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Abstract

Pig production enterprises are among the fastest-growing livestock sectors globally, with significant growth in developing countries. There has been a notable shift from ruminant to mono-gastric livestock production due to the shorter time required to reach market maturity. Despite the presence of an established pig industry, the expanding value chain faces various challenges and remains underexploited, leading to low performance. Superior performance in such a dynamic environment is crucial for the survival of pig farms. However, the lack of well-defined strategies to drive improvement has contributed to the sector's suboptimal performance. This study is an extract of a bigger study that examined how strategic management practices affect the financial performance of pig farmers. The specific focus is influence of entrepreneurial innovativeness on the financial performance of small-scale pig farmers in Kiambu County. Specifically, it aimed to assess the effects of new markets, new products, new sources of raw materials, and new processes on financial performance. The research was anchored on the Profit and Value Maximization theory and Schumpeter's theory of innovation. A survey research design was adopted, collecting field data from six sub-counties in Kiambu County. From a target population of 750 pig farmers, a sample of 87 respondents was selected through stratified random sampling. Data was gathered using structured and semi-structured questionnaires, achieving a reliability coefficient of 0.85. Descriptive and inferential statistics were used to analyze the data. The findings revealed that the coefficient of determination was 0.7160, indicating that 71.60% of the variation in financial performance can be attributed to entrepreneurial innovativeness. These findings were further supported by a positive relationship between entrepreneurial innovativeness and the financial performance of small-scale pig farmers, with p-values being positive and significant at 0.029, where $\beta = 0.278$ and $p < 0.05$. The beta coefficient for the relationship between the two variables was both positive and significant, implying that the null hypothesis was rejected. Hence, entrepreneurial innovativeness significantly affects the financial performance of pig farms in Kiambu County. Based on these findings, the study recommends that pig farmers adopt strategic entrepreneurial innovative practices to enhance financial performance. Additionally, policymakers should create incentive-driven policies to promote innovation in farming, recognizing agriculture's critical contribution to Kenya's GDP. Moreover, future research should focus on developing accessible models for registering and tracking innovations to protect the intellectual property of farmers, enabling them to share strategic insights without compromising their competitive advantage.

Keywords: *Entrepreneurial Innovativeness, Financial Performance, Pig Farmers, Kiambu County, Kenya*

1.0 Background of the Study

Entrepreneurial innovativeness plays a critical role in transforming agricultural sectors. Schumpeter (1934) identifies an entrepreneur as one responsible for new economic combinations and demonstrates his importance for economic growth. An entrepreneur is a person who innovates and creates combinations changes in the business environment. In line with the combinations, Schumpeter's perspective on innovation covers four cases: the introduction of a new product or service or a new quality or both that no one has launched yet, the introduction of a new production process, the opening of a new market, and the creation of a new source of raw material for its industry no matter whether the source existed before. Small-scale pig farmers need to adopt and incorporate innovative practices to enable them achieve enhanced financial performance. Globally, pig production systems vary by herd size, structure and feeding dynamics, adapting to resource availability. For instance, Thailand's pig sector transitioned from small-scale to large-scale, commercially oriented systems in the 1960s, driven by strategic innovations such as improved breeds and advanced management (Thanapongtham et al., 2016). Similarly, in Sweden and the U.S., efficient managerial practices, technical innovation, and integrated supply chains significantly enhanced profitability, as highlighted by Labajova (2018) and Boehlje et al. (2011).

In Africa, challenges like poor breeding practices, high feed costs and inadequate technical expertise hinder productivity. In Ghana and Uganda, systemic constraints on pig farming lead to low financial performance and limited expansion. A strategic approach to addressing these constraints could yield better financial results (Okello et al., 2015; Banson et al., 2018).Kenya's pig farming industry, dominated by small-scale farms, plays a vital socio-economic role. Approximately 70% of farms operate on small scales, serving as a source of income, a safety net, and a contributor to household food security (Mbuthia et al., 2014). However, traditional practices and insufficient strategic management have hindered performance. Njogu (2014) demonstrates three pig-production systems in Kenya: large-scale commercial farms with advanced technologies and improved breeds, free-range scavenging systems dependent on minimal external inputs, and small-scale production systems focused on available resources and basic operations.

