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Technology Transfer by Multinational Corporations in Lesser Developed Countries: The Case of Nigeria

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Abstract
Inequality in technological generation, application, and diffusion are the key factors that account for the discrepancy in income gaps among nations. New technology innovation has become essential for maintaining market competition and achieving a competitive edge, regardless of the size and industry of any organisation, since the world has developed into a Global Village. The study examines the impact of technology transfer by multinational corporations to less developed nations like Nigeria. On the scale of technological advancement, Nigeria has had an undesirable position. Nigeria should, therefore, adequately articulate and capitalise on opportunities presented by technology transfer. Such technology transfer arrangement may be achieved by carefully formulating and enforcing policies that emphasise the optimum transfer alternatives. By examining the idea of technology transfer and emphasising the connection between multinational firms and technology transfer, this paper added to the body of previous literature. The role played by MNCs in relocating technological knowledge worldwide as it relates to the Tripartite Declaration of Principles regarding Multinational Enterprises and Social Policy (MNE Declaration) was also discussed, and, finally, multinational corporations and the Nigerian economy. This review would stimulate prospective researchers to recognise and explain technology transfers by multinational corporations, primarily focusing on the parties and the process involved in transferring technology simultaneously.

Keywords: Technology, Technology Transfer, Multinational Corporations, lesser developed countries, Nigeria and MNE Declaration

I. Introduction

The interest in technology transfer (TT) among policymakers, practitioners, and academics has grown over the past few decades (Bozeman, Rimes, & Youtie, 2015; Bozeman, 2000). It is a long, complicated process involving many different factors from numerous stakeholders. According to the pieces of literature, the TT process is an essential component of achieving sustainability (Qian, Xia, Liu, and Tsai, 2018; Vega-Gomez, Miranda, Chamorro Mera, and Pérez Mayo, 2018). It is described as academic entrepreneurship by Vega-Gomez and Miranda-Gonzalez (2020). Recognising good TT enablers is urgently needed so stakeholders may better comprehend and support the procedure (Purushotham, Sridhar, & Sunder, 2013).

The expansion of the use of sound knowledge and the extension of its application constitute the core of recent economic progress. Since the origins of technical and social discoveries have never been limited to national boundaries, the successful application of a global knowledge base is a factor that affects the economic growth of all nations. In other words, a successful global technology transfer is intrinsically tied to the economic progress of every country. There are numerous ways that technology is transferred. New technology is incorporated into imported goods and inputs, marketed directly through license agreements, or absorbed by exporters who acquire new skills from their international clients (Hyung-Yom & Yunjong, 1995).

Technology is essential to attaining economic achievement and increased national wealth (Millman, 2001). According to Doz, Santos, and Williamson (2001), a steadily increasingly important foundation for aggressive performance is the ability of multinational firms to outperform their expertise across numerous affiliates in the face of escalating knowledge- and technology-based competition. Dunning (1993) stipulates that MNCs globally own, manufacture, and manage most technologies. Nearly 80% of all non-government Research and Development (R&D) expenditures worldwide are the responsibility of MNCs.

In a lot of writing on development, the technological disparities between wealthy and developing countries have been emphasised (Streeten, 1972 & Patel, 1974). For instance, it has been proposed that less developed countries could undergo rapid socioeconomic transition if only the world's existing technological knowledge could be distributed to them. According to Streeten (1972), multinational companies (MNCs) play a crucial role in creating and disseminating this information. This role has been seen as a critical justification for less developed nations encouraging MNCs to start production in their economies (Reuber, 1973). According to Lucia and Giulia (2018), a revitalised interest in technology transfer has become essential given the crucial role that technology plays in any country's economic development and industrialisation and the unpleasant profile of Nigeria in this area. Technology continues to have a significant impact even though other elements like land, labour, and money are equally substantial predictors of economic progress. Indeed, the inequalities in technical development, application, and diffusion are the leading causes of the wealth disparity between industrialised and developing countries (WIPO, 2019).

