

Acquisition of Science and Technology Resources, Globalization and the Control of Africa's Economy and Development

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Abstract

Scholars' position on globalization and its impact on Africa's development remains divided hence, this paper strives to unravel how the acquisition of science and technology resources and globalization serves as a major source of control over Africa's economy and development. The study is descriptive hence; it adopted secondary data and the Marxian political economy approach as its theoretical framework. In the same vein, analysis was also done qualitatively and thematically in order to critically interrogate the subject-matter. Findings from the study revealed that the acquisition and positive utilization of science and technology resources by the industrialized nations have now become a weapon and a source of control over Africa's economy and development therefore; Africa and other less developed countries have continued to remain at the receiving end of the globalization spectrum. The paper however posits that this anomaly can be corrected if African states and its leaders accord more priority to the development of education, science and technology in its annual budgets across the continent coupled with strict monitoring and implementation of all policy actions and measures in the education, science and technology sector.

Keywords: *Acquisition, Science and technology resources, Globalization, Control, Africa's economy and Development.*

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Background to the Study

The consensus position of scholars on globalization is that the concept is a complex but dynamic subject-matter that can be analysed from different perspectives. Thus, some see it as a curse while others describe globalization as a blessing when it is well explored and utilized by states and state actors. It is also believed that the father of globalization is science while the activator is technology (the mother). The most pronounced manifestation of globalization are in the economic and telecommunication sectors while the most important characteristic of globalization is the information technology (IT) subsector which makes it possible for people and countries to interact freely without physically crossing the borders. Revolution in science and technology has also made it possible for countries to engage in warfare without the usual deployment of troops. It is imperative to also state that with massive acquisition of science and technology resources via globalization, countries can now encroach and intercept another country's satellite or defence system by simply pressing a button hence, affirming the fact that globalization has drastically changed the way human activities are conducted. How far these changes have affected Africa and its economy remains a source of contention among scholars across the world. Scholars in the field of political economy however are of the view that the acquisition and positive utilization of science and technology by states influence its socio-economic development (rate of growth, employment, income distribution, healthcare, welfare of citizens etc.) and other national objectives such as prestige, defence capabilities, and self-reliance. On the other hand, the absence of science and technology and the inability of states especially peripheral formations (Third World Countries) to acquire and develop its own technology attracts severe consequences such as excessive dependence, budget deficits, economic stagnation and retrogression etc. in the light of the above analysis, the major thrust of this paper is, therefore, to examine the various ways or channels in which the acquisition of tremendous science and technology resources by highly industrialized states has led to the control of Africa's economy and development.

Theoretical and Conceptual Analysis

The Marxian political economy approach was adopted in order to fully understand the reasons why countries struggle, compete, and try to outsmart and dominate one another in the globalization process at the global level. The basic tenet of the Marxian political economy approach derived from the inter-connection between the economic, political and other facets of the substructure hence, this approach recognizes the complementary relationship of all spheres of human existence but in which the economy plays a determinant role. While describing the relationship between developed and developing countries as a struggle for power and economic resources Karl Marx, maintained that the importance of geo-politics in human history and the underlying economic benefits account for the establishment of ever-large political and economic associations such as the World Bank, World Trade Organization etc. Marxian political economy scholars argued further that political attitudes especially, individual, group behaviour and character (political actions and states policies) cannot be analysed or determined in isolation hence, this approach was adopted in this study to explain the interrelationship between the developed countries, their economic policies and its impact on Africa's economy and development. Such interrelationships according to Karl Marx always produce two classes of individuals which he calls the international capitalist

bourgeoisies (imperialists) and privileged African elites (proletariats) who usually aid the international capitalist bourgeoisies to make super profits. The unequal level of trade coupled with the discriminatory trade policies which give advantage to the industrialized nations to the detriment of Africa and other less developed countries clearly explains why the Marxian political economy approach was adopted in the study.

Conceptual Analysis

Nations engage in international trade and collaborate with one another for different reasons hence from the power and collaboration perspective otherwise known as the theory of hegemonic stability posit that international economic collaboration in pursuit of an open or liberal economic order is most likely to occur when the global economy is dominated by a single power as was the case from 1945–1971 when the United States was the hegemonic power. However, by the 1990s, the theory of hegemonic stability became less fashionable as new trends and theoretical works emerged. For instance, Keohane (1984), in his work “After Hegemony: Cooperation and discord in the world political economy” identified power and economic resources as the major reason why countries relate with one another at the regional and global levels. He added that when these resources are scarce or limited, such relationship could degenerate or improve depending on the value and location of the resources.

