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Bridging the Gap or Widening the Divide? The Role of Technology in Global Economic Inequality

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ABSTRACT

This article explores the relationship between technological advancements, transnational capitalism, and the growing divide in global economic inequality. It analyzes how developed nations' dominance in technology research and innovation has contributed to the disproportionate distribution of wealth, productivity, and economic development. By examining data such as G7 countries' investments in research and development, accounting for over 88% of global expenditure, and their holding of over 90% of patents filed in 2014, the article highlights the intricate links between multinational corporations, technological diffusion, and global inequality. The findings reveal that the concentration of technological advancements in a few developed countries not only fuels global capitalism but also exacerbates the economic disparities between rich and poor nations. The article calls for a more equitable approach to technological development and diffusion to bridge this widening gap.

Keywords: Global Economic, Technology, Inequality

INTRODUCTION TO GLOBAL INEQUALITY AND TECHNOLOGICAL ADVANCEMENTS

Multinational corporations and technology and its diffusion are intricately linked with the rising levels of global inequality. The contemporary digital age is characterized by unprecedented technological advancements that have turned the world into an interconnected global village. Massive technological advancements have fostered globalization and the notions of transnational capital and labor that buttress the contemporary notion of global capitalism. The emergence of transnational capitalism has promoted open trade, private and global enterprises, and fostered massive increases in trade and investment flows; thus, spurring improvement in national income and economic growth. However, advancements in technology and the emergence of transnational capitalism have been characterized by a noteworthy increase in global economic disparities and wealth inequalities. As various nations record exponential economic growth due to technological advancements and increase in trade and investment flows, the gap between the global rich and the poor has ballooned. Technology is at the core of productivity and the disproportionate rate of technological advancement and diffusion between the developed countries and developing nations through multinational corporations has worsened global inequality.

The Role of Technology in Productivity and Economic Development

Technology is integral in determining productivity, which helps explain uneven economic development. Technology is conceptualized as the rules and ideas that direct the way goods are produced (Alguacil et al., 2011; Wang & Lin, 2021; Sabadash, 2013). Therefore, the notion of technology not only encompasses landmark and innovative software and hardware, but also the ideas behind their operations. Notably, it is a widely acknowledged fact in the field of economics that some countries are more technologically advanced compared to others (Coe & Helpman, 1995). Developed countries, such as the U.S. and England, are more technologically advanced compared to developing countries like Kenya and Myanmar. Technology plays a key role in determining productivity that is defined as an outcome measure of technology (Coe et al., 1997; Barbosa & Eiriz, 2009). Differences in technological advancements among countries result in productivity variations that explain the wealth inequalities between rich and poor nations (Wooster & Diebel, 2010). Practically, advanced technological knowledge enables developed nations, such as the U.S., to produce more goods, thus dominating international trade and gaining more wealth compared to developing nations that are mostly technologically inept. Therefore, technology and productivity contribute to uneven economic development.

Investment Disparities in Technological Research and Development

Developed nations have invested intensively in technological research and development compared to developing countries, thus fostering global economic inequalities. The main difference in technological knowledge between rich and poor countries lies in the fact that the developed countries have invested heavily in the production of technological knowledge, innovation, and invention compared to their developing counterparts. According to Gong and Keller (2003), in 1995, members of the G7 accounted for 84% of the world's total expenditure on technological research and development. A survey conducted by the United States Patent and Trademark Office in 2014 revealed that the same G7 countries invested more than 88% of the world's expenditures on research and development, with the rest of the international community contributing a meager 12% towards technological advancements (Wang & Lin, 2021; van der Loos et al., 2020). Additionally, the same G7 countries took out more than 90% of all patents filed with The United States Patent and Trademark Office in 2014 (van der Loos et al., 2020). The self-evident variation in investments in technological research and development means that only a few of the world's richest countries account for the world's creation of new technology, further fueling global inequalities.

