

## STRATEGIC RENEWAL UNDER PRESSURE: HOW FIRM SIZE DICTATES INNOVATION PATHWAYS

**Ogidiga Lawson Okpogberi.**

Department of Business Administration and Management,  
International Institute of Tourism and Hospitality.

Yenegoa Bayelsa State

**ORCID:**0009-0007-1992-6611

+23408130278314

**Ozogu Erepanmowi.**

Department of Business Administration and Management,  
International Institute of Tourism and Hospitality.

Yenegoa Bayelsa State

**ORCID:**0009-0008-3496-1764

+23408133678015

### Abstract

*In dynamic and competitive environments, strategic renewal enables firms to adapt by reconfiguring resources, capabilities, and strategic orientation to respond to changing market and technological pressures. This study examines how firm size influences innovation pathways and strategic renewal outcomes under environmental stress. Using a quantitative cross-sectional design, data were collected from 292 firms across multiple industries and analyzed with ANOVA and regression techniques. Results indicate that small firms predominantly pursue radical innovation, leveraging flexibility and entrepreneurial culture to explore disruptive opportunities. Large firms favor incremental innovation, optimizing existing processes and resources, while medium firms adopt hybrid strategies that balance exploration and exploitation. Strategic renewal success is significantly affected by both firm size and innovation type, with large firms achieving more consistent outcomes through incremental innovation. These findings highlight the moderating role of organizational scale in shaping innovation strategies and renewal effectiveness, providing insights for managers seeking to align strategic initiatives with firm characteristics and environmental conditions.*

**Keywords:** *strategic renewal, innovation pathways, firm size, radical innovation, incremental innovation, organizational adaptation*

### Introduction

In today's globalized economy, firms are increasingly operating within highly dynamic, competitive, and turbulent environments. Firm size affects sustainable innovation and business

models. Rapid technological advancements, the digital transformation of industries, shifting consumer preferences, heightened global competition, and economic volatility collectively create conditions that demand constant vigilance and adaptive strategies. Under such conditions, firms can no longer rely solely on traditional, static approaches to strategy and innovation; instead, they must engage in continuous organizational adaptation to maintain competitiveness and ensure long-term survival. In this context, strategic renewal has emerged as a fundamental mechanism for sustaining organizational performance. Strategic renewal can be defined as the deliberate and systematic reconfiguration of a firm's resources, capabilities, and strategic orientation in response to changing internal and external conditions (Teece, 2021). Unlike reactive problem-solving, strategic renewal is inherently proactive: it involves identifying new opportunities, reimagining existing business models, investing in novel capabilities, and recalibrating organizational structures to align with evolving market and technological realities. According to Aguilar & Otegi (2018), strategic renewal equips firms with the ability to anticipate change, respond effectively to disruption, and transform potential challenges into sources of competitive advantage. A critical manifestation of strategic renewal is the adoption of innovation pathways, which represent the mechanisms through which firms implement change and pursue growth. Innovation pathways are broadly categorized as incremental or radical (Teece, 2021; Dankwah, 2024). Incremental innovation refers to the process of making continuous, small-scale improvements to existing products, services, processes, or operational routines. This type of innovation allows firms to exploit existing knowledge and resources efficiently, improve operational effectiveness, and maintain steady performance in competitive markets. Radical innovation, in contrast, involves fundamental and disruptive changes that reshape a firm's core offerings, processes, or business models. Radical innovation often entails significant risk, uncertainty, and resource investment but can generate high returns by enabling firms to create entirely new markets, disrupt existing industry paradigms, or achieve sustainable competitive advantage. Broader innovations and competitiveness research supports linking strategy to outcomes (Agazu & Kero, 2024).