The primary focus of MNCs has always been on transferring technology to emerging markets from developed nations (Tihanhi & Roath, 2002). Multinational Corporations (MNCs) comprise a group of physically isolated affiliates that combine technical know-how with practical product marketing obligations (Nohria & Ghoshal, 1997; Galunic & Eisenhardt, 2001). MNCs are recognised as crucial technology transfer channels and major technology manufacturers. MNCs can transfer their technology to foreign associates in tangible and intangible forms. Royalties and license fees paid to MNCs can be evidence of the intangible technologies transferred. In contrast, exported goods from the MNCs for further processing are proof of tangible technologies (Nune, 2012).

Foreign Direct Investment (FDI) from various multinational corporations is essential to develop countries as developing countries lack vital resources like a strong R&D foundation, adequate R&D investments, an endless supply of ideas for industrialisation, and reliable transportation, communications and technology (Tepstra & David, 1985; Lado & Vozikis, 1996). Emerging economies look to multinational corporations (MNEs) as their primary source of technology to increase their technological prowess and competitive advantage over locally based industries (Lee & Tan, 2006). Conversely, MNCs are thought to be the only reason multinational firms exist since they serve as a reliable worldwide information medium (Kogut & Zander, 1993).

International business and economic interactions frequently involve technology transfer on a global scale (Maribel & David, 2019). Developing nations have a significant stake in the transfer controversy because they want to acquire technology to change the odds favouring economic development (Maribel & David, 2019). Historically, developing countries have made considerable attempts to implement transfers through various channels, such as resolutions and declarations. The issue of transfer has also been addressed in a significant number of multilateral and bilateral agreements, including the UNFCCC (2007), the World Intellectual Property Organization (WIPO) development agenda, and Trade-Related Aspects of Intellectual Property Rights Agreement (TRIPS), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), as well as numerous environmental multilateral treaties.

According to UNIDO (2005), differences in the stock of knowledge account for more than 60% of the income levels between industrialised nations and sub-Saharan Africa (SSA), including Nigeria. Long ago, it was noticed that "the body of information gathered from tested results of empirical research and the capacity and training of its population to utilise this knowledge effectively" constitutes the major capital stock of an industrially advanced country (Kuznets 1968). This is no less a testament to the systematic research generation and implementation culture that is sorely lacking in Nigeria.

Most nation-states in third-world nations greatly rely on foreign direct investment FDI from MNC investments to support developmental projects, finance the budget, and provide for necessities like roads, education, hospitals, and other services. It is important to note that MNCs are viewed as potential drivers of socio-economic development because of their Corporate Social Responsibility (CSR). These include paying taxes, providing capital inflow for the government, creating jobs for the general public, transferring knowledge and technology, and encouraging industrialisation, among other things. The transfer of information and technology is Undoubtedly essential to the development and success of developing nations. Costa Rica is an excellent example, as it switched from exporting bananas to semiconductor chips and medical supplies. This was accomplished by attracting Intel Corporation, the second-largest and second-highest-valued multinational corporation in the world, to the area.

The Etisalat Telecommunications Engineering Programme (ETEP), which Etisalat launched, is another illustration. Nigerian colleges offer no undergraduate or graduate degrees in telecommunication engineering, despite the crucial importance that information and communications knowledge play in the globalised world. Due to this, Etisalat launched the ETEP on 16 May, 2013, at Ahmadu Bello University Zaria. The ETEP is a strategic project in collaboration with Huawei, Plymouth University in the UK, and Etisalat Academy. The curriculum aims to educate Nigerians on telecommunications engineering, including GSM network design, fundamental VAS operation and maintenance, telecommunication network security, understanding of the Long Term Evolution (LTE) network architecture, IP/MPLS design and topology, and fault management.

