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Technological Capability and Competitiveness of Pharmaceutical Manufacturing Companies in South-South, Nigeria

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ABSTRACT

This study investigated the relationship between technological capability and the competitiveness of pharmaceutical manufacturing companies in South-South, Nigeria. Employing a cross-sectional survey design, data was collected from 50 senior managers across 10 registered pharmaceutical companies in the region. The research focused on three dimensions of competitiveness: market share, cost leadership, and innovativeness. The findings reveal a significant and positive relationship between technological capability and each measure of competitiveness. Specifically, Spearman's rank-order correlation indicated a strong positive correlation between technological capability and both market share and innovativeness, as well as a moderate positive correlation with cost leadership. The results suggest that pharmaceutical companies with advanced technological capabilities are better positioned to increase market share, achieve cost efficiencies, and foster innovation. These findings align with existing literature, reinforcing the critical role of technological capability in enhancing organizational performance and competitiveness. The study concludes that investments in technological capability are essential for pharmaceutical manufacturing companies in South-South, Nigeria, to strengthen their competitive position and ensure long-term success in the industry.

Keywords: Technological capability, Organizational Competitiveness, Market share, Innovativeness, Cost leadership.

INTRODUCTION

In the face of a rapidly evolving business environment, organizations are compelled to navigate turbulent ecosystems marked by uncertainty and intense competition (Binci, Cerruti, Masili & Paternoster, 2022; Ekweli & Hamilton, 2020; Poi & Lebura, 2022). To succeed in such an environment, it is crucial to develop organizational competitiveness, which is essential for long-term success (Badakhshan, Conboy, Grisold & Brocke, 2020). In order to fulfil the demands that businesses face and effectively deal with uncertainties, it is necessary to possess not just competitiveness but also the development of strategic capability to transform expectations into reality (Lemos & Nascimento, 1999, as cited in Darlan, Janaina, Marie-Anne & Nelson, 2012). Competitiveness is evidently a decisive factor for survival in the business world. To achieve it, one must set priorities, which can be defined as a set of options of varying importance that a firm must have to compete in the market over a set time frame (Darlan et al., 2012).

The competitiveness of manufacturing companies in Nigeria faces multifaceted challenges, encompassing market share, cost leadership, and innovativeness. These challenges significantly impact the industry's ability to thrive and compete effectively within the region and beyond. The market dynamics in the region are characterized by intense competition and fragmented consumer preferences. Local companies often contend with limited resources and infrastructure, constraining their ability to expand market penetration (Ozoya, 2018). Furthermore, the dominance of multinational pharmaceutical corporations, equipped with extensive marketing budgets and established distribution networks, poses a significant barrier to entry for smaller local firms (Aina & Adedayo, 2016). As a result, local companies struggle to assert their presence and capture a substantial share of the market.

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Achieving cost leadership is a persistent challenge for manufacturing companies in Nigeria. The industry operates within a regulatory framework that mandates compliance with stringent quality standards and manufacturing practices, which entail substantial investments in infrastructure and human resources (Ogbonna, Okerulu, Nwalozie & Onwe, 2019). Additionally, factors such as fluctuating exchange rates, importation costs for raw materials and equipment, and infrastructural deficiencies contribute to escalating operational expenses (Ekwueme, Okafor, Ezenekwe & Orjiakor, 2017). Local companies, lacking economies of scale and access to affordable financing, face heightened cost pressures that undermine their competitiveness in pricing and profitability.

The capacity for innovation is pivotal for manufacturing companies to sustain competitiveness and address evolving healthcare needs. However, local firms in Nigeria encounter significant barriers to innovation. Limited investment in research and development (R&D) infrastructure, coupled with a scarcity of skilled scientific talent, impedes the development of novel drugs and therapies (Ugwu, 2019). Moreover, intellectual property rights issues and regulatory hurdles hinder the commercialization of innovative products, deterring firms from pursuing breakthrough innovations (Aina & Adedayo, 2016). Consequently, local manufacturing companies struggle to differentiate their offerings and compete effectively in the global market.