The decision to pursue either incremental or radical innovation is influenced by a combination of internal and external factors. Internal factors include a firm's resource base, organizational structure, technological capabilities, and managerial expertise. External factors include the level of market turbulence, competitive intensity, technological disruption, regulatory dynamics, and macroeconomic conditions (Ipinnaiye et al., 2025; Bonnini et al., 2025). Navigating these factors successfully requires a nuanced understanding of the firm's internal strengths and constraints, as well as the external pressures it faces. Despite extensive research on strategic renewal and innovation, the moderating role of firm size in shaping innovation pathways under environmental pressure remains underexplored. Firm size is a critical structural characteristic that influences decision-making processes, resource allocation, organizational flexibility, and risk tolerance. Small firms, characterized by lean organizational structures, limited bureaucratic layers, and centralized decision-making, tend to exhibit higher flexibility and responsiveness. These characteristics enable small firms to pursue radical, exploratory innovation, particularly under conditions of environmental uncertainty and competitive

pressure. In contrast, large firms, despite possessing abundant resources, technological capabilities, and market reach, often face constraints imposed by hierarchical structures, rigid processes, and formalized routines (Obizue, Chukwuemeka & Iwezu, 2025). These constraints tend to favor incremental innovation strategies, which optimize existing capabilities, reduce risk, and sustain operational efficiency. Medium-sized firms, occupying the intermediate space, often adopt hybrid or ambidextrous strategies, balancing exploratory and exploitative innovation in ways that allow them to benefit from both approaches without fully committing to either extreme (Ipinnaiye et al., 2025; Bonnini et al., 2025). Although prior research provides valuable insights into the relationship between firm size and innovation, systematic empirical evidence on how firm size dictates strategic renewal under environmental pressure remains limited. Existing studies frequently focus on single industries, regional contexts, or fail to differentiate between the innovation pathways employed by firms of varying sizes under comparable external conditions. This limitation restricts our understanding of how organizational scale shapes not only the selection and intensity of innovation strategies but also the success of strategic renewal initiatives across diverse business contexts. Consequently, managers lack empirically grounded guidance on tailoring innovation strategies to firm size, and researchers face a critical gap in knowledge regarding the mechanisms linking organizational scale, innovation pathways, and renewal outcomes (Enomah, 2025).

The primary aim of this study is to investigate the impact of firm size on strategic renewal pathways under external pressure. Specifically, the study seeks to:

1. Identify predominant innovation pathways among small, medium, and large firms facing external pressure.
2. Analyze the influence of firm size on the selection of innovation pathways.
3. Assess the effectiveness of different innovation strategies in driving successful strategic renewal across firms of varying sizes.

To address the research aim, the study will focus on the following research questions:

1. What predominant innovation pathways among small, medium, and large firms facing external pressure?
2. How do small, medium and large firms differ in their innovation approaches under stress?
3. Does firm size significantly affect strategic renewal outcomes across different organizational contexts?

The study tests the following hypotheses:

- H1: Firm size does not significantly affect the choice of innovation pathway under external pressure.

- H2: Small firms are not more likely to engage in radical innovation compared to medium and large firms.
- H3: Large firms do not achieve greater strategic renewal success from incremental innovation than small and medium firms do from radical innovation.

This study examines a general set of firms across multiple industries, including manufacturing, services, and technology sectors. Firm size is operationalized using standardized criteria such as employee count and annual revenue, ensuring consistency with contemporary empirical studies. By drawing exclusively on empirical evidence from 2018 onward, the study ensures contemporary relevance, methodological rigor, and alignment with the current global business landscape. The rationale for this study is underscored by the increasing volatility, uncertainty, complexity, and ambiguity (VUCA) that characterize modern markets. Firms must adopt tailored innovation strategies that align with their structural characteristics, resource endowments, and strategic objectives to survive and thrive. Understanding how firm size influences innovation pathways and strategic renewal under environmental pressure contributes both theoretically and practically. Theoretically, it advances the literature on organizational adaptation, dynamic capabilities, and strategic renewal. Practically, it provides actionable insights for managers and decision-makers seeking to implement innovation strategies that are congruent with their firm's scale, risk appetite, and operational capacity, thereby enhancing the likelihood of sustainable competitive advantage.

