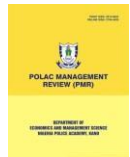




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EFFECT OF ENTREPRENEURIAL ECOSYSTEM ON THE PERFORMANCE OF AGRO PROCESSING MANUFACTURING FIRMS IN BENUE STATE

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Abstract

Agro-processing manufacturing performance in many developing countries continue to be weak despite its contribution in term of economic diversification of employment generation. This study examined the effect of entrepreneurial ecosystem dimensions on the performance of agro processing manufacturing firms in Benue State. Specifically, the study investigated the influence of entrepreneurial culture, human capital, and market access on the performance of agro-manufacturing firms. A cross-sectional survey research design was adopted, and primary data were collected through a structured questionnaire administered to owners and one senior staff member of selected agro-manufacturing firms in Benue State. A sample size of 100 respondents was determined using the consensus sampling method. The data were analyzed using descriptive statistics and multiple regression analysis with the aid of the Statistical Package for the Social Sciences (SPSS) Version 26. The regression results revealed that entrepreneurial culture ($\beta = 0.182$, $t = 3.970$, $p < 0.05$), human capital ($\beta = 0.205$, $t = 4.410$, $p < 0.05$), and market access ($\beta = 0.221$, $t = 4.850$, $p < 0.05$) each had a positive and statistically significant effect on the performance of agro-manufacturing firms in Benue State. Furthermore, the coefficient of determination ($R^2 = 0.796$) indicated that entrepreneurial culture, human capital, and market access jointly explained 79.6% of the variation in firm performance, while the remaining 20.4% was attributable to other factors not included in the model. The overall regression model was statistically significant ($F = 96.418$, $p < 0.05$), confirming the joint predictive power of the explanatory variables. The study concluded that entrepreneurial culture, human capital, and market access are critical determinants of the performance of agro-manufacturing firms in Benue State. It recommended that agro-manufacturing firms should strengthen entrepreneurial values, invest continuously in employee capacity development, and expand market access through improved distribution networks and strategic partnerships. The study also recommended that government should formulate supportive policies and provide adequate infrastructure to enhance the entrepreneurial ecosystem and improve the competitiveness of agro-manufacturing firms.

Keywords: Entrepreneurial Ecosystem, Entrepreneurial Culture, Human Capital, Market Access, Agro-Manufacturing Firms, Firm Performance, Multiple Regression Analysis.

1. Introduction

In contemporary entrepreneurship and development research, firm performance has increasingly attracted attention due to the growing need to understand how

environmental, institutional, and structural factors shape business outcomes. Within this context, the concept of entrepreneurial ecosystem has become a widely accepted framework for explaining variations in firm performance. The entrepreneurial ecosystem refers

to a dynamic network of interconnected actors, institutions, cultural values, and resource flows that collectively influence entrepreneurial activity, business growth, and sustainability. Recent studies emphasize that entrepreneurial ecosystems function as enabling environments where multiple components interact to determine the success or failure of firms (Stam & Van, 2021; Audretsch et al., 2023). These components typically include access to finance, entrepreneurial culture, human capital, market structures, policy support, and infrastructure, all of which jointly shape firm-level outcomes.

The Agro-processing manufacturing sector remains a critical driver of industrialization, employment creation, and economic diversification through their impact-based activities. However, despite its importance, Agro manufacturing performance in many developing economies continues to be weak. In Nigeria, the sector faces persistent challenges such as low productivity, high production costs, and limited competitiveness (World Bank, 2023; UNIDO, 2022). In Benue State specifically, manufacturing firms continue to experience underperformance, characterized by low output levels, weak innovation capacity, and restricted market expansion. These challenges are largely linked to weaknesses within the entrepreneurial ecosystem that supports industrial activities.

One of the key ecosystem factors is entrepreneurial culture, which reflects societal attitudes toward innovation, risk-taking, creativity, and enterprise development. A weak entrepreneurial culture often limits entrepreneurial intention and business sustainability, thereby affecting firm performance (Wurth et al., 2021). In addition, human capital plays a crucial role in determining how effectively firms operate, as it encompasses the skills, knowledge, and competencies of employees. Studies have shown that inadequate human capital reduces productivity and limits firms' ability to adopt modern technologies and improve operational efficiency (OECD, 2023). Furthermore, market access remains a significant constraint for many manufacturing firms in developing regions. Limited access to markets, weak distribution

systems, and low demand integration reduce firms' growth potential and competitiveness (UNCTAD, 2022).

Despite increasing scholarly attention to entrepreneurial ecosystems, there remains limited empirical evidence on how their components jointly influence the performance of Agro manufacturing firms in Benue State. Most existing studies have examined these variables in isolation, without adequately capturing their combined effects at the sub-national level. This creates a significant gap in the literature and highlights the need for a more integrated empirical investigation.

