HUMAN CAPITAL INVESTMENT AND INDUSTRIAL GROWTH IN NIGERIA

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Abstract: Human capital investment is widely acknowledged as a crucial driver of industrial growth, particularly in developing economies such as Nigeria, where the industrial sector remains underdeveloped despite abundant natural resources. This study investigates the relationship between human capital investment and industrial growth in Nigeria, with a focus on the manufacturing sectors. Drawing on Human Capital Theory, and Endogenous Growth Theory, the study examines the effects of human capital, composed of education, training, and workforce health and wellness as well as personal development on industrial productivity. Secondary data that were sourced from the World Bank Development Indicators (WDI) covering the period 1992- 2023, and the OLS regression estimation technique was employed for the study. The findings suggest that human capital has a positive and significant impact on industrial growth in Nigeria, while infrastructure development is positively related to industrial growth, albeit a weak impact due to poor infrastructure spending and lack of proper resource utilization in Nigeria. In view of the foregoing, it is suggested that there be increased spending/investment in human capital development, as well as infrastructure development and greater access to credit and finance to stimulate industrial growth and development in Nigeria.

Keywords: Human Capital, Industrial Growth, Infrastructure development, Economic, OLS.

1.   INTRODUCTION

In today's competitive and rapidly changing business world, organisations need to ensure maximum utilization of their resources to their own advantage; a necessity for organisational performance and industrial growth. Ample evidence has shown that organisations can create and sustain competitive position through management of non-substitutable, rare, valuable, and inimitable internal resources (Barney, 2019). Human Resource Management (HRM) has transcended from policies that gather dust to practices that produce results. Human resource management practices have the ability to create organisations that are more intelligent, flexible, agile and competent than their rivals through the application of policies and practices that concentrate on recruiting, selecting, training skilled employees and directing their best efforts to cooperate within the resource bundle of the organisation. This can potentially consolidate organisational performance and create a competitive advantage on account of the historical sensitivity of human resources and the social complex of policies and practices that rivals may not be able to imitate or replicate their diversity and depth (Bartol, & Srivastava, 2002; Hendry & Pettigrew, 2019).

Human resource management (HRM) entails the process of managing organization's human resource for the achievement of its objective, effectively and efficiently, and this, entails in particular, all efforts and strategies aimed at human capital investment. To this end, the human resource management (HRM) function, includes the conscious and strategic policy of developing its human resource through investments in human capital, training, acquisition of critical knowledge and skills, and relevant experiences necessary for driving industrial growth. Studies (see, for instance, Bartol, 2001; Barney, 2019, Collins, 2021) reveals that human resource management creates opportunities for employees, so that they can utilize their skills and abilities efficiently for the achievement of goals and objective of organization. Differences in human capital investment intensity, therefore explain variation in inequality of remuneration and organizational performance across firms or countries (Castelló-Climent & Doménech, 2004; Blomm, & Van- Reenen, 2010).

Several companies are dependent on their employees to gain advantage in the competitive market. Therefore, they are strongly related to the efficiency of their human resources and their human resources management (Collins, 2021). In these times of intense global competition and rivalry, the human

resource is considered as one of the most important factors used to enter or even manage to dominate the market (Byrne, 2015). This kind of resource plays a crucial role to maintain the organizations' sustainability, credibility as well as creation of public trust. According to Sheffi (2018), organisations especially in Africa have been hit with the undeniable fact that the creation of competitive advantage lies in people, and thus, human resource. Private sector organisations have increasingly recognized the potential for their people to be a source of competitive advantage (see Kaufman, 2013).

Lately, industrial sector organisations have focused on achieving superior performance through the best use of talented human resources as a strategic asset. HRM policies or strategies must now be aligned to business strategies for organisational success. No matter the amount of technology and mechanisation developed, human resource remains the singular most important resource of any success-oriented organisation. After all, successful businesses are built on the strengths of exceptional people. HRM has now gained significance academically and business wise and can therefore not be relegated to the background or left in the hands of non-experts. Human resources are an organization's most valuable asset; thus, it is essential to pay close attention to the individuals they have invested so much time and effort in selecting. Organizations, that have well equipped human resources have the capacity to gain more competitive edge in the market place among its competitors. For this reason, human capital investment or policies and strategies that give emphasis to investment in human capital are in better position to reap higher returns, profitability, growth and competitive edge (Raymond, 2021).