## Literature Review

Strategic renewal represents a critical organizational capability, encompassing the deliberate reconfiguration of a firm's resources, competencies, and strategic orientation in response to dynamic environmental conditions (Teece, 2021). The process of strategic renewal allows firms not only to survive in turbulent environments but also to maintain long-term competitiveness and growth. Central to this process are innovation pathways, which determine how firms operationalize renewal efforts. These pathways typically range from incremental innovation, involving gradual improvements to existing products, services, and processes, to radical innovation, characterized by transformative changes that fundamentally alter the firm's offerings or business model. The choice of innovation pathway is often shaped by a firm's internal capabilities, external pressures, and strategic priorities, reflecting the balance between exploitation of existing capabilities and exploration of new opportunities (Teece, 2021; Dankwah, 2024).

## Firm Size and Innovation

Firm size is a key determinant of innovation strategy and intensity. Empirical evidence demonstrates that smaller firms are often more capable of engaging in radical innovation due to their structural flexibility, lower bureaucratic inertia, and entrepreneurial orientation (Bonnini et al., 2025). Structural and capital differences shape innovation modes by firm size (Cretini & Robert, 2022). These firms tend to have less rigid hierarchies and fewer formalized processes, allowing them to respond rapidly to emerging market opportunities or technological

shifts. Their agility enables experimentation with new ideas, risk-taking, and rapid prototyping, which collectively increase the likelihood of producing radical or breakthrough innovations.

In contrast, larger firms tend to favor incremental innovation, focusing on gradual improvements and optimizations of existing products, services, or processes. This preference is influenced by formalized organizational structures, hierarchical decision-making, and well-established routines that promote stability and efficiency while limiting flexibility (Bogetoft et al., 2024). While larger firms possess abundant financial, technological, and human resources that can theoretically support radical innovation, organizational rigidity and risk-aversion often constrain their ability to pursue disruptive strategies. Consequently, incremental innovation serves as a safer, more predictable approach for sustaining competitiveness while minimizing operational risks (Dankwah, 2024). Medium-sized firms occupy a structural and strategic middle ground. Empirical studies suggest that these firms often adopt hybrid or ambidextrous innovation strategies, engaging in both exploratory (radical) and exploitative (incremental) innovation activities (Dankwah, 2024). By balancing the risks of radical experimentation with the stability of incremental improvements, medium firms can achieve competitive adaptability without overextending their resources. This hybrid approach positions medium firms to respond to diverse environmental pressures effectively while maintaining operational stability (Teece, 2021).

### **Role of Firm Size in Moderating Innovation Effects**

Beyond shaping the type of innovation pathway, firm size also moderates the relationship between innovation activities and performance outcomes. Research indicates that the effectiveness of innovation in driving firm growth, financial performance, and competitive advantage is contingent on organizational scale (Kijkasiwat & Phuensane, 2020). For instance, small firms tend to benefit disproportionately from focused and persistent R&D efforts, where concentrated innovation activities can lead to significant performance gains. Conversely, larger firms experience more complex interactions between innovation investments and outcomes, where diversity in R&D portfolios may produce variable results depending on alignment with existing capabilities, market positioning, and strategic objectives (Ipinnaiye et al., 2025). Firm size moderates innovation-performance relations in global contexts (Kijkasiwat & Phuensane, 2020). The moderating effect of firm size highlights the importance of tailoring innovation strategies to organizational scale. Firms of different sizes not only vary in their capacity to absorb risk but also in their ability to mobilize resources, integrate knowledge, and implement strategic renewal initiatives effectively. Small firms leverage flexibility and entrepreneurial culture to explore new opportunities rapidly, large firms utilize resource abundance and structured processes to refine and exploit existing capabilities, and medium firms strategically blend both approaches to navigate complex environmental pressures (Obizue, Chuu- Uzomah & Jutum, 2025).

## Integration of Strategic Renewal and Innovation Pathways

The literature underscores that strategic renewal and innovation are inextricably linked, with innovation pathways serving as the mechanism through which renewal occurs. Innovation strategy effects differ by firm size and context (Kahn & Candi, 2021). Firm size is a central factor shaping this link, influencing both how innovation is implemented and how it translates into successful strategic renewal outcomes. By systematically examining the interplay between firm size, innovation pathways, and environmental pressures, this study builds on existing empirical work while addressing gaps in multi-industry, contemporary analyses. Understanding these dynamics enables managers to design innovation strategies that are both contextually appropriate and aligned with organizational capacity, enhancing the likelihood of successful adaptation and sustainable growth.