Therefore, this study seeks to examine the effect of entrepreneurial ecosystem components on the performance of manufacturing firms in Benue State. Specifically,

- i. It investigates the influence of entrepreneurial culture on performance of agro processing firms in Benue State.
- ii. To assess the effect of human capital on agro processing firms in Benue State.
- iii. To determine the influence of market access on agro processing firms performance in Benue State

In line with these objectives, the study addresses the following research questions:

1. To what extent does entrepreneurial culture influence manufacturing firm performance in Benue State?
2. How does human capital affect firm performance in Benue State
3. What is the impact of market access on the performance of manufacturing firms in the study area?

To guide the empirical analysis, the following hypotheses are formulated:

1. Entrepreneurial culture has no significant effect on the performance of manufacturing firms in Benue State;
2. Human capital has no significant influence on manufacturing firm performance in Benue State.
3. Market access has no significant effect on the performance of manufacturing firms in the study area.

These hypotheses provide a basis for statistically testing the relationships between entrepreneurial ecosystem components and manufacturing firm performance.

2. Literature Review

2.1 Conceptual Review

Entrepreneurial Ecosystem

The concept of the entrepreneurial ecosystem has gained significant attention in entrepreneurship and economic development literature due to its ability to explain how external environmental factors influence entrepreneurial activities and firm growth. An entrepreneurial ecosystem refers to a network of interconnected actors, institutions, policies, and environmental conditions that collectively support the creation, survival, and growth of enterprises within a specific location.

According to Daniel (2018), “an entrepreneurial ecosystem is a dynamic, institutionally embedded interaction between entrepreneurial attitudes, abilities, and aspirations that drives the allocation of resources through the creation and operation of new ventures” (p. 43). This definition emphasizes the interactive nature of entrepreneurship and the role of institutional structures in fostering entrepreneurial success.

Similarly, Erkko (2021) stated that “entrepreneurial ecosystems consist of interdependent actors and factors that are coordinated in ways that enable productive entrepreneurship within a particular territory”. This quotation highlights the importance of collaboration among various stakeholders in creating an environment that supports business formation and growth.

Furthermore, Colin (2018) argued that “entrepreneurial ecosystems are designed around the needs of entrepreneurs and comprise the institutions, organizations, and processes that support entrepreneurial activity”. This statement underscores the entrepreneur-centered nature of ecosystems and their significance in facilitating enterprise development.

According to David (2022): An entrepreneurial ecosystem encompasses the economic, social, institutional, and cultural conditions that influence the identification of opportunities, the creation of new ventures, and the growth of existing firms. Strong entrepreneurial ecosystems facilitate innovation, resource mobilization, knowledge exchange, and business expansion, thereby contributing to economic growth and regional competitiveness”.

This view provides a comprehensive explanation of entrepreneurial ecosystems by demonstrating how various environmental factors interact to support entrepreneurship, innovation, and enterprise growth. It suggests that a well-developed ecosystem enhances the capacity of firms to survive, compete, and achieve long-term success.

These components typically include access to finance, government policies and regulations, infrastructure, human capital development, market accessibility, institutional support systems, business networks, and cultural attitudes toward entrepreneurship (Stam, 2015; Spigel, 2017; Roundy et al., 2018). Recent studies further emphasize that these components are interdependent, meaning that the effectiveness of one element is influenced by the strength of others within the ecosystem (Nicotra et al., 2021; Brown & Mason, 2022).

In relation to manufacturing firms, a strong entrepreneurial ecosystem provides an enabling environment that promotes innovation, productivity, and competitiveness. It reduces operational constraints and improves access to critical resources needed for business survival and expansion. Specifically, entrepreneurial culture, human capital availability, and

market access are key ecosystem components that directly influence the performance of manufacturing firms, particularly in developing economies where structural and institutional challenges are prevalent (Acs et al., 2017; Malecki, 2018; World Bank, 2023).

Firm Performance

Firm performance is a multidimensional construct that reflects the extent to which an organization efficiently and effectively achieves its objectives. In the manufacturing sector, performance is commonly assessed using both financial and non-financial indicators to provide a holistic evaluation of organizational success.

According to Richard (2021), “organizational performance refers to the organization's ability to attain its goals by using resources in an efficient and effective manner”. This quotation emphasizes that performance is measured by how effectively organizations achieve their objectives while utilizing available resources efficiently.

Similarly, David (2018) stated that “sustainable superior performance depends on a firm's ability to sense opportunities, seize them, and continuously transform its resources and capabilities”. This view highlights the importance of adaptability and strategic capability in maintaining long-term organizational success.

Furthermore, Robert (2019) argued that “financial measures alone are insufficient for guiding and evaluating an organization's journey toward competitive success”. This statement underscores the need for organizations to complement financial indicators with non-financial measures when assessing performance.

According to John and Schermerhorn (2020) Performance is the measure of work results achieved by an organization, team, or individual. High organizational performance is achieved when resources are utilized efficiently, goals are accomplished effectively, stakeholders' expectations are satisfied, and

the organization maintains its capacity for innovation, growth, and long-term sustainability in a competitive environment”

This quotation provides a comprehensive explanation of firm performance by emphasizing efficiency, effectiveness, stakeholder satisfaction, innovation, and sustainability as key indicators of organizational success. It suggests that performance should be viewed as a multidimensional concept that goes beyond financial outcomes to include broader measures of organizational achievement.

