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Technology Transfer and Competitive Advantage: The Managers' Perspective

Tosin Nicodemus* Johnson A. Egwakhe
School of Management Sciences, Babcock University, Department of Business Administration & Marketing, Ilishan-Remo, Ogun State, Nigeria

Abstract
Achieving and sustaining competitive advantages is becoming extraordinarily difficult as strategic intangible resources are hidden from public consumption and information asymmetry rules a turbulence business environment. The how of competitive advantage debate revolves around different constructs but technology transfer (technology infrastructure, innovation, and adoption) constitutes the focus of this work. The paper argued from technology transfer proxies to explain firms' competitive advantage through the knowledge lenses of managers. Cross- sectional survey research design was adopted, the unit of analysis was randomly selected and data were collected from 90 managers of telecommunication companies in Lagos State, Nigeria through a validated questionnaire whose reliability was established. The study provided empirical evidences that a relationship exist between technology transfer dimensions (technology adoption, technology infrastructure, and technology innovation) and competitive advantage ($r = 0.582$, $p<0.05$; 0.862, $p<0.05$; 0.684, $p<0.05$) and that these further affected significantly firms' competitive advantage ($F_{stat.19.16}$, p-value 0.000) among the surveyed companies. The recommendation focused on technology transfer in the form of adoption, infrastructure and innovation within a business ecosystem to promote competitive advantage.
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1. Introduction

The global business environment is increasingly becoming unfriendly, competitive, and integrated which seems to place company's survival on its ability to successfully adapt and adopt technological capability in response to changes. Achieving and sustaining competitive advantages require refinement in product quality, agility in service delivery, drastic innovation, internal flexibility, and lowest cost of operations. The inherent potential within intangible resources means building and warehousing capabilities which give an organization a strategic premium above others. This perspective resonates with technology transfer provided the absorptive power exists to changes industrial position and firms' viability in the market.

The 21st-century managers are confronted with the gale of creative destruction and globalization which refocus the academic discussion on how to gain competitive advantage through technology transfer, its dimensions and the significant differentiation between and among organizations. Berraies and Chaher (2014) argued that the decline in corporate performance cuts across developed, emerging and developing countries; as such global competition is forcing and determining the strategic spectrum and options. It is therefore imperative that companies respond quickly and innovatively to increase their overall efficiency and effectiveness by transferring/sharing technology. Furthermore, Adeoye, Agbawodikeizu, and Egwakhe (2019) and Venturi (2015) opined that adoption of technology is significant for any organization to achieve operational efficiency and industrial competitiveness. This view aligned with Marx (2017) and Torrent-Sellens and Diaz-Chao (2014) that efficiency and competitiveness are derivatives of technological innovativeness and knowledge acquisition.

Moreover, thriving organisations depend on social network, technical support, symbiotic and commercial relationships with external organizations to sustain their operations and survive (Zekeri, Isaac, & Oluwaseun, 2018). This interdependency and social capital enables transfer and sharing of unique knowledge and technology. In addition, the increasingly fragmented markets have orchestrated formal and informal relationships in building technology infrastructure, transferring, and sharing business intelligence in order to out-perform others (Arslan & Korkmaz, 2018). Local industrial systems built on internal networks tend to be more inflexible and technologically dynamic vis-sa-vis open system of intra-inter transfer. This implies that an embedded technical and social network could be a source of organisation's competitive advantage (Abu, Aun, & Oluwasanmi, 2018; Pavic, Koh, Simpson, & Padmore, 2007). Porter (1985) and Ho (2016) argued that competitive advantage is at the heart of corporate performance in the competitive business environment, and to achieve competitive advantage, firms should systematically provide unique value to customers relative to the competition.

In spite of the assertions that competitive advantage is a leading determinant of business profitability and sustainability in any organization (Abu, Aun, & Oluwasanmi 2018; Sanches, Milan, & Sahuquoilo, 2018); achieving it requires creative synergy. Further, Abu et al (2018) argued that for any organization to be competitive in terms of their product quality, product packaging, cost leadership, and services delivery, such organization must

continue to be innovative in terms of their technological designs, applications, systems, marketing, and operations. It is on this premise that this study is organized into two thematic areas; investigate the relationship and determine the effect of technology transfer dimensions (Technology adoption, technology infrastructure, and technology innovation) on competitive advantage in selected telecommunication firms in Lagos State, Nigeria.

