



HUMAN CAPITAL DEVELOPMENT AND MANUFACTURING OUTPUT IN NIGERIA

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Abstract

The study examined the impact of human capital development on manufacturing output in Nigeria. Time series data for the period between 1981 to 2023 were employed. The manufacturing value added (LMVA) was specified as a function of Government expenditure on health (LGEH), Government Expenditure on Education (LGEE), Manufacturing capacity Utilization (LMCU), Tertiary Education Enrollment (LTER), Gross Fixed Capital Formation (LGFCF) and Inflation rate (LINFL). The technique of estimation is the Error Correction Model (ECM). The result shows that LGEH, LGEE and LMCU had positive and significant impact with the LMVA. LTER and LGFCF had positive and insignificant impact on the LMVA, while LINFL had negative and insignificant impact on the LMVA. The study recommends that government should prioritize funding, monitoring and effective utilization of funds allocated for the health and education sectors. Also, Government and the private sector to improve development of fixed capital in form of modern machinery.

Keywords:

Manufacturing capacity Utilization, Tertiary Education Enrollment, Gross Fixed Capital Formation and Inflation rate.

Introduction

Just as human wants are endless so also the taste continues to change. This continuous quest to satisfy the desires of man, inspired him to understand the need to transform the natural state of goods into a refined package. This transformation will not only improve its taste but the quantity, market value and greater return into the economy at large. Such transformation takes place when the human resources have acquired additional knowledge, health conditions are intact, given that the physical resources to be transformed and capital are in abundance. Human capital is one of the drivers of the manufacturing sector which would contribute to increasing growth and sustained development. In fact, Otu and Adenuga (2006) emphasised that no country has achieved sustained economic development without substantial investment in human capital. Human capital development plays crucial role in the manufacturing sector as the quality of human resources determines the value of output of firms. The effect of human capital development could be an escape route for manufacturing sectors in Nigeria to thrive in

the global knowledge economy (Oko, Oyeranmi, Adamu & Agbadua, 2023). Thus, Human capital development refers to improving the abilities and capabilities of individuals in the productive sector. Kenton (2023) sees human capital as the economic value of workers' experience and skill. The goods and physical stock of an organization are being managed by human capital. The quality of human asset determines the productivity and success of an organization and the economy at large. Therefore, there is real need to develop human capital. Manufacturing is one of the key sectors of economic growth and sustainable development and that is why researchers and policy formulators need to pay attention to the factors that boost the sector. A nation without a viable manufacturing sector will enslave its self at the world market and the economy of such nation will be determined by external shocks. However, diversification of manufacturing product and improvement in quantity and quality of output cannot take place in isolation of developed human capital. The expected output of the manufacturing sector requires the necessary capital. Acquisition of the state-of-the-art technological techniques, machinery and equipment would boost output. The Gross fixed capital formation determines not just the manufacturing output but the gross domestic product.

Empirical evidence so far, based on the data from CBN Statistical bulletin, (2022), shows that Nigerian manufacturing value added (MVA) experience decline between 1982 to 2010 from 4984.79 to 3578.68 respectively. However, in 2011, the MVA rose to 4216.19. This rise is attributed to the significant increase in government health and education expenditures in 2010 and 2011 from ₦99.10B to ₦231.80B (health) and from ₦170.80B to ₦335.80B (education). After 2011, the MVA continues to rise based on the push in health and education expenditures of 2011, until 2015 when it fell from 6586.62 to 6502.26 in 2021. Another rise in MVA was expenditure rose from ₦620.59B to ₦702.98B. This empirical breakdown has shown that the improvement in the manufacturing output depends on the level of recorded in 2022 when it rose to 6661.39 due to increase in health expenditure from ₦386.24B in 2021, to ₦437.52B in 2022. The corresponding education investment in human capital. There was sharp decline in the Global capacity utilization of the productive sector during covid 19 period due to high illness and death. The pandemic led to massive death of human resource, factories were shut down and production capacity experienced significant fall. According to the CBN statistical bulletin, (2022) the capacity utilization fell from 52.54 percent in 2018 to 43.8 percent in 2020. This resulted to decline in the manufacturing value added from 6,420.59 to 6,291.59 in 2018 and 2020 respectively. Therefore, the rate of production depends on the rate of utilization of the available material, machinery and human resources.

The manufacturing capacity utilization (MCU) determines the level of output of the manufacturing sector. The rate of production output depends on the rate of utilization of machinery, material and human resources. Numerous factories exist in the country, but the fact remains that the production capacity of some of them are low. This affects not just the manufacturing output, but the GDP. The low-capacity utilization of the factories in the country also led to rising patronage of foreign goods, thus resulting to imported inflation in the country. Based on this background, the study explored the relationship between human capital development variables, alongside the impact of manufacturing capacity utilization on the manufacturing output in Nigeria.

Objectives of the study

The general objective of the study is to determine the impact of human capital development variables on manufacturing output in Nigeria. The specific objectives of the study are as follows:

- I. To determine the impact of government health expenditure on manufacturing output in Nigeria.
- II. To evaluate the impact of government education expenditure on manufacturing output in Nigeria.
- III. To examine the impact of manufacturing capacity utilization on manufacturing output in Nigeria.