Competitive Advantages Through Innovation and the Slow Process of Technological Diffusion

The creation of new technologies provides rich countries with immense competitive advantages over their poor counterparts, which increases global inequality. Developed countries invest heavily in research and development and are able to come up with innovations and inventions. Through incessant innovation and invention, rich countries are the first to access and utilize new forms of technology. The new forms of technology provide the developed nations with immense competitive advantages that enable them to dominate over other countries in the international market (Atkin et al., 2014; Atkin et al., 2017). Developing countries, on the other hand, rely on technology diffusion in order to access and utilize the various forms of technology invented by the rich countries. Technological diffusion refers to the process and channels through which various forms of technology spread both within and

across countries (Keller & Yeaple, 2009; Kemeny, 2009; Kemeny, 2011). However, technological diffusion is a slow process as it mainly depends on international trade and foreign direct investments (FDI) through multinational corporations. The slow spread of new forms of technology to the developing world further worsens their ability to compete effectively with their developed counterparts in terms of productivity, thus resulting in uneven development.

The Biased Nature of Technological Diffusion and Its Focus on Raw Materials

Technological diffusion mostly results in the transfer to the developing world technologies primarily limited to the production of raw materials for export to developed countries, thus furthering uneven economic development. According to Kemeny (2010), 90% of the technologies transferred to the developing world are primarily aimed at enhancing the exploitation of natural resources and raw materials, such as textiles, that are exported to the developed countries. Economists from the uneven development school of thought and those espousing Marxist-Leninist ideologies, such as Robert Gilpin, argue that technological diffusion occurs mainly through transnational capitalism channels, and are inherently biased in favor of the developed world (Bessen et al., 2010; Coe et al., 1997). Marxist-Leninism espouses that international capitalism is imperialistic, expansionary, conflict, and inherently unstable, and so are all its creations and processes, such as technological diffusion (Waldkirch & Ofosu, 2010; Schuler et al., 2006). The majority of the technologies transferred to the developed world help increase the quantities of raw materials exported back to the developed world for processing into final products. Final products are worth more than raw materials in the international market. Thus, technological diffusion increases uneven development as they further the economic interests of developed countries compared to those of developing nations.

Social Capability and Its Role in Uneven Technological Development

The success of technological diffusion is dependent on social capability, which varies among countries, promoting uneven development in the world. Technological advancement in the developing world is dependent not only on spillovers, but also on social capability. Social capability is defined as the ability of a country to absorb various forms of technology, which is dependent on the existence of certain societal and institutional competencies (Keller, 2010; Keller & Yeaple, 2009). Societal and institutional competencies, such as human capital facilities, influence the adoption of new technology in developing countries. Developing countries with better societal and institutional competencies, such as literate and skilled human capital, are more likely to adopt various forms of technology compared to nations with poor social capabilities. Markedly, it is well accepted in economic circles that various countries in the world, especially developing nations, have divergent levels of social capabilities (Keller, 2002). For example, South Africa has more advanced social capabilities compared to Myanmar. The variance in nations' social capabilities means various developing countries adopt new forms of technology at diverse rates. Therefore, the variance in countries' social capability explains why technological diffusion has not solved but rather worsened uneven development in the developing world.

Geographical Influence on Technological Diffusion and Economic Development

Technological diffusion is also shaped by geography. Thus, further worsening uneven economic development in the world. According to Keller (2004), like all forms of diffusion technological diffusion is a form of contagion whose probability of transmission from one country to the other

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decreases with an increase in geographical distance. Therefore, countries that are geographically closer to rich nations that have massive technological knowledge are more likely to acquire various types of technology than those that are far from the centers of innovation and invention (Eaton & Kortum, 1999; Keller, 2002; Elstner et al., 2020). The notion of geographical location explains why Mexico is more developed than South Africa, as the former is closer to the U.S. than the latter. A study conducted by Narula (2014) reveals that within the Group of 5 (G5) countries, that is, UK, France, Germany, Japan, and the U.S., the rate of domestic technological diffusion is much higher than for non-G-5 countries. That technological diffusion is impacted by geographical distance promotes uneven development in the world as developing countries closer to centers of scientific innovation and development, such as the U.S., have better chances of securing the latest technologies compared to other countries.

