positive (B=0.429) effect between innovativeness and the survival of family-owned manufacturing companies. Table 4.32 reveals that innovativeness has a substantial impact on FOMC survival, as the observed t value (p=.000) is smaller than the critical value (p=.05) at a 95% confidence level. The null hypothesis (Ho1) is thus rejected, whereas the alternative hypothesis (Ha1) is upheld. As a result, innovativness has a huge impact on FOMC survival.

4.3.2 Multiple linear regression analysis

4.3.2.1 Multiple linear regressions are put to the test to see if their assumptions are correct.

4.3.2.1.1 Normality testing

Variables with normal distributions are assumed in regression. To determine the normalcy status, Kolmogorov-Smirnov was used as an inferential test. The distribution of data meets the assumption for regularly distributed data if the Kolmogorov-Smirnov test is negligible (p>.05) (Saunders *et al.* 2012). Data are regularly distributed, according to the null hypothesis. Table 4.22 shows the results of the Kolmogorov-Smirnov test.

Table 4.5: Test of normality

	Kolmogorov-Simonov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
IN	.142	337	.147	.941	337	.223
	Lilliefors Significance Correction					

***Source**: Researcher calculation (2022)*

IN has Kolmogorov-Smirnov values of 0.142. Because all values were more than the crucial value of 0.05, the tested data were substantially regularly distributed. In addition, the standard deviations for IN was 0.942, as calculated from histogram figures 4.1in appendix II and reported in table 4.5.

The standard deviations for a conventional normal distribution were all extremely near to one, indicating that the data were normally distributed. Table 4.6 shows that the standard deviations for independent variables were quite close to one.

Table 4.22: Test of normality

	Kolmogorov-Simonov[a]			**Shapiro-Wilk**		
	Statistic	Df	Sig.	Statistic	Df	Sig.
IN	.142	337	.147	.941	337	.223

a. Lilliefors Significance Correction

Source: Researcher calculation (2022)

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deviations for IN was 0.942, as calculated from histogram figure 4.1in appendix II and reported in table 4.6. The standard deviations for a conventional normal distribution were all extremely near to one, indicating that the data were normally distributed. Table 4.7 shows that the standard deviations for independent variables were quite close to one.

Table 4.6. The standard deviation for independent variables

Independent variables	Standard deviation	Normality status
IN	0.937	the distribution is normal.

Source: Researcher calculation (2022)

4.3.2.1.2 Experiments using extreme values

Outliers are commonly excluded by researchers to boost the accuracy and precision of MLR models, according to Tabachnik and Fidell (2007, referenced in Taruwinga, 2011), hence eleven (11) examples of outliers were removed before data analysis. Anderson (1992) also states that data with no outliers have standardised residuals in the range of 3 that a normal distribution would predict. Outliers' testing results are shown in Table 4.7

Table 4.7: Residuals Statistics

	Minimum	Maximum	Mean	Std	N
Predicted Value	-15928205	1.2914642	2276151	.5718330	337

Dependent variable: Family–Owned Manufacturing companies Survival (FOMCS)

Source: Researcher calculation (2022)

The standardised residuals were -2.115 (minimum) and 1.747 (maximum), which are both within the anticipated boundaries of 3 for a normal distribution, showing that there were no outliers at either the extreme left or right tails, according to Table 4.7. A normal probability plot, also known as a normal P-P plot, was used to assess if residuals were normally distributed.

The values of standardised residuals were plotted against expected values from a conventional normal distribution, as illustrated in figure 4.5. Because the residuals all fell on the diagonal, they were normally distributed, suggesting that there were no extreme values (outliers). Figures 4.7, , depict the box plot IN.

