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Human Capital Development And Manufacturing Sector Performance In Nigeria: The Role Of Women Education

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ABSTRACT
This study examined human capital development and manufacturing sector performance in Nigeria: the role of women education from 1990 - 2018. Female secondary and tertiary school enrolment were used to measure women education and the output of manufacturing sector was used to measure manufacturing sector performance in Nigeria. Other variables such as female labour force participation rate, female life expectancy rate and bank credit to manufacturing sector were used as check variables. Annual time series data on our targeted variables were obtained from secondary sources including the Central Bank of Nigeria annual statistical bulletin for 2018; central bank of Nigeria annual report and statements of accounts (various years), world bank development indicators (various years), journals, internet-based materials, international labour organization (ILO) etc. The study adopted Autoregressive Distributed Lag (ARDL) model to estimate the relationship between human capital development and manufacturing sector performance in Nigeria: the role of women education. From the results of the ARDL estimates it was revealed that: The impact of women education on manufacturing sector output is positive and significant in the short run. Also, women education has positive impact though not significant on manufacturing sector output in the long run. Given that female education especially up to the tertiary level promotes output of the manufacturing sector, it is recommended that incentives be extended to encourage more females to pursue their education. Gender equality should be promoted to give equal opportunity to females.
Keyword: Human Capital Development, Manufacturing Sector Performance.

INTRODUCTION
Human capital development is often regarded as a driving force behind economic progress in any country. According to Almendarez (2011) human capital theorists believe that one of the best ways to improve the quality of human capital is to make sure that everyone has access to excellent education and health care. This is because education improves the cognitive skills possessed by the workforce and as a result increases labour productivity and efficiency which in turn increases wage earnings and helps to eradicate poverty. Thus, women need basic education in order to participate and be productive in the manufacturing sector. No wonder Olowa and Adeofi (2014) opined that the degree of education has a substantial impact on women's labour market participation. Education increases both empowerment and economic prosperity. At first, it raises people's awareness of their responsibilities and rights. It gives you a chance to learn from your mistakes, individual income improves as a result, as does the national income, and therefore economic growth is intended to improve the quality of people's lives. Education is also regarded as a fundamental and self-evident process by which skills, knowledge, and attitudes are learned in order to fulfill socioeconomic duties, social integration, personal competency development, and the pursuit of better opportunities. The importance of education in rural development and economic progress has been hotly debated since the 1960s and 1970s. Women's education has a positive effect on their labor supply

for a variety of reasons. Studies show that education improves career prospects, increases earning power, and encourages women to work beyond their traditional positions. Investment in human capital development, such as education, has been found to significantly contribute to economic development and growth by increasing labor productivity and promoting resource efficiency. Educated women are more likely to adopt new technologies and participate in income-generating activities.

Although, education has reaped enormous rewards across the world, women are still at a disadvantage in a wide range of spheres of life such as work, education, health and civil rights especially in the developing countries like Nigeria. Of the 72 million primary school-aged children who do not attend school, 57 percent are female, according to data from the United States Agency for International Development and the World Bank. In addition, girls are 4% less likely than boys to finish elementary school (Gender Statistics, 2010). Egbulonu and Eleonu (2018) noted that Nigeria is the most populated among the African countries, also ranked the world's seventh most populated country, and forty-nine percent of this magnitude are female. Comparatively, thirty-eight percent of women in Nigeria lack formal education as against twenty-five for men and only four percent of women in Nigeria have higher education against the seven percent of their male counterpart. In the same vein, Aromolaran (2004) noted that in Nigeria, women contribute less than men towards recorded productive output. Also, women are excluded from certain occupational categories which is not as a result of low mental and physical capability but simply because majority of them lack educational qualification necessary for such positions. In particular, the participation of women in the manufacturing sector appears to be dependent on their level of education. It is against this background that the present study attempts to unearth the role of women education in the manufacturing sector performance in Nigeria.

2 LITERATURE REVIEW AND CONCEPTUAL CLARIFICATIONS

2.1 Conceptual Clarifications

2.1.1 Human Capital Development

Human capital is defined as the stock of habits, knowledge, social and personality traits (plus creativity) embodied in man's ability to perform labor in order to produce economic value, whereas human capital development is a process by which individuals' knowledge, skills, and capacities are improved. Gary Becker (1962).

Human capital development is regarded as a major source of labour force participation, increase in wage and economic development. Habison (1962) sees human capital formation as investment in man and his development as creative and productive resource which is very important for the transformation of the institution of every nation. The human capital development includes investment in the following aspects; education, technical or on-the-job training, health, etc are all important factors to consider. Investing in these skills increases the labor force's capacities, resulting in increased economic productivity and individual income.

