Foreign Direct Investments and Human Capital Development in Nigeria: A Firm-Level Analysis of Manufacturing and Information and Communication Technology Industries

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Abstract

The emerging trend of Foreign Direct Investments (FDI) in Nigeria is diverging in favour of technology, ICT, and manufacturing, which are becoming more sensitive for the evolution of the labour force. With the low levels of technology advancement, skill accumulation, and human capital stock in developing countries, and Nigeria especially, FDI inflows have been identified as major sources of technology, managerial, and technical know-how spillover to developing countries. The accruing knowledge spillover effects of FDI inflows are critical for human capital development to propel technological progress and sustainable economic growth. Therefore, this study investigated the impacts of FDI on human capital and the economic prospects of workers in Nigeria's manufacturing and ICT sectors and highlighted the country-specific conditions needed to adequately internalize FDI spillover effects on Nigeria's human capital. This study's data analysis is based on a combination of qualitative and quantitative approaches. The findings revealed that FDI inflows impact human capital development in Nigeria. Meanwhile, the kind of FDI inflows, the measure of human capital development and the sector matter in the relationship, as aggregated analysis yields little knowledge benefit. Specifically, this study revealed that all the types of FDI, except merger and acquisition, have varying impacts on the components of human capital development, while efficiency-seeking FDI is the most important. The policy implication from this study re-emphasizes the need for further improvement in the regulatory environment, general ease of doing business and incentive management.

Keywords: *Foreign Direct Investment (FDI), Manufacturing, Information and Communication Technology, Human Capital Development, and Nigeria.*

1. Introduction

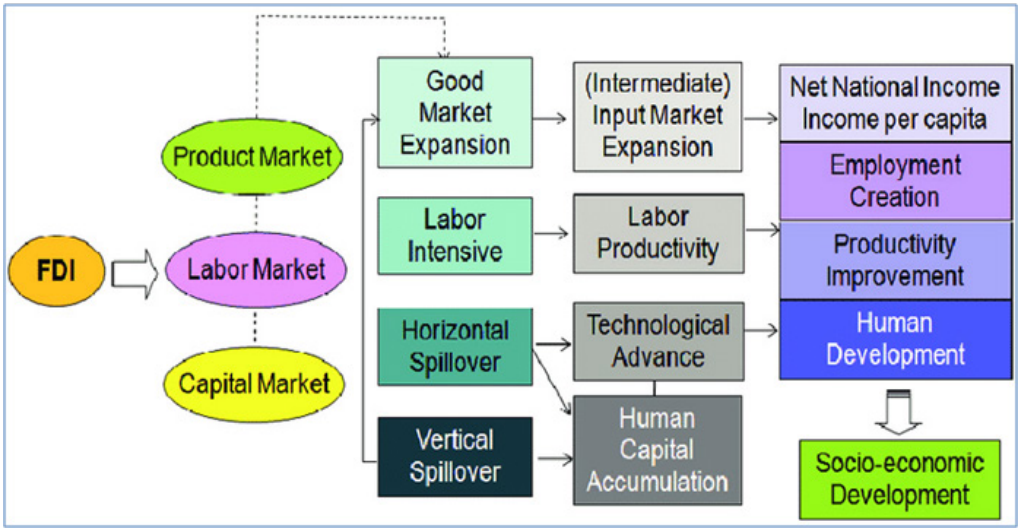
For most developing countries, Foreign Direct Investment (FDI) has been identified as a major source of new technology, managerial and technical know-how. Indeed, the technology, managerial, and technical know-how spillover effects of FDI distinguish it from other forms of foreign capital inflow (Dollar and Kraay, 2000; Massoud, 2008; Tan and Azman-Saini, 2017). Because most developing countries have relatively low levels of human capital, the accruing benefits or externalities/spillover effects of FDI inflows are critical to technical progress, human capital development, and economic growth (Shaw, 1992; Abor and Harvey, 2008; Adeleke, Olowe and Oluwafolakemi, 2014; Adegboye et al., 2020). Many modern growth theories and models also hold that FDI plays an important role in the rate and dynamics of a country's economic growth, particularly in developing market economies (Subbarao, 2008-1; Baghirzade, 2012; Ho et al., 2020).

Moreover, studies have confirmed the existence of a positive and bidirectional relationship between human capital formation and FDI in developing countries (Miyamoto, 2003; Kheng, Sun and Anwar, 2017; Gökmenoğlu, Apinran and Taşpınar, 2018). By implication, FDI inflow helps to build human capital in the host country. The foregoing expectation is because FDI inflows are associated with the transfer of knowledge and technology to the host country. The transfer of knowledge and technology from foreign firms to domestic firms could be through labour and management training, and links between foreign firms and local component suppliers. Furthermore, the presence of foreign-owned firms in the economy, with their superior technological endowments, may compel locally-owned firms to invest in learning, if only to stay competitive. As a result of increased competition from locally owned firms investing in innovation, foreign firms may be compelled to bring in superior quality technology and know-how. In summary, imported skills increase the marginal productivity of host countries' capital stock and promote economic growth (Wang and Blomström, I992; Potterie and Lichtenberg, 2001; Tan and Azman-Saini, 2017).

Miyamoto (2003) asserted that the continuous inflow of FDI into developing countries results in the accumulation of human capital through the entry of Multinational Enterprises (MNEs) and the upgrade of operational efficiency of existing MNEs and domestic enterprises. As a result, these FDIs help to improve the skill level of the existing labour supply and boost the country's productivity and economic growth prospects (Subbarao, 2008:1; Baghirzade, 2012; Fowowe and Shuaibu, 2014).

According to the World Bank (2018), the process results in a "virtuous circle" of human capital development in a country experiencing massive FDI inflows. The "virtuous circle" of human capital development refers to the fact that FDI inflows create an elastic supply of skilled labour, which raises income and household welfare prospects in the host country. This situation incentivizes people and governments to invest in education - people will pursue higher education to get better job offers from foreign firms. These actions will increase the total supply of qualified workforce, which will in turn attract more FDI into the host country. To sustain the spillover effects of FDI - technology, knowledge transfer, job opportunities, and higher labour productivity - the government would support the accumulation of human capital through an increase in educational budgetary allocation (de Mello, 1999; Gökmenoğlu et al., 2018; Kaulihowa and Adjasi, 2019; Abbas, Moosa and Ramiah, 2021).

Figure 1: FDI and human capital development transmission



Source: Uttama (2012)

Stressing the FDI-induced human capital development proposition, observable trends and studies on developing countries have shown a divergent impact of foreign capital inflow on human capital based on the types of inflow (Michie, 2001; Blomström and Kokko, 2002; Bruno, Campos and Estrin, 2018). As illustrated in Table 1 below, FDIs are more critical to generating employment and building human capital in developing countries than portfolio investments. On the spectrum of FDIs, Greenfield, Market-seeking, and Efficiency-seeking investments significantly impact employment and human capital development. Foreign firms or investors with these types of FDIs come into the host economy with their business models and technology transfer. Mergers and Acquisitions (M&A) and resource-seeking FDIs are projected to have low impacts on employment and human capital development, especially in developing countries. The pass-through channels – product, capital, and labour markets – of FDI

inflow are the platforms to access the human capital benefits by the host economy. These markets respond by increasing employment creation through productivity improvement, innovation, and technological advancement (Figure 1). These benefits are considered the most important tool for improving human capital accumulation in developing countries.

Table 1: Types of foreign investments, dimensions, and importance for human capital development

Investments		Importance of investment	
		Employment	Human Capital Development
Portfolio		Insignificant	Insignificant
Foreign Direct Investments		Moderate	Moderate
Foreign Direct Investments	Mergers and Acquisitions	Low-Moderate	Low
	Greenfield Investment	High	High
	Resource-seeking	Low	Low
	Market-seeking	High	High
	Efficiency-seeking	Moderate-high	Moderate-high

Source: UNCTAD (2004), World Bank (2019)
Note: The importance of investments for employment speaks to the ability of investments to create new jobs

In the last two decades, the manufacturing and ICT sectors have experienced an influx of foreign manufacturing firms and foreign investments. Despite the ravaging effects of the COVID-19 pandemic in 2020, both sectors (ICT and manufacturing) accounted for more than 40% of total foreign capital inflows in Nigeria (NBS, 2020; NIPC, 2020). Investigations have confirmed that a substantial part of new investments is dedicated to improving the quality of skills of the workforce through technical training and other human capital development programmes. Also, many new and existing MNEs and investment-receiving ICT startups developed on-the-job training, graduate trainee, and internship programmes to improve the existing skills stock of the workforce in Nigeria. This is to ensure that the workers' skills match the level required for their operations. In the professional services sector, the effectiveness of foreign firms in skills development is confirmed (Slaughter, 2002; te Velde, 2002; Subbarao, 2008:1), but the same has not been explored in the Manufacturing and ICT industries. Answering this question is important for policy makers and other stakeholders as major FDIs are targeted at these two sectors in Nigeria.

The preceding discussions have identified two thematic issues around FDI and human capital development nexus. The first concern is the differing impacts of various FDI types on human capital development, while the second concern is identifying the impacts of regulatory and other issues on the capability of FDI to enhance human capital development in the ICT and manufacturing sectors. While these issues have received some empirical support from studies in other developing countries, Nigeria

has a dearth of studies in this regard. Therefore, this study will strengthen the evidence on the impact of FDI on human capital development in Nigeria by corroborating some of the positions or conclusions of related framework papers. In particular, the study seeks to: (1) identify and dimension the nature of the impacts of FDI, dimensioned by types, on skills development and economic prospects of workers in the manufacturing and ICT sectors in Nigeria; and (2) determine the country-specific conditions needed for FDI to have significant impacts on human capital development in these sectors.

A combination of qualitative and quantitative approaches is employed to achieve these research objectives. The findings from this study illustrated that FDI inflows into these sectors contribute significantly to expansion in employment, staff skills development and training, and talent development programmes. On the types of FDI and human capital development, the study found M&A to be important for human capital development in Nigeria. Another type of FDI found to have a high impact on human capital development is the efficiency-seeking FDI, especially in manufacturing and other sectors. Interestingly, only M&A and resource-seeking FDI contributed significantly to human capital development in the ICT sector. In addition, the condition of service, proxied by income/wage restructuring, is also considered in M&A, market-seeking and resource-seeking FDIs. These results reflected that these types of FDI mainly seek market expansion in the host country, and this motive will make these firms get more qualified personnel from the labour market to quickly achieve the aims of the investments.