### Methodology

This study employed a quantitative cross-sectional research design to examine the relationship between firm size, innovation pathways, and strategic renewal under environmental pressure. A cross-sectional design was selected because it allows data to be collected at a single point in time across multiple firms and industries, enabling the identification of patterns and relationships between variables without requiring longitudinal observation (Creswell & Creswell, 2018). This design is particularly suited for empirical testing of the proposed hypotheses, as it facilitates statistical analysis of differences and predictive relationships across firm sizes. The target population comprised 312 firms from diverse sectors, including manufacturing, technology, and services. Firms were categorized into three size-based strata: small (96 firms), medium (112 firms), and large (104 firms), based on standardized industry size criteria such as employee count and annual revenue (OECD, 2020). To ensure proportional representation and reduce selection bias, stratified random sampling was used. This technique divides the population into strata based on firm size and randomly selects firms within each stratum, ensuring that each category is adequately represented. Stratification allows for meaningful comparisons across small, medium, and large firms and supports generalizable conclusions about the relationship between firm size, innovation pathways, and strategic renewal. Primary data were collected through a structured questionnaire, incorporating validated scales from contemporary empirical studies to ensure reliability and validity. The questionnaire consisted of three core sections:

1. **Innovation Pathways:** Measured the extent of radical versus incremental innovation activities. Radical innovation was defined as disruptive initiatives that significantly alter products, services, or business models. Incremental innovation captured small, continuous improvements aimed at optimizing existing capabilities.
2. **External Pressure:** Captured the level of environmental turbulence, including technological change, market volatility, and competitive intensity. Respondents rated

these pressures on a Likert-type scale adapted from recent studies (Ipinnaiye et al., 2025; Bonnini et al., 2025).

3. **Strategic Renewal Success:** Measured outcomes of strategic renewal using a composite index of performance and adaptive capabilities, incorporating financial metrics, market growth indicators, and organizational adaptability.

A pilot test was conducted with 20 firms to refine the questionnaire, ensure clarity, and verify reliability. The scales demonstrated strong internal consistency, with Cronbach's alpha coefficients exceeding 0.80, confirming that the instrument reliably measured the intended constructs.

Data were analyzed using SPSS version 28, following several key steps:

1. **Data Screening:** Responses were checked for missing values, outliers, and assumptions of normality, linearity, and homoscedasticity. No significant violations were detected, confirming that parametric tests were appropriate.
2. **Descriptive Statistics:** Mean scores, standard deviations, and frequency distributions were calculated to summarize innovation activities, external pressures, and strategic renewal outcomes across firm sizes.
3. **Analysis of Variance (ANOVA):** One-way ANOVA was used to compare mean scores of radical and incremental innovation across small, medium, and large firms. Post-hoc Tukey tests identified specific group differences and assessed the significance of observed variations.
4. **Regression Analysis:** Multiple regression was conducted to examine the predictive effects of firm size and innovation pathways on strategic renewal success. Firm size was entered as a categorical predictor, while radical and incremental innovation scores were continuous predictors. Standardized beta coefficients ( $\beta$ ) and  $R^2$  values were used to interpret effect sizes and model fit.

This methodological approach integrates both comparative and predictive analyses, enabling the study to test hypotheses, identify patterns in innovation pathways across firm sizes, and assess their impact on strategic renewal outcomes. Embedding sampling rationale, instrument validation, and choice of statistical techniques directly into the methodology ensures clarity, transparency, and rigor, aligning with standards for empirical research in peer-reviewed journals.

## Results

The study collected valid responses from 292 firms (response rate 93.6%), distributed as follows: small (90), medium (102), and large (100). Analyses were conducted to examine differences in innovation pathways across firm sizes and their impact on strategic renewal outcomes.

### Research Question 1

1. RQ1: What predominant innovation pathways among small, medium, and large firms facing external pressure?

H<sub>01</sub>: Firm size does not significantly affect the choice of innovation pathway under external pressure.

