

Effect of Passive Tower-Sharing Strategies on Organizational Performance of Mobile Network Operators in Kenya

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Abstract

Mobile network operators (MNOs) in Kenya operate in an increasingly competitive environment characterized by high infrastructure investment costs and pressure to improve organizational performance. Telecommunication tower sharing has emerged as a strategic approach to reducing costs and enhancing operational efficiency. This study examined the influence of passive tower-sharing strategies on the organizational performance of mobile network operators in Nairobi County, Kenya. The study adopted an explanatory research design targeting 235 managers from Safaricom, Airtel, Telkom, and Jamii Telecommunications Ltd. A sample of 148 respondents was determined using Yamane's formula, while stratified random sampling was employed. Primary data were collected using semi-structured questionnaires and analyzed using descriptive statistics and bivariate linear regression in SPSS. The findings revealed that passive tower-sharing strategies had a strong positive and significant effect on organizational performance ($\beta = 0.823$, $R^2 = 0.677$, $p < 0.05$). The results indicate that tower-sharing enhances cost efficiency, network expansion, regulatory compliance, service quality, and overall organizational performance. The study concludes that passive tower-sharing strategies significantly improve the organizational performance of mobile network operators. It recommends that operators expand passive infrastructure-sharing arrangements, while the Communications Authority of Kenya strengthens regulatory frameworks that promote infrastructure sharing, fair competition, and efficient utilization of telecommunications resources.

Keywords: *Passive tower sharing, organizational performance, telecommunications infrastructure, mobile network operators, Kenya*

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1. Introduction

Organizational performance is increasingly defined as a multidimensional construct that evaluates how effectively an entity achieves its strategic objectives by optimizing human, financial, and informational resources (Mahamoud et al., 2025). The importance of organizational performance lies in its crucial role for the survival and long-term success of any entity in a competitive market. High-performing organizations create environments that foster innovation, employee engagement, and adaptability to changing external factors (Sabir et al., 2025). Ultimately, effective management of organizational performance is a vital tool for driving productivity and maintaining a competitive edge, often using frameworks such as the Balanced Scorecard to align daily operations with long-term strategic goals (Moumin, 2024).

Tower-sharing strategies have emerged as a critical driver of organizational performance in the telecommunications industry, primarily by enabling significant cost efficiencies and resource optimization (Koutroumpis et al., 2023). By offloading infrastructure management to independent tower companies (towercos) or entering passive sharing agreements, mobile network operators (MNOs) can reduce capital expenditure (CAPEX) on site acquisition and deployment by 20–30%, while substantially lowering operating expenses (OPEX) related to power and maintenance (Houngbonon et al., 2025). This reduction in fixed-asset dependency improves financial performance by boosting profitability and freeing up capital to reinvest in network upgrades, such as 4G and 5G expansion, rather than site duplication (Totem, 2023). Passive tower-sharing involves the joint use of physical infrastructure, such as towers, masts, and shelter space, without sharing the electronic equipment, and is the most common approach in Kenya due to its simplicity and cost savings (Chepkorir, Wanza & Eng'airo, 2024).

Beyond cost savings, tower-sharing strategies enhance organizational performance by enabling faster market entry, improving network coverage, and sharpening the focus on customer-centric services (PwC, 2023). By leveraging existing infrastructure, MNOs can accelerate the rollout of high-speed broadband in underserved or rural areas, thereby enhancing service quality and driving subscriber growth (Houngbonon et al., 2025). Furthermore, sharing agreements facilitate a shift in strategic focus from infrastructure ownership to service-based competition and innovation, enabling operators to prioritize customer experience and branding, thereby strengthening their overall market position (Totem, 2023).

1.1 Problem Statement

Mobile Network Operators (MNOs) are central to Kenya's economic and social development, facilitating financial inclusion through mobile money services such as M-Pesa, expanding digital infrastructure including 4G and 5G networks, and generating employment opportunities (Communications Authority of Kenya, 2025). Despite these contributions, MNOs face a persistent challenge: sustaining profitability and market share in a highly competitive and saturated market (Asena & Oloko, 2025). The sector generated KSh 425.5 billion in revenue in 2024, yet growth is heavily concentrated around Safaricom, which holds a 65.7% market share, leaving smaller operators such as Airtel (29.6%), Finserve (2.1%), and Telkom (1.7%) with comparatively lower returns. High capital expenditure (CAPEX) for network deployment further pressures the return on assets (ROA) of these smaller operators, creating an unsustainable financial environment for new entrants and less dominant firms (Mutheu, 2023).

