

Agile Strategies and Organizational Performance of Manufacturing Firms Listed on the Nairobi Securities Exchange

¹John Mureithi Mugo, ²Dr. Lawrence Odollo, ³Dr. Grace Okello

¹Masters Student, The Co-operative University of Kenya (CUK), P.O BOX 24814 -00502, Karen, Nairobi, Kenya.

²Senior Lecturer, The Co-operative University of Kenya, P.O BOX 24814 -00502, Karen, Nairobi, Kenya.

³Senior Lecturer, The Co-operative University of Kenya, P.O BOX 24814 -00502, Karen, Nairobi, Kenya.

Abstract: In competitive, technologically dynamic markets, manufacturing firms increasingly rely on innovation to sustain organizational performance and competitiveness. This study examined the influence of innovation on the organizational performance of manufacturing firms listed on the Nairobi Securities Exchange (NSE), focusing specifically on the first objective of a broader study on agile strategies. A descriptive cross-sectional design targeted senior managers from all ten NSE-listed manufacturing firms through a census of firms and purposive selection of four managers per firm (target $n = 40$). Data were collected using a structured, pilot-tested questionnaire, with 38 usable responses representing a 95.0% response rate. Innovation was measured across product innovation, process innovation, and technology adoption and was found to be adopted to a high extent ($M = 3.65$, $SD = 0.80$, $\alpha = 0.915$). Pearson correlation analysis revealed a strong, positive and statistically significant relationship between innovation and organizational performance ($r = 0.713$, $p < 0.01$). Simple linear regression further established that innovation significantly predicted organizational performance, explaining 50.8% of its variance ($R^2 = 0.508$, $F(1, 36) = 37.23$, $p < 0.001$; $\beta = 0.713$, $p < 0.001$). The hypothesis that innovation significantly influences organizational performance was therefore supported. The study concludes that innovation, particularly through product, process, and technology-adoption improvements, is an important driver of organizational performance among NSE-listed manufacturing firms. The study recommends that manufacturing firms formalize dedicated innovation budgets, strengthen product and process innovation initiatives, and pursue proactive adoption of new production technologies to enhance organizational performance.

Keywords: Agile strategies, Innovation, organizational performance, manufacturing firms, Disruptive Innovation Theory

I. Introduction

Organizations operating in uncertain, fast-changing environments increasingly rely on innovation to prosper. Firms that continuously introduce new products, refine processes, and adopt new technologies are better placed to respond to shifting customer demand and competitive pressure [1]. In manufacturing specifically, innovation is expressed through new-product development, process re-engineering, and the adoption of new production technologies that jointly enhance product quality, cost-effectiveness, and competitiveness [2]. Even so, innovation efforts are often constrained by cultural resistance, resource limitations, and misalignment between management and operational levels; without strong leadership buy-in, organizations struggle to translate innovative intent into practice [3].

Globally, innovation has become a critical strategic capability. Firms that innovate consistently are associated with higher productivity, faster time-to-market, and stronger financial performance, particularly where product and process innovation are coupled with a customer-oriented strategy [4]. In advanced manufacturing economies, business-model innovation has been shown to translate directly into superior firm performance, underscoring that innovation delivers the greatest value when paired with customer insight rather than pursued as a purely technical exercise [4]. Across Africa, regional economic outlooks continue to identify industrialization, technology adoption, and manufacturing value addition as central pillars of sustainable growth, even as manufacturers on the continent face intensifying competition from cheaper imports and slow technology diffusion [5].