1.1 Problem Statement

Despite the growing demand for pork products, Kenya’s pig production sector remains underdeveloped. This stagnation is due to low innovation and inconsistent performance. While some farmers excel, most small-scale pig farmers struggle to achieve sustainable profitability (Shaban, 2021). The scarcity of literature addressing entrepreneurial innovativeness within this sector further amplifies the existing gap in research. This study provides actionable insights for pig farmers, policymakers and stakeholders to enhance farm performance. It emphasizes the importance of financial evaluation, strategic adoption and capacity building to improve sustainability and profitability in small-scale pig farming enterprises in six sub-counties of Kiambu.

1.2 Research Objective

To examine whether entrepreneurial innovativeness affects the financial performance of small-scale pig farmers in Kiambu County.

1.3 Hypothesis

Ho: Entrepreneur innovativeness does not significantly affect the financial performance of pig farms in Kiambu County.

2.0 Literature Review

2.1 Theoretical Review

The study was anchored on two key theories: Schumpeter's Innovation Theory and Profit and Value Maximization Theory, each providing a robust framework for understating the role of innovation in enhancing the financial performance. Schumpeter's Innovation Theory highlights the role of entrepreneurial innovation in economic growth, such as adopting new technologies, entering new markets, and improving production methods. Small-scale pig farmers can achieve higher financial performance by incorporating innovative practices like artificial insemination and value-added products (Schumpeter, 1934). Entrepreneurial Innovativeness drives performance by introducing new products, markets, and processes. For pig farmers, adopting innovative practices like superior genetics and advanced feeding techniques enhances productivity and profitability (Sergey, 2008). Profit and Value Maximization Theory posits that businesses aim to maximize profit and achieve sustainable competitive advantages. It provides a framework for efficient resource allocation and highlights the importance of aligning market positioning with organizational goals (Porter, 1981).

2.2 Conceptual Framework

Figure 1 summarizes the conceptual framework, which illustrates the relationship between the independent and dependent variables. The independent variables include entrepreneurial innovativeness, such as new market, new product, new source of raw material, and new process, while the dependent variables include financial performance indicators like return on investment, return on asset, and sales volume.

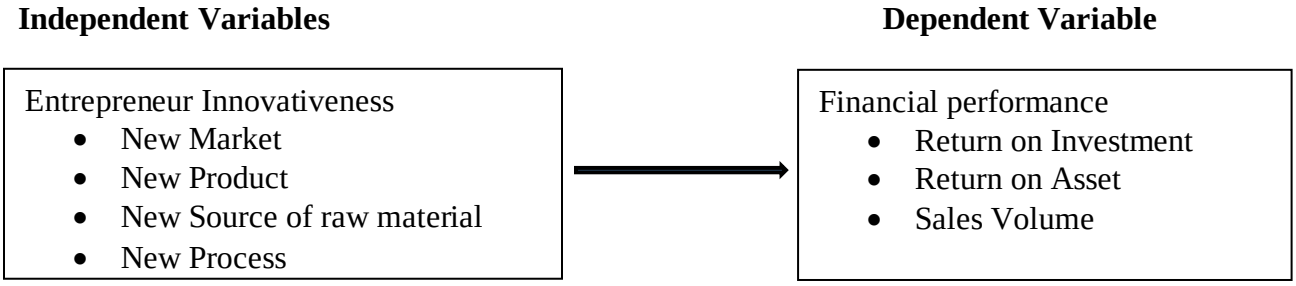

Figure 1: Effects of Entrepreneurial Innovation on Financial Performance

2.3 Empirical Review

The empirical review highlighted the critical role of entrepreneurial innovativeness in enhancing financial performance. Entrepreneurial innovation was identified as essential for adopting new ideas and practices in pig farming. These innovations, ranging from superior genetics to advanced feeding techniques, were evaluated for their impact on financial performance. By identifying and retaining successful innovations, farmers can enhance productivity and profitability (Sergey, 2008). Financial performance, as the dependent variable, was measured by an organization's

ability to generate profits and sustain operations. Metrics such as Return on Investment (ROI), Return on Assets (ROA), and sales volume provided critical insights into profitability, efficiency, and market responsiveness in pig farming enterprises (Planellas, 2013). ROI assessed profitability by comparing net returns to the cost of investment, revealing operational efficiency and competitiveness (Vanhuyse, 2016; Schulte, 2012). ROA measured the ability of farms to generate profit from their assets, offering a comprehensive view of resource utilization (Plastina, 2016). Sales volume indicated the turnover of farm inventory and operational effectiveness, with higher values reflecting better financial outcomes. These financial metrics were crucial in determining the innovative decisions made on the farms.