In the manufacturing sector, where innovation is a critical driver of success, technological capability is fundamental to maintaining a competitive edge. Firms with robust technological capabilities can achieve superior product quality, operational efficiency, and faster response times to market dynamics. This positions them favorably in terms of market share, innovativeness, and cost leadership—key indicators of competitiveness (Bharadwaj, 2000; Solleiro & Castanón, 2005).

Previous studies have underscored the importance of technological capabilities in driving competitiveness. For example, Bharadwaj (2000) emphasized the role of technological capabilities in effective resource utilization, while Bhatt and Grover (2005) linked these capabilities to competitive advantage. Furthermore, studies like those by Solleiro and Castanón (2005) highlight the ability of technological capabilities to increase market share by improving product quality and operational efficiency. Despite these insights, the relationship between technological capabilities and competitiveness in Nigeria's pharmaceutical manufacturing sector remains underexplored, particularly in the context of the South-South region.

This study aims to bridge this gap by investigating the impact of technological capability on the competitiveness of pharmaceutical manufacturing companies in South-South, Nigeria. Specifically, it examined how technological capability influences key competitive factors such as market share, innovativeness, and cost leadership. The findings of this study are expected to provide valuable insights for policymakers, industry stakeholders, and company management, enabling them to develop strategies that enhance technological capabilities and, by extension, the competitiveness of pharmaceutical manufacturing companies in the zone.

With respect to this purpose, the following objectives were drawn for the study:

1. To analyze the relationship between technological capability and competitiveness of pharmaceutical manufacturing companies in South-South, Nigeria.

Based on the above objectives, the study was guided by the following research questions:

1. What is the relationship between technological capability and market share of pharmaceutical manufacturing companies in South-South, Nigeria?

2. What is the relationship between technological capability and innovativeness of pharmaceutical manufacturing companies in South-South, Nigeria?

3. What is the relationship between technological capability and cost leadership of pharmaceutical manufacturing companies in South-South, Nigeria?

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The conceptual framework showing the relationship between technological capability and organizational competitiveness is displayed in Figure 1.

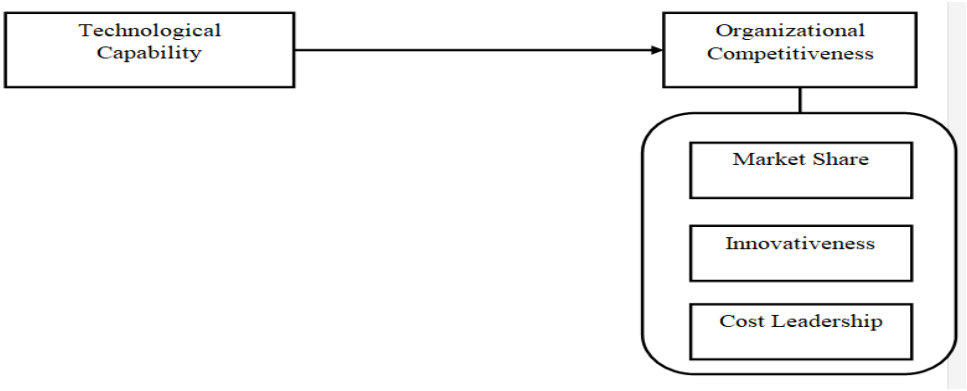

Figure 1: Framework of Technological capability and Competitiveness.

Source: Desk Research, 2025.

LITERATURE REVIEW

Theoretical Foundation

Resource-Based Theory

Resource-Based Theory (RBT), also known as the Resource-Based View (RBV), posits that the unique resources and capabilities of a firm are critical determinants of its competitive advantage and performance (Barney, 1991). This theory emphasizes the importance of firm-specific resources that are valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991). Among these resources, technological capability has become increasingly significant, especially in the context of a rapidly evolving digital economy.