Achieving better corporate performance requires successful, effective and efficient exploit of organisation resources and competencies in order to create and sustain competitive position locally and globally. Organisations have increasingly acknowledged the fact that the company's human resources are very crucial and can be a unique source for achieving success. Organisational performance is derived from the idea of how efficiently and how flexible organizations are in managing their strategies in terms of tangible (capital) and non-tangible (employees) resources. It is vital for the organization to develop their non-tangible resources along with tangible resources. The underlying assumption is that human resources are the only variable that other organizations found difficult to imitate. However, managing, and investing in

human resource development is an arduous task of an organisation as human resources are the wealth of an organisation which can help in achieving its goals (Khan, 2010; Ruck, 2017).

Human capital development is an important factor that drives industrial productivity growth in and as a result, the role of human capital investment in industrial and organizational development has been a subject of empirical and policy discourse. The increased interest has been spurred by the availability of data on training, education and other investments in skills and knowledge. Studies on impacts on industrial productivity growth have increasingly shown that more than anything else, investments in human capital stimulates impacts on organizational performance, and that human resource is an inimitable asset of any organization. All over the world, the human resource is the most important asset of any organization or nation. This is why the preponderance of existing evidence have shown, and continue to show that variations in industrial /organizational growth is directly linked or correlated with differences in the level of human capital investment (Ozekhome, 2018).

This study utilizes the Ordinary Least Squares estimation techniques to examine the impact of human capital investment in Nigeria. The period of examination is important as it marked noticeable changes in both human capital investments in Nigeria and industrial, in addition to increased policy emphasis on the need to enhance human capital development for sectoral growth.

1.2. Statement of Problem

Industrial growth has been declining in Nigeria and in many organizations over the last decade. The decline is explained by many factors ranging from lack/insufficient investment in human capital, weak resource capacity, hostile operating environment, poor infrastructure amongst others. (Ozekhome & Braimah, 2024). Organizational /industrial growth cannot be stimulated without an efficient workforce, which itself is dependent on the level of knowledge, skills, and experiences the workforce possess, which of course is dependent on the level of investments in the human capital workforce (Ozekhome, 2018).

A number of studies report that human capital is positively associated with the organisational performance/industrial growth (Budhwar & Boyne,

2004; Khan, 2010). Despite the fact that the existing empirical evidence supports this positive effect, there is paucity of studies in the Nigerian context on the link between human capital investment and industrial growth, as most of the studies tended to have focus on the human resource role in organization, neglecting the place of investment in this inimitable asset of an organization. Ongoing evidence seems to be exploring again the positive linkage between the human resource investment and industrial growth, due to the aspiration to achieve business excellence and better profits. The emphasis on human resources as a valuable capital in organizations reflect their expectations to stress more on the intangible resources rather than tangible ones. While most of the evidence have been cross-countries studies or case-specific, they, however did not capture other determinants of industrial growth. In addition, most of these existing studies employed primary data, which are highly prone to subjectivity bias. It is the recognition of the foregoing gaps in the literature that provides the basis for this study as an additional contribution and value addition to the human capital investment-industrial growth nexus. Against this backdrop, the objective of the study is to examine the nexus between human capital investment and industrial growth in Nigeria, which to the best of the researcher's knowledge has not been sufficiently examined. Given that human capital development and other variables in this study are economy-wide or aggregate variables, this study is carried out at an economy-wide level, and thus cannot to be done either at cross-organizational or firm level cross-country level.

Aside the introduction, the remaining part of the paper is organized as follows. Section 2 reviews the literature. Section 3 presents the methodology of the paper. The results and discussion are presented in section 4, while the conclusion and policy outcomes are presented in section 5.

1.3. Research Questions

The research questions of this study are:

- What is the relationship between human capital investment and industrial growth in Nigeria?

- What is the impact of infrastructure development on industrial growth in Nigeria?

1.4   Objectives of the Study

- The specific goals objectives of this research include to;
- investigate the relationship between human capital investment and industrial growth in Nigeria.
- examine specifically, the impact of infrastructure development on industrial growth in Nigeria.