Financial performance indicators include profitability, return on investment (ROI), return on assets (ROA), and sales growth. Non-financial indicators include productivity, innovation, product quality, customer satisfaction, market expansion, and operational efficiency (Richard et al., 2009; Cho & Pucik, 2021). Recent literature emphasizes that firm performance is influenced by both internal and external factors. Internal factors include managerial capability, technological resources, and organizational culture, while external factors include market conditions, institutional environment, and the broader entrepreneurial ecosystem (Barney, 2021; Teece, 2018). Therefore, the strength of the entrepreneurial ecosystem particularly entrepreneurial culture, human capital, and market access plays a crucial role in determining the performance level of manufacturing firms in Benue State.

Relationship between Entrepreneurial Ecosystem and Firm Performance

The entrepreneurial ecosystem has been widely recognized as a fundamental driver of firm performance, especially in developing economies such as Nigeria. It comprises interconnected elements including access to finance, government policies and leadership, infrastructure, entrepreneurial culture, human capital, and market access. These components interact to shape the productivity, innovation capacity, competitiveness, and overall growth of firms. Recent studies emphasize that a well-functioning ecosystem

enhances business resilience and performance, while weak institutional and structural support systems hinder firm development and sustainability (Isenberg, 2022; World Bank, 2023; OECD, 2024). In this study, particular attention is given to entrepreneurial culture, human capital, and market access, as they represent critical dimensions of the entrepreneurial ecosystem that directly influence manufacturing performance in Benue State.

Entrepreneurial Culture and Firm Performance

Entrepreneurial culture refers to the shared values, beliefs, attitudes, and behavioural norms that encourage innovation, creativity, risk-taking, and opportunity recognition within an economic environment. A strong entrepreneurial culture promotes proactive thinking, adaptability, and openness to change, which are essential for sustaining competitiveness in the manufacturing sector (Autio et al., 2023).

According to Daniel (2018), “entrepreneurship flourishes in cultures that celebrate innovation, tolerate failure, and encourage individuals to pursue opportunities”. This quotation emphasizes the importance of a supportive cultural environment in fostering entrepreneurial behaviour and stimulating business growth.

Similarly, Erkko (2021) stated that “entrepreneurial culture shapes how individuals perceive opportunities, evaluate risks, and engage in innovative activities”. This view highlights the role of cultural values and norms in influencing entrepreneurial intentions and actions within an economy.

Furthermore, Amar (2019) argued that “a culture that rewards initiative, experimentation, and creativity provide fertile ground for entrepreneurial success”. This statement underscores the significance of encouraging innovation and independent thinking as drivers of enterprise development and competitiveness.

According to David (2022) Entrepreneurial culture encompasses the values, attitudes, and social norms that

support entrepreneurial behaviour, innovation, and the pursuit of new opportunities. Societies characterized by strong entrepreneurial cultures tend to exhibit higher levels of business creation, innovation, adaptability, and economic dynamism, which collectively contribute to sustained economic growth and competitiveness”.

This view provides a comprehensive explanation of entrepreneurial culture by demonstrating how cultural values influence innovation, business creation, and economic development. It suggests that a strong entrepreneurial culture serves as a catalyst for enterprise growth and long-term competitiveness.

Empirical evidence shows that firms operating in environments with strong entrepreneurial orientation are more likely to adopt innovative production methods, improve operational efficiency, and respond effectively to market dynamics. Such cultures also enhance employee motivation, collaboration, and continuous improvement, leading to higher productivity and performance outcomes. Conversely, weak entrepreneurial culture characterized by resistance to innovation, fear of failure, and low risk tolerance limits growth potential and reduces firm performance (Global Entrepreneurship Monitor, 2023).

Human Capital and Firm Performance

Human capital refers to the stock of knowledge, skills, competencies, and experience possessed by employees and management within an organization. It is developed through formal education, training, and workplace learning and remains a critical resource for industrial productivity.

According to Thomas (2019), “human capital represents the knowledge, skills, abilities, and other characteristics embodied in individuals that contribute to personal, organizational, and societal productivity”. This quotation emphasizes that human capital is embedded in people and serves as a vital resource for enhancing organizational effectiveness and economic performance.

Similarly, Eduardo (2020) stated that “employee knowledge and skills constitute strategic assets that enable organizations to achieve superior performance and maintain competitiveness”. This view highlights the importance of investing in workforce development as a means of improving productivity and sustaining competitive advantage.

Furthermore, Rita (2021) argued that “organizations derive value from their ability to develop, deploy, and continuously upgrade the capabilities of their workforce”. This statement underscores the significance of continuous learning and skill development in adapting to changing business environments and technological advancements.