In the context of RBT, technological capability is considered a strategic resource because it meets the VRIN criteria. First, technological capability is valuable as it can lead to innovations that improve efficiency, reduce costs, and enhance customer satisfaction (Teece, 2014). Second, it is rare because not all firms possess the same level of technological expertise or access to cutting-edge technology. Third, technological capability can be difficult to imitate due to the complexities involved in developing and integrating advanced technologies within organizational processes. Finally, it is non-substitutable because the unique technological assets and knowledge within a firm cannot easily be replaced by other resources (Barney, 1991). Resource-Based Theory highlights the importance of technological capability as a strategic resource that can significantly influence a firm’s competitive advantage.

Dynamic Capability Theory

Dynamic Capability Theory (DCT) extends the Resource-Based View (RBV) by emphasizing the need for firms to adapt and renew their resources and capabilities in response to changing environments (Teece et al., 1997). According to Eisenhardt and Martin (2000), dynamic capabilities are often underpinned by a firm's ability to learn from its experiences and to apply this knowledge in developing new capabilities. In this context, technological capability supports organizational learning by enabling firms to experiment with new technologies, gather data, and refine their approaches based on feedback and results (Zollo & Winter, 2002).

Moreover, technological capability can enhance a firm's ability to reconfigure its resource base in response to external changes. For example, in the face of disruptive technological advancements, firms with strong technological capabilities are better equipped to pivot their strategies, reallocate resources, and invest in new technologies that align with shifting market demands (Teece et al., 1997). In an era of rapid technological change, firms that can effectively develop, integrate, and reconfigure their technological capabilities are better

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positioned to maintain competitive advantage. However, this requires continuous investment and strategic foresight to ensure that technological capabilities remain relevant and aligned with evolving market demands.

The Concept of Technological capability

There are a variety of definitions of technological capabilities in the literature, as there are numerous empirical and theoretical contributions about this capability (Gonzales & Cunha, 2012). Technological capability is defined as the ability to generate, learn, disseminate, and use technical knowledge to improve productivity (Lall, 2000; Von Zedtwitz & Jin, 2004). Technological capability is the company's ability to execute any relevant technical function, including the ability to develop new products, processes, and technical knowledge in order to achieve higher levels of firm efficiency (Teece et al., 1997; Tsai, 2004). The company gains a competitive advantage within the industry through its technological capability (Ortega, 2010). As a result, technological capability can mean the knowledge, skill, experience, and ability to choose, install, operate, maintain, adapt, assimilate, improve, and develop new values for processes and products in a dynamically changing manufacturing environment.

Technological capabilities refer to a firm's ability to develop new products and services by aligning its strategy with innovative processes (Wang, 2007). Such capabilities involve knowledge and skills in acquiring, using, absorbing, adapting, improving, and generating new technologies (Bell & Pavitt, 1995). These capabilities have enabled the development of new products and technologies, improved manufacturing processes and quality control skills, and predicted technological changes in the industry (DeSarbo, 2005). According to Rehman, Smith, Johnson and Patel (2020), technology capabilities have been defined as the capabilities that the firm requires to completely assimilate, use, change, and create technology for use. Technological capabilities enable firms to make use of the new technological knowledge for production, innovation, and engineering so as to gain competitiveness in pricing and quality. These technological capabilities are critical for firms to assimilate, adapt, and use new technologies for their own benefit.

Technological capabilities are dynamic resources that encompass the skills, knowledge, and routines involved in generating and managing technological change, whether they concern production activities, investment activities, or relations with other firms (Albu, 1997). For example, before purchasing and absorbing new technologies, the firm should be able to make the right choice about the type of technology, its sources, and the price it is going to pay for it (Gulrajani, 2006). According to Lall (1992), technological capabilities can be described as knowledge and skills technical, organizational, and institutional aspects—that allow productive enterprises to utilize equipment and information efficiently. The concept of technological capabilities can be used either as a micro concept, referring to the technological capabilities of a firm, or as a macro concept, referring to the technological capabilities of a country.

The Concept of Organizational Competitiveness

The significance and influence of competitiveness have increased in the past few decades, leading to a substantial body of literature that aims to establish indicators for measuring competitiveness at both the corporate and national levels. Consequently, it is crucial to acknowledge the diverse contributions of studies that delve into and enhance our understanding of the fundamental aspects of competitiveness. According to Etkin (1996), competitiveness is defined as the production of quality goods that belong to a system that is efficient in resource use, effective in achieving results, and efficient in satisfying the needs of its internal and external customers. Competitiveness is the ability of a company to differentiate itself from other companies on the basis of competitive advantages, with the aim of creating, sustaining, or improving a given situation within a socioeconomic context (Pelayo, 2002).