1.5.   Research Hypotheses

The following hypotheses, in their null forms, are stated for the research

- **$H_{01:}$** There is no significant relationship between human capital investment and industrial growth in Nigeria.
- **$H_{02:}$** Infrastructure development has no significant impact on industrial growth in Nigeria.

1.6.   Research Significance

Human capital resource, without doubt, is the most valuable and critical asset of any organization, enterprise or industry. As the driving force of productivity and industrial growth, the role of human capital investment is a recurring issue\ in theoretical, empirical, managerial and policy discourse. The importance of this research cannot be over-emphasized as it will provide empirical insights on the relationship between human capital investment and industrial growth, and in so doing, accords the human resource its prime place in organizational settings. Bearing this in mind, this study brings potential contribution to the field in three ways. To this end, the research will be of immense benefits to governments, well as regulators, investors/entrepreneurs/managers in the economy at large.

Specifically, the study will help government and policy makers in the formulation and implementation of appropriate policies aimed at enhancing the human capital, and by extension, human capital investment and industrial growth in Nigeria. To investors, entrepreneur's/ business owners/managers, the research will afford them enormous leverage to make informed business and investment decisions through greater attention on investing in the human workforce. Finally, the study will engender further research in the understanding and analysis of the relationship between human capital investment and organizational/industrial growth in Nigeria. The study is timely, current and

relevant given the realities of increased emphasis in developing and investing in the human capital for industrial and economy-wide growth in Nigeria.

2. LITERATURE REVIEW

2.1. Conceptual Review

Human capital investment (HCI) refers to the expenditure of resources, such as time, money, and effort to enhance the skills, knowledge, and abilities of individuals, with the expectation of improved productivity, performance, and well-being. It involves investment in people's skill, knowledge, education, training and other human capacities to improve their innate capacities and productivities and overall well-being (Bloom & Van-Reenem, 2010). Essentially, HCI includes investment in the acquisition of critical knowledge, skills, training as well as health development capacities. Increased investments in the human capital have the capacity to unlock employee's potential, make them more effective, efficient, productive and result-oriented (World Bank, 2018; OECD, 2001; 2019). A better and well-developed human capital enables organization to gain competitive edge in the market, adopt cost-effective measures and achieved enhance performance.

Types of Human Capital Investments

(i)   **Education and Training**: These include formal education, vocational training, apprenticeships, and on-the job-training

(ii)   **Health and Wellness**: These entail investments in physical and mental health, such as health care, fitness programs, and stress management.

(iii)   **Personal Development:** Investments in personal growth and development, such as mentoring, coaching, and leadership development programs.

(iv)   **Recruitment and Selection**: Investments in attracting, selecting, and hiring top talent or workforce,

(v)   **Employee Development**: It includes investment in employee growth and development, such as career development programs/trainings/workshops, succession planning, and performance management.

Some of the benefits of human capital investment include enhanced productivity, increased innovation, better and well-informed decision making, improved employee engagement, competitive advantage, amongst others.

Industrial growth, on the other hand, refers to the increase in the production of goods and services within a specific industry or sector, or over a given time period. It entails sustained rise in the capacity to produce goods and services, arising from improved human, capital and managerial capabilities. Industrial growth could imply productivity growth, which itself increased in the quantity and quality of goods and services produced and the quantity of resources needed to produce them (such as factor inputs like labour, capital and technology) (Okojie 1995; Roberts & Tybout, 1997; Eicher & García-Peñalosa, 2001; Adegboye 2014). Biatour and Dumont (2011) see productivity as a factor that provides an indication of technological efficiency; in terms of greater production of output, with respect to the same amount (and quality) of input factors, or a higher proportionate increase in output when inputs are increased. Productivity reflects the increase in output to the ratio of inputs employed. It is a measure of how resources are being brought together in organizations and utilized for accomplishing a set of results (Mali, 1978). Productivity connotes the attainment of the highest level of performance with the least expenditure of resources. It is conceived as the instrument for continuous progress, and of constant improvement of activities. Some of the indicators of industrial growth are:

(i) **Industrial Production Index**: As a measure of industrial growth, the industrial production index captures the changes in the volume of industrial production, such as manufacturing, mining, and construction**.**

(ii) **Growth rate of Industrial Output as share of Gross Domestic Product (GDP)**: This indicator measures the changes in the total value of goods and services produced within the industrial sector as a proportion of the GDP in a country

(iii) **Capacity Utilization Rate**: As a measure of industrial growth, the capacity utilization rate captures the percentage of industrial capacity that is effectively used to produce goods and services.