However, a careful study on the literature on globalization shows that the concept is one phenomenon that is not easily understood, and is therefore, not agreed by all as what it really is. Thus, there is no simple or agreed definition of what constitute globalization. What is rather evident is that globalization is a major site of contestation making it a complex but dynamic subject-matter at all levels. While analysing international political economy from the realist perspective, Kauppi (1993), stated clearly that international political economy realists work with a conception of the world in which states struggle instinctively for power, prestige and influence but their focus is on the 'low' political arena associated with commercial and financial pre-eminence. He added that realist scholars intuitively turn issues of contemporary concern in world economic affairs into problems of international economic diplomacy and trade wars. In his structural realism model, Hans (1973) explained the reasons for the aggressive and selfish nature of modern states when it comes to international economic relations and trade at the global level. In his words: In anthropomorphizing the state and therefore treating state behaviour as epiphenomenal of essential human behaviour and that it is part of human nature to be self-serving and to chase gains solely by oneself and in process, self-interested actions are consequently inscribed into the very logic of state behaviour. Carl (1971) however disagreed with Hans Morgenthau's postulations and posited that modern historical realists work within a tradition where emphasis is on developing historically contextualized explanations for how the instinct for combative self-interested actions might be balanced in any given instance by the perceived need for a state to demonstrate to rival states that if acting within the bounds of international political norms. He therefore contended that the structural logic of state behaviour can always be offset by historically conditioned concerns for turning away from exercising full aggression towards other states. This no doubt explains why most states try to outsmart one another in the international arena and in organizations such as the world trade organization (WTO) where rules and guidelines are formulated and

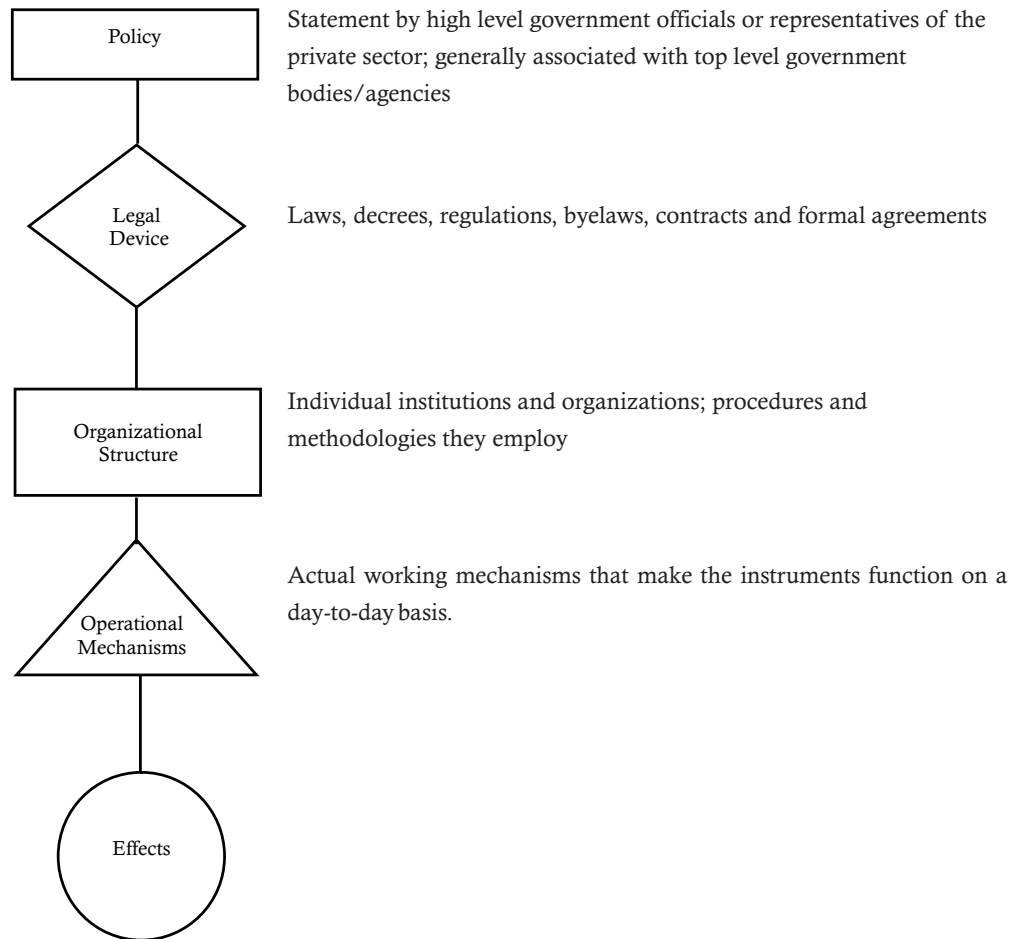
drafted without the consent or input of others. Cox (1981) therefore raised several technical questions bothering on system management: how best to organize the relationship between states in order to minimize the potential for violence and how to integrate states into an international system where emphasis will be on liberal concerns for cooperation in the interest of meeting common goals. On why equity and fairness is not realistic in international economic relations among states Cox (1981) stated thus: the basic structure of world system is predicated upon the forced institutionalization of social relations of production and capital accumulation (Raven Hill, 2003:p.42). Using the structuralist and centre-periphery framework as the basis for his analysis, Wolf (1974) posited that the integration of developing countries economy into the world capitalist system through trade and globalization has resulted into their underdevelopment.