Organizational competitiveness is the capacity of any entity to improve its competitive position by differentiating itself from others and maintaining its market-leading position as a result of the advantages it has purposefully acquired via the development of superior and distinctive goods and services (Camison & Fores, 2015; Orozco, Serpell, Molenaar & Forcael, 2014). Businesses can benefit from a distinct competitive edge when they produce goods or services more profitably than their competitors. Gelfand, Eric and Aycan (2007) have espoused competitiveness from a macroeconomic perspective. He argued that competitiveness is a firm's

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ability to compete in order to increase profits and grow. However, this can only be attained with improved capacity to mobilize all forms of resources (technology, human, operations, finance, etc.) for quality products and work processes. Lall (2011) also notes quality processes as a primary component of competitiveness. When firms deliberately ensure innovational practices through structural flexibility that empower employees to think for the organization while at the same time-sharing knowledge, they are apparently adopting a competitive strategy that makes them compete favourably (Cheng, Yang, Sheu & Chuang, 2011).

Solleiro and Castanón (2005) asserted that competitiveness is the ability and capacity of a company to increase its market share by using business strategies and promoting productivity in a specific competitive environment. In the view of Valencia (2006), competitiveness is related to the production of goods and services that can compete successfully in globalized markets and, at the same time, improve the income and quality of life of the population. Organizational competitiveness relates to continuous presence in markets, profit making, and the ability to adapt production to demand (Ude, Zeb-Obipi & Oparanma 2022). Zuiga (2010) also added that competitiveness is defined as the sophistication of strategy and business operations processes, with strategic direction being the key tool. Competitiveness is a term that refers to a company's position in relation to others, implying that it is associated with market permanence and customer value generation (Monterroso, 2016).

Market Share

According to Gabriel (2018), market share is a company's portion of sales within the entire market in which it operates, and it provides a metric that indicates a company's size in the market. As a result, market share in strategic management and marketing refers to the percentage or portion of the total available market or market segment that a company services. Farris, Bendle, Pfeifer and Reibstein (2010) defined market share as the percentage of a market (defined in terms of either units or revenue) accounted for by a specific entity. Vargo and Lusch (2004) have urged scholars and practitioners to interpret market share as a measure of how well a company has been able to predict market dynamics and the needs of its targeted customers. Market share is, in fact, the share of overall market sales for each brand, and increasing market share is one of the most sought-after objectives of businesses.

Innovativeness

Innovativeness is the willingness to promote change, creativity, and novelty in order to develop new products and processes (Lumpkin & Dess, 1996). Hurley and Hult (1998) state that innovativeness is a part of a firm’s culture and define the term as openness to change. From a macro perspective, innovativeness refers to a new innovation's ability to bring about a paradigm shift in science, technology, and/or industry market structure, while from a micro perspective, it refers to the ability of a new innovation to impact the firm's current marketing resources, technological resources, skills, knowledge, capabilities, or strategy (Garcia & Calantone, 2002). Firm innovativeness is the result of the innovation process (Alexiev, Volberda & Van den Bosch, 2016).

Cost leadership

Cost leadership is often linked to the realization of economies of scale and scope. With increasing production volumes, a firm can distribute fixed costs across a larger output, resulting in lower per-unit costs (Rumelt, 2011). This efficiency-driven cost advantage contributes to organizational competitiveness. Strategic cost management practices are integral to achieving cost leadership. Organizations must continuously evaluate and optimize their internal processes, supply chain, and resource allocation to minimize costs (Hitt, Ireland & Hoskisson, 2019). This ongoing commitment to efficiency is essential for maintaining competitiveness. Cost leadership enables organizations to offer customers a compelling value proposition. By providing quality products or services at competitive prices, a company can attract a larger customer base, fostering loyalty and sustained competitiveness (Porter, 1985).