Additionally, Huawei Technologies supplies the required hardware for the telecom engineering lab at Ahmadu Bello University, Zaria, Department of Electrical, Computer, and Telecommunications Engineering. To promote sustainability, Etisalat has partnered with Plymouth University and the United Kingdom to provide full scholarships and sponsorship to academics from Ahmadu University, Zaria, for PhD studies. It seeks to offer local professors the most up-to-date knowledge of telecommunication engineering.

The National Office for Technology Acquisition and Promotion (NOTAP) recognises that the initiative to accelerate the process of effective technology transfer to Nigeria is severely inadequate after thirty years of study, review, and registration of the technology transfer agreements. Nigeria's technical development has been hampered due to the lack of a practical policy on technology transfer and the inadaptability of foreign technologies. As a result, technical innovation has stagnated, and as a result, the nation has lagged in the struggle for technological advancement worldwide (Bindir, 2011). In light of this, Nigeria must develop policies that encourage transfer within the bounds of the law and enhance the capacity for absorption of the national receptive infrastructure.

The rest of the paper, apart from the introduction, explains what technology and technology transfer means, the importance of technology transfer, conceptual review of Multinational Corporations, Multinational Corporations, Knowledge and Technology Transfer, Multinational Corporations and Nigeria's Economic and the last phase is the recommendations and conclusion.

1.1 CONCEPT OF TECHNOLOGY TRANSFER

1.2.1 Technology

There is a continuum between the tangible and intangible aspects of technology. Nonaka (1994) opined that tangible technology comprises tools, parts, and finished goods, whereas intangible technology includes patents, know-how, and trade secrets. Interestingly, a third technology category combines tangible and intangible technology. For instance, production methods or strategies that require particular skills to carry out various production-related tasks. Technology's non-reproducible and non-transferable characteristics, such as tacit knowledge or business-specific secrets, can also define technology.

1.2.2 Technology Transfer

Technology transfer is one of the answers to the problem of distributed resources, such as money, people, or materials, circulated globally in pursuit of the highest value. As stated by Fransman (1986), "a process whereby entities acquire knowledge relevant to the transfer of inputs into outputs within a country from sources outside that country" is what cross-border technology transfer is. The intangible nature of technology frequently makes technology transfer management highly difficult, as shown in the technology transfer process between organisations (Chen, 1996). The ability to understand and apply information varies; therefore, the technology transfer procedure could be as easy as moving codified knowledge from one organisation to another. Technology can be transferred directly when the receiver purchases a license from the MNC, or it can be transferred indirectly when an affiliate imports intermediary goods that include the technology. Technology transfer is crucial to long-term cross-country income, economic growth, and country convergence (Nune,2012).

1.2.3 Importance of Technology Transfer

Researchers and policymakers have increased the significance of MNCs' foreign technology transfers (Branstetter & Jong-Rong 2006). The symbiotic relationship that both the transferor and transferee enjoy explains the relevance of technology transfer. According to Dunning (1993) and Kobrin (1991), numerous factors explain why organisations enter the international market. When multinational corporations replicate their manufacturing in developing countries to increase market access and dominance, technology can be crucial in determining foreign direct investment (Markusen 1984). These are the justifications for technology transfer:

(i) Technologically advanced businesses frequently enter international markets to expand their market share, avoid product obsolescence, and balance their expensive R&D expenditures (Harris & Ravenscraft, 1991).

(ii) The significant transmission of technology characterises knowledge-based relationships. They are related to the existence of both domestic and international consumers, as well as to the efforts made by MNEs to adopt technology from a local perspective, as well as to the technological prowess of local businesses (Federica & Antonello, 2007).

(iii) MNCs simultaneously provide host countries with technologies that help them achieve long-term economic growth and development (Marton, 1986; Blomstrom, 1990).

(iv) Technology transfer is crucial for technological innovation because it helps bring scientific and technical research, as well as the skills and practices that go with it, to a broader audience and the market.