(iv) **Industrial Value Added**: It measures the value added by industries, such as manufacturing, construction, and services. Some of the factors influencing industrial growth, are technological advancements, infrastructure development, access to credit and finance, government

policies and regulations, skilled workforce, (Ozekhome & Braimah, 2024).

Infrastructure

Infrastructure is posited to have a positive relationship with human capital development and act as an intervening variable that influences its effectiveness. Infrastructure refers to the physical and organizational structures that are critical to for a society or economy to function effectively. Infrastructure includes transportation systems, such as roads, bridges, airports, public utilities, such as water, electricity, gas and telecommunications. Others include building and facilities, such as hospitals, schools, offices, road networks, railway, among others (World Bank, 2019).

Credit to Private Sector

Credit to private sector is posited to be positively related with human capital development and industrial growth. Credit to private sector refers to the proportion of credit and finance the private sector is able to borrow from formal financial institutions, such as deposit money banks for business and investment purposes. Since every economy is expected to be private sector-driven, the proportion of credit to the private sector is an indicator of access to loans and finance, and by extension, financial intermediation (Ozekhome, Esan & Okeowo, 2023).

2.2. Review of Literature

2.2.1 Theoretical Framework

2.2.1.1. Human Capital Theory: Human capital investment enhances industrial growth through the channels of efficiency, innovation, and greater productivity. This position is also supported by the human capital/ human capital investment theory by Schultz (1961), and Becker (1964). According to the theory, through improved methods of production and services, greater productivity, opening of new markets and industries as well cost-effectiveness is made possible. Through critical knowledge, skills, experience brought about by investments in the workforce, and hence, human capital industrial output is stimulated (Ozekhome, 2018). Accordingly, differences in organizational performance and industrial growth can be explained by differences in human

resource management and development practices across firms and countries (Blomm, & Van- Reenen, 2010). In the same vein, differences in the level of education, knowledge, skills and experiences also determine inequality in industrial or organizational remuneration (see also Frederiksens & Poulsen, 2010).

2.1.2. Endogenous Growth Theory

The theory suggests that investments in human capital, alongside physical capital, like infrastructure is essential for stimulating industrial output. The importance of human capital in promoting technological progress that further drives output growth is also emphasized by this theory. The Endogenous or new growth theory further asserts that investments in human capital leads to greater productivity, innovation, and output growth. This theory emphasized the role of human capital in the creation of knowledge, skills, and technological advancements that drive industrial growth (Romer, 1986, 1990; Helpman, 1992; Edward,1998). Thus, through skilled and educate workforce, productivity, output and industrial growth is enganced.

2.2.2. Empirical Review

There is a wide range of evidence explored on the positive linkage between the human resource development and organizational or industrial performance and growth, due to the aspiration to achieve business excellence and better profits. Empirical studies have consistently shown a positive relationship between human capital investment and industrial growth. For instance, a study on the role of human capital in Nigeria's industrial development by Adejumo, Olomola and Adejumo (2013) found that investments in human capital has a significant impact on industrial growth.

A study by Arora and Badge (2008) on 'Private investment in human capital and industrial development': A case study of the India software industry, using the OLS technique found that human capital investment is crucial for industrial growth. Other empirical studies, highlighted the crucial role of human capital in various industries, such as manufacturing.

A study on the Malaysia's manufacturing sector, by Karim and Shabbir (2012), for instance, found that human capital investment is a significant determinant of the sector's growth. In terms of empirical evidence, studies

have used different indicators to measure human capital investment, including educational attainment, training and development, and skilled labour. These studies (see for instance, Arora and Badge, 2008) have shown that higher levels of educational attainment are associated with higher industrial growth.