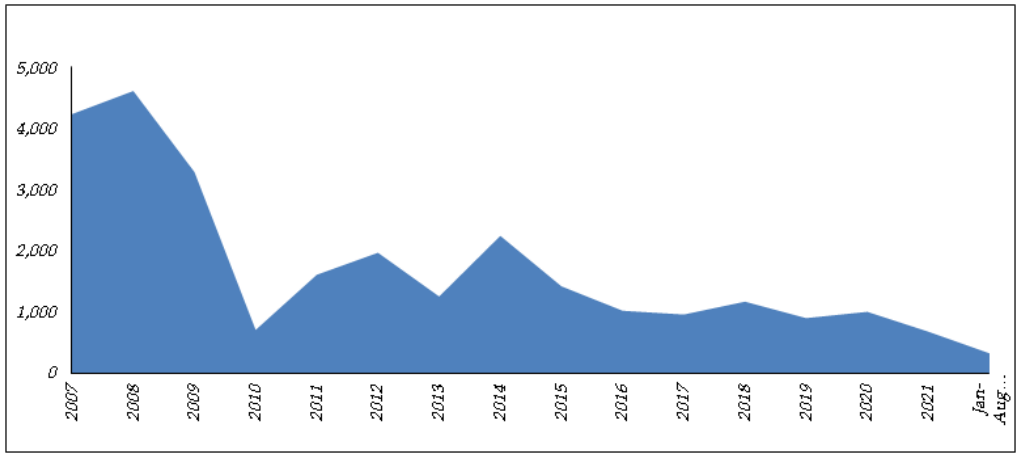
Following this introductory section, the rest of the study is structured as follows: The stylized facts on FDI and human capital development in Nigeria are covered in section 2. A detailed theoretical and empirical review of existing literature is covered in section 3. Section 4 explains the methodology adopted for this study, while section 5 presents the results, mainly descriptive and triangulation of data extracted from the survey. The last section (6) concludes the paper and presents policy recommendations.

2. Stylized facts – FDI and human capital development in Nigeria

General trend of foreign direct investments and human capital development

Despite the dampening trend of FDI influx into Nigeria, the country is the third highest host for FDI in Africa, after Egypt and Ethiopia (UNCTAD, 2021). According to the Central Bank of Nigeria (CBN), Nigeria received a total of US$ 698.9 million FDI inflow in 2021, showing a decrease of 32% from US$ 1.03 billion in 2020. The increase in FDI inflow in 2020, despite the global economic downturn induced by the COVID-19 pandemic, was due to the presence of high FDI pulling factors. Statistics from Nigeria's apex bank – CBN, also showed a declining trend of FDI; a total of US$ 421.64 million was recorded in the first eleven months of 2022 (Figure 2). The main investing countries in Nigeria include the USA, China, United Kingdom, The Netherlands, United Arab Emirates and France.

Figure 2: Trend of new Foreign Direct Investments in Nigeria (US$ million)



Source: CBN Statistical Database, 2022

Another measure of FDI is the actual investment, which is the estimate used by the United Nations Conference for Trade and Development (UNCTAD) and the Nigerian Investment Promotion Commission (NIPC). According to UNCTAD's 2021 World Investment Report, key FDI projects worth US$ 2.4 billion were implemented in Nigeria. Corroborated by data from NIPC, the sectoral distribution of FDI announced showed a huge concentration in the manufacturing sector, with a growing focus on the ICT sector. Between January and September 2022, the manufacturing sector accounted for 45% of the total announced FDI, while 20% was dedicated to the ICT sector (NIPC, 2020). A similar trend is observed in 2021, as 50.3% and 15.7% of the total announced FDI in Nigeria were allocated to manufacturing and ICT projects, respectively. This performance was a significant improvement from 18% for Manufacturing and less than 1% for the ICT sector in 2017.

Analysis of the funding series available to technology startups, spreading across all sectors, also highlighted the human capital development component of these investments (Table 2). Series A and B of the funding rounds underlined the need for team expansion and gaining more market traction/share (customers/users). To achieve these funding criteria or goals, tech startups usually include human capital development such as team expansion, on-the-job training for current employees and improving working conditions as the following implementation step after getting the fund or investments.

Table 2: Human capital components of various funding series

Funding Types	Purpose	Local employment	Skill training & development	Improvement in working conditions like salaries etc
Pre-Seed	To build a prototype or business concept. It is mainly executed by investors that believe an idea can work.	X	√	√
Seed	To test the market acceptability of the business model or products. This type of investment usually comes with equity ownership by investors and can be classified as FDI.	√	√	√
Series A	To consolidate success achieved with the market acceptance of the business model or product. In addition, this type of investment also includes the expansion of the team.	√	√	√

continued next page

Table 2 Continued

Funding Types	Purpose	Local employment	Skill training & development	Improvement in working conditions like salaries etc
Series B	This investment is mainly to drive growth (market share and profitability) of the business model. There is an element of team expansion at this stage.	√	√	√
Series C	To establish a proper business. This investment usually comes in the form of M&A etc.	X	√	√

Like most developing countries, Nigeria also has a long-term diversification strategy, which has yielded some results with respect to types of FDI influx to the country. In 2020, the country received Green investment estimated at US$ 66 million in the manufacturing sector by Ariel Food. There are also many M&A deals in ICT sectors in various tech startups and communication sub-sectors. Other notable FDI diversification deals include the Multichoice Group (South Africa) acquisition of BetKing, a data hosting service provider. Many of these deals are market-seeking and efficiency-seeking FDIs as foreign investors are looking towards expanding into Nigeria. This is due to the presence of attractive factors such as market size (Africa's most populous country), economy size (Africa's largest economy by GDP), presence of important hydrocarbon resources, high agricultural potential, economic liberalization policies promoting Public-Private Partnership (PPP), and strategic alliances with foreign companies (Babatunde, Opawole and Akinsiku, 2012; Oluwasanmi and Ogidi, 2014).

As highlighted by many studies (Slaughter, 2002; Majeed and Ahmad, 2008), Greenfield investments and Market-seeking investments in the form of MNEs operations have the potential to contribute significantly to human capital development in the host country through their interaction with the labour market. Agbebi (2019) confirmed that Chinese MNEs in Nigeria, such as Huawei, among others, contribute to human capital development in the country through the critical channel of local employment, training and skills building for local employees and through corporate social responsibility (CSR) initiatives, and knowledge and technology transfer. This assertion confirms the micro-macro level interaction between FDI and human capital development in Nigeria. Also, there is a weak confirmation of the differing impacts of the types of FDI on human capital development. These insights align with the aim of this research, which seeks to study the micro level, i.e., firm-level analysis, impact of FDI on human capital development. As highlighted by Blomström and Kokko (2002), the firm-level impacts of FDI on human capital development, in the form of training

for local employees, are influenced by factors such as mode of entry, industry, size and time horizon of the investment, type of operations, motivation for the investment and local conditions.

Firm-level analysis of FDI and human capital development

This section provides a detailed analysis of how FDI-receiving firms engage in activities that affect or promote human capital development by enhancing employment through talent development programmes, training, and skills development for their employees as an improvement in the working conditions of the employees.

Local employment in manufacturing and ICT firms

An array of firms in manufacturing and ICT sectors are creating employment for the local populace in Nigeria. Some of these firms are MNEs whose entrance into Nigeria is captured as FDI, and those firms have received a size of investment that could be classified as FDI.

For the manufacturing sector, there is documented increase in the number of jobs created by firms operating in the emerging economic zones in Nigeria. For instance, the Lekki Free Trade Zone is being managed by the LFTZ Company, a PPP initiative. The private sector component of this project is dominated by foreign firms and the use of local and Chinese employees. Specifically, during the first phase of the project, about 100 Nigerian workers were employed (Mthembu-Salter, 2009, cited by Brautigam and Xiaoyang, 2011). There is also an employment quota of 80:20 Nigerians to foreign employment ratio in projects completed within the economic zones (Brautigam and Xiaoyang, 2011).

Huawei, a greenfield FDI and Chinese ICT MNEs, operates in Nigeria with a 70% localization strategy, resulting in its personnel being Nigerians (Agbebi, 2019). The findings from Agbebi (2019) disclosed that the firm's operation in Nigeria has contributed to human capital development through employment of 1,000 employees in Huawei's Nigerian operations, increase in income, and subsequently standards of living, provision of jobs with a high component of training and empowerment of local firms through linkages with service providers and suppliers.

Investments in tech startups by leading global technology companies such as Google and Microsoft have been identified to generate significant jobs. Grants and other forms of investment in Nigerian startups by Google have developed about 3,200 new jobs in the country. This is because many of these tech startups are noted to have a work strength of 5-10 workers. According to Disrupt Africa (2021), two of Nigeria's FDI recipient tech startups - Cowrywise (570 workers) and Flutterwave (541 workers), are among the top three highest recruiting companies in Nigeria.

Training and skill development

As noted in Table 2, on-the-job training and skills development are considered requirements for some types of investments for recipient firms, especially within the ICT-related sector. A similar practice is observed with manufacturing MNEs, usually subsidiaries of a parent company. As a result, MNE manufacturing firms organize capacity building for their employees to sustain their product standards and quality (Ebhota and Ugwu, 2014).

Many of these firms have well-equipped training centres to scale up the skills of new and existing employees. These manufacturing MNEs with dedicated training schools include PZ Cusson, Nestle Nigeria Plc, and Dangote Industries Limited. Nestle Nigeria Plc has an apprenticeship programme for its non-technical employees, structured to meet on-job skill requirements and prepare employees for the British City and Guild examinations (Nestle, 2020).

A report hinted that Nigerian technology firms are raising billions in funding (mostly FDI), but they have challenges recruiting capable personnel due to issues, including high global labour market competition for tech-skilled workers, among others. In response, many firms with foreign investments are developing training programmes to fill the gap, particularly for team managers. Autocheck Africa raised US$ 13.1 million in seed funding in 2021, instituted a middle manager fast-track programme, and a performance management system to improve standards across its 180-person team and help with staff retention.

Heavily foreign-funded technology firms such as Flutterwave, Interswitch, Paystack, Kuda, Opay, etc have started skill acceleration programmes for new and old employees to scale their technical and managerial skills. Some other firms are also noted to adopt a talent development route, which entails hiring and training fresh graduates from Nigerian or foreign universities. A classic example of a talent development programme contributing to human capital development in technology is the Hotel Nigeria (HNG) Internship by Hotels.ng, and the Lambda School Africa Pilot. Both programmes have resulted in training personnel working in tech unicorns such as Flutterwave, Interswitch, and Paystack, among others.