According to Jeffrey (2022) Human capital encompasses the collective knowledge, skills, experiences, creativity, and capabilities of employees that can be used to create economic value for organizations. Firms that effectively invest in and manage their human capital are better positioned to enhance productivity, foster innovation, improve performance, and achieve long-term organizational success”.

This quotation provides a comprehensive explanation of human capital by demonstrating how employee competencies and experiences contribute to productivity, innovation, and organizational growth. It suggests that human capital remains one of the most valuable assets available to firms seeking sustainable competitive advantage.

In manufacturing firms, strong human capital enhances technical efficiency, improves decision-making, and supports the effective utilization of modern technologies and production systems. Skilled employees contribute to innovation, reduced production errors, and improved product quality, thereby strengthening firm competitiveness. In contrast, inadequate human capital results in low productivity, operational inefficiencies, and poor adaptation to

technological change, all of which negatively affect firm performance (UNIDO, 2023).

Market Access and Firm Performance

Market access refers to the ability of manufacturing firms to reach customers, distribute goods, and compete effectively in both domestic and international markets. It is influenced by distribution networks, logistics systems, infrastructure quality, demand conditions, and trade openness.

According to Gary (2018), “market access determines the extent to which firms can integrate into local, regional, and global value chains”. This quotation emphasizes the importance of market access in enabling firms to participate in broader economic networks and expand their business opportunities beyond local markets.

Similarly, Richard (2019) stated that “access to larger markets enables firms to increase production, exploit economies of scale, and enhance their competitiveness”. This view highlights the role of market access in improving productivity and strengthening the competitive position of manufacturing firms.

Furthermore, Deborah (2021) argued that “firms with greater access to domestic and international markets are more likely to experience growth in sales, productivity, and innovation”. This statement underscores the positive relationship between market accessibility and firm performance, particularly in increasingly globalized economies.

According to John (2022) Market access refers to the capacity of firms to enter, operate, and compete successfully within target markets. Effective market access is supported by efficient transportation systems, reliable distribution networks, favorable trade policies, adequate infrastructure, and strong customer demand. These factors collectively influence the ability of firms to expand operations, increase revenues, and sustain long-term competitiveness”.

This quotation provides a comprehensive explanation of market access by demonstrating how logistics, infrastructure, trade policies, and customer demand shape the ability of firms to compete effectively. It suggests that improved market access enhances business growth, profitability, and long-term sustainability.

Improved market access enables firms to expand their customer base, increase sales volume, and enhance profitability. It also encourages production scaling and investment in innovation to meet evolving consumer demands. However, limited market access increases transaction costs, restricts sales opportunities, and reduces competitiveness, particularly in environments with infrastructural and logistical constraints (World Bank, 2023). The entrepreneurial ecosystem plays a decisive role in shaping the performance of manufacturing firms through entrepreneurial culture, human capital, and market access. A supportive ecosystem fosters innovation, strengthens workforce capacity, and expands market opportunities, thereby enhancing productivity, competitiveness, and sustainability. Conversely, deficiencies in these components constrain firm growth and reduce operational efficiency, particularly in developing economies where structural challenges remain significant (OECD, 2024; UNIDO, 2023).

2.2 Empirical Review

Abah and Abah (2023) examined entrepreneurial ecosystems in North-Central Nigeria as a strategy for sustainable development. Using a qualitative content-analysis approach grounded in entrepreneurship literature, the study identified key ecosystem components such as finance, human capital, markets, culture, support services, and policy that influence venture creation and growth. The authors argued that entrepreneurial development should be understood as a process involving interconnected subsystems rather than isolated variables. Their findings revealed that weaknesses in ecosystem integration contribute to persistent industrial and technological underdevelopment in the region. The study concluded

that aligning ecosystem structures with entrepreneurial capabilities would enhance sustainable development. Although the study made a significant conceptual contribution by linking entrepreneurial activities with sustainable development outcomes, its reliance on secondary data limited empirical generalization. Furthermore, the absence of measurable indicators and concrete policy frameworks reduced its practical applicability. The study is relevant to the present research because it highlights entrepreneurial culture, human capital, and market access as critical determinants of firm performance.

Zoltán et al. (2017) investigated the conceptual foundations of the entrepreneurial ecosystem approach. The study traced the origins of entrepreneurial ecosystems to regional development and strategic management theories, emphasizing the interactions among entrepreneurs, institutions, finance, government, culture, and infrastructure. The authors argued that entrepreneurship research often overlooks the broader environment within which firms operate, thereby limiting understanding of entrepreneurial success and value creation. The study contributed to the literature by providing conceptual clarity on how ecosystem interactions shape entrepreneurial outcomes. However, the study was largely theoretical and lacked empirical measurement frameworks for testing ecosystem variables. In addition, it did not provide sufficient policy direction for practical implementation. Nevertheless, the study is relevant to the current research because it underscores the importance of entrepreneurial culture, human capital, and market structures in enhancing manufacturing firm performance.