Empirical Review

Various studies suggest technological capabilities provide the basis for gaining competitive advantage and enhancing organizational performance (Bhatt & Grover, 2005; Santhanam & Hartono, 2003). An extensive

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body of technological capability literature agrees that technological capabilities facilitate effective collection and utilization of organizational resources (Bharadwaj, 2000). Floyd and Wooldridge (1990) suggest that technological capabilities enhance service reliability, reduce transaction errors, and increase consistency in performance. Further additions to the observations are that technological capabilities can contribute to enhancing service quality through better customized or individualized services and by creating knowledge links for identifying and sharing organizational expertise (Quinn, Anderson & Finkelstein, 1994).

Tello-Gamarra and Fitz-Oliveira (2023) investigated the relationship between technological capability and performance in developing countries. The goal of this paper is to find the relationship between technological capability and performance in developing countries. Considering the diversity of quantitative and heterogeneous results in literature, they chose to use the meta-analytic method to achieve the objective of this study. They were able to correlate all of the results from 19 studies regarding more than 6,000 firms from developing countries. This study yielded two significant findings. Firstly, they observed a positive correlation between technological capability and performance in developing countries. Secondly, they found that one of the sources of heterogeneity in the results has to do with the existence of different variables used for measuring technological capability and firm performance.

The study by Heredia, Castillo-Vergara, Geldes, Gamarra, Flores and Heredia (2022) proposed a model to explain the effect of digital capabilities on firm performance in the “new normal” context from a firm-level perspective. Moreover, it analyzes the mediating role of technological capabilities and the Human Development Index (HDI) in explaining firm performance. The study used data from the World Bank’s Enterprise Surveys 2020, which included 999 firms from 27 countries. The results show that digital capabilities positively influence firm performance only through technological capabilities. The study also empirically demonstrates that digital skills in low HDI economies have a more significant indirect effect on firm performance than in high HDI countries.

Campos-Teixeira and Tello-Gamarra (2021) analyzed firm boundaries by considering technological and transactional capabilities through multiple case studies of firms with varying levels of technological intensity. Their main findings are summarized in three propositions. Firstly, all industrial firms possess both technological and transactional capabilities. Secondly, firms with more developed technological and transactional capabilities tend to expand their boundaries. Thirdly, firms expand their boundaries through the accumulation of technological capability, transactional capability, or both. The study indicates that technological and transactional capabilities are essential for expanding the boundaries of firms, regardless of their level of technological intensity.

Mwika (2020) conducted research in Kenya on the impact of innovation and technology on construction firms' organizational performance. The study looked at how innovation and technology affect Kenyan construction firms' organizational performance. In this study, a cross-sectional survey design was adopted. 40 Kenyan construction companies were surveyed for the study. Copies of questionnaire were the major technique for collecting data. The analysis of the data was done using regression. Results from his study show that a company's competitive edge depends on its utilization of innovation and technology.

Nwankwere, Asikhia and Adebola (2017) evaluated the effect of technological capability on the firm efficiency of selected quoted food and beverage manufacturing companies in Lagos State, Nigeria. The study adopted a survey research design. The population was 692 middle- and top-level managers of the quoted firms. The Cronbach's alpha coefficient for the construct is between 0.815 and 0.968. The study concluded that technological capability had a significant effect on the efficiency of the selected food and beverage manufacturing companies in Lagos State, Nigeria. The adoption of technological capability is critical for the efficiency of manufacturing companies.

Kabiru, Mohd and Norlena (2015) determined the effects of information technology (IT) capability on the organizational performance of Nigerian banks. The study used stratified random sampling and simple random probability procedures in selecting the organizations as the sample. Out of 560 copies of questionnaire distributed, 417 respondents were found to be usable for further analysis, representing a 74% valid response rate. Multiple regression analysis was used to analyze the data using SPSS software. The findings showed that

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IT capability is significantly related to the organizational performance of banks based on the resource-based view (RBV) of organization performance.