Similarly, Karim and Sahbbir (2012) found that investments in training and development programs have positive and significant impact on productivity and industrial growth. Also, the availability of skilled labour has been found to be a key determinant of industrial growth and development Arora and Badge (2008), OECD (2019), and better organizational wage remuneration (Stiglitz, 2010; Lavrinovicha, et al., 2015; Oluwabunmi, 2017). Some specific studies, utilizing primary data have examined the impact of human resource management (HRM) practices on organizational performance.

The purpose of this study therefore was to assess whether Guinness's human resource management practices, particularly recruitment and selection, Staff performance appraisal, compensation, and training and development practices influence its performance. Simple random sampling was used to select eighty employees from Guinness Nig. Plc. T-tests were carried out to examine the relationship between the selected Human Resources practices and organization performance. The results revealed that a positive relationship between effective recruitment and selection practices, staff training and development and organizational performance in Guinness Plc.

Gulzar (2016) carried out a study on HRM Practices and Its Impact on Organizational Performance in Private Sector Banks in Kashmir District, India. The research was based on self-administered questionnaire survey of total 384 employees. It consisted of 24 managers, 266 subordinates from JKB, 8 managers, and 86 subordinates from HDFC bank. The key HRM practices studied were general climate, culture, selection, job definition, career planning, training and development, performance appraisal and compensation. The finding revealed that HRM practices have strong impact on the organizational performance in banking sector.

Tukei (2016) examined the impact of human resource development on job performance and productivity growth in private organizations a case study of Kampala International University, Uganda based on sample of fifty respondents. The cross-sectional research design was utilized because the researcher intended to use a variety of knowledgeable respondents. Quantitative measures were

employed through the use of questionnaires. The findings revealed that human resource development through human capital investment is very vital in an organization as it helps employees to develop greater effectiveness and efficiency through delivery of the best knowledge and skills to the students.

Anwar and Abdullah (2021), for instance, using a quantitative research based on structured questionnaire survey of 240 respondents find that human resource management practices of training, recruitment and election positively impacts organizational performance. Human capital development involving people's level of education, skills, experiences, and talents as well as mental and health determine influence the level of productivity, effectiveness and efficiency. Enhanced knowledge and skill spurs innovation, which in turn leads to better production techniques and thus, greater quantity and quality of goods and services. Access to health and educational institutions drives output growth. Basic health and education are factors that affect a worker's performance (Singh, 2015; Sahoo & Sahoo, 2019).

The relationship between education- a proxy for human capital development and in a multivariate regression analysis on the impact of human capital on economic outcomes is positive in in Ekerem and Tugcu (2012). Increased years of schooling positively and significantly influences output (Ekrem & Tugcu, 2012). In a study, on the role of human capital accumulation on output growth in Nigeria, Ozekhome (2018), using the Generalized method of moments (GMM) found that human capital investment is an output growth driver. Other studies that found human capital investment as a critical factor that drives industrial output are UNDP (2022) and ILO (2024).

2.2.2.3. Gap (s) in Literature: Based on the review of the relevant and available literature, only few studies have examined the relationship between human capital investment and industrial growth, as opposed to the aggregate growth perspective. Besides, many of the existing studies tend to have been carried out in other climes and regions of the world, with very few of the studies done in Nigeria. Again, while many of the studies utilized primary data, the focus of this study is secondary data by means of the OLS multiple regression, which is able to evaluate the specific impact of human capital investment as well as the relevance of the other variables on industrial growth in Nigeria. Finally, while most studies used educational attainment or training and development or skilled labour as indicator to measure human capital

investment, this study uses a more holistic and encompassing composite index that accounts for investments in educational attainment, training and skills development and health and wellness to capture human capital investment. These constitute value-additions and further motivations in the literature by the current study, thus making it depart from other previous studies.

3. METHODOLOGY

3.1. Research Design

The overall research design is quantitative in nature as it seeks to utilize quantitative strategies and techniques in achieving the aim of the study. This involves analytical methods that involve the application of secondary data as well as analysis and interpretation of data, where policy inferences are drawn. Specifically, the study employs both the longitudinal and correlational research designs, within the time series approach. It is longitudinal in the sense that the variables are collected over a given time span. It is correlational because we seek to explore the relationship between human resource development/ human capital investment (independent variable) and industrial growth (dependent variable) investigation, as its this type of design aims to identify patterns, or relationships between variables. Also, it is correlational since we are not manipulating the independent variable, but observing existing relationships.