The adverse impact of this situation is felt most by smaller and emerging MNOs, whose limited financial and infrastructural resources restrict their ability to compete effectively with dominant incumbents (Chepkorir, Wanza & Eng'airo, 2024). These operators often struggle with limited network coverage, reduced service quality, and higher operational costs, which impede market expansion and innovation. Consumers are also indirectly affected, as limited competition can constrain service options, quality, and affordability, particularly in rural and underserved areas. This uneven landscape undermines the broader goals of digital inclusion and economic development, highlighting the need for strategies that level the playing field and reduce redundant infrastructure investment.

While regulatory bodies such as the Communications Authority of Kenya and international organizations like the World Bank promote infrastructure-sharing strategies, implementation has largely remained limited to passive arrangements, such as leasing tower space. Previous studies have highlighted the potential of tower-sharing strategies: Argyroulis et al. (2025) analyzed network tower-sharing in Greece but did not link it to organizational performance,

indicating a conceptual gap. Similarly, Koutroumpis et al. (2023) studied mobile network sharing but relied solely on secondary data, creating a methodological gap. In Kenya, empirical evidence on the effect of tower-sharing strategies on organizational performance remains scarce. Addressing this gap is urgent, as effective sharing could reduce CAPEX, improve operational efficiency, enhance network coverage, and ultimately strengthen the competitiveness and sustainability of smaller MNOs in a concentrated market.

1.2 Research Objective

To determine the influence of passive tower-sharing strategies on the organizational performance of mobile network operators in Nairobi County, Kenya.

1.3 Research Hypothesis

H0₁: Passive tower-sharing strategies have no significant effect on the organizational performance of mobile network operators in Nairobi County, Kenya.

2. Literature Review

2.1 Theoretical Review

Barney (1991) and Wernerfelt (1984) put out the Resource-Based View (RBV). According to RBV theory, an organization's internal resources and competencies are what truly matter for maintaining a competitive edge and performing well (Barney, 1991). According to the RBV, valuable, rare, inimitable, and non-substitutable (VRIN) resources enable companies to stand out from the competition and achieve superior performance.

Rather than looking outward at external market conditions, the theory proposes that a company's competitive advantage comes from its capacity to use its distinct assets, both tangible and intangible, to generate value that rivals can't easily imitate. These assets include things like technology, capital, intellectual property, brand reputation, and organizational culture (Wernerfelt, 1984).

RBV also emphasizes the role of capabilities, which are the firm's skills and processes that transform resources into effective outcomes (Teece et al., 1997). Capabilities include routines, managerial competencies, and operational processes that allow the organization to deploy its resources efficiently and innovate in response to changing environments. This theoretical lens is particularly relevant for understanding how firms engage in strategic collaborations, alliances, and shared infrastructure, as such arrangements can enhance or complement a firm's existing resource base. For example, in the telecommunications sector, sharing infrastructure such as towers can be seen as optimizing the use of physical and technological resources and leveraging organizational capabilities to improve cost efficiency and market reach.

Finally, RBV provides a framework for evaluating performance outcomes based on internal resource management rather than solely external market forces. It implies that organizations that invest in developing rare and inimitable resources, as well as the capabilities to use them effectively, are more likely to sustain superior performance over time (Barney, 1991). The theory has been widely applied in studies examining technology adoption, strategic alliances, and operational efficiency, demonstrating that resource optimization through innovation, sharing, or strategic deployment can translate directly into competitive advantage. In practice, RBV encourages managers to identify, protect, and strategically exploit resources and capabilities that are difficult for competitors to imitate, thereby creating long-term organizational value.