MULTINATIONALS AND GLOBAL INEQUALITY

Multinational corporations are integral to contemporary international trade and foreign direct investment FDI. Thus, they are at the core of global technological diffusion. Technological diffusion mostly occurs through two channels: international trade and inward FDI (Wooster & Diebel, 2010).

Multinational Corporations and Technological Diffusion through Trade and FDI

International trade, which is made up of exports and imports, facilitates technological diffusion. However, the significance of global commerce in the transmission of technologies remains contentious. For example, there is irrefutable economic evidence that reveals that imports are a significant channel of technological diffusion compared to exports (Skiti, 2020; Masood & Brümmer, 2014). FDI, on the other hand, is recognized by both mainstream and heterodox economists as integral to technological diffusion (Xu & Wang, 1999; Tinguely, 2013). As a channel of technological diffusion, FDI is divided into two categories: inward FDI and outward FDI. Outward FDI involves the external flow of investment from a country as it is concerned with the expansion of commercial operations to foreign countries (Reiter & Steensma, 2010; Park & Park, 2015). However, inward FDI is concerned with the flow of investment into a country. Inward FDI is widely considered integral to technological diffusion as it involves the inflow of capital from developed countries to developing nations (Narula & Pineli, 2017). Both inward and outward FDI flows are based on the sophisticated activities and operations of multinational corporations that buttress the notion of transnational capitalism. Therefore, multinational corporations are at the center of global technological diffusion.

Characteristics of Technology and the Role of Multinationals in Diffusion

Technology has various peculiar characteristics that enable multinational corporations to play a role in global technological diffusion. Technology is a quasi-public good, and like all public goods, technology has positive externalities, commonly known as spillovers in economic jargon (Narula & Martin, 2015; Narula, 2004).

Since technology is a quasi-public good, developing countries can transform knowledge spillovers into local technologies through reverse engineering, both theoretically and practically. Moreover, technology is a non-rival good, as one's agent use of technology does not prevent other agents from using similar technology (Menzel, 2017). A case in point is the internet, which is currently used by almost every country in the world. Therefore, internet

connection and usage in a poor country, such as Myanmar, has no economic detrimental effect on the use of the internet in a developed nation like the U.K. Technology is also non-excludable as agents who have invested nothing in its research and creation can still exploit it no additional cost (Grossman & Helpman, 1991; Hardy & McCasland, 2021). The majority of technology currently in use in the world was developed and invented in a few developed countries. However, they have diffused to various parts of the globe and they are used by developing countries at no additional costs. The various characteristics of technology make technological diffusion through inward FDI feasible, thus implicating multinational corporations in uneven economic development.

Bias in Inward FDI Flows Towards Developed Countries

Inward FDI flows are heavily biased in favor of developed countries. Thus, the notions of transnational capitalism and multinational corporations inherently contribute towards uneven economic development. The notion of transnational capitalism is inherently imperialistic and primarily biased at improving the interests of developed nations (Schuler et al., 2006). Inward FDI flows are not equal nor equitable, as they tend to favor richer and more developed countries.

A thorough analysis of the volumes of foreign capital flows by source and destination will reveal that capital flows into developed countries are much more than flows into the developing world (Ferrier et al., 2016; Kratz et al., 2020). According to Gong and Keller (2003), in 1998, more than 2.8 trillion dollars of capital flowed into the developed world, while only $1.3 trillion flowed to developing nations, and much less, if China is excluded. In 2019, the U.S. remained the largest recipient of inward FDI as it attracted more than $250 billion, and it was closely followed by China that attracted $140 billion (Elstner et al., 2020). The uneven inward FDI inflows curtail the prompt diffusion of technologies to the developing world that results in uneven productivity, which fosters global economic inequalities. The uneven inward flow of FDI also explains the disproportionately high number of multinational companies in rich nations compared to poor countries.