3. Literature review

Theoretical review

Over the years, alongside trade openness, FDI flows have often been associated with the transfer of wealth, technology, and knowledge across countries (Blomström, Kokko and Zejan, 1994; Checchi, De Simone and Faini, 2007; Lopez, 2008; Subbarao, 2008:2; Kar, 2013; Gandou and Sönmez, 2016; Tan and Azman-Saini, 2017). Multinational Enterprises (MNEs), by their nature, have knowledge assets in the form of patents, proprietary technology, and trademarks, among other advantages that could be deployed in foreign countries to expand their operations (Slaughter, 2002). Theoretically, the vertical view of FDI flows posits that MNEs take advantage of differences in international factor price by locating production facilities in countries with a lower cost of manual labour (low level of innovation and technology). Meanwhile, headquarters are located in countries with a lower cost of skilled labour (advanced technology and innovation). However, the horizontal view of FDI flows argues that MNEs arise because of trade costs and barriers, such that when trade cost is low, firms produce all output domestically and export to foreign customers. Alternatively, when trade cost is high, firms serve foreign customers by becoming MNEs and setting up production facilities at home and abroad.

Dunning (1977), based on the Eclectic Theory, argued that MNEs should be able to simultaneously possess three advantages (ownership, location, and internalisation). This is in terms of ownership of a brand or product that needs to be exploited or marketed in a certain location where the firm has an internalised comparative advantage over other players in the location before cross-border investment. The Eclectic Theory aggregates the Production Cycle Theory, the Location Theory, and the Internalization Theory (Vernon, 1966; Buckley and Casson, 1976). While the associated wealth transfer comes directly in the form of investment by MNEs, the transfer of technology and knowledge happens through the human capital development associated with the investment (Borensztein, De Gregorio and Lee, 1998; Glass and Saggi, 2009; Shahrivar and Jajri, 2012; Gandou and Sönmez, 2016). In this regard, the interaction between FDI and human capital development has the potential to drive growth and alleviate poverty (Driffield, Henry and Love, 2007; Subbarao, 2008:1; Baghirzade, 2012).

A major characteristic of the establishment of MNEs is their knowledge-intensive tendency (Blomström and Kokko, 2002; Slaughter, 2002; te Velde, 2002; Subbarao, 2008:1; Shahrivar and Jajri, 2012). The rest of this section reviews existing literature on how associated FDI flows translate to human capital development in host countries. The theoretical guidance on the relationship between FDI and human capital development rests on the neo-classical growth theories or the new endogenous growth theories. The neo-classical growth theorists opine that there is a linear relationship between FDI and human capital, such that FDI drives technological transfer that translates to growth in human capital stock (Lucas, 1988; Aghion and Howitt, 1992, 1998; Shahrivar and Jajri, 2012). However, the endogenous growth theory of FDI and human capital development recognizes the possibility of non-linearity in the relationship, such that there is a turning point in the way FDI is accompanied by technology and knowledge transfer that eventually grow human capital stock (Romer, 1990; Barro and Sala-i-Martin, 1995; Barro, 1996; Aghion and Howitt, 1992; 1998; Blomström and Kokko, 2002). The endogenous growth theories relax some of the neo-classical growth assumptions, such as the return of human capital development, diminishing returns to capital, and linearity, thus concluding that FDI will lead to growth in human capital stock over time, but the transition could be oscillatory.

The correlation between FDI and human capital development has been established in the literature (Checchi et al., 2007; Nembot Ndeffo, 2010; Adefabi, 2011). Due to the complex dynamics shared, inflows of FDI do not automatically translate to human capital development, hence empirical evidence has been divergent and inconclusive (Blomström and Kokko, 2002; Bruno et al., 2018). Slaughter (2002), alongside Subbarao (2008:1) and te Velde (2002), provided a theoretical prediction framework for FDI and human capital development through skills upgrading. The studies argued based on the demand- and supply-side implications of FDI inflows for human capital development in the host country. On the demand-side, FDI inflows can motivate increased demand for skilled workers in host countries through three channels, namely: (1) technology transfer; (2) domestic spillover; and (3) physical capital investment. On the supply-side, Slaughter (2002) opined that FDI inflows could motivate an increased supply of skilled workers. This could be at the macro-level where, through their Corporate Social Responsibility (CSR) or resulting tax income to the government, MNEs support the education system or micro-level/firm-specific through on-the-job training of workers that form part of the host countries' labour force (Checchi et al., 2007). Empirical evidence from Slaughter (2002) and Subbarao (2008:1) revealed a strong positive correlation between FDI inflows and skill upgrading in developing countries.

Empirical review

A. Physical capital investment and human capital development

The capital investment channel of human capital development and FDI posits that the emergence of MNEs and associated technology involves investment. Due to the complementarity of capital and skilled labour in production factor demand, there will be increased demand for skilled labour to man the new capital investment, hence the motivation for labour force skill upgrade (Slaughter, 2002; te Velde, 2002; Subbarao, 2008:2; Kaulihowa and Adjasi, 2019). Bergstrand and Egger (2007), in their Knowledge and Physical Capital Model, emphasized the role of physical capital in the dynamics of FDI flows in which more than the relatively immobile skilled and unskilled workers can transfer benefits from MNEs to host countries. Though still inconclusive, other demand-side channels have been heavily explored by researchers, but little empirical evidence exists on the physical capital investment channel of human capital development.

Among the few empirical works on the physical capital investment channel, Völlmecke et al. (2016) used a firm-level data analysis. They established a positive interaction between foreign physical capital and human capital development in 269 regions within the European Union (EU). Similarly, Xia, Qamruzzaman and Adow (2022), using Human Capital Development Index and secondary school enrolment to measure human capital, reported a positive tie between the interaction of FDI and gross capital formation with human capital development in the top 10 remittance-receiving countries. They further establish that human capital development exhibits more elasticity to gross capital formation than FDI inflows; FDI-associated changes in gross capital formation generate more intensity on human capital development.

Contrary to the position of Bergstrand and Egger (2007), Checchi et al. (2007) argued that factor mobility exists for both human and physical capital through foreign capital flows. Their finding suggests that rather than FDI-associated physical capital driving human capital, FDI and associated physical capital are attracted by existing human capital. Further evidence revealed that combining human and foreign capital stocks generates a stable equilibrium path. Moreover, Ahmed (2012) suggests that empirical evidence from Malaysia does not support the importance of physical capital investment associated with FDI inflows to promote human capital development, as the study found a negative relationship between both.

FDI and national human capital development

The macro supply-side effect of FDI on human capital postulates that FDI inflow impacts human capital development through an overall national upgrade in the skills of the working population (Slaughter, 2002; te Velde, 2002; Subbarao, 2008:1). Accordingly, the FDI-associated upgrade in the skill and welfare of the labour force emanates from the rise in demand for skilled labour, which pushed workers to acquire

more skills and the rise in the host country's tax revenue due to MNEs activities that could incentivize investment in education (Slaughter, 2002; Checchi et al., 2007; Subbarao, 2008:1). The major empirical studies explaining the relationship between FDI and human capital development through this channel adopted the indicators of the World Bank Human Capital Development Index (HDI), which includes education, health and income, among others (Adefabi, 2011; Baghirzade, 2012; Kar, 2013; Yildirim and Tosuner, 2014; Azam et al., 2015; Gökmenoğlu et al., 2018; Kaulihowa and Adjasi, 2019).

The macro supply-side of FDI and human capital development appears popular in the literature. However, the findings remain inconclusive. While Blomström and Kokko (2002), Checchi et al. (2007), Subbarao (2008:1) and Bayar et al. (2020) acknowledged that FDI inflow into developing countries provides a platform for the growth of human capital, they also recognize that availability of skilled labour could as well be a driver of FDI inflows. The finding from Baghirzade (2012), using four HDI indicators – tertiary school enrolment, health expenditures, Gross National Income (GNI) and life expectancy – found that FDI inflows have positive effects on the four indicators considered in all Commonwealth of Independent States (CIS), except for Azerbaijan. This was motivated by the transiting condition of the economies having broken from the former Soviet Union, any form of investment at the time would materialize on macroeconomic variables. Similarly, Azam et al. (2015), using secondary school enrolment, reported that FDI inflows impact human capital positively for 34 developing countries. This finding is also supported by the Nigerian evidence provided by Otoighile, Raimi and Peluola (2018).

Nevertheless, Blomström and Kokko (2002) reported a mixed result across levels of education. While the impact of FDI is not evident on primary and secondary education, Blomström and Kokko found FDI to significantly impact tertiary education as the STEM needs of MNEs motivate the government and people's interest. Likewise, Kar's (2013) findings revealed that while higher education spending and educational institutes as human capital development proxies are correlated with FDI, only changes in student enrolment exhibit a weak unidirectional causal relationship with FDI, while FDI causes changes in student enrolment in India. Besides, Adefabi (2011) reported that the interaction of FDI and human capital development (HCD) generates a positive outcome on growth in Sub-Saharan Africa (SSA). However, there exists a weak effect of FDI and different measures of human capital on economic growth.

Following the reports of mixed findings across the data set, Kaulihowa and Adjasi (2019) attempted a non-linear analysis of the relationship between FDI and human capital, captured using enrolments at disaggregated levels of education in selected African countries. Despite assuming non-linearity, Kaulihowa and Adjasi also found mixed results across the level of education as the estimated model exhibits turning points. According to them, while the evidence does not support the effect of FDI on secondary education enrolment, the effect of FDI on primary education exhibits an inverted U-shaped relationship. At the same time, the relationship is U-shaped with tertiary education enrolment. In Nigeria, Gökmenoğlu et al. (2018) argued that more

than the growth implication of FDI in Nigeria, there are multiple facets to which FDI inflows benefit the host country, among which is the human capital development. Gökmenoğlu et al. (2018), as supported by Kheng et al. (2017), reported that there is a unidirectional causality between FDI and Gross National Income (GNI), while a long-run bidirectional causality exists between FDI and life expectancy in Nigeria.

Based on their findings, Yildirim and Tosuner (2014) argued that human capital development in the Central Asian Turkic Republics, as captured by the tertiary school enrolment rate, is not affected by FDI. Nembot-Ndeffo (2010) and Tsaurai (2015) reported similar findings on SSA and Austria, respectively. Nembot-Ndeffo (2010) found that FDI does not significantly impact human capital as captured by the percentage of children in full-time education in primary and secondary school. Meanwhile, Tsaurai (2015) reported, using the pupil-teacher ratio (secondary) as a proxy, that FDI does not have a causal relationship with human capital development. Nembot-Ndeffo (2010) further argued that the insignificance of FDI to human capital development in SSA countries is motivated by the relatively low level of FDI coming into the region. While there is a scarcity of evidence directly suggesting that FDI affects human capital negatively, Checchi et al. (2007) reported that the interaction of FDI-human capital negatively impacts GDP per capita.

B. Firm-level human capital development

The micro/firm-level supply-side effect of FDI on human capital claims that FDI inflow impacts human capital development through the direct efforts of the MNEs to upgrade the skills and welfare of their workforce (Slaughter, 2002; te Velde, 2002; Subbarao, 2008: 1). This follows from the fact that the labour factor is not entirely mobile, thus MNEs cannot import all their workforce. Therefore, MNEs provide job opportunities for skilled workers and necessitate upgrading the local workforce's skills to meet global standards and use more advanced technology, thereby supporting human capital development in the host country (Hale and Xu, 2016; Blomström and Kokko, 2002) empirically reported that FDI inflows promote human capital growth for East Asian and Latin American countries. They reported that the domestic employees' training resulting from MNEs' presence had improved host countries' education levels.