The Resource-Based View (RBV) of telecommunication tower-sharing strategies explains how Mobile Network Operators (MNOs) transition from viewing towers as a source of competitive advantage to viewing them as non-core assets to be shared for operational efficiency. According to the RBV, companies gain a competitive edge by securing and effectively managing VRIN/VRIO resources, which stand for Valuable, Rare, Inimitable, and Non-substitutable. In the tower-sharing context, this theory explains the strategic shift towards partnering with Tower Companies to optimize capital (CAPEX) and operating expenses (OPEX).

2.2 Empirical Review

Argyroulis et al. (2025) focused on network tower sharing in Greece. We will also discuss how international trends and competition are affecting the concentration of alternative operators and growth opportunities at home. Finally, the article offers a qualitative, interpretative analysis of viewpoints on network tower sharing in the Greek telecom industry, including future research directions, policy suggestions, and recommendations.

Research by Kumar and Oughton (2023) centred on methods for wireless broadband infrastructure sharing. Infrastructure sharing is thus a new trend in the age of contemporary telecommunications. Network operators and governments alike have shown an increased interest in this strategy in recent years, driven by a shared goal of expanding broadband access at lower prices. First, we look at potential locations for infrastructure sharing, tactics for implementing them, and the people who can help make it happen. Following this, we detail the results of a techno-economic feasibility study of four main solutions for sharing 5G infrastructure in rural areas: business-as-usual (no sharing), passive sharing, active sharing, and a neutral host network/NHN. According to the results, the Net Present Value (NPV) of network sharing schemes is 20–90% higher than the baseline. Specifically, compared with alternative options for providing rural areas with wireless internet, an NHN approach can reduce deployment costs by 10–50 percent.

3. Methodology

An explanatory research design was employed in this investigation. The target population was 235 managers from four firms: Safaricom, Airtel, Telkom, and Jamii Telecommunications Ltd. The unit of analysis included top management, senior managers, and technical staff responsible for strategy formulation, network rollout, and infrastructure management at the firms. All four MNOs were included in the study. Yamane's (1967) formula was used to determine a sample size of 148 managers. The study employed stratified random sampling, the most appropriate approach given the natural heterogeneity among firms. Furthermore, stratified random sampling is particularly suitable when the study seeks to examine relationships between tower-sharing strategies and performance metrics across diverse operational contexts.

The study collected primary data using semi-structured questionnaires. A pilot study was conducted prior to the main data collection to assess the validity, reliability, and clarity of the research instruments, particularly the questionnaires and interview guides. The Statistical Package for Social Sciences (SPSS) program was subsequently used to code and analyze the data. Descriptive and inferential statistics were the main techniques used in this study's data analysis. The mean and standard deviation were among the descriptive statistics examined. The relationship between the independent and dependent variables was examined using linear regression analysis. Content analysis was used to analyze qualitative data collected through open-ended questions.

4. Results and Discussion

4.1 Demographic Analysis

The researcher sought demographic information from the respondents. They included the respondents' age, gender, and education level.

4.1.1 Age of the Respondents

The respondents were asked to indicate their age. Results are shown in Table 1.

Table 1: Age of the Respondents

Age	Frequency	Percent
below 30 years	9	7.4
30-39 years	27	22.3
40-49 years	53	43.8
50-59 years	32	26.4
Total	121	100

Results showed that majority of the respondents who were 53(43.8%) were 40-49 years, 32(26.4%) indicated that they were 50 – 59 years, 27(22.3%) indicated that they were 30-39 years, 9(7.4%) indicated that they were below 30 years. This implies that the findings are informed by individuals with substantial industry experience, institutional knowledge, and a deeper understanding of telecommunications infrastructure and strategic practices such as tower sharing.

4.1.2 Gender of the Respondents

The respondents were asked to indicate their gender. Results are shown in Table 2.

Table 2: Gender of the Respondents

	Frequency	Percent
Male	90	74.4
Female	31	25.6
Total	121	100

Results showed that the majority of respondents (90; 74.4%) were male, while 31 (25.6%) were female. This implies that most respondents were men. This suggests that the telecommunications sector was male-dominated.

4.1.3 Education Level

The respondents were asked to indicate their education level. Results are shown in Table 3.