3.2. Data Collection

The data for this study are annual time series data covering the period 1992-2023. The variables are industrial growth, which is the dependent variable, and human capital development, which is the key explanatory variable of interest, while infrastructure development and credit to private sector are control or intervening variables that influence the effectiveness or impact of human capital development on industrial growth. The data are obtained from the World Bank World Development Indicators (WDI)

3.3. Model Specification

To investigate the nexus between human capital development and productivity growth, the following regression model is specified:

$$INDG_t = f(HCI_t) \qquad (1)$$

where PRG is the dependent variable, here, industrial growth; HCI is human capital investment t, is time. But human capital investment t is decomposed into investment in education andeducation and health capacities. Educational capacities comprise knowledge, skills, talent and training. In line with the literature, two other control variables that influence the human capital investment –industrial growth nexus are added. They are infrastructure and credit to private initiative institutions (Ozekhome & Esan, 2021). Their inclusion stems from the fact that infrastructure, indicating physical infrastructure development, apart from being complementary to human capital investment propels human capital development. Credit to private sector, on the other hand captures access to credit and finance that encourage private initiative, entrepreneurial capacity and managerial enterprise

Thus, the expanded version of the model is specified as:

$$INDG_t = f(HCI_t, INFRA, CRP_t) \tag{2}$$

The justification of the inclusion of the two control variables, infrastructure and credit to private sector is based on the fact that infrastructure development, such as stable and reliable power/energy, good road, efficient railroad and port facilities, well-developed markets, stable and reliable telecommunication and ICT infrastructure, amongst others is a critical requirement for the success of any industry, including SMEs, without which industrial growth cannot be achieved. In the same vein, credit to private sector, which measures access to finance and credit is critical to industrial/organizational success, particularly, SMEs, and thus, its inclusion is based on evidence (Ozekhome & Braimah, 2024).

The empirical specification of the model to be estimated is therefore:

$$INDG_t = \alpha_0 + \alpha_1 HCI_t + \alpha_2 INFRA_t + \alpha_3 CPS + \varepsilon_t \tag{3}$$

$\alpha_1 - \alpha_3$ are the coefficients of the independent variables, which are to be estimated

Apriori expectation: $\alpha_1, \alpha_2, \alpha_3, > 0$.

3.4. Justification of Inclusion of the control variables

The inclusion of the control variables, infrastructure and credit to private sector in this study is based on the fact that infrastructure development is critical to industrial growth, without which the development of the industrial sector cannot be achieved. Critical infrastructures such as good roads, railways, ports,

electricity, developed, bridges, water markets, and telecommunications are necessary for industrial growth. In the same vein, access to credit and finance is critical requirement for business and investment start-ups.

3.5. Definition of Variables and Sources of Data

The definitions of the variables in the model, unit of measurement, as well as the sources of data are provided in Table 1.

Table 1: Definition of Variables, Measurement and Data Sources

Variable	*Description/Measurement*	*Source*
Industrial growth (INDG)	Growth rate of industrial output as a share of GDP percent	World Bank
Human capital investment (HCI)	Investments in education and health as well as skills and talent development as a composite index, indicating the totality of human capital development	World Bank
Infrastructure development (INFRA)	Investment in infrastructure development is measured as gross fixed capital formation to GDP percent.	World Bank
Credit to private sector (CPS)	Access to credit and finance by deposit money banks measured by the actual credit granted to the private sector as ratio of GDP.	World Bank

Source: Authors' compilation.

3.6. Data Analysis

The analysis of the data is carried out using the ordinary least square (OLS) approach. The choice of the estimation technique is because the OLS is the workhouse of the econometrician, and possesses the minimum variance. Given that the variables are economy, -wide variables, as human capital investment and industrial growth are collected at aggregate economy level, as well as the control variables, infrastructure development and credit to private sector, this study is an economy-wide study.

4. RESULTS AND DISCUSSION

4.1. Presentation of Results and Interpretation

4.1.1. Descriptive Statistics

Table 2 shows the descriptive statistics of the data and other basic characteristics within the series. Average industrial growth for the period under investigation

is 5.25 percent which is relatively low; implying that industrial growth has been relatively low over the years due to the over-reliance on oil to the neglect of other non-oil and tradeable sectors of the economy in Nigeria. The maximum industrial growth of 10.23 percent and the minimum value of -1.15 percent also indicate that there has been differential rate of industrial growth over the years.