The literature highlights the pivotal role of entrepreneurial innovation in enhancing financial performance. Strategies such as cost leadership, differentiation, and innovation have been identified as critical drivers of profitability (Genc & Sengul, 2015; Gomera et al., 2018). However, much of this research is outdated, conducted more than a decade ago, or focused on contexts unrelated to small-scale pig farming. For example, studies in England (Vanhuyse, 2016), Poland (Szymanska, 2017), and Malawi (Mbaso & Kamwana, 2013) primarily examined profitability in medium- to large-scale farms, failing to address the specific challenges faced by small-scale pig farmers in Kenya. This gap in the literature underscores the need for a focused examination of how entrepreneurial innovativeness influences the financial performance of small-scale pig farmers in Kiambu County. The findings will offer actionable insights for farmers, policymakers, and other stakeholders, providing practical strategies to improve productivity, profitability, and sustainability within Kenya's pig farming sector.

3.0 Research Methodology

The study adopted an interpretivism paradigm, which emphasizes subjective, culturally, and historically situated knowledge. This approach was ideal for capturing pig farmers' perceptions of strategic management practices and competitiveness in the industry (Ryan, 2018; Bryman, 2008). A mixed-method methodology approach combining qualitative and quantitative methods was employed. The quantitative aspect involved collecting and analyzing numerical data, while qualitative data focused on non-numerical insights. A survey design was employed to gather cross-sectional data within a defined timeline, with stratified random sampling used to ensure proportional representation across sub-counties (Saunders et al., 2016). This study was conducted in Kiambu County, central Kenya. The location was selected for its high concentration of small-scale pig farmers and proximity to markets. The area covers 1,323.9 km² and has a population of approximately 2.4 million people (KNBS, 2019). The region's peri-urban setting and availability of industrial by-products as feed make it a hub for small-scale pig farming. The target population comprised 770 pig farmers from six sub-counties in Kiambu: Kabete, Kiambu, Gatundu South, Juja, Ruiru, and Gatundu North.

Table 1: Distribution of Pig Farmers in Selected Sub-counties of Kiambu

Sub- County	Number of Pig Farmers
1. Kabete	180
2. Kiambu	120
3. Gatundu South	150
4. Juja	130
5. Ruiru	100

6. Gatundu North	90
Total	**770**

Sample Size determination was guided by Krejcie and Morgan's (1970) table where a sample of 87 farmers was selected. Stratified random sampling ensured proportional representation.

Table 2: Sample size of Pig Farmers by Sub-counties

Sub- County	Sample Size
1. Kabete	20
2. Kiambu	14
3. Gatundu South	17
4. Juja	15
5. Ruiru	11
6. Gatundu North	10
Total	**87**

Data was collected using semi-structured questionnaire which captured the demographic data, entrepreneur innovativeness and financial performance. Closed-ended questions used a Likert scale, while open-ended questions allowed for detailed responses. Questionnaires were distributed using the drop-and-pick method. A pilot study was conducted with 36 respondents (6 from each sub-county) to ensure reliability and validity. Reliability test using Cronbach's alpha, yielding a coefficient of 0.85, indicating strong internal consistency while validity using Pearson correlation confirmed the questionnaire's ability to measure study objectives, with p-values <0.05. Data analysis involved descriptive and inferential statistics where descriptive analysis summarized data using percentages, means and standard deviations while inferential analysis based on Pearson's correlation assessed the strength of relationships. Simple linear regression evaluated the effect of independent variable on the dependent variable.

Regression Model

$Y = a + b X_1 + e$

a = Constant

Y= Financial Performance

X_1 = Entrepreneurial Innovativeness

e = Error

The study adhered to ethical research standards, including obtaining a research permit from NACOSTI, securing informed consent from participants, ensuring voluntary participation, maintaining respondent anonymity and confidentiality, using data solely for academic purposes, and acknowledging all sources to uphold academic integrity.