(v) Through technology transfer, research can progress from identifying novel technologies along the value chain to their disclosure, assessment, and protection. The analysis can become a useful product, procedure, or service for society through marketing, licensing, and further product development. A successful product's financial gains might also be put back into more research to start the cycle all over again.

1.2 Conceptual Review of Multinational Corporations (MNCs)

Multinational Corporations (MNCs) is a business that consists of units in several nations. It runs on a decision-making structure that allows consistent policies and a uniform approach, especially when sharing information, resources, and duties with others (Gilpin, 2001; UNCTAD, 2015). MNCs are large companies that frequently have a global impact. MNCs must always have a parent company and subsidiaries around the globe with separate and coordinated financial, managerial, and technical resources. MNCs can promote development in developing nations by presenting chances to raise living standards, promote economic expansion, and promote intergovernmental collaboration. This is achieved through foreign direct investments (FDI) in that nation. MNCs typically engage in FDI outside their countries of origin and possess a sizable portion of other value-added services provided in the host nation (Dunning & Lundan, 2008; Glipin, 2001). MNCs have a significant level of FDI and worldwide business activity. MNCs own and manage value-adding activities in several countries, typically under the direction of their central headquarters (Griffin & Pustay, 2005).

1.3 Multinational Corporations, Knowledge and Technology Transfer: The Connection

Though Multinational companies play an essential part in most countries' economies and international economic relations, the activities of MNCs in developing countries are viewed with scepticism. MNCs are regarded as representatives of global capitalism who seek to profit from and exploit natural and human resources (Gilberthope and Banks, 2012).

Governments, employers, workers, and their respective organisations are becoming more and more interested in the significance of MNCs. These businesses can significantly benefit their home and host nations by promoting the more effective use of capital, technology, and labour through international direct investment and other channels. They can also significantly contribute to the advancement of economic and social welfare, raising living standards and the satisfaction of basic needs, creating direct and indirect employment opportunities, and global enjoyment of fundamental human rights, such as the freedom of association, within the confines of development policies put forth by governments.

Most nation-states in third-world nations greatly rely on foreign direct investment (FDI) from MNC investments to support developmental projects, finance the budget, and provide for necessities like roads, education, hospitals, and other services. It is important to note that MNCs are viewed as a potential catalyst for socio-economic development due to their Corporate Social Responsibility (CSR), which includes, among other things, providing capital inflow for the government, opening up job opportunities for the populace, transferring technology, paying taxes, and encouraging industrialisation. Others also argue that MNCs have mostly harmed developing nations' ability to progress because of adverse environmental concerns connected to their activity (Gilberthope and Banks, 2012; Humphrey, Spratt & Thorpe, 2014). In other words, multinational corporations are perceived as exploiting less developed countries and benefiting them by providing social amenities, creating jobs, and other things. But in the author's perspective, the operation of large multinational corporations leans toward exploitation as their concern is to make a profit and exploit the poor masses by underpaying wages and salaries, which is the goal of most organisations.

The need for MNCs to be socially responsible for maintaining positive relationships with the state and community and the negative aspects of their operations led to efforts to draft international instruments. The document governs their behaviour and establishes relationships with host nations, primarily in developing countries. The "**Tripartite Declaration of Principles relating to Multinational Enterprises and Social Policy (MNE Declaration)**" was adopted due to these social and labour challenges.

1.4 Tripartite Declaration of Principles regarding Multinational Enterprises and Social Policy (MNE Declaration)

The only ILO document that directly advises businesses (both national and international) on social policy and inclusive, accountable, and sustainable workplace practices is the MNE Declaration. It is the only international law in this area developed and used by all governments, employers, and employees worldwide. It was adopted forty years ago and most recently modified in March 2017. Aiming to guide employment, training, conditions of work and living, industrial relations, and general policies, its principles are directed at multinational and national firms, governments of domicile and host countries, and employers' and workers' organisations. The concepts outlined in international labour standards serve as a major foundation for the instruction. This Declaration aims to promote the excellent impact that multinational corporations can have on social and economic advancement and the realisation of decent work for all. It also seeks to lessen and eliminate any problems its diverse operations can cause.