Adeyeye (2014) investigated the impact of technological innovation capabilities on organizational performance. The objectives of the study were to determine the relationship between technological innovation capabilities expressed in terms of strategic planning and marketing planning capabilities and organizational performance in the manufacturing industry. The study employed survey research. Primary data was used with a questionnaire as a research instrument. The subjects were 137 employees of Nestle Foods Nigeria Plc. The hypothesis formulated for this study were tested using Pearson Product Moment Correlation with the aid of Statistical Package for Social Sciences (SPSS). The findings from the study revealed that strategic planning and marketing capability independently and jointly influence organizational performance. It is therefore concluded that technological innovation capabilities has a significant influence on organizational performance.

In their study, Tanabe, Angelo and Alexander (2004) examined the effect of strategic programming and the utilization of new technologies on competitiveness among chain stores in Brazil. They focused on the performance of the subjects between 1998 and 1999, the period of the most dramatic changes in the business environment. Based on the data analysis for the period under study, they concluded that the management of the chain stores has managed to adjust their businesses to the changes in their business environment. To this end, which led to an increase in competitiveness, they utilized strategic programming and new technologies in the management of their businesses.

Organizational capability can confer on the firm the ability to adopt industrial innovations, and in this case, these capabilities are defined as technological capabilities. Through technological capabilities, firms are able to successfully adopt technology that enables them to implement new production techniques and, in turn, solve problems arising from the use of outdated production systems (Chen et al., 2014; Shin, Taylor & Seo, 2012). Technological capabilities often leverage external resources, thereby reducing the risk inherent in breakthrough innovations (Chen et al., 2014; Teece, 2007).

Technological capabilities are a knowledge-based, comprehensive set of organizational capabilities that enable a firm to search for, recognize, organize, apply, and commercialize innovative products and services (Chang et al., 2012). As part of the organizational capabilities of a firm (Barney, 2001), technological capabilities also enable a firm to use resources to generate competitive advantage. Technological capabilities are considered a dynamic capability held by a firm to better adapt to technological opportunities (Teece, 2007) and hence are positively linked to organizational effectiveness. Based on the foregoing, the following hypotheses are formulated for appropriate empirical analysis:

Ho_1: There is no significant relationship between technological capability and market share of pharmaceutical manufacturing companies in South-South, Nigeria.

Ho_2: There is no significant relationship between technological capability and innovativeness of pharmaceutical manufacturing companies in South-South, Nigeria.

Ho_3: There is no significant relationship between technological capability and cost leadership in pharmaceutical manufacturing companies in South-South, Nigeria.

METHODOLOGY

The study employed a cross-sectional survey design, a type of quasi-experimental research. Additionally, the study was conducted in a non-contrived setting. There are ten operational local pharmaceutical manufacturing companies in South-South, Nigeria that are registered with National Agency for Food and Drug Administration and Control (NAFDAC, 2022). As a result, the population of the study consisted of these 10 registered and operational local pharmaceutical manufacturing companies in South-South, Nigeria. Given that this study is domiciled at the macro level of analysis, consequently, five (5) representatives from the top management category were chosen from each of the ten (10) operational pharmaceutical manufacturing companies to giving rise to 50 respondents as the study elements. For the purpose of data collection, copies of

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the questionnaire were administered on the fifty sampling elements made up of three senior managers drawn from each of the ten companies. A panel of subject-matter experts used expert judgement to assess the research instrument's items in relation to the construct. The experts considered whether the items cover the full range of the construct and whether any essential aspects are missing. Following careful consideration, they deemed the instrument suitable for the study. Spearman's rank-order correlation technique was employed to assess all prior hypothetical bivariate relations using SPSS 25.0 at a 95% confidence interval and a 0.05 level of significance.