4.0 Findings, Discussion and Conclusion

The response rate was 67 out of 87, yielding a 77% response rate. According to Babbie (2005), a response rate of 70% or higher is considered "very good" for research publication. This high response rate enhances the reliability and validity of the findings, ensuring that the data collected accurately reflects the views of the target population and strengthens the conclusions drawn from

the study. On study participation, 30% of the respondents were from Gatundu North, followed by Juja at 20%. Kiambu, Ruiru and Gatundu South had 15% each. Kabete had the lowest representation at 5%, despite having the largest number of pig farmers (Farmer's Choice Limited data sheet). These findings imply a disparity between pig farmer distribution and participation in the study. Demographic data of the respondents and operational characteristics included gender, age, roles in the farm, farm age, duration of service, educational background, and specialized farming training. These attributes provide insights into the profile of small-scale pig farmers in Kiambu County and their preparedness for strategic management practices. Table 3 displays the respondents' response rate and interpretation

Table 3: Demographics findings on Respondents and interpretation

Category	Characteristics	%	Discussion
Gender of respondent	Male	85	This indicates that pig farming in the county is male-dominated. The findings may guide gender-based initiatives to promote inclusivity in pig farming.
	Female	15	
Age of Respondent	36-50 years	50	These findings suggest that most pig farmers in the County are mature and likely engaging in pig farming as an entrepreneurial venture to supplement their incomes.
	50 years	40	
	25-35 years	10	
	<25 years	0	
Role of respondent	farm owners	88	These results indicate that most respondents were directly involved in farm operations, making them ideal for providing reliable data on strategic practices.
	Managers	20	
	Supervisors	5	
	Employee/not sure	2	
Age of the Farm	3-10 years	60	These findings suggest that pig farming in Kiambu has been gaining popularity over the last decade, growth appears to have slowed recently.
	Over 10 years	22	
	<3years	18	
Duration at the farm	Over 5 years	82	This indicates a high level of experience among the respondents, enhancing their ability to provide insights into farm management practices.
	1-5 years	13	
	< 1year	5	
Education Level	Graduate	45	This indicates that most respondents are well-educated and capable of understanding and implementing innovative practices.
	College	38	
	Secondary	15	
	Primary	2	
Specialized Training	Animal Health	40	The findings suggest that most farmers have sought relevant training to enhance their operational efficiency and financial performance.
	Farm Management Entrepreneurship	26	

	Self-taught	5	
	Did not respond	3	

4.1 Descriptive Statistics Analysis

4.1.1 Entrepreneurial Innovativeness Strategies

Entrepreneur innovation strategies that have been implemented by the participants in their farms were rated. Five categories were provided to choose the one mostly used by the pig farmers including new market, new products, changing into a better new farm, new/better processes and new sourcing and use of farm inputs. The results are presented in figure 2.