Giacchino (2006) computed a firm-level composite human capital development index for the Kenyan manufacturing sector using three variables: training expenditure, training mode and human development resource practices. Giacchino found that FDI inflows significantly impact human capital development. However, further evidence revealed that foreign firms have a greater advantage in benefiting from human capital development and firm-level capabilities' growth than locally owned firms.

Bruno et al. (2018), in a systematic meta-analysis on FDI knowledge transfer in emerging economies, proposed a new methodological framework that allows country- and firm-level effects to be combined. They found that country-level knowledge transfers are much larger in literature than firm-level ones by a factor of at least six. Moreover, the conditionality often attributed to FDI knowledge spillover to locally

owned firms is less significant than thought. More so, the findings from Nguyen (2021) stated that workers in locally owned firms become better off due to the presence of foreign firms due to the higher pay from MNEs, which incentivizes locally owned businesses to pay higher.

Gaps in the literature

Evidence on FDI and macroeconomic variables in Nigeria is not unpopular in the literature (Ekpo, 1997; Uwubanmwen and Ajao, 2012; Ayomitunde, Ganiyu, Sokunbi and Adebola, 2020; Adebayo, Onyibor and Akinsola, 2020). However, empirical research on FDI inflows and human capital development in Nigeria is scanty. Attempts from Akinlo (2004), Adegbite and Ayadi (2011), Nkechi and Okezie (2013) and Hussaini and Kabuga (2016) were channelled to determine the impact of FDI and human capital development on economic growth and other macroeconomic variables. Nevertheless, a close attempt by Gökmenoğlu et al. (2018) to understand the impact of FDI on human capital development in Nigeria considered human capital as one of the avenues FDI inflows impact the economy. Consequently, there is a dearth of Nigerian evidence across all the channels of transmitting the benefits of FDI inflows to human capital development.

The literature has established a strong correlation between FDI and human capital development. The deficiency in the empirical explanation of the impact of FDI inflows on human capital development in Nigeria motivates this research. This study seeks to take a micro/firm-level approach to investigate the effects of FDI inflows on human capital development in Nigeria. While it would be insightful to explore knowledge transfer, technology spillover, physical capital and national-level channels of transmitting FDI inflows to human capital development, the analytical processes involved are often based on secondary data, and implications are derived from distant indicators or proxies that do not adequately align the peculiarity of FDI and the nature of human capital development it generates. Therefore, firm-level assessment of the impact of FDI on human capital will give room to analyse how FDI inflows, in their true nature, have motivated improvement in the workforce, by extension, the Nigerian labour force.

Moreover, FDI inflows over the years have been dominated by resource-seeking investors, especially in the oil and gas sector. Due to the low job creation potential of the oil and gas sector, FDI inflows may not have the expected impact on human capital development (Adefabi, 2011; Nembot Ndeffo, 2010). The emerging inflows of foreign investments are diverging from the usual trend and are now aimed at other growth sectors, especially in technology, ICT, fintech and manufacturing. Therefore, it becomes worthy of exploring how the associated inflows of FDI and the different types affect human capital development and workers' economic prospects with a focus on manufacturing and ICT sectors.

4. Methodology

Theoretical framework

The endogenous growth model of Borensztein et al. (1998) and Alfaro et al. (2003) is the theoretical foundation for this study. Adopting a Cobb-Douglas production function, the model posited that FDI affects output level through the accumulation of human capital and technology spillover (see Equation 1).

$$Y_t = A_t H_t^{\propto} K_t^{1-\propto} \quad 0 <\propto< 1 \tag{1}$$

Y is the output level, *A* denotes exogenous factors affecting the level of productivity, *H* represents the stock of human capital, and *K* represents physical capital.

Accordingly, FDI inflows, including the setting up of foreign firms, play a vital role in accumulating capital goods. Borensztein et al. (1998) argued that foreign firms, especially those with a parent company in a developed economy, bring advanced technologies to developing countries. Domestic firms benefit from the process through a positive spillover of technology and knowledge by imitating and replicating the new technology from developed countries. As such, FDI is the optimal channel of transferring advanced technology, plus the increasing number of human capital stocks in the host country (Blomström et al., 1994; Checchi et al., 2007; Subbarao, 2008:2; Gandou and Sönmez, 2016).

$$F_t = F(n*/N, N/N*) \quad 0 <\propto< 1 \tag{2}$$

where,

$$\frac{\partial F}{\partial(\frac{n*}{N})_t} < 0 \; and \; \frac{\partial F}{\partial(\frac{N*}{N})_t} > 0 \tag{3}$$

Here, the number of varieties of capital is denoted by $N=n+n^*$, n^* is the number of FDI or foreign firms attracted to the country. Thus, the higher the number of FDI receiving firms coming into the country, the more productivity (human capital development) in the economy. Also, through technology and human capital development, foreign firms reduce fixed costs and increase labour productivity and the quality of goods produced.

Moreover, the stock of human capital plays an important role in imitating and absorbing FDI's spillover effects. As labour in the host country learned new skills and technical capabilities from the foreign firms, more indigenous firms sprung up and started competing in the market with foreign firms. This is because labour exposed to new technology or techniques replicates these skills through positive spillover in the host country. These personnel either set up their production line or use it to seek higher compensation in a similar firm (Görg and Greenaway, 2001; Slaughter, 2002; Branstetter et al., 2006; Tan and Azman-Saini, 2017). In all, the resultant impact of the FDI would be an increase in human capital stock in the host country.

Model specification

For this study, the size of FDI inflow into the sampled firms or sectors will be stated as the regressor or independent variable. This FDI inflow will further be classified by type to determine the impact on human capital development at the firm or sector level. Following Borensztein et al. (1998), human capital development will be estimated as a dependent variable, which is measured by the observed increase in workers' skill level, income level and staff retention rate of the organization.

The generalized econometric model is specified below:

$$\boldsymbol{HCD_{\partial,t} = \propto_0 + \propto_{1i,t} FDI_{i,\delta,t} + \propto_{2i,t} \gamma_{i,t} + \ + \varepsilon it} \quad (4)$$

HCD = Human Capital Development is composite variable for workers' skill development (SD), income restructuring (IR) and talent development (TD) of the organization.

FDI = Size of Foreign Direct Investment

∂ = Composite for workers' skill development (SD), income restructuring (IR) and talent development (TD) of the organization.

δ = Instrument variable for types of FDI received by the firm

γ = Instrument variable for various regulatory conditions influencing the impact of FDI on HCD.

i = Sector, manufacturing, ICT and other sectors

t = Time (year of FDI recipient)

To achieve the objectives of the study, the reduced form equation for each

component of the HCD - workers' skill development (SD), income restructuring (IR) and talent development (TD) of the organization, as stipulated by ∂, is specified as:

$$\boldsymbol{SD_{i,t}} = \propto_{\mathbf{0}} + \propto_{\mathbf{1}i,t} \boldsymbol{FDI_{i,\delta,t}} + \propto_{\mathbf{2}i,t} \boldsymbol{\gamma_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \quad (5)$$

$$\boldsymbol{IR_{i,t}} = \propto_{\mathbf{0}} + \propto_{\mathbf{1}i,t} \boldsymbol{FDI_{i,\delta,t}} + \propto_{\mathbf{2}i,t} \boldsymbol{\gamma_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \quad (6)$$

$$\boldsymbol{TD_{i,t}} = \propto_{\mathbf{0}} + \propto_{\mathbf{1}i,t} \boldsymbol{FDI_{i,\delta,t}} + \propto_{\mathbf{2}i,t} \boldsymbol{\gamma_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \quad (7)$$

SD = Workers' skill development

IR = Income restructuring

TD = Talent development

FDI = Size of Foreign Direct Investment

δ = Instrument variable for types of FDI received by the firm.

γ = Instrument variable for various regulatory conditions influencing the impact of FDI on HCD.

i = Sector, manufacturing, ICT and other sectors.

t = Time (year of FDI recipient).

Panel data specification

Based on model 4, panel data estimation is used to estimate the impact of FDI on human capital development in the host country. Panel data analysis investigates the dynamic behaviour of repressors to provide efficient repressor estimation. The advantage of this analysis is that it can estimate data using both time series and cross-section data. The main advantage of panel data is that it allows for more data observations, eliminating or reducing the risk of biased results (Kao and Baltagi, 2001). Panel analysis is estimated using three different models: pooled OLS, fixed effect, and random effect.

By pooling all observations in the OLS estimation and ignoring the dual nature of time series and cross-sectional data, the dependent variable's coefficients are assumed to remain constant across sections and time. As a result, the model is also known as the constant coefficient model (Gujarati, 2015). In the case of balanced panel data, where all cross-sectional data variables are constant and there are no

missing values, the fixed effect method is appropriate. The random effect method is a good estimator.

The error term is assumed to vary over time and industry in this case. The heterogeneity of the industries is ignored in the pooled OLS regression. The fixed effects Least Squares Dummy Variables (LSDV) model allows each observation to have its own intercept dummy and pools all the given observations.

Data collection

To capture different dimensions' impacts of FDI on human capital development, a survey was administered using face-to-face method. In doing this, questionnaires were administered to identified MNEs in the manufacturing and ICT sectors alongside those that have recently received foreign investments.

This quantitative approach will complement secondary data about the industry and key stakeholders. Integrating both data sources (primary and secondary) will provide a better understanding of the FDI and human capital relationship than using either of the sources alone.

Sampling considerations

Selection of study location

Budgetary and other resource constraints inevitably force us to draw samples from players in both industries. One way to ensure fair representation is to use administrative categorization based on industrial zones for the manufacturing sector and innovation hubs for the ICT sector. To select a location, we have considered the presence of a hub for commercial and industrial activities as a central and underlying theme critical to the industries' locations and establishment of ICT firms in any part of the country. Table 3 presents the selected States based on the presence of industrial diversity and IT innovation hubs. To balance the studies, Other sectors are introduced to check the robustness of results and examine the research findings with Other sectors of the economy, firms from Other sectors of the economy were also captured in the survey and analysis.