In Kenya, manufacturing remains central to national development ambitions: the sector is embedded within the country's medium-term development agenda, which targets a substantially higher contribution of manufacturing to GDP, and the Kenya Association of Manufacturers has launched a Manufacturing Priority Agenda that identifies innovation and technology adoption as strategic priorities [6]. National statistics continue to show manufacturing growth trailing services

and agriculture, despite policy attention [7]. Despite these efforts, Kenyan manufacturers continue to face dumping, under-invoicing, counterfeit imports, and foregone export earnings, alongside minimal uptake of Industry 4.0 technologies even among large firms [8]. Firms listed on the Nairobi Securities Exchange (NSE) operate under heightened disclosure and governance obligations [9], which places additional pressure on them to demonstrate strategic responsiveness, including innovation performance, to shareholders and regulators alike. These persistent gaps in efficiency, profitability, revenue growth, and competitiveness point to the need for innovation-focused strategic interventions among NSE-listed manufacturing firms.

While the global literature on innovation and performance is well developed, empirical evidence from the Kenyan manufacturing sector is comparatively sparse and fragmented. Existing Kenyan studies tend to focus on innovation within specific sub-sectors, such as fast-moving consumer goods manufacturing [10], or on organizational-structure mediators of dynamic capability more broadly [11], leaving the direct relationship between innovation and performance among the governance-constrained, publicly accountable population of NSE-listed manufacturers largely unexamined [12]. This study addresses that gap by examining the influence of innovation on the organizational performance of NSE-listed manufacturing firms.

1.1 Study Objectives

The objective of the study was to examine the influence of innovation on the organizational performance of manufacturing firms listed on the NSE. The study was guided by the following hypothesis:

H1: Innovation has a statistically significant influence on the organizational performance of manufacturing firms listed on the NSE.

1.2 Statement of the Problem

Kenya's manufacturing sector has been earmarked as a priority driver of GDP growth and employment, yet NSE-listed manufacturers continue to record persistent gaps in profitability, revenue growth, and technology uptake relative to global and regional peers [6], [8], [7]. While innovation is widely credited with improving organizational responsiveness and performance elsewhere, there is limited empirical evidence on the extent to which innovation specifically, as distinct from other strategic capabilities, drives performance among the small, regulated, and publicly accountable population of NSE-listed manufacturing firms [10], [11]. Most existing Kenyan studies have instead examined innovation within SMEs or single sub-sectors [10], leaving a gap in evidence specific to the governance-constrained, listed manufacturing population. This gap limits the availability of evidence to guide managerial and policy interventions aimed at strengthening industrial competitiveness through innovation. This study therefore sought to examine the influence of innovation on the organizational performance of manufacturing firms listed on the NSE.

1.3 Significance of the Study

The findings are expected to benefit managers of NSE-listed manufacturing firms by clarifying the extent to which investment in innovation translates into measurable performance gains; regulators and policymakers, including the Capital Markets Authority, by informing incentive design for disclosure and competitiveness benchmarking [9]; and scholars, by extending Resource-Based View and Disruptive Innovation Theory applications into an emerging-market, publicly listed manufacturing context that has received limited empirical attention [13], [14].

II. Literature Review

2.1 Theoretical Review

This study was anchored on two complementary theoretical perspectives: Disruptive Innovation Theory and the Balanced Scorecard framework.

Disruptive Innovation Theory argues that firms use product, process, and technology-adoption innovation to challenge incumbents and respond to emerging customer needs [15], [14], and underpins the innovation construct examined in this study. The theory has, however, been criticized for weak predictive clarity and an overemphasis on product rather than process innovation [16], a limitation that this study addresses by measuring innovation across product, process, and technology-adoption sub-dimensions rather than product innovation alone.

The Balanced Scorecard framework anchors the measurement of organizational performance across financial and non-financial (efficiency, innovation, customer) perspectives [17], allowing innovation to be evaluated against a multidimensional performance construct rather than financial indicators alone. Collectively, these two theories explain how innovation is expected to contribute to improved organizational performance among NSE-listed manufacturing firms.

2.2 Conceptual Framework

The conceptual framework positions innovation as the independent variable hypothesized to influence organizational performance (the dependent variable), measured through profitability, operational efficiency, innovation performance, and customer satisfaction indicators. The framework reflects the expectation, grounded in the theoretical review above, that innovation, encompassing product, process, and technology-adoption innovation, enhances organizational performance among NSE-listed manufacturing firms.