2.1.2 The Concept of Education

Informal, non-formal, and formal education are the three forms of education that are often used. The most popular type of education is informal learning. It begins at birth and lasts the rest of a person's life. Its main goal is to pass along society's rules and customs. It can occur in any location, at any time, and in any way. It is not pre-planned, and there are no assigned teachers. It does not include a formal examination or a certificate.

Non-formal education and Informal education are closely linked. It is, however, only partially planned. Apprenticeship education is for the learning of vocational skills. While informal and non-formal education are grouped together under the umbrella term of traditional education, formal education is referred to as school education or Western education. Formal education is a well-planned education that is defined by a well-defined curriculum and is centered on examinations and certificates. It takes place in a designated location known as the school.

Education is the process of bringing out the abilities and potentials that each person has inside of him or her, as well as learning the skills, abilities, and competencies that are important for self-realization and

dealing with life's problems (Achuonye and Ajuku, 2002). In a related manner, Fafunwa (1974) on his part defines education as the aggregate of all the processes through which a child develops abilities, attitudes and other forms of behaviour which are of positive value to the society. It is a mechanism through which a person acquires knowledge to maximize his physical, mental and emotional capabilities which are useful for him and his society. Thus, education is seen as a selective agency for placing people in deferent positions according to their talent and abilities.

For the purpose of this paper, women education is defined as the process of acquiring all the necessary knowledge, skills, norms and values that will help them to unlock their potentials in order to function effectively in the manufacturing sector.

2.1.3 Manufacturing in Nigeria

Manufacturing according to Anyanwu (1997), involves the transforming of raw materials into finished consumer goods or intermediate or producer goods. It creates avenues for employment, enhance agriculture, helping to diversify the economy, increase the foreign exchange earnings, enables the work force to acquire skills reduce over-dependence on foreign good and helps in the management of available resources.

The manufacturing sector is one of the favoured sectors in Nigeria; this is because it is widely believed that economic growth, structural change and self-sufficiency is based on the manufacturing sector. Hence, the macroeconomic policy in Nigeria channeled resources into the sector through heavy public sector investments.

The growth in manufacturing output expanded in the period, 1976 to 1985 with the establishment of more import substitution industries, with an annual average growth rate of 18.5 percent. This was occasioned by the oil boom of the era which provided enough foreign exchange for the importation of needed inputs such as raw materials, spare parts, and machinery. However, with the collapse of the world oil market and drastic reduction in foreign exchange earning capacity, the sub-sector performed poorly. This is because there was reduced foreign exchange to import needed inputs. For example, between 1986-1998, the annual average manufacturing output was about 2.6 percent, even with the introduction of the Structural Adjustment Programme (SAP) in 1986.

The rate of capacity utilization in the manufacturing sub-sector followed the same downward trend from an annual average of 53.6 percent in the period 1981 to 1985 to 8.3 percent in the periods 1986 to 1990, 1991 to 1995 to 8.3 percent in the periods 1986 to 1990, 1991 to 1995 and 1996 to 1998. The main problems identified as hindering the growth of manufacturing output were poor performing infrastructure.

According to Anyanwu (1997), poor performance of infrastructural facilities characterized by frequent disruption in electric power and water supplies, inefficient telecommunications and transportation systems are the major problems of the sector. Other factors responsible for poor performance of the manufacturing sub-sector include high cost of production, inflation, low level of investment, high rate of interest and fallen capacity utilization.

2.2 Theoretical Literature

2.2.1 Human Capital Theory

This work is anchored on the human capital theory as presented by Almendarez (2011), human capital theory rests on the assumption that formal education is highly instrumental and necessary to improve the productive capacity of a population. Human capital theory emphasizes how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings. The provision of formal education is seen as an investment in human capital, which proponents of the theory have considered as equally or even more worthwhile than that of physical capital.

From the forgoing, it is obvious that the human capital theory implies that education is an important determinant of an individual's income, employability and hence, his or her performance in the manufacturing real sector. Relating this to our contest, an increase in the level of education of women will have a positive effect on their manufacturing sector performance and vice-versa.

2.3 Empirical Review

Sackey (2005) conducted research on female labour force involvement and fertility in Ghana. The Ghana living standard survey data from 1998/1999 were used. Profit and multinomial logit techniques were used to estimate the model. Primary, secondary, and post-secondary school levels are among the factors used in this study. The findings revealed that female schooling matters in both urban and rural areas, at both the primary and secondary levels, have a considerable favourable impact on women's labour market involvement while having the opposite effect on fertility.

Cohen and Soto (2007) conducted research on the relationship between growth and human capital and concluded that a unit increase in a country's average cognitive test scores improves per capita GDP growth rate by 1.2 to 2.0 percentage points. Furthermore, boosting average maths and science results by one unit raises per capita GDP growth rates by 2.0 points in high-income nations and by 2.3 points in low-income ones. Overall, research indicated that education is significantly and positively connected with economic growth, leading to the conclusion that causality runs from education to growth in accordance with human capital growth theories.