Table 3: The selected States in each zone

S/No.	Geopolitical Zone	State	Industrial and Economic Hub	IT Clustered Environment
1	Southern Nigeria	Lagos State	High	Yes
2	Northern Nigeria	Kaduna State	High	Yes

Table 4: Sampling considerations for key informant interviews and focus group discussions

S/No.	Study Target Group	Key Informants Interviews (KII)	Explanation
1	Foreign-owned manufacturing firms	20	These industries are Greenfield and market investments or M&A by foreign investors
2	ICT sector – IT firms	10	Foreign IT firms offering technical services to private and public sectors in Nigeria, such as Huawei, CISCO, MTN, etc
3	ICT sector – tech startup	20	Tech startup across industries that have received either Series A or Series B investment from Venture Capitalists and other foreign investors
4	Other firms	10	Firms in other key sectors of the economy, such as trade and finance, among others
Total		**60**	

5. Results and discussion of findings

This section presents results from the analysis of data collected through survey of firms in ICT, manufacturing and other sectors of the Nigerian economy. This section consists of two sub-sections – descriptive analysis and empirical analysis. The descriptive analysis explores the characteristics of the interaction between FDI and human capital development in Nigeria using graphical and tabular presentations. The empirical analysis explores econometric tools to understand the relationship between FDI and human capital development in Nigeria.

Descriptive analysis

Overall distribution of information/data

Having completed the survey process, 70 questionnaires were retrieved and analyzed. Eighteen firms (25.7%) each were interviewed in the ICT and manufacturing sectors. The remaining 34 firms (48.6%) interviewed represent the spread of firms across other sectors of the economy that have equally received foreign investment in the last 10 years.

Table 5: Distribution of firm (%)

	ICT	Manufacturing	Others	Total
Number of firms (%)	18	18	34	70
	(25.7)	(25.7)	(48.6)	(100)

Source: Author's Computation from Survey 2022

On the employment features of firms surveyed, the survey analysis indicates that majority of the firms (51.4%) has workforce strength of below 10 employees before receiving FDI. This is followed by firms with 11-50 and 51-100 employees, in that order. Interestingly, the survey analysis confirms the changes in employment dynamics that come with inflows of FDI in host countries as firms increase their employment strength.

Firms with employees of 501 and above increased from 2.9% before FDI inflows to 4.3% after FDI inflows of total companies surveyed. Also, firms with 101-500 employees increased from 2.9% before FDI inflows to 12.9% after FDI inflows. Likewise, firms

with 11-50 employees increased from 22.9% before FDI inflows to 34.3% after FDI inflows. Meanwhile, firms employing below 10 reduced from 51.4% before FDI inflows to 21.4% after FDI inflows due to changes in employment size following FDI inflows. This suggests that FDI inflows resulted in a significant increase in the number of firms with higher employee strength after the inflows.

Table 6: Employment analysis of firms (%)

	Number of employees before FDI inflows to your firm		Number of employees after FDI inflows to your firm	
	Number	%	Number	%
Missing	3	4.3	7	10.0
Below 10	36	51.4	15	21.4
11-50	16	22.9	24	34.3
51-100	11	15.7	12	17.1
101-500	2	2.9	9	12.9
501 & Above	2	2.9	3	4.3
Total	70	100	70	100

Source: Author's Computation from Survey 2022

The total amount of FDI received by these firms also differs in the last ten (10) years (Table 7). Thirty percent of the firms surveyed received FDI inflows that were less than US$ 100,000. This is followed by firms with FDI inflows of US$ 500,001-1 Million (22.9%) and US$ 1-10 million (21.4%). Some firms were also noted to have accumulated foreign investment inflows of more than US$ 10 million in the period under review.

Table 7: Size of FDI inflows (US$)

	Missing	0-100,000	100,001-500,000	500,001-1,000,000	1,000,001-10,000,000	10,000,000 & Above	Total
Number of firms (%)	5)0	21	9	16	15	4	70x
	(7.10	(30.0)	(12.9)	(22.9)	(21.4)	(5.7)	(5.7)

Source: Author's Computation from Survey 2022

B. Sectoral distribution of information/data

Based on the focus of this study, the sectoral analysis of data is important to enable the generation of valuable insights on dimension, impact and the interacting relationship between the key components of human capital development and FDI in Nigeria. Table 8 presents the sectoral distribution of FDI inflows into Nigeria in the last ten years. In the ICT sector, 38.9% received less than US$ 100,000 followed by 33.3%, which received US$ 500,001-1,000,000. A similar pattern is observed in the other sectors category, with less than US$ 100,000 accounting for 32.4% of firms that received inflows. This is followed by firms that received

US$ 500,001-1,000,000 and US$1,000,001-10,000,000 with 17.6% each. Due to the high capital-intensive nature of the manufacturing sector, FDI inflows of US$ 1,000,001-10,000,000 account for 44.4% followed by less than US$ 100,000 and US$ 100,001-500,000 with 16.7% each. Manufacturing and other sectors had 5.6% and 8.8% of firms, respectively, receiving FDI inflows of more than US$ 10 million in the last decade.

Table 8: Industry and size of FDI inflows (%)

	Size of total FDI (US$) received by your firm over the past 10 years				
Industry	**0-100,000**	**100,001-500,000**	**500,001-1,000,000**	**1,000,001-10,000,000**	**10,000,000 & Above**
ICT	38.9	22.2	33.3	5.6	-
Manufacturing	16.7	16.7	11.1	44.4	5.6
Others	32.4	5.9	17.6	17.6	8.8

Source: Author's Computation from Survey 2022

The survey also shows that most of the ICT, manufacturing and other firms received significant inflow of FDI in the previous year (2021) and spread across various sizes of inflow. The analysis shows that 55.6% and 50.0% of ICT firms indicated an inflow of foreign investment between US$ 100,001-500,000 and US$ 500,001-1,000,000, respectively, in year one. Similarly, 22.2% and 50.0% of manufacturing firms surveyed reported that they received ranges of US$ 100,001-500,000 and US$ 500,001-1,000,000, respectively, in year one. In Other sectors, the firms considered also received the highest intensity of FDI inflow in year 1 in the higher scale (US$ 500,001-1,000,000 and Above US$ 10 million). The survey shows that 61.8% of firms in other sectors received FDI inflows in the range of US$ 500,001-1,000,000, 44.1% of these firms received the highest value of FDI inflow of above US$ 10 million, and 23.5% these firms received FDI valued at US$ 1-10 million in this particular year.

On the impact of these FDI inflows on employment size of investment-receiving firms, Table 9 shows that there is a positive impact of these investments on the workforce expansion of firms across sectors in Nigeria. In the ICT sector, all employment bands experienced expansion of their workforce, aside from the 501 and above band, which has zero firms. The most profound change is experienced in the employment band of below 10 (a decrease from 66.7% to 27.8%), while the 11-50 employment band increases from 22.2% to 50.0%. The employment band of 101-500 also increased from zero to 5.6% after receiving investments. In the Manufacturing sector, the number of firms with the lowest share of employment – below 10 employment band – and 51-100 employment band decreased after receiving FDI from 33.3% each to 5.6% and 27.8%, respectively. The employment share is redistributed, as the number of firms with employment band of 101-500 increased from zero to 27.8% share after receiving FDI inflows.

Table 9: Impact of FDI inflows on employment by industry (%)

		Size of Employee Before FDI	Size of Employee After FDI	Impact of FDI on employment
ICT	Below 10	66.7	27.8	Decrease
	11-50	22.2	50.0	Increase
	51-100	5.6	11.1	Increase
	101-500	-	5.6	Increase
	501 & Above	-	-	
Manufacturing	Below 10	33.3	5.6	Decrease
	11-50	22.2	22.2	Constant
	51-100	33.3	27.8	Decrease
	101-500	-	27.8	Increase
	501 & Above	-	-	
Others	Below 10	52.9	26.5	Decrease
	11-50	17.7	32.4	Increase
	51-100	11.8	11.8	Constant
	101-500	5.9	8.8	Increase
	501 & Above	5.9	8.8	Increase

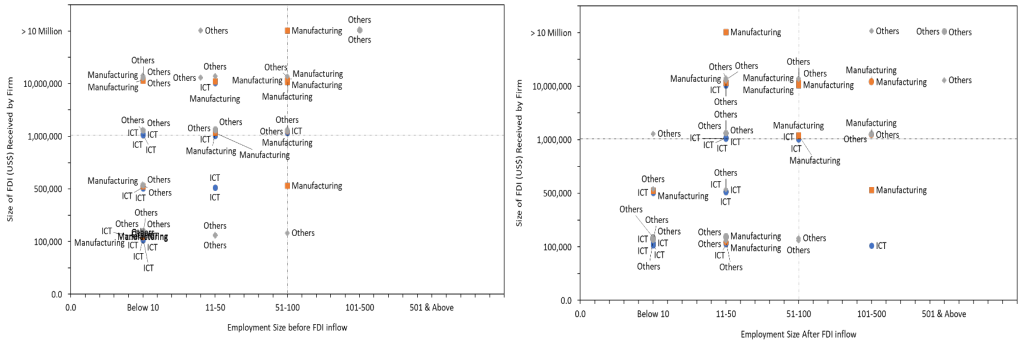
Source: Author's computation from Survey 2022 **Impact Indicators: Positive Neutral**

Employment dynamics in the other sectors have a similar trend as observed in the ICT and manufacturing sectors because the distribution of employment changes in favour of the higher employment band. Aside from the employment band 51-100 employees, all other workforce bands experienced positive impacts of FDI on their capacity to create more jobs.

As anticipated, with the influence of the size of FDI on the components of HCD, there is a significant drifting of firms to high employment bands triggered by the size of the FDI received. Figure 3A indicates that more firms across sectors clustered around three employment bands – below 10, 11-50 and 51-100 employees. Only a few firms in other sectors had workforce strength in the 101-500 employment band. Upon the receipt of FDI inflow, the employment dynamics of these firms changed, with more firms moving towards higher employment bands. The impact is more visible in the ICT sector, where more firms are moving to the 51-100 employment band from a huge clustering within below 10 and 11-50 employment bands before the inflow of FDI (Figure 3B).

Some manufacturing firms also expanded their workforce towards the highest employment band, with 27.8% of players in the sector moving to 101-500 from zero percent prior to the FDI inflow. These changes are observed with FDI inflows between US$ 100,000-500,000 and US$ 1-10 million. A similar effect is observed with employment dynamics in the other sectors.