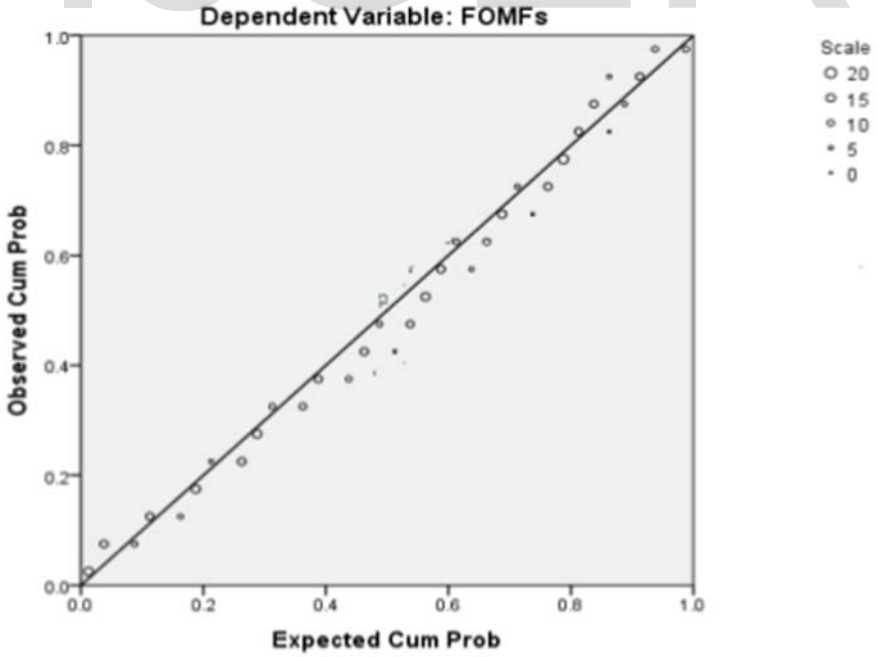

Figure 4.1: The regression standardised residuals are plotted in a normal P-P plot.
Source: Data analysis (2022).

4.3.2.1.3 Linearity testing

Correlation coefficients and scatter plots were used to evaluate the linearity assumption. Linearity indicates that the correlation between variables is linear, which is true if the bivariate correlations for each pair of independent variables are significant (*p 0.05, **p 0.01 or ***p 0.001). The rest of the bivariate correlations for each pair of independent variables in this study were all significant (*p 0.05, **p 0.01), indicating that the majority of the variables matched the linearity assumption (Table 4.4). Furthermore, as indicated in appendix IV by the scatter plots in Figures 4.10 the association between each independent variable, namely IN and the dependent variable FOMCs was likewise linear.

4.3.2.1.4 Homoscedasticity testing

To check the homoscedasticity assumption, the SPSS Levene test was done to assess whether the variances of a single metric variable were significantly equal across any number of groups (Hair *et al.,* 2010). The null hypothesis stated that the variance of errors is similar across all levels of the independent variables and the alternative hypothesis stated that the variance of errors is not similar across all levels of the independent variables. The findings in Table 4.8 indicate that the calculated p-value (0.767) is greater than the critical value (0.05). Therefore, the null hypothesis is accepted that the variance of errors is similar across all levels of the independent variables, an indication that the homoscedasticity assumption is fulfilled.

Table 4.8 Levene's Test of Equality of Error Variances[a]

Dependent Variable: FOMCs			
F	df1	df2	Sig.
.131	337	1	.767

a. Design: Intercept + IN

Source: Data analysis (2022)

4.3. 2.1.5. Reliability testing

The variables assessed were subjected to a reliability study to see if they were free of mistakes. As shown in Table 4.2, the alpha values for IN was 0.854, indicating that the data were trustworthy. Saunders *et al.* (2012) stated that excellent reliability is defined as an alpha value of less than 0.7.

4.3.2.1. 6 Multicollinearity testing

To determine if multicollinearity exists, correlational analysis and the Variance of Inflated Factor (VIF) were used. The assumption is that no independent variables are coupled in such a way that the estimate of model parameters is destabilized. The standard correlation coefficients and their explanation are shown in Table 4.9. (Rule of thumb).

Table 4.9: Standard correlation coefficient and their interpretation

Positive Correlation	Interpretation	Negative Correlation	Interpretation
From 90 to 1.00	A strong positive association exists.	between -.90 and 1.00	A very strong negative association exists.
From.70 to.90	A strong positive association exists.	from -.70 to -.90	There is a strong negative association.
Between.50 and.70	Positive association of moderate strength	-.50 to.70 cents	A negative correlation of moderate strength
.30 to.50 cents	There is a low positive association.	-.30 to.50 cents	The negative correlation is low.
From .00 to .30	There is no association.	from -00 to.30	There is no association.

Source: Mukaka. (2012)

All correlation coefficient estimates derived from the correlation between independent variables were between -0.308 and 0.268, as shown in Table 4.9. As a result, there were very low correlations between independent variables in Table 4.10, indicating that multicollinearity concerns were not present. As a result, all of the factors in this study were distinct.