**Table 1 — ANOVA for Innovation Pathways by Firm Size**

Innovation Type	F	p
Radical Innovation	18.47	< .001
Incremental Innovation	20.01	< .001

ANOVA results indicate that firm size has a statistically significant effect on the type of innovation pathway adopted. Small firms score higher on radical innovation compared to medium and large firms, reflecting the flexibility and entrepreneurial orientation that enable them to pursue exploratory strategies under pressure. In contrast, large firms tend to favor incremental innovation. The null hypothesis H<sub>01</sub> is rejected. This finding confirms that firm size shapes innovation behavior, with small firms prioritizing radical change, medium firms balancing both radical and incremental approaches, and large firms emphasizing structured, incremental improvements.

### Research Question 2 / Hypothesis 2

RQ2: How do small, medium and large firms differ in their innovation approaches under stress?

H<sub>02</sub>: H2: Small firms are not more likely to engage in radical innovation compared to medium and large firms.

**Table 2 — Post-Hoc (Tukey) Comparisons of Radical Innovation**

Comparison	Mean Difference	p
Small vs Medium	0.42	0.018
Small vs Large	1.04	< .001
Medium vs Large	0.62	0.002

Interpr Post-hoc tests show that small firms engage in significantly more radical innovation than large firms ( $p < .001$ ). Medium firms adopt a hybrid innovation approach, balancing exploratory and exploitative strategies. These results reinforce that firm size moderates the type

of innovation strategy employed, supporting the hypothesis that small firms are more radical in their approach. The null hypothesis  $H_{02}$  is rejected.

### Research Question 3 / Hypothesis 3

**RQ3:** Does firm size significantly affect strategic renewal outcomes across different organizational contexts?

- $H_{03}$ : Large firms do not achieve greater strategic renewal success from incremental innovation than small and medium firms do from radical innovation.

**Table 3 — Regression Analysis for Strategic Renewal Success**

Predictor	B	$\beta$	t	p
Radical Innovation	0.24	0.24	2.34	0.021
Incremental Innovation	0.29	0.29	3.12	0.002
Firm Size (categorical)	0.31	0.31	3.45	< .001

Regression results indicate that incremental innovation and firm size have statistically significant positive effects on strategic renewal success ( $\beta = 0.29$  and  $0.31$ ,  $p < .01$ ), while radical innovation also contributes positively ( $\beta = 0.24$ ,  $p = 0.021$ ). This demonstrates that large firms' incremental strategies are more effective in achieving successful strategic renewal, whereas small firms' radical innovations yield more variable outcomes. The null hypothesis  $H_{03}$  is rejected.

Across all analyses, the results reveal a clear pattern:

1. Firm size significantly influences innovation pathways under environmental pressure, with small firms prioritizing radical innovation, medium firms balancing hybrid strategies, and large firms focusing on incremental improvements ( $H_{01}$  and  $H_{02}$  rejected).
2. Strategic renewal success varies by firm size and innovation type, with large firms achieving higher and more consistent outcomes through incremental innovation, while small firms' radical approaches offer high potential but greater variability ( $H_{03}$  rejected).
3. These findings collectively highlight that organizational scale moderates both innovation strategy adoption and the effectiveness of strategic renewal, confirming the theoretical expectation that size affects flexibility, resource utilization, and risk management in innovation-driven adaptation.

## Discussion

The findings of this study provide robust empirical support for the hypothesis that firm size is a critical determinant of innovation strategy and strategic renewal under environmental pressure. Analysis revealed that small firms exhibit a pronounced orientation toward radical innovation, whereas large firms tend to favor incremental innovation, and medium firms adopt hybrid strategies that combine elements of both approaches. These patterns reflect fundamental differences in organizational structure, resource availability, and risk tolerance across firm sizes.

For small firms, the preference for radical innovation is consistent with their structural flexibility, entrepreneurial culture, and reduced bureaucratic constraints (Bonnini et al., 2025; Ipinnaiye et al., 2025). The ability to make rapid decisions, experiment with novel ideas, and pivot in response to environmental turbulence enables small firms to pursue disruptive initiatives that can yield high returns. However, the inherently higher risk and uncertainty associated with radical innovation also introduce variability in strategic renewal outcomes, as evidenced by slightly lower average renewal success scores compared to larger firms. This aligns with prior research suggesting that small firms' agility and exploratory capacity are strengths in volatile markets but can also expose them to failure if not carefully managed (Teece, 2021).