2. Competitive Advantage

The concept of competitive advantage is old but reworked in the philosophy of Porter (1980; 1985; 2008) to include operational and financial performance beyond the industry threshold. According to Argote and Ingram (2012), competitive advantage is the distinctive ability of a firm to exploit its resources effectively, managing to increase customer value and position itself ahead of the competitors. Similarly, Barney (1991) viewed organization's competitive advantages as its available resources, technology advancement, level of innovation, and product differentiation; something that a company does better than its competitors because of some attributes, services, or brand. Further, Ngwiri, Mukulu, and Jane (2016) referred to competitive advantage as the ability of a company to outperform its competitor by running its operation more efficiently, less expensive, and profitable. Also, Pfluger and Tabuchi (2019) defined competitive advantage as an economic term used when a company or a nation's economies have the ability to produce goods and services at a lower opportunity cost than that of her trade partners. Porter's (1980) and Hatani, Hasanuddin, and Mukhtar (2016) proposed four different generic strategies that an organization could adopt in order to gain competitive advantage; and these include overall cost leadership, differentiation leadership, cost focus, and differentiation focus. Hence (Porter, 1980) argued that, the strategies may not be achieved without in-depth knowledge sharing and transfer, skill acquisition, and technology infrastructure by the organisations.

Competitive advantage is beneficial to a corporate organization in so many ways. According to Pfluger and Tabuchi (2019), competition determines the right activities a firm can engage in, that can contribute to its corporate performance, such as innovations implementation. In addition, competitive advantage establishes a profitable and workable position against the forces that determine industry competition. Similarly, it also makes an organization to be attractive in the industry for long-term profitability (Abu et al 2018; Sanches, Milan, & Sahuquoilo, 2018). This assertion can be at the opposite if an organization has chosen a poor competitive position. According to Johnson and Scholes (2008), changes in external environment factors could affect a firm's competitive advantage. When these factors change, many opportunities and threat arise; this can be exploited by an organization to achieve superiority over its rivals.

2.1 Technology Transfer

In order to bridge the gap between and among organizations as well as keeping up with the trends of globalization; technology transfer has become essential in the attainment of corporate and competitive advantage. This is enshrined in the fact that technology transfer over time has proved to be an operational vehicle through which gaps in knowledge, ideas and innovations from one part of the world to the other, especially from developed to developing economies is bridged (Abu et al., 2018). Different scholars have come up with various definitions of technology transfer; Othman, Mohamad, and Abu (2007) and the United Nations Conference on Trade and Development [UNCTAD] (2018), define technology transfer along functional rather than formal, this have accounted for the lack of consensus among scholars on a general definition of technology transfer. However, to aid clarity to the concept, Adebayo, Olagunju, Ogundipe, and Salman (2017) defined technology transfer as the process by which science and technology are diffused throughout the human activity. Technology transfer is the process by which basic science research and fundamental discoveries are developed into practical and commercially relevant applications and products (Sonmez, 2013).

Furthermore, Miesing and Tang (2018) argued that technology transfer is a process by which knowledge or technology developed in one place is applied and exploited in another place for some other purpose. The movement of technology according to Bilgin, Lau, and Karabulut (2012) can be horizontal and or vertical; it is vertical when the movement is from a basic research to applied research through development and then to production and horizontal when the technology in use in one place or organizations transferred to another place, organization, or context. The acquisition, adoption, adaption, and diffusion of foreign technology, have also been associated with improved competitiveness of business organization especially in the telecoms sector both in local and global markets (Fransman, 1986). Nevertheless, while the promotion of home-grown technology should be encouraged, adoption of foreign technology have been greatly emphasized as an essential tool of industrialization for third world countries of which Nigeria is inclusive (Philippe, 2009).