These guidelines are not intended to establish or uphold disparities in treatment between national and multinational enterprises. They represent best practices where the MNE Declaration's principles apply to both multinational and national enterprises and should be held to the highest standards of behaviour in general and social practices in particular.

Its guiding principles cover areas including employment, training, conditions of work and living, industrial relations, and general policies and are directed to MNEs, governments of the home and host countries, employers' organisations, and workers' organisations. The groundwork for the MNCs' knowledge and technology transfer was laid by the tripartite Declaration, which stated that;

"Most economies and international economic relations depend on multinational firms. Governments, businesses, unions representing employees, and other organisations are becoming more interested in this. These businesses can significantly benefit their home and host nations by promoting the more effective use of capital, technology, and labour through international direct investment and other channels. They can also significantly contribute to the promotion of economic and social welfare, the enhancement of living standards and the fulfillment of basic needs, the provision of job opportunities, directly and indirectly, and the global enjoyment of fundamental human rights, including the freedom of association, within the framework of development policies established by governments.

In collaboration with all parties involved, governments should design national policies for vocational training and guidance that are tightly tied to employment. Multinational corporations should pursue their training policies within this framework.

Multinational corporations should ensure that, as part of their operations, proper training is offered for all employees in the host country to suit the demands of the business and the nation's development policies. As much as feasible, such training should encourage employment options and the development of practical skills. When applicable, this duty should be carried

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out in collaboration with the nation's government, employers' and workers' organisations, and qualified local, national, or international institutions.

Multinational enterprises operating in developing nations should participate in programs, such as special funds, sponsored by employers' and workers' organisations and promoted by the host governments alongside local businesses. These initiatives should be collaboratively run by the organisations supporting them and encourage skill development, training, and career assistance. As part of their contribution to national development, multinational corporations should, whenever possible, make the services of qualified individuals available to assist in government training programs.

Multinational corporations should provide opportunities inside the business as a whole for local management to expand their knowledge in the relevant field, such as industrial relations, with the support of governments and to the extent consistent with the efficient functioning of the enterprise. (ILO 2001), p. 6).

1.5 Multinational Corporations and Economic Development

MNCs are companies with branches in several foreign countries. They are frequently affected by sudden changes in levies, tariffs, trade restrictions, and recent trade conflicts. Some top MNCs have established manufacturing outlets in regions with cheap labour and flexible shipping prices to their target markets. Conglomerates like Toyota and Apple, for example, have numerous locations abroad, but Sony relies on exporting production to less expensive dealers. It has been shown that the nation's issues have slowly grown due to bad leadership, poor governance, and a lack of accountability. According to numerous works of literature, this has kept policymakers from focusing on the necessity of funding human capital development, which enhances the skills and knowledge employees get through various forms of training, experience, and, most importantly, education. The depth of internalisation and technological transfer is still a mirage. However, some multinational corporations continue to engage in unethical commercial practices that harm their reputation and the nation's reputation.

MNCs increase living standards, provide locals with employment and job opportunities and transfer technology. At the same time, nationals of the host countries who worked for international corporations and received training from those companies use the skills and adaptable knowledge they learned while working with these multinationals to start their businesses. The income streams produced by the MNCs have also allowed the government to diversify its tax base. Multinational corporations' taxes have been used to fund infrastructure development, security enhancements, and economic growth in the nation. (Isaac, Ibidunni, Kehinde, Ufua, Elizabeth, Oyo-Ita, & Mathis, 2020)