DATA ANALYSIS AND RESULTS

Table 1: Correlation Matrix for Technological Capability and Measures of Organizational Competitiveness

			Technological Capability	Market Share	Cost Leadership	Innovativeness
Spearman's rho	Technological Capability	Correlation Coefficient	1.000	.737**	.586**	.742**
		Sig. (2-tailed)	.	.000	.001	.000
		N	50	50	50	50
	Market Share	Correlation Coefficient	.737**	1.000	.873**	.847**
		Sig. (2-tailed)	.000	.	.000	.000
		N	50	50	50	50
	Cost Leadership	Correlation Coefficient	.586**	.873**	1.000	.776**
		Sig. (2-tailed)	.001	.000	.	.000
		N	50	50	50	50
	Innovativeness	Correlation Coefficient	.742**	.847**	.776**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	50	50	50	50

**. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS Version 25.0 Output (2024)

Technological Capability and Market Share in Pharmaceutical

Manufacturing Companies in South-South, Nigeria

The result in Table 1 shows a Spearman's Coefficient (rho) value of .737 for the relationship between technological capability and market share. This value indicates a strong relationship between technological capability and market share, with the positive rho value suggesting a positive direction for this relationship. In other words, an increase in technological capability corresponds to an increase in market share for pharmaceutical manufacturing companies in South-South, Nigeria. Therefore, the relationship between technological capability and market share in this context is both strong and positive.

Ho_1: There is no significant relationship between technological capability and market share in pharmaceutical manufacturing companies in South-South, Nigeria.

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Table 1 presents the result of the test of significance, indicating that the relationship between technological capability and market share is significant with a p-value of .000, which is less than the alpha value of .05 (p = .000 < .05). This means that the observed p-value of .000 is significantly lower than the threshold for significance (.05). According to the decision rule established earlier, we reject the null hypothesis (Ho_1). Therefore, we conclude that there is a significant relationship between technological capability and market share in pharmaceutical manufacturing companies in South-South, Nigeria.

Technological Capability and Cost Leadership in Pharmaceutical

Manufacturing Companies in South-South, Nigeria

The result in Table 1 shows a Spearman's Coefficient (rho) value of .586 for the relationship between technological capability and cost leadership. This value indicates a moderate relationship, with the positive rho value suggesting that the relationship is in a positive direction. In other words, an increase in technological capability corresponds to an increase in cost leadership among pharmaceutical manufacturing companies in South-South, Nigeria. Therefore, the relationship between technological capability and cost leadership in this context is both moderate and positive.

Ho_2: There is no significant relationship between technological capability and cost leadership in pharmaceutical manufacturing companies in South-South, Nigeria.

Table 1 presents the result of the significance test, indicating a p-value of .001 for the relationship between technological capability and cost leadership. Since this p-value is less than the alpha value of .05 (p = .001 < .05), it demonstrates that the relationship is statistically significant. According to the decision rule established earlier, we reject the null hypothesis (Ho_2). Therefore, we conclude that there is a significant relationship between technological capability and cost leadership in pharmaceutical manufacturing companies in South-South, Nigeria.

Technological Capability and Innovativeness in Pharmaceutical

Manufacturing Companies in South-South, Nigeria

The result in Table 1 shows a Spearman's Coefficient (rho) value of .742 for the relationship between technological capability and innovativeness. This value indicates a strong and positive relationship, suggesting that as technological capability increases, innovativeness also increases among pharmaceutical manufacturing companies in South-South, Nigeria. Therefore, in this context, the relationship between technological capability and innovativeness is both strong and positive.

Ho_3: There is no significant relationship between technological capability and innovativeness in pharmaceutical manufacturing companies in South-South, Nigeria.

Table 1 presents the result of the significance test, indicating a p-value of .000 for the relationship between technological capability and innovativeness. Since this p-value is less than the alpha value of .05 (p = .000 < .05), it demonstrates that the relationship is statistically significant. According to the decision rule established earlier, we reject the null hypothesis (Ho_3). Therefore, we conclude that there is a significant relationship between technological capability and innovativeness in pharmaceutical manufacturing companies in South-South, Nigeria.

DISCUSSION OF FINDINGS

The findings of the current study show a positive and significant relationship between technological capability and each measure of organizational competitiveness—market share, cost leadership and innovativeness. This indicates that technological capability is positively and significantly related to the competitiveness of pharmaceutical manufacturing companies in South-South, Nigeria. In other words, an increase in technological capability translates to increased competitiveness for these companies. Technological capability enhances a

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company's ability to produce high-quality products efficiently and respond quickly to market demands. Advanced technologies can improve production processes, reduce downtime, and enhance product features, making the company more attractive to customers and increasing its market share.