Table 2: Descriptive Statistics

	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	J-B
INDG	5.25	4.20	10.23	-1.15	1.72	0.73	1..87	2.64
HCI	0.513	0.502	0.912	0.221	0.160	0.85	1.77	12.26
INFRA	12.77	10.26	225.82	9,30	5.12	1.25	2.10	7.50
CRP	13.50	11.65	22.72	5.88	4.76	1.82	1.98	7.22

Source: Authors' computation.

The skewness value for the distribution is low, suggesting that the industrial growth was centered on the mean. This is also confirmed by the kurtosis and the Jarque Bera value. The corresponding values for the independent variables, human capital investment (HCI), infrastructure development (INFRA) and credit to private sector (CPS) are 0.513, 12.77 percent and 13.5 percent. The values indicate poor investments in education and health, as well as skills and talent development, weak infrastructure development and inadequate access to credit and finance for business and industrial activities due to stringent loan requirements.

4.3. OLS Multiple Regression Results

The result of the OLS regression estimation, showing the impact of human capital investment and other control variables on industrial growth in Nigeria is presented in Table 3. An examination of the results shows that the goodness of fit indicated by the coefficient of determination (R^2) is 0.912. With this, about 91.2 percent of the systematic changes in industrial growth in Nigeria in the reference period is explained by human capital investment and other variables. After adjusting for the degrees of freedom, the adjusted coefficient of determination stood at 0.903, indicating that approximately 90.3 percent of the net systematic changes in organizational/industrial growth is explained by the independent variables. The independent variables, therefore jointly

explained industrial growth in Nigeria, with only about 9.7 percent attributed to the unexplained factors. The estimated model therefore has a high predictive and explanatory power. The F-statistic of 22.6 (with a p-value of 0.000] is significant at the 1% level, confirming the existence of a significant linear relationship between the independent variables and industrial growth. The Durbin - Watson statistic of 1.77 shows that there is no auto correlation in the model. The estimated model is therefore, fit for policy formulation and implementation purposes.

Table 3: OLS Results

Dependent Variable: Industrial Growth (INDG)

Variable	Coefficient	T-Stat.	p-value
C	0.012	0.921	0.32
HCI	0.422	2.803	0.01
INFRA	0.227	1.424	0.13
CPS	0.163	1.820	0.07
Diagnostics			
R^2 = 0.912			
Adjusted R^2 = 0.903			
DW= 1.77			

*, **, *** denotes statistical significance at the 10%, 5%and 1% levels, respectively.
Source: Authors' computation

The contribution of the individual regressors (independent variable) to the dependent variable (industrial growth) is determined by observing the coefficients of the variables in the model in terms of signs, size and significance. Human capital investment (HCI) is positively related to industrial growth and attains statistical significance only at the 5 percent level, implying that the higher the investments in human capital, the greater the level of industrial growth. Nigeria's industrial growth, without doubt is heavily dependent on the skills and education of its workforce. This finding supports the findings of Tugcu (2012), Dixit & Ghosh (2013), Ozekhome (2018), and Sahoo and Sahoo (2019). A 1percent increase in human capital investment generates industrial growth of 0.422 percent.

The coefficient of infrastructure development (INFRA) variable is positively signed, and in line with theoretical expectation but not significant. At the 5 percent level. The positive sign indicates that improvements in

infrastructure (e.g. roads, ports, energy) facilitate industrial growth. The positive sign supports the findings of OECD (2019), while the weak impact is in line with the findings of the OECD (2019), and at variance with Ozekhome (2018).

Finally, the coefficient of credit to private sector (a measure of the access to credit and finance) for business and investment purposes (financial intermediation) is appropriately positively related with industrial growth, and achieves statistical significance only at the 10 percent level. Thus, increased access to credit and finance stimulates business and industrial activities, particularly through entrepreneurial/creative and investment initiatives. A 1 percent increase in credit to the private sector is associated with a 0.16 percent increase in industrial growth in Nigeria.