1.6 Multinational Corporations and the Nigerian Economy

Profit maximisation at the lowest possible cost is the primary goal of every multinational company. In a genuine sense, this was the characteristic that initially led to the development of MNCs. Therefore, the fundamental idea behind investing in foreign countries was never to bring about betterment or growth for the host country but rather to exploit and extract lots of resources from them to develop their own country (Ozoigbo & Chukuezi, 2011). Due to low production costs, most technologies were manufactured in Asian nations in the late 1990s and early 2000s, and it was then shipped to the West and Europe. The technology they created with their hands was out of reach for the populace in the host nations. Several economists have expressed their disapproval of several multinational corporations' activity in the nation. Researchers also viewed MNCs as monstrous forces that had repeatedly and methodically stifled economic expansion in numerous nations. Most researchers agree that multinational corporations are extremely exploitative because most natural resources and minerals found in developing countries intended for national development have not been effectively utilised, partly because the national economy has been de-capitalised through profit repatriation. MNCs want to ensure their products have the lowest production costs for the global markets. Apple Inc., for instance, manufactures its phone in China.

An iPhone X typically costs $300 or more to produce, yet it has occasionally sold for as much as $800 and sometimes over $1,000. The resulting profit is transferred back to the US, where it originated. As a result, Apple Inc. has a reserve of more than $250 billion (Isaac, Ibidunni, Kehinde, Ufua, Elizabeth, Oyo-Ita, & Mathias, 2020). This goal can be accomplished by purchasing or relocating manufacturing to the most cost-effective manufacturing regions or by securing tax exemptions and incentives from the host countries. This principle supports the Marxist theory that multinational corporations act as agents of capitalism. Multinational corporations make every effort to minimise or reduce costs to increase profit. Multinational corporations frequently have a professional management team and headquarters in a country with numerous domestic offices in other countries. This work aims to comprehend and explore the MNCs' activity in Nigeria and how they have impacted the Nigerian economy. This study examined how MNCs served as imperialism's stewards in their varied economies. It sought to determine how MNCs fueled Nigeria's economic growth. This paper used publications, journals, and textbooks to review MNC actions pertaining to the nation's economic development, everything about technical transfer, growth, and development.

1.7 Recommendation

(i) In the course of the adoption and implementation of strategic foreign direct investment and efficient technology transfer policies that would, in turn, help to safeguard any negative effects of a diminishing foreign direct investment inflow from the multinationals, there is an urgent desire to improve the learning capacities of the local establishments in developing countries.

(ii) The government should broaden and reinforce its measures to support higher cost-effectiveness by lowering tariffs imposed on imported inputs to attract FDI further.

(iii) To draw foreign direct investment (FDI) away from the newly industrialised and developed countries, the government should also update and improve the transportation and telecommunications sectors and invest in infrastructure.

(iv) As some of the connections, interconnections, and advantages between MNCs and economic development were highlighted in this paper, this research may provide policymakers and academics with useful information to present at the negotiating table.

II. CONCLUSION

This study examined the impacts of technology transfer by multinational corporations to less developed nations like Nigeria. According to the literature review, multinational corporations are a byproduct of their involvement in exporting commodities or goods and services. Potential MNCs are often sizable exporters or importers, to put it simply. Technology and innovative capabilities are the fundamental building blocks of competitive strength for businesses and nations. Since technology does not originate in a single fixed nation, consistent economic growth depends on the efficient adaptation of technology through technology transfer, particularly in developing nations where technology transfer is a major driving force for economic development. Technology transfer is multinational firms' most significant support to their home nations. Given the development gap, the discussion of technology transfer continues to hold a prominent place on the global stage. Due to Nigeria's unenviable position on the technical development ladder and the role of technology in revolutionising the economy, the transfer has become compelling for developing nations like Nigeria.

Therefore, Nigeria must clearly define its technology transfer policy to utilise and maximise the transfer frameworks and techniques. This would be supported by the facilitative policies that deepen the national receptive infrastructure's absorptive capacities and innovation capabilities and create a more sustainable transfer. The country's economic future is thought to change with well-articulated technology development strategies incorporating research output from academic and research institutions, shifting the odds in favour of accelerated development.

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