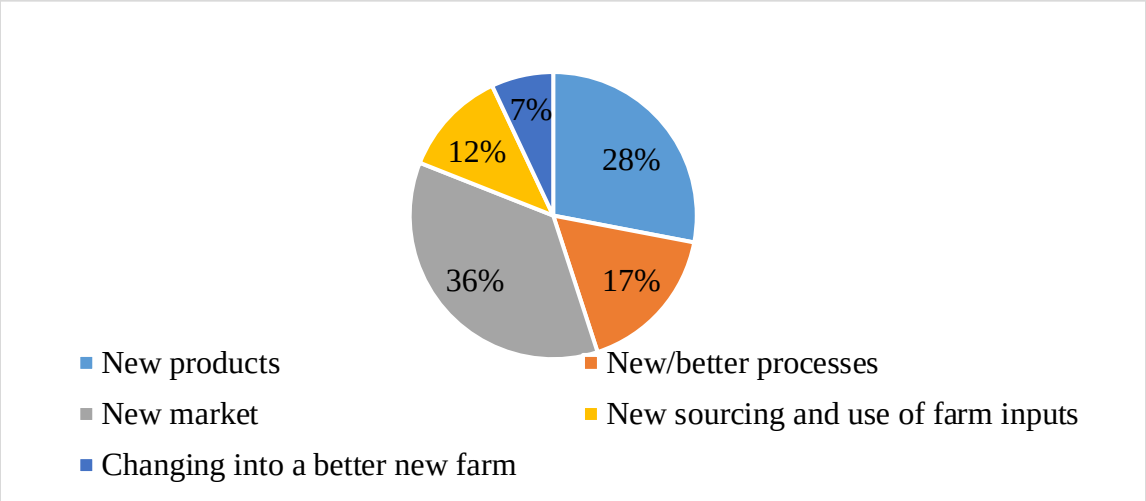

Figure 2: Highlights the innovations adopted

The participants chose the entrepreneur innovation strategies that they have implemented in their pig farms to enhance financial performance. The results show that majority of the respondents (36%) used new market as an entrepreneurial innovation strategy they have implemented from pig farming to enhance performance. Twenty eight percent (28%) implemented new products, 17% created new markets for pig products, 12% developed new sourcing and use of farm inputs while 7% changed into a better new farm. The findings imply that pig farmers in Kiambu County embrace entrepreneurship opportunities created from their farm operations. They implement new ways of enhancing financial performance from their farm activities and products.

4.1.1.1 Improvement of Innovation Strategies for the Past Year

After assessing their strategies implemented in the farm and the benefits gained, the participants' response on whether they have improved the strategies for the past year as shown in Table 4.

Table 4: Improvement of Strategies for the Past Year

Statement	Yes (%)	No (%)	Std Dev	Variance
Improvement of strategies in the last one year	86	14	36	1296

The results show that majority (86%) of the participants had improved the strategies for the past one year. However, 14% had not improved the strategies for the past year. The findings imply that

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pig farmers put efforts in improving the strategies implemented in their farms as indicated for the past one year. That ensures their focus on achieving improved financial performance in the coming years. The changes that respondents noted to have made on the strategies in the last one year enhanced financial performance. The participants indicated that they made changes to achieve a better farm, doing marketing on modern platforms, applying focused cost leadership and focused product differentiation, and better ways of achieving customer feedback. Other participants stated that they have changed by better business planning, awesome staff and sober minds, great teamwork, getting support from family, and accepting brilliant ideas. Some of the participants focused on Improvement in genetic component of pigs thus improving quality of products, use of efficient farming systems, and improvement on expertise and skills and knowledge. Entrepreneurial innovativeness has also enabled the pig farmers to acquire new markets, increase capacity of stock, expand customer base, produce some of the pig feeds at the farm, motivation of farm workers, chip in food from suppliers and obtain better progeny to improve pig genetics.

The study results revealed a positive relationship between entrepreneurial innovativeness and financial performance in small-scale pig farmers in Kiambu County. The results are similar to investigations done to establish how entrepreneur strategy formulation influences financial performance in organizations (Andalya 2013; Chavunduka *et al.* 2014; Monday *et al.* 2015; Wijetunga 2013). The current study results support findings of Wijetunga (2013) and Andalya (2013) which showed a positive relationship between entrepreneurial innovativeness strategy formulation and the financial performance of commercial enterprises. It shows that new and unique ideas for pig farmers enhance their innovativeness and that enhances financial performance in their farms. Furthermore, monitoring and evaluation plays a key role while determining which innovation to keep and ones to drop along the implementation process (Sergey 2008).

4.1.1.2 Effect of Entrepreneurial Innovativeness on the Financial Performance

The participants were asked to rate the impact of entrepreneurial innovativeness on financial performance based on return on investment (ROI), better farm operations and customer service. The answers are presented in the Table 5.

Table 5: Entrepreneurial Innovativeness Effect on Financial Performance

Impact	Positively (%)	Negatively (%)	Mean	Std Dev	Variance (σ^2)
Return on Investment	96.3	3.7	50	46.3	2143.69
Better farm operations	98.2	1.8	50	48.2	2323.24
Customer service	88.4	11.6	50	38.4	1474.56
Average			**50**	**44.3**	**1980.50**

The results indicates majority of the participants rated entrepreneurial innovativeness to have positively impacted the financial performance of the pig farms as indicated by the return on investment (96.3%), better farms operations (98.2%), and customer service (88.4%). Only a few pig farmers felt that entrepreneurial innovativeness affected financial performance negatively as indicated by return on investment (3.7%), better farm operations (1.8%), and customer service (11.6%). The findings imply that an increase in the three indicators proves financial performance

growth in pig farms when strategic management practices such as entrepreneurial innovativeness are implemented.