Large firms, in contrast, exhibit a marked preference for incremental innovation, reflecting their reliance on established routines, formalized processes, and abundant resources. Incremental innovation allows large firms to optimize existing operations, reduce risk, and leverage accumulated knowledge for steady performance gains (Bogetoft et al., 2024). The higher strategic renewal success observed among large firms underscores that structured innovation processes, when combined with resource depth, can yield consistent and reliable adaptation outcomes even under intense environmental pressure. This finding confirms the theoretical expectation that organizational scale mediates the trade-off between exploration and exploitation, where larger entities prioritize exploitation of existing capabilities over radical experimentation (Ipinnaiye et al., 2025).

Medium-sized firms occupy an intermediate position, demonstrating hybrid innovation profiles that blend incremental and radical approaches. This ambidextrous strategy allows them to explore new opportunities while simultaneously optimizing existing processes (Dankwah, 2024). By balancing exploration and exploitation, medium firms achieve moderate but stable strategic renewal outcomes, highlighting their capacity to adapt flexibly to environmental demands without the extreme risk exposure typical of small firms or the conservative structure of large firms. This pattern reinforces the notion that strategic ambidexterity is a viable pathway for organizations with intermediate scale and resources, providing a mechanism to navigate complex and dynamic environments.

The findings collectively emphasize that organizational scale shapes both the choice of innovation pathway and the effectiveness of strategic renewal. Small firms leverage agility and

entrepreneurial orientation to pursue high-risk, high-reward strategies, large firms exploit structure and resource abundance to ensure stable adaptation, and medium firms adopt hybrid strategies that balance these dimensions. Importantly, the study demonstrates that strategic renewal is not a one-size-fits-all process; rather, it is contingent upon firm characteristics, contextual pressures, and the alignment of innovation strategy with organizational capacity.

From a theoretical perspective, this research extends the literature on strategic renewal and organizational adaptation by providing contemporary, cross-industry empirical evidence on the moderating role of firm size. It corroborates existing theory on ambidexterity, exploration vs. exploitation, and size-dependent innovation strategy, while offering new insights into how these dynamics play out under conditions of environmental pressure. Practically, the study informs managers and policymakers that innovation strategies should be calibrated according to firm scale: small firms should embrace agility and radical experimentation, large firms should optimize structured incremental innovation, and medium firms should pursue a balanced, hybrid approach to maintain competitiveness.

## Conclusion

This study demonstrates that firm size plays a pivotal role in shaping strategic renewal and innovation pathways under environmental pressure. Small firms are shown to pursue radical innovation, driven by structural flexibility, entrepreneurial orientation, and a capacity for rapid decision-making. This enables them to explore disruptive opportunities and adapt dynamically to changing market conditions, though with higher variability in outcomes. In contrast, large firms prioritize incremental innovation, leveraging formalized processes, abundant resources, and risk mitigation strategies to achieve consistent and reliable strategic renewal outcomes. Medium-sized firms occupy an intermediate position, adopting hybrid approaches that balance exploratory and exploitative strategies, which allows them to navigate environmental pressures with moderate but stable performance. The findings highlight that strategic renewal is not a one-size-fits-all process. Organizational scale fundamentally influences both the type of innovation strategy adopted and the effectiveness of renewal initiatives. Small, medium, and large firms each possess distinct structural characteristics and resource configurations that determine their ability to respond to environmental turbulence. This has important theoretical implications, extending understanding of the interplay between firm size, innovation orientation, and strategic renewal. It also reinforces ambidexterity theory, demonstrating that medium-sized firms can leverage hybrid strategies to achieve adaptability without the extremes of risk faced by smaller firms or the structural rigidity of larger firms. From a practical perspective, these insights provide guidance for managers seeking to enhance strategic renewal initiatives. Tailoring innovation strategies to firm size ensures alignment between organizational capabilities and external pressures. Small firms can focus on fostering radical innovation and leveraging agility to gain competitive advantage. Large firms can concentrate on incremental innovation to optimize existing operations and sustain growth. Medium firms can benefit from carefully balancing exploratory and exploitative approaches to maintain adaptability while managing risk. In conclusion, understanding how firm size dictates

innovation pathways under pressure offers both a theoretical and practical framework for guiding firms through complex, competitive, and rapidly changing environments. By aligning strategic renewal efforts with firm scale and contextual demands, organizations can enhance their ability to adapt, innovate, and achieve sustainable long-term performance.