Social Capability and Its Impact on FDI and Multinational Activities

Inward FDI flows and activities of multinational corporations are influenced by the notion of social capability that further widens the gap between rich and poor countries. Inward FDI tends to flow to countries with higher social capabilities, particularly societal and institutional capabilities that favor global commerce (Helliar et al., 2020).

Human capital is one of the key elements of social capabilities, and countries with advanced levels of human capital are likely to attract more inward FDI and multinational corporations. Among the developed world, the U.S. not only has a large and literate, but also technologically savvy human capital that enables it to attract more inward FDI and multinational corporations (Johansson, 2021). The same is similar in the developing world as middle-income countries, such as Singapore and South Africa, attract more FDI and multinational corporations compared to low-income countries, such as Myanmar. The ability of high and middle-income nations to attract more inward FDI flows makes them ideal for many multinational corporations, making them hubs of technological diffusion. Technological diffusion within and across high and middle-income countries widens the gap between rich and poor countries.

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Research and Labor Preferences of Multinational Corporations

Multinational corporations also prefer countries with not only massive investments in research and development, but also highly skilled labor, a factor that increases global inequalities. Inward FDI flows are influenced by investment in technological research and development. Countries that have invested massively in technological and scientific advancements, such as the U.S., attract more inward FDI.

According to Kemeny (2009), research and development expenditures are associated with the notion of absorptive capacity, which is the idea that a firm or country needs to have a certain type of skillset to adopt foreign technology successfully. Countries with high research and development expenditures are deemed more ready to adopt new technology and are preferred by multinational corporations (Narula & Pineli, 2007). Multinational corporations also prefer high-skilled workers compared to low-skilled workers who they ultimately replace by introducing various forms of technology. Over time, the economic gap between high-skilled employees and low-skilled workers balloons and furthers uneven economic development (Alguacil et al., 2011; Wang & Lin, 2021; Sabadash, 2013). The preferences of multinational corporations with regard to highly skilled workers and research and development expenditures further global inequalities.

Economic Interests of Multinationals and Uneven Development

Multinational corporations primarily promote the economic interests of developed nations, thus furthering uneven economic development. When multinational corporations expand their activities to foreign countries through inward FDI, they present advanced forms of technology, massive physical capital, and management expertise among others (Wang & Lin, 2021).

The amalgamation of advanced technology, massive capital, and management knowledge enables multinationals to dominate other companies in the domestic market. To protect their market power most multinational corporations protect their technical advantage by giving their employers relatively higher salaries, thus thwarting technological diffusion (Ferrier et al., 2016; Kratz et al., 2020). Their relatively superior market power enables multinational corporations to achieve massive profits that are primarily shipped back to their country of origin. Shipping back of profits made by multinational corporations to their countries of origin further deprives developing nations of the much-needed capital, further widening the gap between rich and poor countries (Schuler et al., 2006). Moreover, that multinational corporations thwart technological diffusion in developing countries to protect their technical advantage fosters uneven economic development.

CONCLUSION

We live in a digital age where unprecedented technological advancements are being made than ever before. Advancements in technology have resulted in massive benefits, such as the emergence of transnational capitalism, widespread eradication of poverty, and increased global interconnectedness. However, technological advancements have failed to bridge but have rather worsened the gap between the rich and the poor. Uneven economic development can be traced to the variance in national productivity that is buttressed on technology and its diffusion.

Though technology is a quasi-public, non-excludable, and non-rival good, a global pool of technology does not exist. Technological diffusion facilitates the transmission of various forms of technology from developed to developing countries mainly through international trade and inward FDI. Inward FDI flow is a result of transnational capitalism and is buttressed on the intricate operations of multinational corporations.

Therefore, multinational corporations not only provide an integral channel for technological diffusion, but they are also implicated in uneven economic development. Variance in factors, such as research and development expenditure, social capability, and human capital, influences the activities of multinational corporations, thus increasing the gap between rich and poor states.

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