2. Literature Review

Habison, (1973) in Mba, (2013) wrote that: “Human resource, not physical capital, not income or material resources constitute the ultimate basis for the wealth of nations. Yesufu (2000), in agreement with this view, opines that —the essence of human resources development becomes one ensuring that the workforce is continuously adapted for, and upgraded to meet, the new challenges of its total environment. This implies that those already on the job require retraining, reorientation or adaptation to meet the new challenges. This special human capacity can be acquired and developed through education, training, health promotion, as well as investment in all social services that influence man ‘s productive capacities (Adamu, 2003).

Human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience that are crucial for the economic growth and political development of a country (Okojie, 1995). Obikwelu, (2018) views human capital as knowledge embedded in all levels such as individual, organization, or nation. According to Oladeji, (2015) Human capital development has been described as an end or objective of development. It is a way to fulfil the potentials of people by enlarging their capabilities, Okoh, Oyanami, Adamu and Agbadua (2023) studied the relationship between human capital development on manufacturing performance in Nigeria, using macro data from 1981 to 2023. The manufacturing value added was used as dependent variable while the independent variables are human capital development indicators: primary, secondary and tertiary school enrollment, consumer price index, interest rate, population growth and exchange rate. The method of analyses includes the Augmented Dickey Fuller test, ordinary least square and the Auto Regressive Distributed lag (ARDL) bounds test. The result shows that human capital development and manufacturing value added had insignificant inverse relationship in Nigeria. Lekan –Akomolafe (2023) investigated the link between human capital development and organizational effectiveness of manufacturing firms in South East Nigeria, Surveyed data from 944 employees of manufacturing firms were analysed using multiple regression method. The data include the career development, competence-based assessment, etc. The study found that human capital investment had positive and statistically significant effect on organizational effectiveness of manufacturing firms in Nigeria.

Ihensekhien and Sorewei (2023) examined the link between human capital development on industrial sector growth in Nigeria from 1986 to 2020. The industrial sector output used as the dependent variable while the independent variables include: secondary school enrollment, government expenditure on education and health, labour force, infant mortality rate etc. ARDL

was employed for analysis and the result indicates that government recurrent investment on education had significant positive impact on industrial sector growth in the longrun, while government recurrent expenditure on health had negative significant impact on industrial sector growth.

Ubaka, Nwaonuma and Ifeaka(2022) studied the impact of human capital development on economic growth in Nigeria using time series data which span between 1986 to 2020. GDP was the explained variable while the explanatory variables are total government expenditure on education and health ,life expectancy ,primary school enrollment ,external debt and private domestic investment .Multiple Regression and Vector Error Correction model were employed in the analyses .It was found that there exit longrun relationship equilibrium among the variables.

Abugwu (2021) analysed the impact of human capital on the productivity of manufacturing firms in Nigeria, using time series data from 1981 to 2017. Manufacturing value added was the explained variable while government expenditure on education and health, secondary school enrollment, gross fixed capital and minimum wage were the explanatory variables. The method of analysis include OLS, ADF/Johansen tests and VECM. The result shows that government expenditure on education, secondary school enrolment and annual minimum wage impacted negatively and significantly on productivity of manufacturing firms.

3. Methodology

The expo facto design was employed in this econometric approach research and the ordinary least square technique was adopted.

The ECM was the estimation technique. The error correction model has high potency in estimating both the speed of adjustment of the short-run impact and the longrun equilibrium impact. An error correction model for this study was specified as follows;

$$\Delta(\text{LMVA}_t)_{t-1} = \alpha + \sum_{i=0}^k \lambda_1 \Delta(\text{LNGEH})_{t-1} + \sum_{i=0}^k \lambda_1 \Delta(\text{LNCEE})_{t-1} + \sum_{i=0}^k \lambda_1 \Delta(\text{LMCU})_{t-1} + \sum_{i=0}^k \lambda_1 \Delta(\text{LGFCF})_{t-1} + \sum_{i=0}^k \lambda_1 \Delta(\text{TER})_{t-1} + \sum_{i=0}^k \lambda_1 \Delta(\text{INF})_{t-1} \delta_{\text{ECM}_{t-1}} + \mu_t \quad 3.1$$

3.1 Theoretical Framework

The Cobb –Douglas production function was adopted as the theoretical frame work of this study. This model was propounded by H. Douglas and C.W. Cobb in 1928. This theory expresses production output as a function of labour and capital. It is a linear homogeneous production function of degree one which considered two inputs, labour and capital for the entire output of the manufacturing firm. Mathematically cobb – Douglas production function can be represented thus $Q = F(AL^\alpha K^\beta)$, Q is the output level, L stands for labour input and K stands for capital. Cobb - Douglas production function is very suitable in applied research which concerns the impact of human capital (labour) and capital on the manufacturing output .Labour and capital are considered very essential in the production process .

The Cobb Douglas production function is given by the equation:

$$Q = F(AL^\alpha K^\beta) \quad 3.2$$

Where;

K = Capital

Q = Quantity of product

L = quantity of Labour applied for the production of Q.

applied to the production. $A = a$ positive constant α and $\beta =$ Constants between 0 and 1.