## References

- Agazu, B. G., & Kero, C. A. (2024). *Innovation strategy and firm competitiveness: A systematic literature review*. Journal of Innovation and Entrepreneurship, 13, Article 24. <https://doi.org/10.1186/s13731-024-00381-9>
- Aguilar, M. E., & Otegi, J. R. (2018). *Firm size and the business model for sustainable innovation*. Sustainability, 10(12), 4785. <https://www.mdpi.com/2071-1050/10/12/4785>
- Bonnini, S., Borghesi, M., & Giacalone, M. (2025). *Nonparametric analysis of firm size and innovation intensity in circular economy adoption*. Quality & Quantity, 59, 1345–1367.
- Bogetoft, P., Kroman, L., Smilgins, A., & Sørensen, A. (2024). *Innovation strategies and firm performance: Evidence from a 15,000-firm panel*. Journal of Productivity Analysis, 62(2), 175–196.
- Cretini, I. O., & Robert, V. (2022). *Firm size, foreign capital and modes of innovation: An analysis of manufacturing firms in Argentina*. Revista Brasileira de Inovação, 21, e022006. <https://www.redalyc.org/journal/6417/641771991006/html/>
- Enomah Sylvester (2025). A Philosophical Appraisal of Discipline Policies and the Ethics of Punishment in Nigerian Secondary Schools. *Internatinal Journal of Humanities, Economic Developemnt and Contemporary Studies (IJHEDCS)*. 1(2), 142–154. <https://journals.iempsglobal.org/index.php/ijhedcs/article/view/131>.
- Dankwah, J. B. (2024). *Innovation orientation and firms' financial performance: An empirical analysis*. Journal of Innovation & Management, 12(1), 45–62.
- Ipinnaiye, O., Lenihan, H., Mulligan, K., Doran, J., & Roper, S. (2025). *Innovation success in small and larger firms: Does persistence and diversity in R&D matter when building a unique knowledge base?* Journal of Technology Transfer.
- Kahn, K. B., & Candi, M. (2021). *Investigating the relationship between innovation strategy and performance*. Journal of Business Research, 132, 56–66. [https://www.researchgate.net/publication/351015249\\_Investigating\\_the\\_relationship\\_b etween\\_innovation\\_strategy\\_and\\_performance](https://www.researchgate.net/publication/351015249_Investigating_the_relationship_b etween_innovation_strategy_and_performance)
- Kijkasiwat, P., & Phuensane, P. (2020). *Innovation and firm performance: The moderating and mediating roles of firm size and small and medium enterprise finance*. Journal of Risk and Financial Management, 13(5), 97. <https://www.mdpi.com/1911-8074/13/5/97>

- Obizue M N, Chuu- Uzomah F O & Jutum J I (2025). Management Strategies for Higher Institutions through Ethical and Values Education for Sustainable National Development. *International Journal of Education, Management Sciences and Professional Studies* (IJEMPS).1(3),81-92. <https://journals.iempsglobal.org/index.php/IJEMPS/article/view/200>
- Obizue M.N, Chukwuemeka M C & Iwezu C N (2025). Theoretical Perspectives on AI Integration in Educational Institution. Obizue Et al (Eds). Artificial Intelligence and Ethical Transformation: Management, Leadership and Data-Driven Decision-Making for sustainability. Deep Science Publishing. [https://doi.org/10.70593/978-93-7185539-6\\_2](https://doi.org/10.70593/978-93-7185539-6_2)
- Teece, D. J. (2021). *Dynamic capabilities and strategic management: Organizing for innovation and growth*. Strategic Management Journal, 42(1), 1–12.