Table 4.10 Correlation Analysis to measure Multicollinearity

		IN
IN	Pearson correlation	1.000
	N=337	

***p<0.05, **p<0.01**

Source: Researcher's calculation (2022)

However, Hair *et al.* (2010) contend that correlational analysis does not accurately evaluate the degree to which each independent variable is explained by the set of other dependent variables and that the Variance Inflated Factor (VIF) should be used instead. To assess multicollinearity, the VIF was utilized, and the mean value of the VIF should be less than 5. (Hair *et al.,* 2010; Kapaya, 2017). As shown in Table 4.28, all VIFs were between 1.028 and 1.232, indicating that multicollinearity was not present. Furthermore, the mean VIF value for independent variables was 1.119, indicating that multicollinearity issues were not present.

Table 4.11: Multicolinealty diagnostic using VIF

Variable	VIF	Tolerance (1/VIF)

In addition, as shown in Table 4.28, the tolerance (1/VIF) for IN, PA, RT, AT, CA, and TS, which is the proportion of the variation in a particular predictor that cannot be explained by the other predictor, was 0.872, 0.850, 0.973, 0.965, 0.956, and 0.933, respectively. All fractions were close to 1, indicating that all predictors were substantially self-explanatory, indicating that there was no difficulty with multicollinearity

4.5.2.2 Multiple Linear Regression Analysis results

Tables 4.12, 4.13, and 4.14 show how IN affect FOMC survival and are included in equations (2).

Table 4.12 : Overall model fit statistics of multiple linear regressions

Model Summary				
Model	R	R-Square	Adjusted R-Square	Std.An error in the Estimate
1 Predictors: IN	.718*	.502	.487	.72437967

Dependent Variables, Family-owned manufacturing companies (FOMC s)

***Source**: Data analysis (2022)*

The regression model fit test for the influence of the independent variable on the dependent variable is evaluated in Table 4.12. The modified R-square and standard error of the estimate are used to assess the overall model fit (Hair *et al.,* 2010). While R-square implies that every single independent variable explains the variance in the associated dependent variable, adjusted R-square is the best at explaining the proportion of variation in the independent variable (Hair *et al*., 2010). This means that the adjusted T-square statistic assesses the model's overall prediction accuracy as well as the extent to which the model's variables effectively explain variance in the dependent variable. The regression model fit test for the influence of the independent variable on the dependent variable is evaluated in Table 4.12. The modified R-square and standard error of the estimate are used to assess the overall model fit (Hair *et al.,* 2010). While R-square implies that every single independent variable explains the variance in the associated dependent variable, adjusted R-square is the best at explaining the proportion of variation in the independent variable (Hair *et al.,* 2010). This means that the adjusted T-square statistic assesses the model's overall prediction accuracy as well as the extent to which the model's variables effectively explain variance in the dependent variable.

Table 4.13: ANOVA F-test in the regression model

ANOVA[a]

Model		Sum of square	Df	Mean Square	F	Sig.
1	Regression	119.046	4	29.521	57.874	.003[b]
	Residual	170.473	354	.520		
	Total	298.499	358			

a.Dependent Variables : FOMCS
B.Predictors :(Constant), IN

***Source**: Data analysis (2022)*

Table 4.13 shows the coefficient (B) for IN, which were calculated to determine the degree of their impacts on FOMC survival. Holding constant (IN) results in a.041 increase in FOMC survival, according to the regression equation (2-2). The findings also show that if IN are held constant, a one-unit increase in IN results in a.327 increase in FOMC survival. The ANOVA F statistic was calculated to see if the regression model as a whole was significant (see Table 4.14). The p-value is 0.003, which is less than the crucial threshold of 0.05, indicating that the six independent factors had a significant influence on the dependent. As a result, the employment of a multiple linear regression model is almost certainly permissible. IN the independent variable, accurately predicted the dependent variable FOMC's survival.