According to him, dependence causes underdevelopment. The high level of conflict and instability confronting Africa and indeed the third world explains why Marxian political economy scholars have continued to insist that capitalism at the national and global level that is responsible for the underdevelopment and poverty in the past and present day Africa. Neo-Marxist scholars (dependency theorists) also contended that the international capitalists through Foreign Direct Investment (FDI) collaborate with their domestic allies (governments) in host economies especially developing countries to perpetuate the exploitation of the unsuspecting host economy.

Analysis Showing the Control of Africa's Economy and Development by Foreign Economies

The acquisition and positive utilization of science and technology by states no doubt influences its socio-economic development (rate of growth, employment, income distribution, healthcare, welfare of citizens etc.) and other national objectives such as prestige, defence capabilities and self-reliance. On the other hand, the absence of science and technology and the inability of states especially peripheral formations (Third World Countries) to acquire or develop its own science and technology designs and policies often attract severe consequences such as excessive dependence, budget deficits, economic stagnation and retrogression etc. The consensus view among scholars is that science and technology knowledge or resources does not fall from the sky but rather it is developed through conscious effort by states, organizations and individuals. It is also important to state that the mode of acquisition and technique adopted by countries are developed against a background of a particular technology package, a particular set and quality of inputs, infrastructural, legal and administrative system, labour force etc. The process of technology acquisition may be slow, complex and dynamic as it involves huge capital investments, a sound science and technology development framework etc. These factors as reflected in the table below are essential for any country to enjoy the gains in science and technology:

Figure 1: Science and technology development policy framework and guideline



Source: Organization for Economic Cooperation and Development (OECD) 1981 publication.

Commenting on the gains and importance of science and technology from the military perspective Schelling (1969) argued that development in science and technology led to revolution in military affairs and the subsequent invention of missiles and bombs have made war and military strategy less attractive. From the socio-economic perspective, liberal scholars have also argued that modern science and technology has made production and expansion easy since industries and industrial complexes have moved from manual labour to scientific labour (use of machines). Clarke (2009) corroborated the above point when he stated thus: Now with cyberwar, we have another means of launching attacks on the other side of the world this time with only a keyboard. The control of Africa's economy and development by external forces was done from two main perspectives/themes, namely:

1. Socio-economic control
2. Technology transfer measures

Socio-economic control Measures: The theory of dependency and foreign aid was thoroughly examined in order to interrogate the subject-matter. The dependency theorists are concerned with the whole relationship between advanced industrialized countries and third world countries: the dependent relationship is exhibited in cultural as well as economic features of third world countries. For scholars in the Marxist school of thought, dependency is the inevitable outcome of capitalist development in the advanced countries, and the internationalization of conflicts within the third world represents the Marxist class struggle transferred to the third world. It is therefore argued that the nature of inter-state relations at the global level and its impact on the third world were such as to impoverish the third world economically, culturally and psychologically. In the same vein, Frank and Griffin (1971), posited that many poor countries were not only relatively much better off in the eighteenth century but absolutely per capita income was substantially higher than it is presently. While affirming the fact that post-independence African states have been under economic control of the industrialized nations Mytelka (1989), in his work “The Unfulfilled Promise of African Industrialization” stated unequivocally that policies and development plans in the immediate post-independence period were mainly drawn up with the assistance of foreign experts. According to him, the first Nigerian national development plan (1962–68) assumed that foreign sources would provide 50 percent of the capital expenditure required. In Tanganyika (now Mali) both the three year development plan (1961–64) and the first five year development plan (1964–69) left the industrial sector to private entrepreneurs (largely foreign). In his words: these foreign sources were expected to provide about 52 percent of the total and not less than 78 percent of government development expenditure during the plan period. Foreign investment as a source of capital and technology was also emphasized in the first development plans of Ghana, Kenya, and most of the French speaking African countries (Mytelka, 1984:p.153). A second source of capital for Africa according to Mytelka (1984), was foreign aid which served as a major source of control over the economy of most African states. He made this point clear when he stated thus:

Foreign aid became increasingly important when expectations of rising net inflows of foreign investment proved illusory. The harsh economic conditions attached to foreign aid and the debts incurred by third world countries constitute a major source of control of the economies of peripheral formations (third world states) by core states (highly industrialized nations) (Mytelka, 1984:p.162).

Technology Transfer Measures: Technology transfer involves the systematic and organized exchange of information or idea between two enterprises which may or may not be located in different countries. Such an exchange may be the object of a formal cooperation agreement between the parties involved. The process of technology transfer involves:

- a) Commercial transactions involving transfer of technology and
- b) Non-context of globalization

In the process of technology transfer who are the key players? What are the products? What are the terms of trade and who are the winners and losers? All these and other questions will be answered in this section of the paper. The role of globalization being the main channel of the technology transfer process was also examined and re-evaluated in order to observe the impact

of such transfers on the economies of Africa and the third world states. Thus, globalization is simply defined as the process of bridging existing gaps in international relations especially in the area of trade and economic development of countries hence; it involves exchange of ideas, personnel, resources, and goods etc. Marxian political economy scholars therefore see globalization as an extension of capitalism and a means of exploitation of weak and vulnerable states by stronger states. Others see globalization as a platform or market centre where the integrity and negotiation ability of countries are tested. The globalization spectrum currently has three key players namely: United States and European Union Countries, China and other emerging powers, and Brazil and other third world countries. The emerging powers led by China currently constitute a threat to the United States and European Union countries which had dominated the global stage for decades. The general impact of technology transfer is reflected in the table below.

Table 2: General impact of technology transfer

Positive Impact	Negative Impact
<p>Short Term</p> <ol style="list-style-type: none"> 1. Sales of technology, processes, engineering know how, assistance. 2. Sales of equipment. 3. Opportunities for no risk investment by simply providing technology 	<p>Loss of export markets</p> <p>Emergence of new competition (which may be disruptive) in domestic markets and third world markets.</p> <p>No job creation or loss of jobs in countries which have long established competing industries.</p>
<p>Medium and Long Term</p> <p>Opening of new markets with growing effective demand.</p> <p>Dynamic re-organization of long established industries in the direction of: advance technologies, technological services, complex equipment, high technology products.</p> <p>Faster innovation, improved processes, improved product performance.</p> <p>New products and availability of cheaper products.</p>	<p>Serious crisis in countries where structural rigidities and low technological potentials inhibit adaptation to new competitive conditions.</p>

Source: Organization for Economic Cooperation and Development (OECD) Classification data, Annex 1, Published in 1978.