Table 3: Education Level

	Frequency	Percent
Certificate	3	2.5
Diploma	40	33.1
Bachelor's degree	50	41.3
masters	28	23.1
Total	121	100

The results showed that 50 (41.3%) held a bachelor's degree, 40 (33.1%) held a diploma, 28 (23.1%) held a master's degree, and 3 (2.5%) held a certificate. These findings indicate that the majority of respondents have relatively high levels of education, with most holding at least a diploma or a bachelor's degree, and a substantial proportion holding postgraduate qualifications. This suggests that managers at mobile network operators are generally well educated, enhancing their capacity to understand and implement complex strategies, such as telecommunications tower-sharing arrangements.

4.2 Descriptive Results

Descriptive results for both the dependent and independent variables are presented in this section.

4.2.1 Passive Tower-Sharing Strategies

The respondents were asked to indicate their level of agreement on passive tower-sharing strategies. Results are shown in Table 4.

Table 4: Descriptives for Passive Tower-Sharing Strategies

	Mean	std.dev
Our firm’s adoption of co-location at competitor-owned sites has significantly reduced our capital expenditure (CAPEX) on new network rollouts.	4.01	1.3
The use of shared passive infrastructure (e.g., shelters, generators) has decreased our operational expenditure (OPEX) in remote locations.	3.85	1.28
Passive sharing agreements have allowed us to accelerate the deployment of new base transceiver stations (BTS) in Kenya.	3.73	1.25
The quality of shared passive infrastructure has positively influenced our network uptime and service quality.	3.55	1.3
The use of passive tower-sharing strategies has contributed to faster network expansion.	3.83	1.21
Average	3.79	1.27

The results showed that the majority of respondents agreed that the firm’s adoption of co-location at competitor-owned sites has significantly reduced our capital expenditure (CAPEX) on new network rollouts (mean=4.01, std.dev=1.30). This suggests that passive infrastructure sharing plays a key role in cost optimization, particularly in areas where deployment and maintenance costs are typically high. In addition, the majority of respondents agreed that passive sharing agreements have enabled the faster deployment of new base transceiver stations (BTS) in Kenya (mean = 3.73, std. dev. = 1.25). This implies that passive sharing arrangements accelerate network rollout, allowing firms to expand coverage more efficiently.

The findings also indicated that the majority of the respondents agreed that the quality of shared passive infrastructure has positively influenced network uptime and service quality (mean = 3.55, std. dev = 1.30). This suggests that shared infrastructure improves service reliability, albeit with some variability in perceptions. Moreover, most respondents agreed that the use of passive tower-sharing strategies has contributed to faster network expansion (mean = 3.83, std. dev = 1.21). This reinforces the view that infrastructure sharing supports broader, faster network coverage.

In an open-ended question, the respondents were asked to indicate the influence of passive tower-sharing strategies on the organizational performance of mobile network operators in Kenya. The majority of respondents indicated that co-location on competitor-owned sites reduces capital expenditure (CAPEX) by minimizing the need for new infrastructure. This cost reduction was frequently linked to improved financial efficiency and better allocation of resources to core business activities. For example, one of the managers indicated;

‘By co-locating on existing towers owned by other operators, we have been able to avoid the high capital costs of building new sites.’M2

The study findings aligned with those of Kumar and Oughton (2023), who found that infrastructure-sharing models (including passive sharing) yield higher Net Present Value (NPV) than non-sharing approaches, suggesting improved financial outcomes.

4.2.2 Organizational Performance

The respondents were asked to indicate their level of agreement on organizational performance. Results are shown in Table 5.

Table 5: Descriptives for Organizational Performance

	Mean	std.dev
Our organizational profitability has increased due to tower sharing.	3.91	1.36
Our network coverage has significantly expanded through shared infrastructure.	3.89	1.28
Our operating costs have decreased as a result of sharing strategies	3.79	1.33
Our market share has grown due to improved network quality from sharing	3.94	1.23
Return on assets of the firm has greatly increased	3.28	1.40
Average	3.85	1.23

The results showed that the majority of the respondents agreed that organizational profitability has increased due to tower sharing (mean = 3.91, std. dev = 1.36). This suggests that by increasing efficiency and decreasing investment duplication, infrastructure sharing leads to better financial results. Similarly, respondents agreed that network coverage has significantly expanded through shared infrastructure (mean = 3.89, std. dev = 1.28). This implies that tower-sharing agreements are essential for expanding service reach, thereby enhancing accessibility and promoting market penetration.