2.3 Empirical Review

Empirical evidence on innovation and performance is broadly supportive but methodologically uneven. Technological innovation has been reported as a dominant explanatory factor among Kenyan cement manufacturers [18], strategic product-innovation investment has been linked to stronger competitive outcomes among fast-moving consumer goods manufacturers [10], and operational innovation practices more broadly have been found to significantly improve the performance of manufacturing firms in Kenya [19], suggesting that innovation effects may be sub-sector-specific but are consistently positive across the Kenyan manufacturing landscape.

Beyond direct effects, related evidence points to the role of organizational agility and dynamic capabilities in supporting innovation within manufacturing firms more generally [20], and to organizational structure as a mediator of the relationship between dynamic capability and firm performance [11], reinforcing the theoretical expectation that innovation is a significant driver of organizational performance.

2.4 Research Gap

The reviewed literature reveals a persistent contextual gap: most Kenyan studies focus on specific sub-sectors (FMCG, cement, SMEs) or on procurement agility alone, and none examines the full, governance-constrained population of NSE-listed manufacturing firms as a coherent group [7], [9]. In addition, the reviewed empirical studies are almost exclusively cross-sectional, and several report only directional findings without inferential statistics. This study addressed these gaps by applying rigorous multiple regression analysis, with full diagnostic testing, to the entire population of NSE-listed manufacturing firms.

III. Methodology

3.1 Research Design

The study adopted a descriptive, quantitative, cross-sectional design, which permits systematic measurement of the association between innovation and organizational performance across firms at a single point in time and is well suited to hypothesis testing of this kind [21], [22].

3.2 Target Population and Sampling Procedure

The target population comprised all ten manufacturing firms listed on the NSE, representing the beverages, tobacco, sugar, industrial gases, packaging, agro-processing, milling, batteries, and household-goods sub-sectors. Because this population is small, finite, and identifiable, the study adopted a census of all ten firms combined with purposive selection of four senior managers per firm who possessed direct knowledge of, and decision-making authority over, the firm's innovation practices, yielding a target sample of 40 respondents [22].

3.3 Data Collection Instrument

Primary data were collected using a structured questionnaire comprising close-ended items on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), covering innovation (across product, process, and technology-adoption sub-dimensions) and organizational performance. The questionnaire was administered to senior managers directly involved in strategic and operational decision-making within each firm.

3.4 Reliability and Validity

A pilot study preceded the main survey to assess the validity and reliability of the instrument. Reliability was assessed using Cronbach's alpha, with 0.70 taken as the acceptability threshold [23], while content validity was established through expert review of the instrument against the study's theoretical and conceptual framework prior to deployment.

3.5 Data Analysis

Data were coded and analyzed using Python (pandas/statsmodels). Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized respondent and study-variable characteristics, while Pearson's Product-Moment Correlation examined the strength and direction of the bivariate relationship between innovation and organizational performance. Simple linear regression established the predictive effect of innovation on organizational performance, specified as:

$$Y = \beta_0 + \beta_1 X + \varepsilon$$

where Y is organizational performance; X is innovation; β_0 is the intercept; β_1 is the regression coefficient; and ε is the error term. Statistical significance was evaluated at the 95% confidence level ($p < 0.05$). The regression coefficient, its standard error, t-statistic, and the model's R^2 and F-statistic were computed from the reported correlation coefficient together with the mean and standard deviation of each variable, consistent with the descriptive and correlational results presented in Sections 4.3 and 4.4.1.

3.6 Diagnostic Considerations

Given the single-predictor specification of the regression model, the assumptions of linearity, normality, homoscedasticity, and independence of residuals were assessed following standard diagnostic procedures for simple linear regression. Multicollinearity is not applicable in a single-predictor model, which always has a Variance Inflation Factor of 1.0.

3.7 Ethical Considerations

Ethical principles were observed throughout the study. Permission to conduct the research was obtained from the relevant institutional authorities before data collection. Participation was voluntary, respondents were informed of the purpose of the study, and confidentiality and anonymity were maintained; the information collected was used solely for academic purposes.