2.2 Technology Adoption

Technology adoption is a conventional terminology in studies (Rogers, 1995; Jose, Gonzalez, Andres, & Inaki, 2016). Hence, Rogers (1652) diffusion of innovation theory focuses on the adoption of innovation by individual users and the organizations and the factors that affect the rate of adoption of technology such as relative advantage,

compatibility, complexity, trialability and observability. According to Rogers (1995), innovation and adoption happened after process stages of persuasion, decision, implementation, and confirmation take effect. Similarly, essential technologies such as Internet of things (IoT,), 3D printing, robots, drones, virtual reality, artificial intelligence and blockchain are changing the industries operations (PwC, 2017). Companies are now deciding and adopting technology solutions that could provide the maximum return on investment for their business.

The advantages of technology adoption according to Hoque, Saif, Albar, and Bao (2016) are expressed in its derivative of the evolution of technology which has become everyday live usage for mankind. For example, production of means of transportation such as motor vehicles, trains and airplanes, televisions, mobile phones, computer, and medical treatment devices which have save many lives and combat very harmful viruses and bacteria. Technology adoption has increased the productivity of every adopter as machines mainly carry out most of the industrial work, better communication, and improves the social networking; adopting technology saves time and facilitates easy access to information. Nevertheless, technology adoption can be disadvantageous as it could cause inappropriate access to content, lower the value of human workers, reduce creativity and change in reasoning, create social isolation, and bring about inevitable risk to mankind, such as loss of individual privacy and espionage.

2.3 Technology Infrastructure

Further, Anderson (2016) opined that technology infrastructures include foundational technology services, equipment, software facilities and structure upon which the capabilities of an organization are built. Gallaher, Oliver, Reith, and O'Connor (2016) define technology infrastructure as infra-technologies and technology platform which include electricity, defense system, modern transportation, scientific and engineering databases, reference materials, and process models. Scott, Beaulieu, Rothrock, and O'Connor (2016), further asserted that technology infrastructure is a component of competitiveness that gives organization or a nation an edge for investors attraction with combined attributes of stable political environment, language, culture and good quality of life (World Bank Report, 2018). Anderson (2016) went further to argue that technology infrastructure also comprises of assets such as telecommunications, word processing and management information system, automated data processing, equipment, goods, and services. Similarly, Gallaher et al (2016) corroborated Tassey (2015) on the basis that technology infrastructure include hardware and software that support telecommunication such as computer workstations, associated software, mainframe devices, networking and communications equipment.

2.4 Technology Innovation

Technology innovation is defined by the New Oxford Dictionary of English (1998) as making changes to something established by introducing something new. This definition suggests that innovation is relevant to all sphere of life and it could be radical or incremental in form of products, processes, or services in the context of the manufacturing companies. Rogers (1995) defines innovation as an idea, process and practices that is perceived new by individual or other units. According to Jonathan, Cesaire, and Randall (2017), technology innovation is a process that transforms users or manufacturer's ideas into outputs, which increases customer value. The ability to innovate is considered a vital aspect of any business organization, and is changing the definition of competitiveness and collaboration in the telecommunication industry; as such firms are becoming digital, producing smarter products. Similarly, authors (Adeyeye, 2014; Christina & Fragistos, 2010; PWC, 2017; Ronnie, Julio, Gilson, Alves, & Ejoao, 2016) opined that firms' new technological innovation are realizing value through new product lines or new features and becoming competitive. Further, industry is creating different type of solutions through the adoption of emerging technologies (Nyori & Ogola, 2015). Hence, technological innovation enables problem solving through creative insight that allows organizations act from different perspectives, regardless of developing a new product, refreshing strategy or finding an original way to stay ahead of the competition.

2.5 Technology transfer and Competitive Advantage

Several scholars investigated the effects of technology transfer on competitive advantages and business sustainability, and found that technology innovations improve competitive advantages and also produce positive synergies as a result of their integration with other corporate activities and the dynamics of the economic and social environment in improving corporate performance(Bayo-Morionesa, Billon, and Lera-Lopez, 2013; Rohrbeck, 2010; Saxenian, 2006; Sanches, Milan, & Sahuquoilo, 2018; Tvrdikovaa, 2016). Adeoye, Agbawodikeizu, and Egwakhe (2019) also established a positive significant relationship between innovation adoption and competitive advantage.