The respondents agreed that operating costs have decreased as a result of sharing strategies (mean = 3.79, std. dev = 1.33). This suggests that one of the main advantages of infrastructure sharing is cost-effectiveness, as businesses may lower capital and operating costs. The majority of respondents also agreed that market share has grown due to improved network quality resulting from sharing (mean = 3.94, std. dev. = 1.23). This suggests that improved service quality enabled by shared infrastructure strengthens competitive positioning by enhancing customer acquisition and retention. However, respondents showed relatively low agreement that return on assets (ROA) has increased significantly (mean = 3.28, std. dev. = 1.40). This implies that whereas tower-sharing solutions enhance several performance metrics, their direct effect on asset efficiency may be less pronounced or take longer to fully manifest.

4.3 Regression Results

4.3.1 Bivariate Regression between passive tower-sharing strategies and organizational performance

Bivariate analysis of the influence of passive tower-sharing strategies on the organizational performance of mobile network operators.

Table 6: Model Summary for passive tower-sharing strategies

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.823a	0.677	0.675	0.6163

The results showed that the R was 0.823. This implies that passive tower-sharing strategies were strongly correlated with organizational performance. In addition, the R-squared was 0.677, implying that passive tower-sharing strategies explain 67.7% of the variation in organizational performance.

Table 7: Analysis of Variance for passive tower-sharing strategies

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	94.885	1	94.885	249.839	.000b
Residual	45.195	119	0.38		
Total	140.08	120			

Table 7 indicates that passive tower-sharing strategies are a good predictor of organizational performance of mobile network operators, as evidenced by an F statistic of 249.839 and a reported p-value of 0.000, which was lower than the 0.05 significance level. This implies that the passive tower-sharing strategies have a statistically significant effect on organizational performance at a 95% confidence level.

Table 8: Regression Coefficient for passive tower sharing strategies

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0.516	0.213		2.425	0.017
Passive tower-sharing strategies	0.853	0.054	0.823	15.806	0.000

Optimal model

$$Y = 0.516 + 0.823X + e$$

Where;

Y= Organizational performance

X= Passive Tower-Sharing Strategies

The results showed that passive tower-sharing strategies had a positive and significant effect on the organizational performance of mobile network operators ($\beta = 0.823$, $p = 0.000$). A positive beta coefficient indicates that an increase in the adoption of passive tower-sharing strategies by one unit is associated with an improvement in organizational performance of 0.823 units.

The null hypothesis (H_{01}) was that passive tower-sharing strategies have no significant effect on the organizational performance of mobile network operators in Nairobi County, Kenya. Results showed a p-value less than 0.05, implying rejection of the null hypothesis; thus, passive tower-sharing strategies have a significant effect on the organizational performance of mobile network operators in Nairobi County, Kenya. The study findings agreed with those of Kumar and Oughton (2023), who found that infrastructure-sharing strategies, including passive sharing, significantly improve financial outcomes by increasing the Net Present Value (NPV) of network investments.

5. Conclusion

The study concluded that passive tower-sharing strategies had a positive and significant effect on the organizational performance of mobile network operators. In addition, the study establishes that passive sharing agreements contribute to the faster deployment of base transceiver stations, thereby accelerating network expansion and service delivery nationwide. The study concluded that co-location at competitor-owned sites plays an important role in reducing capital expenditure associated with new network rollouts, thereby improving cost efficiency among operators.

6. Recommendations

The study recommended that mobile network operators should expand the adoption of co-location on competitor-owned sites to further reduce capital expenditure and improve efficiency in network rollouts. In addition, operators should strengthen and formalize passive infrastructure-sharing agreements to enhance coordination and accelerate the deployment of base transceiver stations across Kenya. The study recommended that the Communications Authority of Kenya and other relevant regulatory bodies should develop and enforce supportive policies that promote infrastructure sharing while ensuring fair competition and service quality standards within the telecommunications sector.

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