Thus, equation (3.2) is modified to reflect the objectives of this study relaxing the equation above to capture the objectives of this study, the researcher re-structured equation (3.2) as follows:

$$MVA = F(\text{GEH}, \text{GEE}, \text{MCU}, \text{GFCF}, \text{TER}, \text{INF}) \quad 3.3$$

Where:

LMVA = Manufacturing value added as proxy for manufacturing output.

GEH= Government Expenditure on Health

GEE= Government Expenditure on Education

MCU= Manufacturing Capacity Utilization

GFCF= Gross Fixed Capital Formation as proxy for capital

TER= Tertiary Education Enrollment as proxy for labour

INF =Inflation rate

4. Result Presentation

Error Correction Mechanism (ECM) Result

Dependent Variable: D(LMVA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.104622	2.175283	4.185489	0.0243
D(LGEH)	7.007573	2.390645	2.931248	0.0464
D(LGEE)	5.038022	0.522837	9.635927	0.0292
D(LMUC)	2.316551	1.126606	2.056221	0.0477
D(LGFCF)	1.507275	1.241182	1.214387	0.5316
D(TER)	3.610909	38.07007	0.094849	0.9250
D(INF)	-0.000538	0.001095	-0.491248	0.6265
ECM-1	-0.730491	0.352455	-2.072578	0.0212
R-squared	0.767452	Mean dependent var	0.003214	
Adjusted R-squared	0.740149	S.D. dependent var	0.110751	
S.E. of regression	0.111256	Akaike info criterion	3.380786	
Sum squared resid	0.408471	Schwarz criterion	4.046430	
Log likelihood	36.30611	Hannan-Quinn criter.	7.259032	
F-statistic	19.94895	Durbin-Watson stat	1.867165	
Prob(F-statistic)	0.003923			

Source: Author's computation from E-view 9 .

The above result showed that the coefficient of government expenditure on health (LGEH) is 7.007573. This implies that LGEH has positive impact on the Manufacturing Value Added (LMVA) and conforms with the apriori expectation. Therefore, holding other variables

constant, a unit change in government expenditure on health (LGEH), will lead to 7.007573 increase in LMVA. The probability value (P. value) of LGEH is 0.0464 , which is less than 0.05 and this means that LGEH has significant impact on LMVA

The coefficient of government expenditure on education (LGEE) is 5.038022, This implies that LGEE has positive impact on manufacturing Value Added (LMVA). The sign conforms with the apriori expectation. Therefore, a unit change in government expenditure on education (LGEE) will lead to 5.038022 increase in LMVA. The LGEE has p. value of 0.0292 which is less than 0.05. This shows that LGEE has significant impact on LMVA.

The coefficient of Manufacturing Capacity Utilization (LMCU) is 2.316551. This implies that it has positive impact on the manufacturing Value Added (LMVA) and the sign conforms with the apriori expectation. Thus, a unit change in manufacturing capacity Utilization (LMCU) will lead to 2.316551 increase in LMVA. The P. Value of LMUC is 0.0477, which is less than 0.05. This shows that LMUC has significant impact on LMVA.

The coefficient of gross fixed capital formation (LGFCF) is 1.507275 which indicates that gross fixed capital formation (LGFCF) has positive impact on LMVA. The sign conforms with the apriori expectation. Therefore , a unit LMVA. The P. Value of LTER is 0. change in gross fixed capital formation (LGFCF) will lead to 1.507275 increase in LMVA. The P. Value of LGFCF is 0.5316 which is greater than 0.05 and this implies that LGFCF has insignificant impact on LMVA .

The coefficient of tertiary School Enrollment (LTER) is 3.610909. This shows that tertiary school enrollment has positive impact on Manufacturing value added(LMVA). The sign conforms with the apriori expectation. Therefore , a unit change in tertiary school enrollment will lead to 3.610909 increase in 9250, which is greater than 0.05 .This implies that LTER has insignificant impact on LMVA.

The coefficient of inflation rate (INF) is -0.000538 . This indicates that inflation has negative impact on LMVA. The sign conforms with the apriori expectation. Therefore ,a unit change in inflation rate (INF) will lead to 0.000538 decrease in LMVA. The P. Value of LINF is 0.6265 ,which is greater than 0.05 .This implies that LMVA has insignificant impact on the LMVA.

5. Recommendations

Based on the findings, the following recommendations were suggested by the researcher:

- i. Since the result indicates LGEH has positive and significant impact on LMVA, therefore government to priotize funding of the health sector, strategize for close monitoring and effective disbursement of funds allocated for health care in the country.
- ii. Also, the result shows LGEE has positive and significant impact on LMVA, there is need for the government to place funding of the education sector on top priority, as well as ensure effective management and utilization of funds for this sector, so as to achieve more of the desired output level.
- iii. Furthermore, the result reveals a positive and significant impact of LMCU on manufacturing output, thus efforts should be made by the government and the private sector to improve acquisition of fixed capital in form of state of the art machines and equipments , so as to boost capacity utilization for the growth of the manufacturing output.

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