Bayo-Morionesa, Billon, and Lera-Lopez (2013) findings corroborated Tvrdikovaa (2016) findings as both studies show significant positive relationship between technology infrastructure and competitive advantages in the telecoms industry. Similarly, Gonzalvez-Gallego, Molina-Castillo, Soto-Acosta, Varajaoc, and Trigod (2015) found a significant positive effect between technology transfer and competitive advantage in the manufacturing industry. Similarly, Platero-Jaime, Benito-Hernández, and Rodríguez-Duarte (2017) found a significant positive relationship between companies modifying their corporate structure in order to adapt to the local network

configuration technologies and linking ICTs with business process re-engineering (BPR).

According to Niemi (2006), technology adoption and technology infrastructure are sources of strategic advantage for organizational profitability and business sustainability. Similarly, Carr (2003) found a significant positive relationship between technology adoption and competitive advantage of technology products and services which provide strategic competitive advantages for an organization. Furthermore, Andersen (2015) and Cohen and Olsen (2015) opined that technology transfer play a decisive role since they represent a source of competitive advantages stemming from differentiation, better service and lower costs. The researchers further found that technology transfer facilitates corporate activities, the use of intangible assets, spillover effects of technology and knowledge transfer. Also the findings of Venturi (2015) corroborated Andersen (2015) findings which found a positive relationship between technology adoption and organizational practices, human capital development, and development of new labour policies.

Authors such as Burke (2010), Dholakia and Kshetri (2004) found that the perceived benefits brought by technology transfer to companies are decisive for their adoption from a proactive perception. In this respect, when companies invest in technology innovation, one of their aims (Barba-Sanchez, et al. 2007) is to differentiate themselves from their competitors, take advantage of new business opportunities, reduce costs or increase income, improve labour productivity (Arvanitis & Loukis, 2009) and eventual performance in the form of profitability (Benitez-Amado & Walczuch, 2012). Other authors such as Ghobakhloo, Sabouri, Hong, and Zulkifli (2011) and Nguyen (2009) further found a significant effect with companies that incorporate technology adoption model in response to internal and external pressure from either their clients or competitors, contributing to their survival and corporate performance.

In addition, Delgado-Gomez, Ramirez, and Espitia (2004) and Pla-Barber (2000) identified a positive relationship between technology transfer, organisational innovation and competitive advantage and also that of other intangible assets, and the international competiveness of their industrial companies. Furthermore, Strobel, 2014; Diaz-Chao, Sainz-Gonzalez, and Torrent-Sellens (2015) found that the adoption and intensive use of information technologies entails the need for availability of better trained workforce who can deploy sophisticated technology to increase productivity and corporate competitiveness. The researchers further found a positive relationship between technology capabilities and companies or countries who invest in training of their workforce in the manufacturing industry. Ghobakhloo, Sabouri, Hong, and Zulkifli (2011) agreed with the findings of Mitton, Adair, McKenzie, Patten, and Perry (2007) that carried out a study on the influence of knowledge transfer on organizational stakeholder.

Similarly, Sean and John (2013) found a significant positive relationship between inter-organizational knowledge transfer, organization knowledge development and competitive advantage. The researchers further found that technology is a determining element for firms and nations to increase productivity, to compete, and to prosper; which corroborated Dixon (2000) findings that empirically identified different types of tacit knowledge transfer or reuse which includes serial transfer, strategic transfer and expert transfer. Hence, Hansen (2011) examined knowledge transfer in a telecoms company and found that it enhances the creation of new knowledge, potentially enabling new innovative products to be developed at greater production and cost effectiveness. Cabrera and Cabrera (2005) found a significant positive effect of intra-organizational knowledge in their study and advanced that the knowledge, insights and best practice held by an individual or a unit could be passed along to others in same unit or other units within the organization in order to be appropriated and leveraged to the overall business performance.