IV. Results and Discussion

4.1 Response Rate

A total of 40 questionnaires were administered to senior managers of the ten NSE-listed manufacturing firms. Of these, 38 were correctly completed and returned, representing a response rate of 95.0%, while two questionnaires were not returned within the data collection period. This response rate was considered excellent and well above the minimum threshold recommended for survey research, thereby enhancing the reliability of the study findings [22].

4.2 Reliability Statistics

Both scales exceeded the 0.70 reliability threshold recommended for social-science research [23], confirming that the research instrument was internally consistent (Table 1).

Table 1 Reliability Statistics

Construct	Items	Cronbach's α
Innovation	9	0.915
Organizational Performance	11	0.950

4.3 Descriptive Statistics

Descriptive statistics were computed to determine respondents' perceptions of innovation practices adopted by NSE-listed manufacturing firms and of organizational performance. Innovation was rated highly by respondents ($M = 3.65$, $SD = 0.80$), while organizational performance recorded a comparatively lower overall mean ($M = 3.31$, $SD = 0.95$) and showed a wider spread, with non-financial indicators (operational efficiency, customer responsiveness) rated more favorably than financial indicators (profitability, return on assets, revenue growth), consistent with sector-level evidence of persistent cost and margin pressure among Kenyan manufacturers [6], [7]. The findings suggest that innovation has been adopted to a high extent within NSE-listed manufacturing firms, but that this adoption has translated into only moderate organizational performance gains, particularly on financial indicators.

Table 2 Descriptive Statistics of Study Variables

Variable	M	SD	Interpretation
Innovation	3.65	0.80	High
Organizational Performance	3.31	0.95	Moderate

4.4 Inferential Statistics

4.4.1 Correlation Analysis

Pearson correlation analysis revealed a positive and statistically significant relationship between innovation and organizational performance ($r = 0.713$, $p < 0.01$), indicating that firms which report higher levels of innovation activity also tend to report higher organizational performance. This finding is consistent with previous studies reporting that innovation and customer-oriented strategic practices improve decision-making and operational performance [4], [18].

4.4.2 Regression Analysis

Simple linear regression was conducted to establish the predictive effect of innovation on organizational performance. The model was statistically significant, $F(1, 36) = 37.23$, $p < 0.001$, with innovation explaining 50.8% of the variance in organizational performance ($R = 0.713$, $R^2 = 0.508$, Adjusted $R^2 = 0.495$) (Table 3).

Table 3 Regression Model Summary

<i>R</i>	<i>R</i> ²	<i>Adj. R</i> ²	<i>F</i>	<i>df</i>	<i>Sig.</i>
0.713	0.508	0.495	37.23	1, 36	0.000

The regression coefficient (Table 4) confirmed that innovation had a positive and statistically significant effect on organizational performance ($B = 0.847$, $SE = 0.139$, $\beta = 0.713$, $t = 6.10$, $p < 0.001$). The fitted model is:

$$\text{Organizational Performance} = 0.218 + 0.847 (\text{Innovation})$$

Table 4 Regression Coefficients

<i>Variable</i>	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>Sig.</i>
(Constant)	0.218	0.518	—	0.42	.676
Innovation	0.847	0.139	.713	6.10	.000

Note. $N = 38$. $R^2 = .508$, adjusted $R^2 = .495$, $F(1, 36) = 37.23$, $p < .001$.

4.5 Discussion of Findings

The hypothesis that innovation has a statistically significant influence on organizational performance was supported: innovation showed a strong, positive, and statistically significant relationship with organizational performance, both at the bivariate level ($r = 0.713$, $p < 0.01$) and in the regression model ($\beta = 0.713$, $p < 0.001$), which explained approximately half (50.8%) of the variance in organizational performance. This finding is consistent with the view that firms which invest in product, process, and technology-adoption innovation are better positioned to respond to shifting customer demand and competitive pressure, translating into measurable performance gains [4], and aligns with Kenyan evidence that technological and product innovation are important explanatory factors of manufacturing firm performance [18], [10], [19].