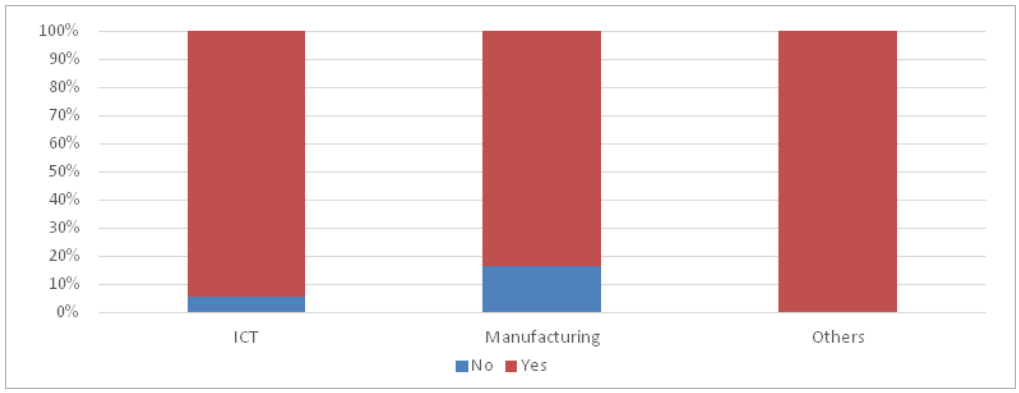
Figure 3: Firm's employment by the size of FDI inflow in Nigeria
(a) Employment before FDI inflow (b) Employment after FDI inflow



Data: Survey, 2022 Chart: NESG Research

Figure 4 presents the response of firms on their experience of FDI inflow on human capital development activities. Majority of the firms indicated that FDI inflow is a significant contributor to strengthening the various human capital development of the firm. In the ICT and other sectors, 94.4% and 100.0% of firms reported that FDI inflow significantly contributes to human capital development. About 83.0% of manufacturing firms surveyed indicated that FDI inflows contributed to their human capital development programme. The lower value here is likely the case for resource-seeking manufacturing FDI that relies heavily on technology and technical personnel of the country of origin to execute major parts of their operational activities.

Figure 4: Do you consider FDI investment inflows as a significant contributor to human capital development (%)



Data: Survey, 2022 Chart: NESG Research

On the importance of FDI to various components of human capital development considered in this study, most firms across sectors agreed that FDI is important to staff skills development and training, income/wages structuring and talent development programmes. For the ICT and Manufacturing sectors, FDI is considered important for staff development and training (83.3% and 33.3%, respectively) and income/wages

structuring (22.2% and 50.0%, respectively), and less important for talent development programmes. In the other sector, FDI is considered important for all components of human capital development.

Table 10: Importance of FDIs to components of HCD by industry (%)

	Not important	Less important	Neutral	Important	Very important
ICT					
Staff Skills Development and Training	5.6	0.0	5.6	83.3	0.0
Income/Wages Structuring	5.6	5.6	27.8	22.2	0.0
Talent Development Programme	16.7	16.7	5.6	16.7	11.1
Manufacturing					
Staff Skills Development and Training	0.0	16.7	38.9	33.3	22.2
Income/Wages Structuring	0.0	16.7	44.4	50.0	5.6
Talent Development Programme	22.2	27.8	33.3	16.7	0.0
Others					
Staff Skills Development and Training	0.0	2.9	5.9	64.7	23.5
Income/Wages Structuring	0.0	0.0	2.9	61.8	8.8
Talent Development Programme	2.9	8.8	2.9	32.4	2.9

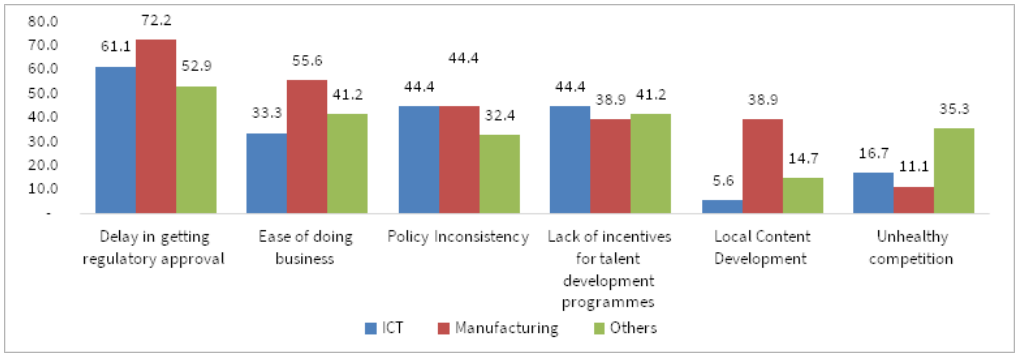
Source: Author's Computation from Survey 2022

In closing this section, an attempt is made to identify some factors limiting the contribution of FDI to human capital development in Nigeria. The challenges with getting regulatory approval and other problems of ease of doing business were identified by firms across sectors. The survey shows that 61.1% and 72.2% of firms in the ICT and the manufacturing sectors, respectively, identified issues with getting regulatory approval as a challenge that limited their contribution to human capital development. In Other sectors, 52.9% identified this challenge as a major limitation to human capital development.

Other critical challenges with higher intensity across sectors include the problem with the ease of doing business, policy inconsistency and limited incentives to organize talent development programmes to enhance human capital development in the country.

Local content development is a major challenge to FDI in manufacturing, while unhealthy competition played out more in the Other sectors of the economy. The high figure of local content development challenges in manufacturing is due to the legal and regulatory framework, stipulating that a portion of the workforce in the industrial sector, including manufacturing, must be locals or nationals of Nigeria. As good as this regulation is, it becomes a challenge for the firm if the required skill level or professionals are scarce in the country. As a result, it affects the performance and other operational activities of these firms.

Figure 5: Factors affecting human capital development potential of FDI (% of respondents)



Data: Survey, 2022; Chart: NESG Research

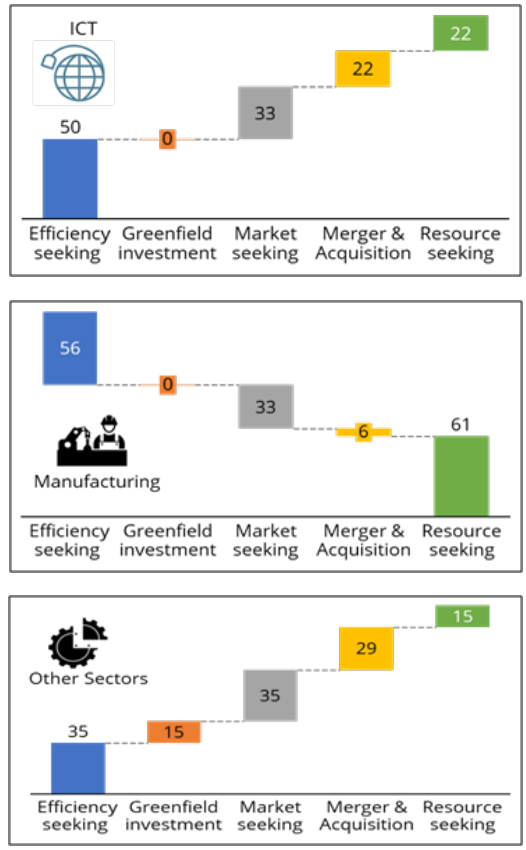
C. Types of FDI inflows by industry

FDI investments in a host country are influenced by a lot of factors, including location advantage, the presence of a large market, and resource abundance, among others. As a result, information is sought on what types of foreign investments surveyed firms received. As illustrated in Figure 6, majority of foreign investments in these sectors were geared towards efficiency-seeking (50% in ICT, 56% in manufacturing and 35% in other sectors). Instructively, this shows that many of these investments are aimed at improving the performance of the targeted firm.

In addition, market-seeking and merger and acquisitions are also popular among the firms surveyed for this study. Aside from manufacturing with a few merger and acquisition deals, these FDI inflows – merger and acquisition – account for more than 20% of investments received in the last five years in Nigeria.

Resource-seeking FDI is also very high in the manufacturing sector. This is clearly understandable due to the

Figure 6. Investment Types by Industry (% of Respondents)

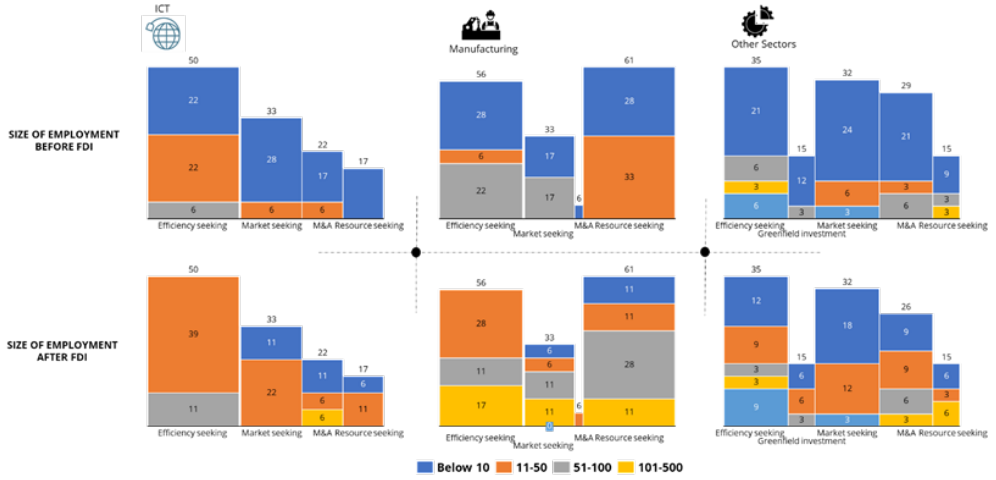


Data: Survey, 2022 Chart: NESG research

presence of huge mineral deposits in Nigeria. However, there is also a higher portion of these types of investment in ICT, mainly driven by the presence of a huge tech-skilled workforce in Nigeria. This conclusion on the high-skilled tech workforce can be strengthened by the presence of major technology corporations such as Google, Microsoft, IBM, Cisco and Huawei, among others, in Nigeria.

As noted by Utama (2012), there are varying impacts of types of FDI investment in employment and human capital development components in a host country. Figure 7 indicates that efficiency-seeking FDI triggered a moderate to a higher layer of employment band as postulated by the highlighted nature of the relationship between human capital and FDI types in Table 1. Both market-seeking and greenfield investments also engendered higher employment. The impacts are observed in both ICT and manufacturing sectors. Essentially, there is an appropriate spread to higher employment bands with market-seeking FDI in the Manufacturing sector. Whereas this type of investment in ICT only resulted in a step-higher movement in employment band – 28% of ICT firms had less than 10 employees prior to investment, which reduced to 11%, and 11-50 employees increased to 22% from 6% after receiving this type of investment (market-seeking).