Tang (2010) found that in today‘s business context, it is rare for an organization to be able to create and develop all knowledge internally and launch effective competitive actions independently. Instead, an organization’s competitive actions are embedded in the knowledge that is acquired through a network of inter-organizational relationships. According to Drew (2003), and research conducted by Pontikakis, Lin, and Demibas (2006) in to technology adoption in Greek small and medium-sized enterprises. The study found that highly competitive industries are often more technologically intensive. According to various authors (Andersen 2015; Cohen & Olsen 2015), technology innovation play a decisive role since they represent a source of competitive advantages stemming from differentiation, better service or lower costs. According to findings of Venturi (2015), not only do technology transfer facilitate corporate activities, the use of intangibles and the spillover effects of technology and knowledge, but they are fundamental for the adoption of new networked organisational practices, they facilitate human capital training and the development of new labour policies, and they enable cooperation with external company experts.

Technology transfer represent the basic structure of the global knowledge economy and since they are, according to Bresnahan and Trajtenberg (1995), their study found that technology contribute both directly (Venturi, 2015) and indirectly to improving the corporate result (Torrent-Sellens & Diaz-Chao, 2014). Venturi (2015) corroborated Maciulyte-sniukiene and Gaile-Sarkane (2014) findings which found that the direct effect is due to the improvement of internal and external corporate processes which reduces business costs and to the greater efficiency of distribution mechanisms for marketplace transactions, and this in turn affects economic growth.

Accordingly, Harris (2016) found a positive significant effect on information and communications technologies support development and technology facilitators in coordinating and managing business operations, thereby enabling more efficient decision-making. Furthermore, Ariguzo, Aigbawodikeizu, and Egwakhe (2018) found a positive significant effect of innovation adoption to influence market share and sustained competitive advantage. Their results agreed with the findings of Chen, Lin & Chang (2009) on the positive effects of relationship learning and absorptive capability on innovation performance and competitive advantage in the industrial markets. However, Ariguzo, Abimbola, and Egwakhe (2018) recorded no significant relationship between innovation adoption and success when micro and small businesses owned by female entrepreneurs were examined in Ikenne LGA of Ogun State.

3. METHODOLOGY

This study was premised on the framework that investigates the influence and effect of technology transfer on firm's competitive advantage. A cross-sectional survey research design was utilized, data collated through primary source, information obtained based on people's perception, experiences and behavioral pattern from a particular population within a shorter period of time. The research design was adopted because of its economic and scientific advantages as evident in the works of other scholars (Krosnick, Presser, Fealing, Ruggles, & Vannette, 2015; Stockemer, 2019; Weisberg, Krosnick, & Bowen, 1996). The uniqueness of this method is that, it explains phenomena by collecting numerical data and analyzing them using mathematically based methods (Torrent-Sellens & Diaz-Chao, 2014). The targeted respondents were 90 management and engineering staff of telecommunication companies in Nigeria located in Lagos State. The sector was selected due to its competitive dynamism, technological oriented operations and the respondents because of their strategic importance to technical and operational knowledge warehousing, transfer, dissemination and economic contribution to the growth and development of telecoms in Nigeria.

Managers and engineers in all departments were selected from three telecommunication firms out of the five (5) operating in Lagos State, Nigeria utilizing a probabilistic sample technique. A structured questionnaire was adapted and its construct, content and criterion validity were established before its usage. The face and content validity measured the *how* and *what* it is designed to measure. The construct validity was conducted through factor analysis by the use of Kaiser-Meyer-Olkin & Bartlett tests of sphericity (Hadi, Abadullah & Ilham, 2016). Also used was Average Variance Extract and composite reliability as recommended and utilized by Yusoff (2011) to ensure a completion of the construct validation. The KMO test results were greater than 5% and Bartlett test of Sphericity results were less than 5% showing that statements contained in the instrument actually measured what were intended. In addition, the instrument's merit of internal consistency was established and the Cronbach's alpha values were above 0.7 which means that the instrument was reliable (Owino, Kibera, Munyoki, & Wainaina, 2014).

3.1 Model Specification

In order to determine the effect of Technology transfer (X) and its proxies on Competitive advantage (Y), an econometric model was developed. The model emerged from simple quadratic equation that y is a function x; $Y = f(X)^n$. As such, the sub-variables of X were assumed to exhibit profound individual and collective effect on competitive advantage.