4.2 Inferential Statistics Analysis

Table 6 presents the model summary entrepreneurial innovativeness

Table 6: Model Summary Entrepreneurial Innovativeness

Model	R	R Squared	Adjusted R Square	Std. Error of the Estimate
1	0.8781[a]	0.7160	0.701	0.04190

a. Predictors (Constant – Entrepreneurial Innovativeness)

The null hypothesis states that entrepreneurial innovativeness does not significantly affect the financial performance of small-scale pig farmers in Kiambu County. The alternative hypothesis states that entrepreneurial innovativeness significantly affects the financial performance of small-scale pig farmers in Kiambu County. The model summary results from the linear regression tests for organizations' activity in Table 6 presented the value of r = 0.8781, indicating that there is a strong positive correlation between the financial performance and Entrepreneurial innovativeness. The coefficient of determination was 0.7160 implying that a 71.60% change in the financial performance is due to variation in entrepreneurial innovativeness. These findings were supported by the positive relationship between entrepreneurial innovativeness and financial performance of small-scale pig farmers with P values positive and significant at 0.029, where $\beta = 0.278$, and $p < 0.05$. The beta coefficient for the relationship between the two variables is positive and significant implying that the null hypothesis is rejected and therefore Alternative Hypothesis holds that entrepreneurial innovativeness significantly improved financial performance in pig farming. The study revealed positive relationships between entrepreneurial innovativeness and financial performance, with a positive impact on ROI and operational efficiency (R = 0.8781). These findings align with prior studies (Monday et al., 2015) that emphasize the importance of entrepreneurial innovation in enhancing organizational performance. The results underscore the critical role of innovative management practices in optimizing financial performance in pig farming enterprises.

5.0 Conclusion

The study concludes that entrepreneurial innovativeness plays a critical role in enhancing the financial performance of small-scale pig farmers in Kiambu County. By adopting innovative strategies such as accessing new markets, developing new products, integrating advanced processes, and sourcing new raw materials, farmers are able to improve the efficiency and profitability of their operations. These practices not only optimize the use of available resources but also provide opportunities for diversification and growth. Farmers who adopt entrepreneurial innovation are better positioned to navigate the challenges of the agricultural sector, including fluctuating market demands, high production costs, and limited access to technical support. As such, embracing innovation is vital for improving financial outcomes and ensuring long-term sustainability in pig farming enterprises. Furthermore, the study finds that small-scale pig farmers who actively incorporate and refine innovative practices experience significant improvements in productivity and resilience. For instance, adopting better genetic selection techniques, using efficient feeding systems, and leveraging modern marketing platforms have enabled farmers to achieve higher quality outputs and expanded market reach. These innovations address long-

standing barriers in the sector, such as low production yields and limited customer engagement, paving the way for sustainable growth. The findings emphasize that entrepreneurial innovativeness is not only a driver of profitability but also a catalyst for transforming traditional farming methods into dynamic and competitive agricultural enterprises. This reinforces the importance of innovation as a central strategy for achieving success and stability in the agricultural industry.

6.0 Recommendations

The study recommends that pig farmers should embrace entrepreneurial innovation to create new products, explore alternative markets, and improve their overall farm operations, ensuring they remain competitive in a dynamic agricultural environment. For policymakers, the study recommends that robust policies should be developed to promote innovative environment, provide training programs and allocate resources to enhance farmers' capacity for innovation and strategic planning. This includes offering technical support and funding to facilitate the adoption of modern farming practices and tools. Additionally, access to markets and infrastructure should be improved to support the growth and sustainability of pig farming enterprises. By addressing these structural barriers, policymakers can create an enabling environment that fosters the development and competitiveness of small-scale pig farming operations. The study further recommends that stakeholders, including private sector players and non-governmental organizations, should collaborate with pig farmers to implement sustainable farming practices and expand market reach. Partnerships between stakeholders and farmers should focus on creating value chains that ensure market access, fair pricing, and quality assurance, enabling farmers to maximize their financial performance and long-term sustainability. Finally, for academia, the study recommends that future research should expand to include other sub-counties in Kenya to understand regional differences in the application and impact of strategic management practices. Researchers should investigate additional aspects of entrepreneurial innovativeness, supply chain optimization, and their influence on financial performance. Alternative performance measures, including operational efficiency, market share growth, and customer satisfaction, should be utilized to validate the findings and provide a broader perspective.

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