The above data clearly shows that technology transfer in any form has both negative and positive impacts on the economy of states hence, African scholars have consistently argued that over reliance on external sources for capital and technology transfer for the development of third world economies could be counterproductive. It will be recalled that during the transitional period, little of the foreign aid received: Found its way into productive activities while bulk of the aids received went into infrastructure, in particular, expensive airports and administrative buildings with high future maintenance and operating cost. Little of the external capital sourced went into production or infrastructural development that was directly related to building a link between domestic production and consumption. Hayter (1966), therefore, posited that in the process of technology transfer, the dependent relationship between the receiving country (third world countries) and the transferring country (core states) means that events in third world countries are determined by what happens elsewhere,

notably in the centre (industrialized countries). According to him, this also implies that parts of the third world which can be described as the modern foreign technology sector are more accurately viewed as part of the centre (industrialized countries), rather than the periphery (third world), and their actions, therefore are taken in the light of the interests of the industrialized countries rather than that of the third world and their people. From the foregoing, it is obvious to conclude that Africa and third world states may be politically independent but are economically trapped by the policies and actions of the core states (advanced countries).

Conclusion

The study examined the acquisition of science and technology resources, globalization and the control of Africa's economy and development. In order to interrogate the subject-matter, the study relied on secondary data and the Marxian political economy approach as its theoretical framework. The study adopted the descriptive research method while data analysis was done qualitatively and thematically. The study shows that science and technology resources are acquired and developed through continues research efforts by states, institutions and organizations at all levels. While some countries have through hard work become technological giants, others have chosen to remain as consumer nations and by implication, made their countries dumping ground for all types of goods, services and technologies including substandard and inferior products. This is the case with Africa and third world countries whose dependence on external capital and services have transformed their states into vassalage (beggar) countries in the hands of core states (advanced countries). In the course of the study, it was also observed that globalization enhanced and accelerated the pace of socio-economic development and growth in both developing and developed economies. In the process of engaging in globalization (trade relations), industrialized countries gained more advantage while African countries find themselves at the receiving end of the globalization spectrum due to a number of factors including refusal to acquire and develop its indigenous science and technology potentials and framework for the benefit of its teaming population. Through foreign loans and aids which usually attract stiff conditions, the industrialized countries have continued to control and manipulate the economy and development of third world states as well as international relations and trade in its favour. Thus, both Beyart (2009) and Mytelka (1984), castigated post-independence African leaders for promoting parochial interests and over relying on external sources of revenue for its growth, development and industrialization.

Recommendations

Science and technology resources constitute an important instrument of power at the regional and global level hence; the race for its acquisition by states is understandable. The following recommendations will no doubt help African states to come out of its dilemma of dependence:

1. Africa and third world countries should endeavour to develop its indigenous science and technology package based on its environment and peculiarities. This will no doubt check and control the influx of foreign technology into the third world.

2. Through policy measures, African states and leaders should re-channel its resources to the science and technology sector by allocating more funds to the sector in its appropriation acts and budgets.
3. Science and technology development thrives in a peaceful and stable atmosphere hence, it is important for African states and its leaders to always ensure peace and political stability in order to attract foreign investment and investors. In addition, sit-tight leadership and tenure elongation which often lead to violence and insecurity should be avoided.
4. The need for rule of law and credible elections is also crucial and fundamental to the development of any nation. This is because good governance will facilitate development while elections serve as a means through which political leaders emerge hence, a free, fair and credible electoral process will produce patriotic leaders who will pursue national development goals and objectives while a fraudulent electoral process will lead to the emergence ethnic champions as leaders and the result will definitely produce what Beyart (2009), calls leaders who believe in the politics of the belly (primitive accumulation of state resources).
5. There is need for the democratization of international trade/economic organizations such as the world trade organization (WTO) to ensure that all states especially weak and vulnerable states are protected and treated fairly and equally.
6. There is also need for Africa and third world states to diversify its economy and create new sources of revenue. In the words of Bassey (2012), the concept of resource diversification policy denotes the creation of many productive avenues such as in agriculture and industry, by the introduction of a greater variety of agricultural and industrial produce, or in terms of creation of entirely new productive sectors ... In the sphere of export goods, diversification entails developing and boosting manufactured exports. In which every way diversification is viewed, it will surely create more markets and additional sources of capital for less developed countries and in the process, bridging the gap between the less developed and advanced countries.