Table 4. 14: Coefficients of multiple linear regression analysis

Coefficients [a]						
Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.014	.044		.337	.739
	IN	.317	.065	.330	5.023	.001

Dependent Variable: Family-owned manufacturing company's survival (FOMCs)

***Source**: Researcher calculation (2022)*

5. DISCUSSIONS

Objective of this study examined the effect of innovativeness on the survival of family-owned manufacturing companies in Kigali City. Lack of innovativeness was established as one of the factors that hinder the survival of FOMCs from one generation to another. As a result, one of the countermeasures for fixing the

FOMCs' poor survival problem was proposed: innovation. The company's preference for a heavy emphasis on R&D, technological advancement, and innovation are among the aspects of innovativeness in business management explored. The firm has created new companies or released new goods in the previous 5 years, it has frequently made drastic changes to products and services, it searches out new ways to do things, it always attempts to take the initiative in every circumstance, and it excels at finding chances. The research hypotheses for objective one were stated as follows:

$H0_1$: Innovativeness has no significant effect on the survival of family-owned manufacturing companies in Kigali city

Ha_1: Innovativeness has significant effects on the survival of family-owned manufacturing companies in Kigali city.

Equation (3-2) reveals a positive (B=0.429) relationship between innovation and family-owned manufacturing business longevity. Table 4.12 reveals that innovativeness has a substantial impact on FOMC survival, as the observed t value (p=.003) is smaller than the critical value (p=.05) at a 95% confidence level. The null hypothesis (Ho1) is thus rejected, whereas the alternative hypothesis (Ha1) is upheld. As a result, innovativeness has a huge impact on FOMC survival.

The findings are contrary to Kallmuenzer et al.'s (2018) findings that the non-significance between innovativeness and a family firm’s performance, but on the other hand the empirical investigation approves the positive relationship between innovativeness and a family firm’s performance (Cruz, et al., 2012). Kellermanns

et al.'s (2012) findings on family companies disclose that numerous family companies are unwilling to present any modifications to their products, and decide on an alternative to preserving the legacy created through their forefathers. Though, Ayyagari et al.(2011) assert that companies possessed by families perform better than other companies.

The findings are in harmony with Nwankwo and Kanyangale(2020) who asserted that innovativeness plays a great role in SME manufacturing companies of Nigeria. They revealed that in order for manufacturing SMEs in Nigeria to survive, they must be creative. In this direction, for the firm to survive in the long run it needs to be more creative and make sure that the strategy for the whole firm is known to the members who intended to be later involved in the family business. Family-owned manufacturing companies need to involve their siblings in innovativeness to survive for the subsequent generation. The findings of this study are supported by Sindambiwe's' arguments which asserted that being involved in business management at an early stage will lead to the continuity of the firm in Rwanda if there is no conflict among family members.

The findings are in line with many scholars who asserted that Innovation is a vital driver in the longstanding survival and performance of family companies (Kellermans et al., 2008; Aziz *et al.*, 2014) the results also are in line with Kellermanns *et al.*(2012) and Schumpeter (1934) cited in Taylor (2013) stipulated that innovation acts as a key driver and influences family firm performance, as well as is responsible for the longstanding survival of the family companies. However, the success of a family firm is measured by its continuing survival.

The findings are also in harmony with Hatak *et al.*(2016)) and Kellermanns *et al.*(2012) arguments that innovativeness is positively correlated to the family firm's performance, given that it turns well-using family companies' ongoing alignment and their craving to move a dynamic firm to the later cohort. The results of this study are also very close to the Kellermanns *et al*.(2012) and Saan (2020) findings that family memberships play an important in the management of the firm, they are more dominant when making decisions concerning companies' innovative undertakings. The findings of this study also are in line with Saan's (2020) arguments that innovation is indispensable for the firm to survive for long-term, which implies that innovation, when is done regularly makes the company outstand for the long term since it brings new products or services which attract many customers, therefore, it remains on the top of all other companies which will lead to continuity of FOMCs.