Ajirowo (2024) assessed entrepreneurial ecosystems and SME growth in Ilorin Metropolis, Kwara State. The study adopted a cross-sectional survey design and collected quantitative data from 343 SMEs selected from registered tax-paying enterprises. Using multiple regression analysis, the findings revealed that access to capital, entrepreneurial support infrastructure, and talent and knowledge exchange significantly influenced SME growth. The study concluded that strong

entrepreneurial ecosystems are essential for business sustainability and economic development. The study contributed empirical evidence on the role of entrepreneurial ecosystem dimensions in business growth within a developing economy context. However, its exclusive use of quantitative methods limited deeper understanding of informal entrepreneurial dynamics, while the exclusion of informal enterprises reduced the generalizability of the findings. Despite these limitations, the study provides valuable insight into the effects of human capital and market-related factors on enterprise performance, which are central variables in the present study.

Aziz et al. (2022) investigated the influence of entrepreneurial ecosystems on SMEs in Malaysia. The study examined how ecosystem components such as infrastructure, institutional support, human capital, and policy frameworks affect SME performance and growth. The findings showed that weak infrastructure, inadequate support mechanisms, and limited access to talent hinder SME development despite government interventions. The authors concluded that a strong entrepreneurial ecosystem is necessary for sustainable SME growth. Although the study emphasized the practical relevance of ecosystem components, it lacked sufficient methodological detail regarding sampling procedures and analytical techniques, thereby limiting the reliability of its conclusions. Furthermore, the findings were largely descriptive and did not adequately establish causal relationships among the variables. Nevertheless, the study remains relevant because it demonstrates the influence of entrepreneurial support systems and human capital on firm performance.

Binuyo et al. (2024) explored the relationship between entrepreneurial ecosystems and sales growth among manufacturing SMEs in South-West Nigeria. Using a cross-sectional survey of 404 owner-managers across industrial clusters, the study employed multiple and hierarchical regression analyses to assess the effects of entrepreneurial ecosystem variables on firm performance. The findings indicated that entrepreneurial ecosystems significantly influenced

operational outcomes and sales growth among manufacturing SMEs. The study concluded that strengthening cluster-level support structures is critical for sustaining manufacturing enterprises in Nigeria. The study contributed to African entrepreneurship literature by focusing specifically on manufacturing firms; however, the operationalization of sales growth through waste-reduction indicators weakened the theoretical clarity of the dependent variable. Additionally, the use of self-reported data introduced possible common-method bias. Despite these shortcomings, the study provides empirical support for the relationship between entrepreneurial ecosystem dimensions and manufacturing firm performance, which aligns with the objectives of the present study.

Breivik-Meyer et al. (2025) examined gender dimensions within entrepreneurial ecosystems in their work titled *Gendering Entrepreneurial Ecosystems: Levelling the Field*. Drawing from interdisciplinary perspectives and international case studies, the authors argued that entrepreneurial ecosystems are socially constructed and often shaped by masculine norms that influence access to finance, networks, and opportunities. The study highlighted how structural barriers limit the participation and performance of women entrepreneurs and recommended ecosystem redesign rather than adaptation to biased systems. Although the work provided important conceptual and practical insights into inclusivity within entrepreneurial ecosystems, methodological inconsistency across chapters reduced the strength of cumulative findings. Nevertheless, the study is relevant because it demonstrates how socio-cultural structures and institutional support systems shape entrepreneurial performance outcomes.

Brown and Mawson (2019) reviewed entrepreneurial ecosystems and public policy implementation. The study critically assessed the increasing adoption of entrepreneurial ecosystem policies and argued that many policy frameworks suffer from conceptual ambiguity and policy imitation without consideration for contextual realities. The authors maintained that entrepreneurial ecosystems should not merely focus on

increasing the quantity of entrepreneurial activities but should address network failures and ecosystem-specific challenges. The study concluded that effective entrepreneurial policies require context-sensitive approaches tailored to the unique characteristics of each ecosystem. Although the study provided a critical perspective on entrepreneurial ecosystem policies, it focused primarily on macro-level analysis and paid limited attention to the lived experiences of entrepreneurs and firm-level dynamics. Nonetheless, the study is relevant to the present research because it highlights the importance of institutional and infrastructural support in shaping manufacturing firm performance

2.3 Theoretical Review

The theories underpinning this study is the Resource-Based View (RBV), Institutional Theory, and Systems Theory, which together provide a robust framework for explaining how the dimensions of the study influence manufacturing firm performance. The Resource-Based View asserts that organizations attain sustainable competitive advantage through the acquisition and effective utilization of valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991; Barney, 2021). Within the context of this study, entrepreneurial culture, human capital, and market access represent critical strategic resources capable of enhancing innovation, productivity, competitiveness, and overall firm performance (Teece, 2018).