4.4. Test of Research Hypotheses

As a further confirmation of the empirical results, the testing of the hypotheses is performed in this section against the backdrop of the findings. This is to enable us determine whether the given null hypotheses are accepted or rejected.

Hypothesis 1

H_{01}: *There is no significant relationship between human capital investment and industrial growth in Nigeria*. Given the empirical results, the t-ratio of the coefficient of human capital investment coefficient of 2.083 (in absolute terms), is statistically significant at the 5 percent level, confirming the existence of a significant relationship between human capital and industrial growth in Nigeria. The null hypothesis of no significant relationship is therefore fore rejected in favour of the alternative hypothesis.

Hypothesis 2

H_{02}: Access to credit and finance (i.e. credit to private sector) has no significant impact on industrial growth in Nigeria. Based on the empirical results, the t-value of the coefficient of access to credit and finance has a t-value of 1.800 (in absolute value), which is significant only at the 10 percent level. The results, therefore suggest a moderately statistically significant impact or weak evidence of credit and finance on industrial growth at the 10 percent level (p < 0 .10).

4.5. Discussion of Findings

The findings of this study have important implication for both practical and managerial policy**.** First, human capital investment has the potential to stimulate organizational growth. Through various programmes and initiatives aimed at enhancing the human resource function, such as education, training and development, skills acquisition, health capacity, personal development, and recruitment and selection, organizational//industrial growth can inevitably be stimulated. In terms of managerial and policy implication, human resource managers, organizations and government should increasingly invest in the development of the human capital to enhance its productivity, and thus organization growth. This finding and submissions are in consonance with that of Ahmad and Schroeder (2013), Burma (2014), Ozekhome (2018) and (Raymond (2021), and novel in the Nigerian context, given the fact that prior studies found mixed results due perhaps, to methodological differences and the non-inclusion of important or intervening variables (e.g. access to credit and infrastructure) that influence the human capital –industrial growth relationship.

Second, the findings point to the existence of a positive relationship between infrastructure investment and industrial growth in Nigeria. This implies that the more the spending on infrastructure such as roads, rail, ports, power, etc., the greater the level of organizational growth. This finding compares, and is in line with the existing literature of OECD (2019) on the positive effects of infrastructure development on overall business environment in propelling organizational/industrial growth. However, for Nigeria to propel industrial growth, and make the business environment favourable and competitive in the global space, issues of institutional weakness, corruption, security must be dealt with.

Finally, the findings indicate that greater access to finance and credit, in the form of loans, support from government and the private sector, as well as subsidies, where necessary has the potential to stimulate industrial growth in Nigeria. The finding corroborates that of Ozekhome (2018). In terms of contributions, this finding is novel, as previous studies did not account for the role of financial intermediation in the human capital investment-industrial growth nexus.

5.   CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The study empirically investigated the relationship between human capital investment and industrial growth in Nigeria. It utilized annual time series data and the ordinary least squares multiple regression technique. The results indicate that human capital investment has a positive and significant impact on industrial growth in Nigeria. Infrastructure development is positively related with industrial growth, albeit a weak impact, due to corruption, misuse of public funds and other institutional weakness in Nigeria. Credit to private sector, a measure of the access to credit and finance for private initiative and entrepreneurial capacity that facilitates industrial growth development is positively related to industrial growth, implying that the greater the access to credit and finance for private initiative and investment purposes, the greater the industrial growth in Nigeria.

Without doubt, these findings are instructive, as their point to the imperativeness of investing heavily on the human capital through enhanced education and training, skills acquisition and development and mental and health capacities to drive industrial growth in Nigeria Complementary factors that can drive industrial growth, such as infrastructure development and increased access to credit and finance for private initiative/venture are also important.

5.2. Recommendations

Against the backdrop of the significance of the findings of this research, and the potential to impact on managerial and policy action, the following evidence-based recommendations are suggested:

- Increased human capital investment in both educational, skills and health development capacities to enhance industrial growth in Nigeria.
- Greater spending on infrastructure by both the public and private, especially through public-private cooperation to improve the business environment for greater growth.
- Increased access to credit and finance through sectoral-based support policies, and concessional lending by both the government and financial institutions to encourage drive industrial growth in Nigeria.

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