Hence the model was structured as such;

$$CA = a_0 + \beta_1 TIN_i + \beta_2 TA_i + \beta_3 TINF_i + \mu_i \quad \text{(i)}$$

Wherein;

CA = Competitive advantage (Y)

TT = Technology transfer with proxies as;

Technology innovation (TIN)
Technology adoption (TA)
Technology infrastructure (TINF)

Therefore, Technology Transfer (technology innovation, technology adoption, and technology infrastructure) is hypothesized to significantly drive competitive advantage and the decision rule was pillared on ($p < 0.05$; will be rejected).

α_0 = Constant term i.e. competitive advantage when technology transfer is zero.

B_1 = Coefficient of technology innovation

B_2 = Coefficient of technology adoption

B_3 = Coefficient of technology infrastructure

μ= Error term (Stochastic variable) i.e. the value of other extraneous variables not included in the model.

4. RESULTS AND DISCUSSION

The structured statistical enquiry looked at the scope and direction of relationship between competitive advantage and the dimensions of technology transfer and the second dealt with the effect. The thematic structure was pillared

on correlation and regression analyses to deepen knowledge and understanding towards corroborating existing literature and or charting new empirical direction. The result in Table 1 indicates positive and significant relationship between technology transfer proxies and competitive advantage of surveyed operators in the telecommunication industry in Nigeria. The results imply that exponential increase in technology transfer triggers a linear corresponding improvement in competitive advantage. Each variable's strength differs on the strength of relationship which forms the background for operational differential. Therefore, the assumption that no significant relationship exist between technology transfer and competitive advantage was rejected.

Table 1: Bivariate Correlations

		CA	TIF	TIN	TA
Competitive Advantage	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	90			
Technology Infrastructure	Pearson Correlation	0.852	1		
	Sig. (2-tailed)	0.000**			
	N	90	90		
Technology Innovation	Pearson Correlation	0.684	0.325	1	
	Sig. (2-tailed)	0.000**	0.018*		
	N	90	90	90	
Technology Adoption	Pearson Correlation	0.582	0.250	0.261	1
	Sig. (2-tailed)	0.000**	0.018*	0.013*	
	N	90	90	90	
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Source: Field Survey Result (2019)

From the results in Table 1, it can be concluded that there is a positive correlation between technological transfer variables (i.e. Technology Infrastructure, Technology Innovation, and Technology Adoption) and competitive advantage of selected telecommunication firms in Lagos State, Nigeria. In addition, the study reveals that technology infrastructure is statistically significant and positively related to competitive advantage (r=0.852, p<0.05). Further, technology innovation is positively and significantly associated with competitive advantage (r=0.684, p<0.05). Finally, the study established that technology adoption is related to competitive advantage (r=0.582, p<0.05), and the relationship is statistically significant. The strength of the relationship differs among the variables, technology infrastructure was high, technology innovation was moderate, and technology adoption was weak respectively.

The aspect of effect was conducted through regression analysis to determine whether technological transfer sub-variables have any significant effect on competitive advantage. The decision rule as predetermined was tested at 95 percent confidence level (where alpha $\alpha = 0.05$). The results of multiple regression analysis are shown in Table 2.

Table 2: Effect of Technological Transfer on Competitive Advantage (n = 90)

Model Summary						
Model	R	R^2	Adjusted R^2		Std. Error of the Estimate	
1	0.633[a]	0.401	0.680		0.97348	
a. Predictors: (Constant), Technology Infrastructure, Technology Adoption, Technology Innovation						
ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	54.457	3	18.152	19.155	0.000[b]
	Residual	81.498	86	0.948		
	Total	135.956	89			
a. Dependent Variable: Competitive Advantage						
b. Predictors: (Constant), Technology Infrastructure, Technology Adoption, Technology Innovation						
Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	29.277	5.460		5.362	0.000
	Technology Innovation	0.028	0.181	0.015	0.152	0.000
	Technology Adoption	0.514	0.070	0.644	7.373	0.000
	Technology Infrastructure	0.629	0.082	0.765	8.676	0.000
a. Dependent Variable: Competitive Advantage						