In addition, Institutional Theory emphasizes the importance of formal and informal institutional arrangements, such as government policies, regulatory systems, market structures, and socio-economic conditions, in shaping organizational behavior and performance outcomes (North, 1990; Scott, 2014). A supportive institutional environment encourages

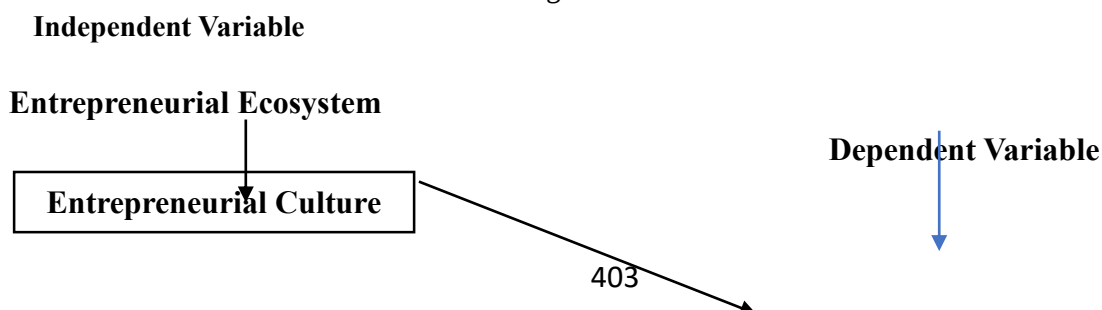
entrepreneurial orientation, strengthens workforce capabilities, and improves firms' access to markets, thereby enhancing organizational performance (Acemoglu & Robinson, 2019; World Bank, 2023).

Furthermore, Systems Theory offers a holistic perspective by viewing firms as part of an interconnected system in which different components interact and influence one another (von Bertalanffy, 1968; Meadows, 2008). In this regard, entrepreneurial culture, human capital, and market access are interrelated dimensions whose combined effectiveness determines the success and sustainability of manufacturing firms. Consequently, the integration of these theories demonstrates that manufacturing firm performance is influenced not only by internal organizational capabilities but also by the broader institutional and systemic environment within which firms operate.

However, Systems Theory is an appropriate underpinning theory for this study because it views agro-manufacturing firms as open systems whose performance depends on continuous interaction with various elements of the entrepreneurial ecosystem. The theory explains the interdependence among ecosystem actors, highlights the role of environmental factors in organizational success, and provides a holistic framework for analyzing how entrepreneurial ecosystem components collectively influence the performance of agro-manufacturing firms in Benue State.

Conceptual Framework

The conceptual framework presents the concepts of entrepreneurial ecosystem and manufacturing firm performance.



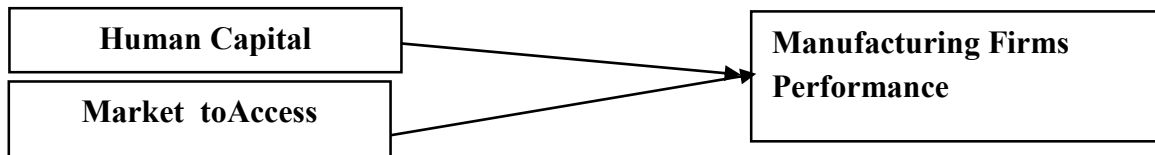


Figure 1: Model showing the relationship between the variables

Source: Researcher's Design (2026)

3. Methodology

This study adopted a cross-sectional survey research design, which was considered appropriate for obtaining quantitative data from different firms at the same time within a defined geographical area. The design enabled a systematic investigation of the relationship between the entrepreneurial ecosystem and the performance of manufacturing firms in Benue State. A cross-sectional approach was employed, allowing data to be collected at a single point in time without manipulating the study environment.

The population of the study comprised of selected registered agro-manufacturing firms operating within Benue State, particularly firms registered with the Corporate Affairs Commission (CAC) and affiliated with the Manufacturers Association of Nigeria (MAN), Benue State Branch. A total of fifty (50) agro-manufacturing firms were identified. The units of analysis consisted of the owners and one senior staff member from each firm, giving a total population of 100 respondents.

Considering the size of the population, the consensus sampling was to obtain a sample size of 100 respondents at a 5% level of precision. The sample was proportionately distributed among the selected firms to ensure adequate representation.

Primary data were collected using a structured questionnaire developed from existing literature and adapted to the Nigerian manufacturing environment. Responses were measured on a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5).

The instrument was subjected to face and content validity by experts in Business Administration and Measurement and Evaluation. Reliability was established using Cronbach's Alpha coefficient, with all constructs recording values above the acceptable threshold of 0.70.

Data were analyzed using descriptive statistics such as frequencies, percentages, means, and standard deviations to summarize respondents' characteristics. The hypotheses were tested using multiple linear regression analysis with the aid of the Statistical Package for the Social Sciences (SPSS) Version 26. The regression model is specified as:

$$Y = \beta_0 + \beta_1 EC + \beta_2 HC + \beta_3 MA + \mu \quad (1)$$

Where:

- Y = Manufacturing Firm Performance
- EC = Entrepreneurial Culture
- HC = Human Capital
- MA = Market Access
- β_0 = Constant
- $\beta_1 - \beta_3$ = Regression coefficients
- μ = Error term

The decision rule was to reject the null hypothesis where the probability value (p-value) was less than 0.05.