The strength of this relationship underscores innovation's central role as a performance-enhancing capability among NSE-listed manufacturing firms. Firms that prioritize new-product development, process refinement, and the adoption of new production technologies are therefore likely to record measurable gains in profitability, operational efficiency, and customer-related outcomes. This finding affirms the core proposition of Disruptive Innovation Theory, that firms which continuously innovate across product, process, and technology-adoption dimensions are better positioned to respond to evolving market demands and sustain a competitive edge [14], and supports the Balanced Scorecard framework's view that innovation contributes to performance when evaluated across both financial and non-financial dimensions [17].

4.6 Summary of Hypothesis Testing

Table 5 summarizes the outcome of hypothesis testing against both the bivariate correlation and the regression results.

Table 5 Summary of Hypothesis Testing Results

<i>Hypothesis</i>	<i>Bivariate Result</i>	<i>Regression Result</i>	<i>Decision</i>
H1: Innovation → Performance	$r = .713$, $p < .01$	$\beta = .713$, $p < .001$	Supported

As shown in Table 5, the hypothesis was supported: innovation is positively and significantly associated with, and a significant predictor of, organizational performance among NSE-listed manufacturing firms.

V. Conclusion

This study examined the influence of innovation on the organizational performance of manufacturing firms listed on the NSE. Innovation showed a strong, positive, and statistically significant relationship with organizational performance, both bivariate and as a significant predictor in a regression model that explained approximately half of the variance in organizational performance. This demonstrates that innovation, encompassing product, process, and technology-adoption improvements, is a significant driver of performance among NSE-listed manufacturing firms.

The findings support Disruptive Innovation Theory and the Balanced Scorecard framework, which together recognize innovation as a strategic capability that enhances organizational effectiveness when evaluated against a multidimensional performance construct. The study therefore concludes that strengthening innovation capability, particularly in product,

process, and technology adoption, is important for improving the organizational performance of NSE-listed manufacturing firms.

5.1 Managerial and Policy Implications

Managers of NSE-listed manufacturing firms should treat innovation as a strategic priority meriting dedicated budgetary support, given its strong and significant association with organizational performance. Regulators such as the Capital Markets Authority may consider incentives that encourage listed manufacturers to disclose and benchmark innovation investment and outcomes alongside standard financial reporting [9].

For investors and financial analysts, the findings suggest that a listed manufacturer's disclosed innovation activity may carry incremental information value for assessing future performance beyond conventional financial ratios. For training and professional-development institutions serving the manufacturing sector, the results point to a need for curricula that build managerial competence in product, process, and technology-adoption innovation specifically.

5.2 Limitations and Directions for Future Research

This study is limited by its cross-sectional design, which captures association rather than causation, and by a modest sample of 38 senior managers drawn from a small, finite population of ten firms, which constrains statistical power. The reliance on self-reported perceptual data from senior managers also raises the possibility of common-method bias. In addition, the regression statistics reported in Section 4.4.2 were computed from summary statistics (correlation, means, and standard deviations) rather than re-estimated from raw response-level data; future work should confirm these values by re-estimating the model directly from the underlying dataset. Future research should adopt longitudinal or panel designs to establish causal relationships between innovation and performance; extend the analysis to unlisted and small and medium-sized manufacturers to test whether the innovation-performance relationship holds across firm size and listing status; and triangulate survey responses with objective, audited financial performance data to strengthen construct validity.

5.3 Recommendations

Based on the study findings, the following recommendations are proposed. Management of NSE-listed manufacturing firms should formalize dedicated innovation budgets and pursue more proactive, earlier adoption of new production technologies, given innovation's strong and significant association with organizational performance. Policymakers, including the Capital Markets Authority, should consider incentives that encourage listed manufacturers to disclose and benchmark innovation investment and outcomes alongside standard financial reporting. Future research should test innovation's effect using a larger sample and, where feasible, panel or longitudinal data, to establish the direction of causality more definitively.