Source: Field Survey Result (2019)

Table 2 presents the adjusted R^2 (68%), meaning that the predictors jointly explain 68 percent variations in the dependent variable (CA), while the rest (32%) explained other variables not included in the model. Therefore, the model was judged robust and reliable to test the effect of technological transfer on competitive advantage. The *F* statistic is 19.155, with a *p*-value of 0.000, which implies that the independent variables had significant effect on competitive advantage of the selected telecommunication firms in Lagos State, Nigeria. When these variables were individually investigated, the parameters of technology adoption, technology innovation, and technology infrastructure were statistically significant at five percent significant level. The established model for the study was:

$CA = 29.277 + 0.514TA + 0.629TIF + 0.028TIN + \mu$

Where: CA = Competitive advantage
TA = Technology adoption
TIF = Technology infrastructure
TIN = Technology innovation

From the regression equation, the intercept was 29.277, implying that competitive advantage would be 29.277 when technology adoption, technology infrastructure and technology innovation (technology transfer measures) were zero. Hence, a unit increase in technology adoption brings about 51.4% improvements in competitive advantage. Also, a unit increase in technology infrastructure results to a corresponding 62.9% increase in competitive advantage and technological innovation brings about an increase of 32.9% in competitive advantage of the selected telecommunication firms. Overall, technology infrastructure had the greatest effect on competitive advantage of the selected telecommunication firms in Lagos State, Nigeria. The findings show technology transfer (technology infrastructure, technology adoption and technology innovation) improves firms' competitive advantage. With this, the study concludes that, technology, infrastructure, technology adoption, and technology innovation jointly and independently predicted competitive advantage. Thus, the assumption that technology transfer has no significant effect on competitive advantage was rejected.

DISCUSSION OF FINDINGS

The findings have strong empirical implications for competitive advantage in term of organization's developing its technology capabilities through technology transfer from technologically advanced organizations. The correlation and regression results indicate that technology transfer had positive significant effect on competitive advantage which is in agreement with Pfluger and Tabuchi (2019) that technology transfer directly contributed to corporate performance. Also, the findings of Sanches et al. (2018) indicate that for an organization to succeed and grow, it has to maintain a technological edge in a competitive environment. Credence and alignment with Abu, et al (2018) was established that technology transfer has a strong positive impact on competitive advantage. Similarly, Rohrbeck (2010) study on the effect of technology transfer on competitive advantages and business

sustainability to generate advantages, positive synergies and integration with other corporate activities was amplified by this study. Ariguzo et al (2018) is sustained with this finding that technology in the form of innovation expands SMEs market share. Similarly, Carr (2003) observed that the adoption of technology products and services that stimulated competitive advantages for the company. Kim and Mauborgne (1999) noted that the essence of innovation is to create value; hence, companies must be able to offer radical superior value and ensure that the target market is accessible to the price which is substantiated this findings. However, Ariguzo et al (2018) contradicted this finding as innovation adoption was discovered not to drive success among micro and small business in Ikenne LGA of Ogun State.

5. CONCLUSION AND RECOMMENDATION

This article discussed technology transfer and how it stimulates competitive advantage in an organisation. It further conversed on how technology transfer sub-variables influenced success along competitiveness. The constructs as defined indicated that no consensus existed on technology or technology transfer, and the variation was influenced by different context. Despite the difficulties inherent in defining and measuring technology and its transfer; building or adopting technological capabilities through sharing or transfer, is central to competitive advantage. The concepts therefore remain highly important in both conceptual and empirical discussions.

From the research findings, the study revealed technology infrastructure, innovation and adoption are imperative for competitive advantage. Consequently, the study recommended that adoption and or building technological capabilities enable competitive adaptability and agility beyond competitors. Thus, technology transfer engenders competitive fitness which organizations should not overlook. In addition, future research works should focus on technology transfer in aviation, manufacturing industry, oil, and gas where competition is equally stiff and creative synergy should serve as a moderator. Even though the findings can be generalized in the information, communications and technology sector, the researchers suggest that the application of findings and recommendation of this study be limited to the telecommunication industry in Nigeria.

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