References

- Aboyade, O. (1976). *Issues in the development of tropical Africa*, Ibadan: University of Ibadan Press.
- Adelman, I. & Morris, C. T. (1973). *Economic growth and social equity in developing countries*, London: Stanford University Press.
- Amin, S. (1973). *Neo-colonialism in West Africa*, London: Penguin Press.
- Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: Is Africa different? *World Development Report*.
- ATPS Special series (2009). *The impact of globalization on science and technology in Sub-Saharan African countries*, Available at: <http://www.watpsnet.org/pubs/specialpaper/siamwiza.pdf>, (Accessed 20 June 2019).
- Bassey, C. O. (2012). Resource diversification for sustainable economic development in Nigeria, *British Journal of Humanities and Social Sciences* 5(1). April 2012.
- Bertelson, J. (2000). *Three concept of globalization” in International Sociology* 25, (2).
- Brown, M. E. (1981). *North/South technology transfer: The adjustments ahead*, Paris: Organization for Economic Cooperation and Development (OECD).
- Clarke, I. (1999). *Globalization and international relations theory*, Oxford: Oxford University Press.
- Cooper, C. (1974). Science policy and technological change in underdeveloped economies” in *World Development Journal* 2, (2)
- Cormick, M.D. & Pedersen, P. (1999). *Globalization and regionalization of Kenya's foreign trade and production*, Kenya: University of Nairobi: Available at: <http://www.dils.dk/graphics/CDR.publications/cdrpublications/workingpapers/wp-99-8.pdf>.
- Dann, J. (1978). *West African states: Failure and promise*, Cambridge: Cambridge University Press.
- Francesco, R. & Sanoussi, B. (2011). *Emerging economies in Africa and the development effectiveness debate*, South Africa: ECDPM, SAIIA.
- Gachung, H. (2009). *Impact of globalization on human resources management function in developing countries: A case study of Kenya public corporation*, Available at: <http://ajo/.ifo/index.php/ak.jbm/article/viewfile/43822/27340>.
- Issa, G. S. (2003). *The rise, the fall, and the insurrection of nationalism in Africa, being a keynote address to the Codesria East African regional conference at Addis Ababa, Ethiopia October 29-31, 2000*.

- Jenkins, R. (2005). *Globalization, production, and poverty*, Available at: <http://www.wider.unu.edu/publications/workingpapers/research-papers/2005/enGB/rp2005-40>.
- Kalama, T. J. (2008). *Public policy formulation and implementation in Nigeria: Problems and prospects*, Port-Harcourt: Pearl Publishers.
- Kwame, P. (2009). *The impact of globalization on African culture*, University of Southern Denmark publication, Available at: <http://www.csus.edu/org/caper/documents/archieves/2006/conferenceproceedings/kwame.pdf>.
- Martin, K. (2001). *Rethinking globalization*, London: Zed Books.
- Mytelka, L. K. (1989). *The unfulfilled promise of African industrialization in the African Studies Review* 32(3), 77-137.
- Richard, C. (2009). *War from cyberspace*, United States: Good Harbour Consulting.
- Rodney, W. (1972). *How Europe underdeveloped Africa*, London: Bogle – L'Ouverture Publications.
- Sabelo, J. N. (2011). *The logic of violence in Africa*, working paper No. 2 published by the Ferguson Centre for African and Asian Studies.
- Said, A. & Adejumobi, O. (2009). *The African Union and new strategies for development in Africa*, Ethiopia: CODESRIA&DPMF.
- Sawyerr, A. (1999). Globalization and social sciences in Africa” in African Sociological Review, Available at: <http://www.codesria.org/links/publications/asr31full/sawyerr.pdf>.
- Tandon, Y. (2000). *Globalization and the post-colonial African state*, Harare: AAPS Press.
- Toye, J. (1987). *Dilemmas of development: Reflections on the counter-revolutions in development theory* Oxford: Blackwell.
- United Nations Conference on Trade and Development (UNCTAD) World Investment Report 2012.
- William, A. J. et al. (1996). *Third world politics at the crossroads*, Canada: D.C. Heath and Company.
- Wilmot, P.F. (2006). *In search of nationhood: The theory and practice of nationalism in Africa*, Zaria: S. Asekome & Co. Publishers.
- Zartman, W. I. et al. (1979). *Africa in the 1980s: A continent in crisis*, New York: Mc Graw Hill.