Pastor and Verashchagina (2008) explored the determinants of female labour force participation using time series data from the Belarusian Household Survey from 1996 to 2001. The empirical data reveal that education, access to media, community socio-cultural norms, women's jobs, and household participation rate all have a significant impact on women's empowerment.

Mujahid and Zafar (2012) investigated the association between female labour force participation and economic development in Pakistan from 1980 to 2010. The findings of the ARDL approach revealed a long-term u-shaped association between female labour force and economic development.

Theveron, Ali, Adema, and Pero (2012) investigated the extent to which increases in women's human capital (as assessed by educational attainment) have contributed to OECD economic growth. Using time-series/cross-country data from 30 OECD countries from 1960 to 2008, the study shows that an increase in women's educational attainment relative to men has a positive and significant influence on output per capita growth.

Mujahid (2014), examines the determinants of both personal and household of female labour supply in Pakistan. The finding shows that woman with higher education are more likely to participate and involve in the productive activities.

Afridi (2016) employed the ARDL and VECM models to explore the relationship between human capital and economic growth in Pakistan from 1972 to 2013. The findings show that human capital is critical to the economy's progress.

Between 1995 and 2013, Nowak and Dahal (2016) explored the relationship between education and economic growth in Nepal. The outcome of using the OLS and Johansen Co-integration techniques revealed a long-run association between education and economic growth.

Bibi and Afzal (2012) conducted a descriptive analysis of the factors that influence married women's labour force participation in Wahcantt. The findings revealed that education of the respondent, number of offspring, number of dependents, family size, income of husband, monthly expenditure of family, positive attitude of husband and family towards the job of women, job satisfaction have a positive impact on the labour force participation of married women, whereas age of respondent, living with husband, satisfaction of house wives with their current life, family restrictions regarding job have a negative impact.

Human capital theory: implications for educational development was examined by Aromolaran (2004). Using characteristics such as married women's labour force involvement in Nigeria in pay market employment, self-employment, and overall labour market participation. The study reveals that married women's labour force involvement in Nigeria is positively influenced by their own education and their husband's education. His findings reveal that both his own and his husband's education at all levels positively influence labour involvement in wage, self, and total employment to varying degrees.

Dauda (2012) explored if female education improves Nigerian economic performance. Annual time series data from 1975 to 2008 were used in the study. The findings revealed that male education has a

considerable positive influence on the Nigerian economy, whereas female education, among other things, had no significant positive benefit.

Babalola and Akor (2013) conducted an empirical study on married women's labour force participation in Adamawa State, Nigeria. The findings revealed that women's education has a beneficial effect on married women's labour force involvement, whereas husband's employment and household size had a negative effect.

Iwayemi and Olusoji (2013) explored the factors that influence women's labor-force participation in Nigeria. The logit model and two-stage technique were used in the investigation. The findings revealed that the labour force participation rate of women varies according to age, education, ethnic origin, and other factors.

Olowa and Adeoti (2014) conducted research on the effects of different levels of education on women's labour market involvement in rural Nigeria. The results revealed that educational attainment levels significantly influence women's labour market involvement.

From the review of empirical literature, it is observed that all the studies focused on the relationship between women education and labour force participation. None of these studied specified on any of the sectors of the economy. This present work is therefore, set to empirically examine women education and manufacturing sector performance in Nigeria.

3 RESEARCH METHODS

3.1 Variables of the Study

i) Dependent Variable

The dependent variable for this study is Manufactural Sector Output. This is the value of the total output of the manufacturing sector. It is computed from the contribution of the sector to total Real Gross Domestic.

ii) Independent Variables

The independent variables for this study are female secondary school enrolment rate, female tertiary school enrolment rate, female labour force participation rate, female life expectancy rate and bank credit to manufacturing sector.

3.2 Model Specification

The model for the study is derived from the human capital theory. Almendarez (2011) opined that formal education is instrumental and necessary to improve productive capacity. Thus, we opined that;

Y = f(women education, women health, women labour force, investment) ……. 3.0

Where

Y= output of the sector

Specifically, women education that is relevant to this study are female secondary school enrollment rate (FSSER), female tertiary school enrollment rate (FTSER) and women health is proxied by female life expectancy rate (FLER) and labour force by female labour force participation rate (FLFPR). Investment can be proxied by Bank Credit to the sector.

Hence, the mathematical form of our model is

MSO= F(FSSER, FTSER, FLFPR, FLER, BCM)…… 3.1

Where MSO– Manufacturing Sector Output
FSSER = Female Secondary School enrolment rate.
FTSER = Female Tertiary School Enrolment rate
FLFPR = Female labour force participation rate.
FLER = Female life expectancy rate
BCM =Bank Credit to manufacturing Sector
F = functional notation

MSO is the dependent variable while

FSSER, FTSER, FLEFPR, FLER and BCM are the explanatory variables.