Figure 7: Impact of class of FDI on employment size by industry (% of respondents)

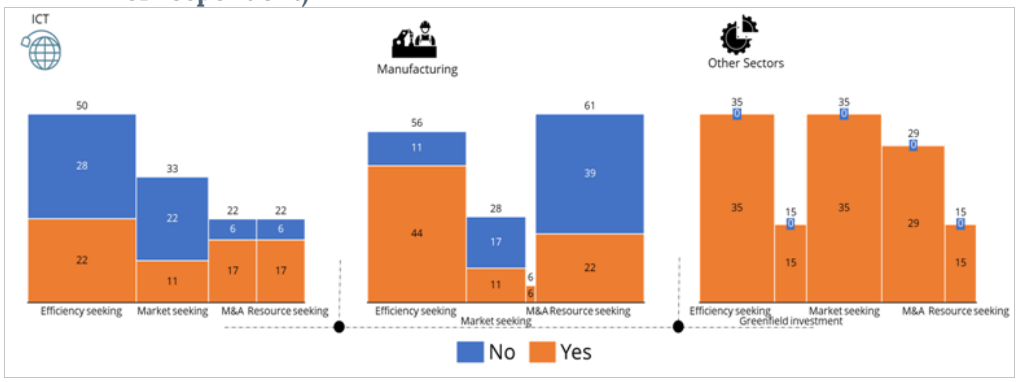


Data: Survey, 2022 Chart: NESG Research

D. Human capital development and types of investments

To distil the importance of types of investment on human capital development at the firm level, Figure 8 highlighted that most of the firms confirmed the postulation of Utama (2012). Across the sectors, Efficiency-seeking FDI is found to be important for human capital development. Other types of FDI reported to have a high impact on human capital development across sectors in Nigeria are Market-seeking and Resource-seeking FDI. Meanwhile, merger and acquisition significantly impacts human capital in the ICT and other sectors, while the impact is low in the manufacturing sector.

Figure 8: Importance of human capital development and types of investment (% of respondent)



Data: Survey, 2022 Chart: NESG Research

Disaggregation of human capital development components showed that staff skills development and training are important considerations for all types of FDI. This is most significant in efficiency-seeking FDI, as highlighted in Figure 9. The condition of service, proxied by income/wage restructuring, is also considered in merger and acquisition, Market-seeking and resource-seeking FDI. These results indicate that FDI-seeking market expansion in the host country motivates these firms to get more qualified personnel from the labour market to quickly achieve the aim of the investments.

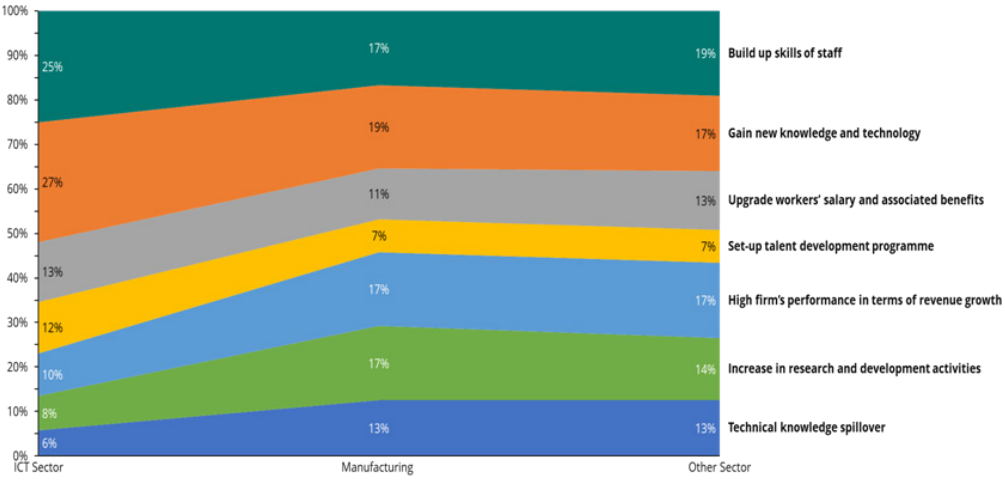
Figure 9: Component of HCD by investments by types (%)

Data: Survey, 2022 Chart: NESG Research

Overall, the accumulative impact of these FDI inflows was assessed beyond the three core components of human capital development considered in this study. Across sectors, building staff skills and gaining new knowledge and technology were identified as the most significant benefits by firms in Nigeria. ICT and other sectors noted an increase in staff condition; i.e., salary and associated work benefits (13% in both sectors). Instructively, manufacturing and other sectors of the economy hinted that there is a technical knowledge spillover (13% of firms in each sector).

The technical knowledge spillover in ICT was noted to have the lowest rate (6%). As noted earlier, Nigeria is considered to have a huge supply or availability of high-tech skilled workforce. Therefore, this could be valid to this assertion and contributes to the low technical knowledge spillover benefits from the FDI inflows received by the sector.

Figure 10: Impacts of FDI on other components of HCD by industry



Empirical analysis

Descriptively, it has been established that FDI inflows motivate changes in the structure of the labour force across different FDI-receiving firms in Nigeria. This section will further pry into the empirical relationship that exists between FDI and human capital development across different types of FDI inflows and human capital indicators.

Table 11 presents the Pairwise correlation result. It reveals that human capital indicators, as measured by skills level, income and talent, are correlated, especially with income. As a human capital development measurement, income positively correlates with skills and talent. Meanwhile, the correlation between skills and talent is not statistically significant, as the p-value of the correlation between them is greater than 0.1. But then, aggregately, all the measures of human capital development and the type of FDI correlate with the composite measure of human capital development (aggregating skills, income and talent). Besides, the size of FDI is correlated with skills, but inversely, while the type of FDI positively correlates with talent. Moreso, skills and income are correlated with the measure of the interaction of FDI and human capital development at the firm level. In summary, the correlation analysis emphasizes the potential importance of FDI on skills and income.

Table 11: Pairwise correlations

Variables	(1) HCDSkills	(2) HCDIncome	(3) HCDTalent	(4) Industry1	(5) SizeoftotalFDI1	(6) TypesofFDI1	(7) HCD	(8) FDIHCD1
(1) HCDSkills	1.000							
(2) HCDIncome	0.211*	1.000						
	(0.080)							
(3) HCDTalent	0.193	0.277**	1.000					
	(0.110)	(0.020)						
(4) Industry1	-0.065	0.020	-0.146	1.000				
	(0.596)	(0.870)	(0.236)					
(5) SizeoftotalFDI1	-0.234*	-0.028	0.090	-0.140	1.000			
	(0.065)	(0.827)	(0.484)	(0.279)				
(6) TypesofFDI1	-0.015	0.285	0.337*	-0.189	-0.185	1.000		
	(0.943)	(0.177)	(0.107)	(0.375)	(0.410)			
(7) HCD	0.271**	0.514***	0.618***	-0.049	-0.136	0.346*	1.000	
	(0.023)	(0.000)	(0.000)	(0.694)	(0.289)	(0.098)		
(8) FDIHCD1	0.394***	0.244**	0.173	-0.157	-0.012	0.053	0.172	1.000
	(0.001)	(0.042)	(0.152)	(0.200)	(0.925)	(0.805)	(0.155)	

A. FDI and composite human capital development

This study proceeds to establish the impact of FDI on the aggregated human capital development indicator across sectors of interest. The empirical analysis further considers the impact of the presence or absence of regulatory factors in the relationship between FDI and human capital development.

In the ICT sector (Table 12), the analysis shows that aggregated FDI does not impact composite HCD, irrespective of the effect of regulatory factors. At a disaggregated level, FDI types such as efficiency-seeking and market-seeking become statistically significant in impacting HCD in the ICT sector, while others considered in the analysis (Merger & aquisition and resource-seeking FDIs) have no impact. At a 0.01 p-value, efficiency-seeking FDI positively impacts HCD; however, the relationship is not statistically significant when accounting for regulatory factors. On the second note, the analysis revealed that market-seeking FDI has a negative impact on HCD in the ICT sector. The negative impact of market-seeking FDI is reinforced when the role of regulatory factors is being considered. Among many regulatory factors, the lack of regulatory incentives constituted the major reinforcer of the negative impact of Market-seeking FDI on HCD in the ICT sector. These findings suggest that the type of FDI matters for the relationship between FDI and HCD in the ICT sector in Nigeria.

In the Manufacturing sector, the situation is slightly similar to the ICT sector, as evidence suggests no statistically significant relationship between FDI and composite HCD (see Table 13). However, at a disaggregated level, Efficiency-seeking and Resource-seeking FDIs become statistically significant in impacting HCD in the Manufacturing sector. Efficiency-seeking FDI exerts a positive impact on HCD when the role of regulatory factors is accounted for. In contrast, the absence of regulatory factors in the analysis makes the relationship statistically insignificant. Likewise, Resource-seeking FDI positively impacts HCD as the consideration of regulatory factors in the analysis strengthens the relationship. These findings are intuitive, especially with respect to resource-seeking FDI, as many manufacturing MNEs seek to take advantage of Nigeria's diverse natural resource endowment. Furthermore, while the result did not emphasize any regulatory factor as important, it suggests that the regulatory environment plays a vital role in the relationship between the types of FDI and their impact on HCD.

On the contrary, the findings in the Other sectors show that FDI negatively impacts composite HCD, reiterated by the consideration of regulatory factors. This finding appears unintuitive; however, at a disaggregated level, Efficiency-seeking and Market-seeking FDIs become statistically significant in impacting HCD in the Other sector. Moreso, both efficiency-seeking and market-seeking FDIs positively impact Other sectors of the economy. This continues to emphasize that understanding the relationship between FDI and human capital requires a disaggregated approach, as a lump up macro analysis will not yield any empirical benefit.

Table 12: Impact of FDI on composite human capital development (HCD)

	ICT		Manufacturing		Others	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	0.013	0.25	0.098	-0.111	0.777***	1.119***
FDI	-0.013	0.017	-0.043	-0.016	-0.123**	-0.165***
Efficiency-seeking	0.002***	-0.21	0.043	0.241*	0.498**	-0.034
Market-seeking	-0.008*	-0.409*	-0.04	0.000005	0.387*	0.000004
Merger and Acquisition	0.0002	-0.368	0.00004	0.063	0.00003	-0.353
Resource-seeking	0.26	0.00003	0.261*	0.464**	0.531	-0.029
Regulatory Factors						
Delay in Registration Approval		0.127		0.11		0.355***
Ease of Doing Business		0.163		0.151		0.099
Policy Inconsistency		0.111		0.068		-0.335**
Lack of incentives		-0.387**		-0.361		0.345**
Local content requirements		0.096		0.079		-0.006
Unhealthy competition		0.04		0.051		0.048
R-Square	0.275	0.653	0.282	0.649	0.478	0.866

*** p<0.01, ** p<0.05, * p<0.1

B. FDI and skills development

Having considered the impact of FDI and its types on human capital development at the composite level, this study examines the impact of FDI on decomposed human capital development. Across all the sectors considered, particularly ICT and Manufacturing sectors, aggregate FDI does not impact skills development (see Table 13). However, at the disaggregated level, some relationships exist. Only resource-seeking FDI impacts skills development In the ICT sector, and the relationship is positive. This contradicts the findings from the composite HCD analysis where resource-seeking FDI is insignificant to HCD in the ICT sector. With a growing tech-savvy youth population, this finding points to how foreign IT organizations tap into the human source of Nigeria, as observable in the growing funding for tech startups. In the manufacturing sector, only efficiency-seeking FDI impacts skills development, exhibiting a positive relationship. Meanwhile, none of the components of FDI impact skills development in Other sectors. Furthermore, the evidence reveals that the role of regulatory factors is insignificant in the relationship between FDI and skills development, irrespective of the type. This suggests that MNEs are in complete control of the decision to improve their workforce's skill sets and capacity.