The findings of this study are in harmony with Rauch *et al.*(2009) and Nwankwo and Kanyangale (2020)who highlight that for family manufacturing companies to survive there is a need to always come up with new products which will contribute to the company’s performance through the increase in sales. The study of Rauch *et al.*(2009) confirmed that EO is positively related to a firm's financial performance. Based on the findings of this study innovativeness contributes significantly to the firm’s performance and the survival of FMOFs by providing new products that satisfy customers’ needs. However, the success of a family firm is measured by its continuing survival. The findings of Hatak *et al*.(2016) asserts that innovativeness is positively correlated to the family firm's performance, given that it turns well-

using family companies' ongoing positioning nd their yearning to transfer a vital firm to the consequent generation. Therefore to be able to innovate there must be sufficient resources to change the ideas into products. Product differentiation can lead to superior firm performance, according to RBT logic it is the creativity and innovativeness of the firm in developing a new product or process which lead to product differentiation. leads findings show that to the extent a firm's creativity and innovativeness lead and allow the firm to catch up with outside opportunities, reduce cost and treats and finally increase revethreatsthus they can be conceived as valuable resources. ,

6. CONCLUSION

The objective of this study looked at the impact of innovativeness on the survival of family-owned manufacturing companies in Kigali. Inadequate innovativeness has been identified as one of the problems preventing FOMCs from surviving from generation to generation. As a result, one of the solutions for fixing the FOMCs' poor survival problem was proposed: innovation.

6.1 Implications

With objective one, the effect of innovativeness on the survival of FOMCs, which has been an essential construct of EO in FOMCs elsewhere outside of Rwanda but with conflicting results was empirically studied and validated in the FOMCs located in Kigali. The findings indicate that innovativeness significantly affects the survival of FOMCs. The findings imply that innovativeness boosts the business's brand name and increases sales, and strengthens the survival of FOMCs, The literature review and the findings suggest several reasons why innovativeness significantly affects the survival of FOMCs. First, the findings indicate that 42.4%

of the respondents agreed that FOMCs innovativeness the company favours a strong emphasis on R&D, Technological development and innovation, seeks the new way to do things and ofto d,ramatic changes t,o products and services. Therefore, innovativeness in business increases sales by often bringing new products or services to the market. Introducing new products or services to the market regularly make the company always be on the top and attract many customers to the company hence the survival of FOMCs.

Thus, to be innovative, one must first be a risk-taker; similarly, to be proactive, a company must first take calculated risks to introduce new products/services to the market, as it is unknown whether customers will appreciate the product/service or whether they will prefer the existing ones and reject the unfamiliar ones. To be innovative, a company must have sufficient funds to develop a new product or service, so it must take a calculated risk to borrow that money if it does not have enough. If it does have enough funds, it must also take the risk of investing, not knowing whether the innovation will succeed or not. As a result, risk-taking on a corporate level refers to a company's willingness to fund endeavours to forecast predicted earnings (Walter& Ritter, 2006), as if joining an unknown creative firm and investing considerable resources with equivocal results (Lumpkin & Dess, 2001). As a result, taking risks is critical for the FOMCs to improve their performance and ensure their existence in the next generation. Third, 42.2 per cent of respondents agreed that staff at the company are encouraged to take reasonable risks with innovative ideas. The findings suggest that when employees are encouraged to take calculated risks with new ideas in the FOMCs, the firm will

perform better because employees will be motivated and feel a sense of belonging, and will then make decisions to implement those ideas, improving performance and ensuring the FOMC's survival. In terms of goal four, autonomy, which is seen to be an important characteristic that supports entrepreneurial orientation in FOMCs, was experimentally researched and verified in Kigali City FOMCs. The findings suggest that autonomy helps FOMCs perform better and survive longer. A survey of the literature found various reasons why autonomy is critical to the survival of FOMCs. To begin, the data show that 47.7% of respondents believed that their company supports the efforts of individuals and/or teams who work independently. This means that a company that encourages individual effort will function better than one that does not. Individual freedom to make everyday decisions enhances and encourages novel ideas, which leads to being more inventive, which leads to being more competitive, which leads to greater performance and, eventually, the firm's survival.

6.2. Recommendation to FOMCs

In terms of goal one, the data reveal that innovation has a strong favourable impact on FOMC survival. To grow the FOMCs and perform successfully in the long run, it is recommended that they step by step fully integrate innovativeness into daily company management. Technological progress and innovation will be possible if the FOMCs take this chance to launch new goods or services since they favour a heavy emphasis on R&D. The FOMCs should enhance the manner they provide services and the items they create regularly. To do this, FOMCs must excel in

identifying business possibilities rather than relying on traditional methods. The better the FOMCs are at detecting opportunities and allowing all of their employees to attempt new things in all conditions, the better their success and long-term survival will be. These will aid in the development of new products/services as well as significant adjustments to existing ones, resulting in a strong performance and ensuring the FOMC's survival.

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