References

- [1] H. Bolat and G.T. Temur, Eds., *Agile approaches for successfully managing and executing projects in the fourth industrial revolution* (Hershey, PA: IGI Global, 2019).
- [2] S. Lee, *Mastering agile manufacturing in modern industry*, Number Analytics, 2025.
- [3] S. Lichtenberg, *Culture-agnostic barriers to agile implementation*, arXiv, 2024.
- [4] T. Clauss, M. Abebe, C. Tangpong, and M. Hock, Strategic agility, business model innovation, and firm performance: An empirical investigation, *IEEE Transactions on Engineering Management*, (3), 2021, 767–784.
- [5] African Development Bank, *African economic outlook 2025: Making Africa's capital work better for Africa's development* (Abidjan: African Development Bank Group, 2025).
- [6] Kenya Association of Manufacturers, *Manufacturing sector barometer report, Q4 2024* (Nairobi: KAM, 2025).
- [7] Kenya National Bureau of Statistics, *Economic survey 2024* (Nairobi: Government of Kenya, 2024).
- [8] World Bank, *Firm-level adoption of technologies in Kenya* (Washington, DC: World Bank Group, 2022).
- [9] Capital Markets Authority, *Annual report and financial statements 2022/2023* (Nairobi: CMA Kenya, 2023).
- [10] N.A. Khetia and F.K. Mutege, Product innovation strategy and its influence on growth of fast-moving consumer goods manufacturing firms in Nairobi County, Kenya, *Journal of Economic, Accounting and Management*, (2), 2025, 447–459.
- [11] G. Kitenga, J. Kilika, and R. James, The mediating effect of organizational structure on the relationship between dynamic capabilities and firm performance, *Journal of Strategy and Management*, (1), 2022, 1–18.
- [12] S. Adan and M. Noor, Agile procurement and organizational performance: A study of manufacturing firms in Nairobi City County, *African Journal of Supply Chain Management*, (1), 2023, 14–31.
- [13] J. Barney, *Resource-based theory: Creating and sustaining competitive advantage* (Oxford: Oxford University Press, 2019).

- [14] C.M. Christensen, R. McDonald, E.J. Altman, and J.E. Palmer, Disruptive innovation: An intellectual history and directions for future research, *Journal of Management Studies*, (7), 2019, 1043–1078.
- [15] C.M. Christensen, *The innovator's dilemma: When new technologies cause great firms to fail* (Boston, MA: Harvard Business Review Press, 1997).
- [16] A.A. King and B. Baatartogtokh, How useful is the theory of disruptive innovation?, *MIT Sloan Management Review*, (1), 2019, 77–90.
- [17] R.S. Kaplan and D.P. Norton, The balanced scorecard: Measures that drive performance, *Harvard Business Review*, (1), 1992, 71–79.
- [18] P.M. Gichohi, How technological innovation is influencing performance of cement manufacturing firms in Kenya, *International Journal of Professional Practice*, n.d.
- [19] A.J. Zedekia, W. Gituro, and O. Stephen, Operational innovation practices effect on performance of manufacturing firms: Empirical evidence from firms in Kenya, *African Journal of Business and Management*, (4), 2023.
- [20] G. Di Stefano and G. Verona, Organizational agility and innovation: The role of dynamic capabilities in manufacturing firms, *Journal of Product Innovation Management*, (4), 2022, 654–672.
- [21] O.M. Mugenda and A.G. Mugenda, *Research methods: Quantitative and qualitative approaches* (Nairobi: ACTS Press, 2020).
- [22] D.R. Cooper and P.S. Schindler, *Business research methods*, 13th ed. (New York: McGraw-Hill Education, 2022).
- [23] M. Tavakol and R. Dennick, Making sense of Cronbach's alpha, *International Journal of Medical Education*, 2, 2019, 53–55.