4. Results and Discussion

4.1 Multiple Regression Analysis

Multiple regression analysis was employed to determine the effect of entrepreneurial culture, human capital, and market access on the performance of manufacturing firms in Benue State.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
1	0.892	0.796	0.788	0.371

Source: Field Survey Analysis (2026)

The model summary indicates a correlation coefficient (R) of 0.892, suggesting a strong positive relationship between entrepreneurial ecosystem variables and manufacturing firm performance.

The coefficient of determination (R^2) of 0.796 implies that entrepreneurial culture, human capital, and market

access jointly explained 79.6% of the variation in manufacturing firm performance, while the remaining 20.4% was explained by factors outside the model. The adjusted R^2 value of 0.788 confirms that the explanatory power of the model remains high after adjusting for the number of explanatory variables.

Table 2: ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	42.581	3	14.194	96.418	0.000
Residual	10.991	76	0.145		
Total	53.572	79			

Source: Field Survey Analysis (2026)

The ANOVA result shows an F-statistic of 96.418 with a significance value of 0.000, indicating that the overall regression model is statistically significant. Therefore,

entrepreneurial culture, human capital, and market access jointly have a significant effect on manufacturing firm performance.

Table 3: Multiple Regression Coefficients

Variables	Unstandardized B	Std. Error	Standardized Beta	t-value	Sig.
Constant	0.741	0.281		2.638	0.010
Entrepreneurial Culture	0.182	0.046	0.261	3.970	0.000
Human Capital	0.205	0.047	0.294	4.410	0.000
Market Access	0.221	0.046	0.323	4.850	0.000

Dependent Variable: Manufacturing Firm Performance

Source: Field Survey Analysis (2026)

4.2 Regression Equation

The estimated regression model is expressed as:

$$MFP = 0.741 + 0.182EC + 0.205HC + 0.221MA + \mu$$

The estimated regression equation indicates that entrepreneurial culture, human capital, and market access all exert positive effects on the performance of manufacturing firms in Benue State. Specifically, holding other explanatory variables constant, a one-unit increase in entrepreneurial culture leads to an increase of 0.182 units in manufacturing firm performance. Similarly, a one-unit increase in human capital results in

a 0.205-unit improvement in firm performance, while a one-unit increase in market access contributes 0.221 units to manufacturing firm performance. Among the three independent variables, market access has the strongest positive influence on manufacturing firm performance, followed by human capital and entrepreneurial culture.

Hypothesis One

The first hypothesis stated that entrepreneurial culture has no significant effect on the performance of manufacturing firms in Benue State. The regression analysis produced a coefficient of **0.182**, a **t-value of 3.970**, and a **p-value of 0.000**, which is less than the 0.05

level of significance. This indicates that entrepreneurial culture has a statistically significant positive effect on manufacturing firm performance. Consequently, the null hypothesis is rejected, while the alternative hypothesis is accepted. The finding implies that fostering an entrepreneurial culture characterized by innovation, creativity, and proactive decision-making significantly enhances the performance of manufacturing firms in Benue State.

Hypothesis Two

The second hypothesis stated that human capital has no significant effect on the performance of manufacturing firms in Benue State. The regression results show that human capital has a regression coefficient of **0.205**, a **t-value of 4.410**, and a **p-value of 0.000**, which is below the 0.05 significance level. This demonstrates that human capital has a positive and statistically significant influence on manufacturing firm performance. Accordingly, the null hypothesis is rejected in favour of the alternative hypothesis. The result suggests that investments in employees' education, skills, knowledge, and experience contribute significantly to improving organizational productivity and overall business performance.

Hypothesis Three

The third hypothesis stated that market access has no significant effect on the performance of manufacturing firms in Benue State. The regression analysis revealed a coefficient of **0.221**, a **t-value of 4.850**, and a **p-value of 0.000**, indicating statistical significance at the 5 percent level. Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted. This finding confirms that market access has a significant positive effect on manufacturing firm performance. It implies that firms with better access to customers, distribution channels, market information, and broader commercial opportunities are more likely to experience improved sales, profitability, competitiveness, and long-term sustainability. Among the explanatory variables included in the model, market access emerged as the strongest predictor of manufacturing firm performance.

4.3 Discussion of Findings

The findings revealed that entrepreneurial culture has a positive and statistically significant effect on manufacturing firm performance in Benue State. This suggests that organizations that promote innovation, creativity, risk-taking, and proactive decision-making are more likely to improve productivity and achieve superior performance. The result supports the proposition that an entrepreneurial culture creates an enabling environment for organizational growth and competitiveness.