Table 13: Impact of FDI on skills development

	ICT		Manufacturing		Others	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	0.027	0.615*	0.222	0.345	0.527	0.991
FDI	-0.012	-0.081	-0.099	-0.042	-0.012	0.046
Efficiency-seeking	0.137	-0.169	0.474*	0.089	-0.113	0.0000004
Market-seeking	0.322	0.00008	0.243	0.0000009	-0.178	0.251
Merger and Acquisition	0.00006	-0.435	0.00009	-0.169	0.000003	0.01
Resource-seeking	0.753**	0.51	0.025	-0.549	-0.247	0.046
Regulatory Factors						
Delay in Registration Approval		-0.018		-0.105		0.478
Ease of Doing Business		-0.26		0.215		0.144
Policy Inconsistency		-0.278		0.355		-0.412
Lack of Incentives		0.238		0.017		0.089
Local Content Requirements		-0.265		0.082		0.177
Unhealthy Competition		0.322		-0.475		0.201
R-Square	0.323	0.521	0.257	0.446	0.027	0.266

*** p<0.01, ** p<0.05, * p<0.1

C. FDI and income structuring

The relationship between aggregated FDI and income structuring is similar to skills development. As revealed by the analysis, aggregated FDI does not impact income structuring in all the sectoral categorizations considered in this study (Table 14). Nevertheless, disaggregated FDIs exhibit some relationship with income structuring only in the ICT sector. The result shows that Efficiency-seeking FDI positively impacts income structuring in the ICT sector only when regulatory factors are accounted for, while it does not impact in the absence of regulatory factors. Also, Resource-seeking FDI positively impacts income structuring in the ICT sector, which is strongly buttressed when the role of regulatory factors is considered. This further reiterates the findings from the skills development analysis in the ICT sector. To take advantage of Nigeria's tech-savvy human resources, the tech MNEs offer better-structured income packages. Again, the lack of incentives is the major regulatory factor that impacts the relationship between FDI types and income structuring in the ICT sector. However, in the manufacturing and other sectors, none of the types of FDI impacts income structure.

Table 14: Impact of FDI on income structuring

	ICT		Manufacturing		Others	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	0.098	-0.111	0.081	-0.029	-0.033	-0.037
FDI	-0.043	-0.016	-0.036	-0.023	0.014	0.021
Efficiency-seeking	0.043	0.241*	0.161	0.095	-0.014	-0.114
Market-seeking	-0.04	0.000012	-0.033	0.000054	0.013	0.0000041
Merger and Acquisition	0.0000001	0.063	0.00034	0.039	0.00012	0.044
Resource-seeking	0.261*	0.464**	0.009	-0.015	0.246	-0.143
Regulatory Factors						
Delay in Registration Approval		0.11		0.044		-0.023
Ease of Doing Business		0.151		-0.035		0.312*
Policy Inconsistency		0.068		0.052		0.142
Lack of Incentives		-0.361**		0.064		0.178
Local Content Requirements		0.079		0.13		-0.176
Unhealthy Competition		0.051		0.031		-0.309
R-Square	0.282	0.649	0.131	0.276	0.222	0.466

*** p<0.01, ** p<0.05, * p<0.1

D. FDI and talent development

Contrary to other measures of human capital development, aggregated FDI exhibits a statistically significant impact on talent development in Nigeria's ICT and Manufacturing sectors, leaving out Other sectors entirely (Table 15). The results of the analysis show that aggregated FDI positively impacts talent development in the ICT sector only when regulatory factors are accounted for, while the impact is not statistically significant in the absence of regulatory factors. At the decomposed level, the result shows that only Resource-seeking FDI positively impacts talent development, while the impacts of other types of FDI are insignificant. The positive impact of Resource-seeking FDI is further strengthened by considering the impact of regulatory factors, with the lack of incentives being a major regulatory factor in the relationship.

In the Manufacturing sector, FDI negatively impacts talent development. The relationship is, however, weakened when the role of regulatory factors is considered. Decomposing FDI into different types, the analysis reveals that Efficiency-seeking, Market-seeking and Resource-seeking FDIs positively impact talent development in the Manufacturing sector, contrary to the findings on the aggregated FDI. The role of regulatory factors rubs off on the relationship, as only Resource-seeking FDI becomes

significant when the analysis takes into account the regulatory environment. In this regard, the most militating regulatory factors are Ease of Doing Business, delay in registration approval and lack of incentives in that order.

Table 15: Impact of FDI on talent development

	ICT		Manufacturing		Others	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Constant	-0.179	0.241	0.087	0.098	0.527	0.991
FDI	0.08	0.101*	-0.123**	-0.043	-0.012	0.046
Efficiency-seeking	0.045	0.283	0.498**	0.043	-0.113	0.0000004
Market-seeking	0.073	0.000034	0.387*	-0.04	-0.178	0.251
Merger and Acquisition	0.0000021	-0.087	0.99992	0.000024	0.000003	0.01
Resource-seeking	0.48**	1.063***	0.531**	0.261*	-0.247	0.046
Regulatory Factors						
Delay in Registration Approval		0.133		0.137***		0.478
Ease of Doing Business		-0.176		0.229***		0.144
Policy Inconsistency		-0.147		0.073		-0.412
Lack of Incentives		-0.634**		-0.157**		0.089
Local Content Requirements		0.294		-0.063		0.177
Unhealthy Competition		0.284		-0.114		0.201
R-Square	0.361	0.654	0.213	0.478	0.027	0.266

*** p<0.01, ** p<0.05, * p<0.1

6. Conclusions and policy recommendations

Multinational Enterprises (MNEs) are naturally endowed with knowledge assets that they deploy to their advantage in foreign countries. These knowledge assets are often transferred to host countries in their operations and interaction with markets. In Nigeria, FDI inflows have been identified as major sources of technology, managerial, and technical know-how spillover. Moreover, the recent trend in FDI inflows is becoming sensitive for human capital development in Nigeria. Therefore, this study sought to investigate the impacts of FDI on human capital development and the economic prospects of workers in the Manufacturing and ICT sectors in Nigeria and highlighted the country-specific recommendations to adequately internalize FDI spillover effects on Nigeria's human capital development.

The stylized fact highlighted that despite the recognized importance of FDI in Nigeria, FDI inflows have been persistently subdued since the global financial crisis. Moreso, it has fallen behind Egypt and Ethiopia as the favourite investment destination in Africa despite having the largest GDP in the continent. Interestingly, there is a diverging trend of recent FDI inflows into Nigeria in favour of technology, ICT, and Manufacturing (away from the resource-seeking Oil and Gas sector) with favourable implications for human capital development.

The survey findings confirmed that FDI inflows impact human capital development in Nigeria. Meanwhile, the impact of FDI on human capital development in Nigeria depends on the kind of FDI. Specifically, this study found that efficiency-seeking FDI is the most significant type of FDI for human capital development in Nigeria. Other types of FDI considered for high impact on human capital development include merger and aquisition and resource-seeking FDIs. Nevertheless, there are varying impacts of types of FDI investment in employment and human capital development in Nigeria.

The econometric analysis substantially substantiates insights from the descriptive analysis. The econometric analysis emphasized that the impact of FDI on human capital development in Nigeria depends on the type of FDI, the kind of human capital measure, and sector. This is because an aggregated and composite analysis of the relationship between FDI and human capital development yields little to no benefit for understanding the relationship. Furthermore, the findings on composite human capital development revealed that Efficiency-seeking FDI positively impacts human capital development across all sectors of the economy, while the relationship varies

across other types of FDI. Instructively, the findings from the econometric analysis suggest that M&A does not impact human capital development across sectors or measures of human capital.

At the decomposed level, Resource-seeking is the only type of FDI that impacts skills, income and talent in the ICT sector. In the manufacturing sector, efficiency-seeking FDI impacted skills development, while Efficiency-seeking, Market-seeking and resource-seeking FDIs impacted talent development. But then, none of the types of FDI impact income structure in the Manufacturing sector. Moreso, the role of regulatory factors is strongly emphasized in the relationship between FDI and human capital development across the sectors. The most emphasis is on the lack of incentive despite the government's 80% local content requirement.

The policy implication from this study re-emphasizes the need for further improvement in the regulatory environment, general ease of doing business and incentives to organize talent development programmes to enhance human capital development in the country. The following are policy recommendations for Nigeria to unlock the benefits of FDI for human capital development:

(i) **Invest in education and training:** The government needs to invest in education and training programmes in Nigeria to enhance the workforce's skills, at the least to strengthen their basic capacity to fit into the workforce MNEs need. This also involves identifying the knowledge and skills needs for modern MNEs and identifying appropriate ways and investing in the same to imbibe such in the workforce. This is important as the learning process is fast evolving beyond conventional practice. Therefore, education policies will include developing specialized training programmes out of the conventional education system, strengthening the Technical and Vocation Education and Training (TVET), and restructuring the education system to deemphasize certification and emphasize skills and capacity development.

(ii) **Collaborate with foreign investors to develop training centres and talent development programmes:** The government needs to work with MNEs to support the labour force by providing specialized training programmes. The government needs to provide incentives for MNEs to hand down their knowledge resources and improve their human capital development practises through subsidies, tax incentives, and some sector-specific incentive programmes. For instance, the government can also tap into the benefit of the Free Trade Zones to negotiate human capital development packages that hinge on skills and talent development.

(iii) **Invest in research and development:** The government needs to create a specialized funding framework for supporting research and development activities. Research and development create a platform for creating, domiciling, and internalizing knowledge. The existence of research and development can attract foreign investors seeking to tap into new markets.

(iv) **Develop an industrial partnerships framework for knowledge transfer between foreign and domestic firms:** There is a need to promote partnerships between foreign and domestic firms to facilitate technology and knowledge transfer. The government needs to establish a framework that will allow for seamless interaction of domestic firms with MNEs to help build their workforce's skills sets and capacity.

(v) **Liberalize local content:** The emphasis on 80% local content serves as a disincentive for MNEs, which require a high level of technical skills to operate. With a relatively low level of skilled workforce in Nigeria, the government will need to liberalize (albeit partially) the local content rule of employment for FDI to encourage them to bring in people with transferable technical skills.

(vi) **Institute a favourable and competitive business environment:** The government needs to ensure that the business environment is conducive for MNEs and domestic firms to facilitate their competitiveness in the global market. This involves providing regulatory incentives, improving ease of doing business, improving policy consistency, reducing corruption, ensuring cheap access to finance, and strengthening the entrepreneurial climate.

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