By leveraging advanced technologies, pharmaceutical companies can automate processes, reduce waste, and optimize resource utilization. These technological efficiencies lower production costs and operational expenses, enabling the company to achieve cost leadership and gain a competitive edge in the market. Furthermore, technological capability supports innovation by providing the tools and platforms necessary for research and development, improving flexibility, and accelerating time-to-market for new products. This fosters a culture of continuous improvement and adaptation, which is essential for sustaining competitive advantage

The study's findings reinforce the conclusions of Tello-Gamarra and Fitz-Oliveira (2023), who investigated the relationship between technological capability and performance in developing countries. Their results showed a positive correlation between technological capability and performance in these regions. Additionally, the findings corroborate those of Heredia et al. (2022), who proposed a model to explain the effect of digital capabilities on firm performance in the "new normal" context. Their study demonstrated that digital capabilities positively influence firm performance through technological capabilities.

The current study's findings complement those of Campos-Teixeira and Tello-Gamarra (2021), who analyzed firm boundaries considering technological and transactional capabilities through multiple case studies. They concluded that these capabilities are essential for expanding firm boundaries, indicating an inherent competitiveness in firms that expand their boundaries. Moreover, the findings confirm the results of Mwika's (2020) study in Kenya, which showed that a company's competitive edge in the construction industry depends on its use of innovation and technology.

Nwankwere, Asikhia and Adebola (2017) evaluated the effect of technological capability on the efficiency of selected food and beverage manufacturing companies in Lagos State, Nigeria. Their study concluded that technological capability significantly affects the efficiency of these companies, aligning with the current study's findings. Similarly, Kabiru, Mohd and Norlena (2015) determined that IT capability significantly influences the organizational performance of Nigerian banks, supporting the current study's conclusions. The findings also affirm Adeyeye's (2014) research on the impact of technological innovation capabilities on organizational performance. Adeyeye concluded that technological innovation capabilities, through strategic planning and marketing, significantly influence organizational performance, mirroring the current study's results.

Furthermore, the study agrees with Bharadwaj's (2000) view that technological capabilities facilitate effective resource utilization. Floyd and Wooldridge (1990) suggested that technological capabilities enhance service reliability, reduce transaction errors, and increase performance consistency, which aligns with the current study's findings. Quinn, Anderson and Finkelstein (1994) added that technological capabilities improve service quality through customization and knowledge sharing, further supported by the current study's results.

The study reveals a positive correlation between technological capability and organizational competitiveness, particularly in pharmaceutical manufacturing companies in South-South, Nigeria. This finding supports previous research in developing countries and the "new normal" context. It also supports the importance of technological capabilities in expanding firm boundaries, enhancing efficiency, and enhancing service quality. The study supports various theories on the impact of technological capabilities on organizational performance.

CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between technological capability and the competitiveness of pharmaceutical manufacturing companies in South-South, Nigeria. The findings reveal a significant and positive relationship between technological capability and three key measures of organizational competitiveness: market share, cost leadership, and innovativeness. Specifically, the analysis shows that an increase in technological capability is strongly associated with an increase in market share, indicating that

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companies with advanced technological capabilities are better positioned to capture and maintain a larger portion of the market. Additionally, the study finds that technological capability has a moderate yet positive impact on cost leadership, enabling companies to optimize production processes, reduce operational costs, and achieve a competitive edge in terms of pricing. Furthermore, the study demonstrates a strong positive relationship between technological capability and innovativeness, highlighting that companies that invest in technological advancements are more likely to introduce new products, adapt to market changes, and sustain a culture of continuous improvement.

In conclusion, the study underscores the vital role of technological capability in driving the competitiveness of pharmaceutical manufacturing companies in South-South, Nigeria. It recommends that companies aiming to strengthen their competitive position should prioritize the development and implementation of advanced technological capabilities. By doing so, they can not only enhance their market share and cost leadership but also stimulate innovation, ensuring long-term success in an increasingly competitive industry.

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