The study further established that human capital significantly influences manufacturing firm performance. The positive coefficient indicates that firms investing in employee education, training, experience, and skills development tend to record higher levels of operational efficiency and organizational effectiveness. This finding is consistent with Human Capital Theory, which emphasizes that employee knowledge and competencies are strategic assets that contribute to sustainable organizational performance.

The analysis also showed that market access exerts the strongest positive influence on manufacturing firm performance among the explanatory variables. This implies that improved access to customers, distribution networks, market information, and broader commercial opportunities enhances sales growth, profitability, and long-term sustainability. The result highlights the importance of strengthening market linkages and expanding business opportunities for manufacturing firms in Benue State.

5. Conclusion and Recommendations

This study examined the effect of entrepreneurial culture, human capital, and market access on the performance of manufacturing firms in Benue State using the multiple regression analysis via SPSS. The findings revealed that all the dimensions of the study significantly and positively influence manufacturing firm performance. Specifically, entrepreneurial culture

was found to enhance innovation, creativity, and adaptability within manufacturing firms, thereby improving organizational productivity and competitiveness. Human capital also contributed significantly to firm performance, indicating that employees' knowledge, skills, competencies, and experience remain critical determinants of organizational success. Furthermore, market access emerged as a strong predictor of firm performance, suggesting that firms with wider access to customers, distribution channels, and market opportunities are more likely to achieve higher productivity, profitability, and sustainability.

The study therefore concludes that the performance of manufacturing firms in Benue State depends largely on the strength of entrepreneurial culture, the quality of human capital, and the level of market access available to firms. Consequently, improving these factors will significantly enhance the growth, competitiveness, and sustainability of manufacturing firms in the study area.

Based on the findings of the study, it is recommended that management of manufacturing firms in Benue State should promote an entrepreneurial culture that encourages innovation, creativity, teamwork, and calculated risk-taking among employees. This can be achieved through supportive leadership practices, employee empowerment, and reward systems that

recognize innovative ideas and performance. In addition, manufacturing firms should continuously invest in human capital development through regular staff training, workshops, skill acquisition programmes, and professional development initiatives aimed at improving employee competence and productivity. Government and industry stakeholders should also support vocational and technical education programmes to strengthen the quality of manpower available to the manufacturing sector.

Furthermore, government agencies and business support organizations should provide enabling platforms that improve market access for manufacturing firms through trade fairs, export promotion programmes, digital marketing support, and improved transportation and communication systems. Policymakers should also formulate and implement favorable business policies such as tax incentives, reduced bureaucratic bottlenecks, and improved access to business information to create a conducive environment for manufacturing activities. Additionally, manufacturing firms should establish strategic partnerships with suppliers, distributors, financial institutions, and research organizations to improve innovation and operational efficiency, while government should prioritize the provision of modern infrastructure such as stable electricity supply, good road networks, and internet connectivity to enhance business growth and sustainability.

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Questionnaire

Dear Respondent,

My name is **ABEDA Tersoo**, I am a Ph.D. student in the Department of Entrepreneurship Studies, Nasarawa State University, Keffi, conducting research titled "Effect of Entrepreneurial Ecosystem on the Performance of Agro-Processing Manufacturing Firms in Benue State." This study is designed to examine how entrepreneurial culture, human capital, and market access influence the performance of agro-processing manufacturing firms in Benue State. You have been selected to participate because your knowledge and experience are valuable to the success of this study. The information you provide will be used strictly for academic purposes and will be treated with the highest level of confidentiality. You are kindly requested to respond to all the questions honestly and objectively. There are no right or wrong answers; what is important is your sincere opinion based on your firm's experiences.

Your participation in this study is entirely voluntary, and your responses will remain anonymous. No information that could identify you or your organisation will be disclosed. The results of this study will be presented only in aggregate form and will contribute to academic knowledge as well as provide useful recommendations for improving the entrepreneurial ecosystem and the performance of agro-processing manufacturing firms in Benue State.

Thank you very much for your valuable time, cooperation, and support.

Instructions

Key: Strongly Agree (5/SA), Agree (4/A), Undecided (3/U), Disagree (2D), Strongly Disagree (SD)

S/N	Questions	SA	A	U	D	SD
	Human Capital.					
1	Our employees possess the skills and competencies required to perform their jobs effectively.					
2	The educational qualifications of our workforce contribute positively to firm performance.					
3	Employees regularly participate in training and development programs to improve their Capabilities.					
4	Our firm has adequate experienced personnel to achieve its business objectives.					
	Entrepreneurial culture.					
1	Our firm encourages employees to generate and implement innovative ideas.					
2	. The organizational culture promotes creativity, initiative, and continuous improvement.					
3	Taking calculated risks is supported and rewarded within our organization.					
4	. The organizational culture promotes creativity, initiative, and continuous improvement.					
	Access to Market					

1	Our firm has easy access to local and regional markets for its products or services.					
2	We are able to identify and reach new customers effectively.					
3	The firm has established reliable distribution channels for its products.					
4	Market information is readily available and helps us make informed business decisions.					