The linear regression model base on the above functional relation is express as:

$MSO = \beta_0 + \beta_1 FSSER + \beta_2 FTSER + \beta_3 FLFPR + \beta_4 FLER + \beta_5 BCM + U$ ……. 3.2

$\Delta Ln\ MSO_t = \alpha_0 + \alpha_{1i} Ln\ MSOT_{t-1} + \alpha_{2i} FSSER_{t-1} + \alpha_{3i} FTSER_{t-1} + \alpha_{4i} FLEPR_{t-1} + \alpha_{5i} FLER_{t-1} + \alpha_{6i} LnBCM_{t-1} + \sum_{i=1}^{q} \alpha_{BCM1i} \Delta LnMSO_{t-1} + \sum_{i=1}^{p_1} \alpha_{2i} \Delta FSSER_{t-1} + \sum_{i=1}^{p_2} \alpha_{3i} \Delta FTSER_{t-1} + \sum_{i=1}^{p_3} \alpha_{4i} \Delta FLFPR_{t-1} + \sum_{i=1}^{p_4} \alpha_{5i} \Delta FLER_{t-1} + \sum_{i=1}^{p_6} \alpha_{6i} \Delta Ln_{t-1} + et$…… 3.3

ECM

$\Delta Ln\ MSO_t = \alpha_{0i} + \sum_{i=1}^{q} \alpha_i \Delta LnMSO_{t-1} + \sum_{i=1}^{p_1} \alpha_{2i} \Delta FSSER_{t-1} + \sum_{i=1}^{p_2} \alpha_{3i} \Delta FTSER_{t-1} + \sum_{i=1}^{p_3} \alpha_{3i} \Delta FLFPR_{t-1} + \sum_{i=1}^{p_4} \alpha_{5i} \Delta FLER_{t-1} + \sum_{i=1}^{p_6} \alpha_{6i} \Delta LnBCM_{t-1} + \lambda ECT_{t-1} + et$…..…… 3.4

Where β_0 is the regression constant or intercept, β_1, β_2, β_3,$\beta_4$and $\beta_5$are the coefficients of the explanatory variables while U is the error term. All other terms are as earlier defined.

A prior theorical expectation

Based on economic theory, we expect the following signs of the coefficients of the explanatory variables.

β_1>O, β_2>O, β_3>O, β_4>β_5>O

3.3 Data Required and Sources

Annual time series data on our targeted variables were obtained from secondary sources including the Central Bank of Nigeria annual statistical bulletin for 2018; central bank of Nigeria annual report and statements of accounts (various years), world bank development indicators (various years), journals, internet-based materials, international labour organization (ILO) etc.

3.4 Techniques of Data Estimation

In deciding the technique of data estimation, we started the analytical procedure with the test for unit root. Both the augmented dickey-fuller and Phillips-perron unit root test were used in conducting the stationarity test. Based on the result of the unit root test, the autoregressive distributed lag (ARDL) approach was used in estimating the specified model.

4.0 PRESENTATION OF RESULTS/DISCUSSION OF FINDINGS

4.1 ADF and Philips-Perron Unit Root Test

Table 4.1: ADF and Philips-Perron Unit Root Test

VARIABLE	ADF					PP					DECISION
	Level		1st Diff		I(.)	Level		1st Diff		I(.)	
	Coeff	5%CV	Coeff	5%CV		Coeff	5%CV	Coeff	5%CV		
FLER	-2.034	-3.633	-3.441	-1.958	I(1)	21.568	-2.972	-4.845	-2.976	I(1)	I(1)
FLFPR	1.238	-1.954	-5.012	-2.981	I(1)	-4.878	-2.972	-	-	I(0)	I(0)
FESSER	-3.600	-3.581	-4.712	-3.595	I(1)	-1.012	-2.972	-7.894	-2.976	I(1)	I(1)
FTSER	-1.066	-3.581	-5.161	-3.588	I(1)	-1.208	-2.972	-5.023	-2.976	I(1)	I(1)
BCM	3.502	-2.998	-4.568	-2.976	I(1)	-1.461	-3.581	-16.66	-3.588	I(1)	I(1)
MSO	4.491	-3.622	-2.537	-1.954	I(1)	4.483	-3.581	-122.5	-3.588	I(1)	I(1)

Source: Computed from E-view

4.2 ARDL Bound Test

Table 4.2 ARDL Bound Test

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	13.05027	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Computed from E-view

4.3 ARDL-ECM Short-run Test

Table 4.3. ARDL-ECM Short-run Test

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FSSER)	18.527768	7.145282	2.593007	0.0268
D(FSSER(-1))	-18.172169	9.408119	-1.931541	0.0822
D(FSSER(-2))	-23.486756	9.926275	-2.366120	0.0395
D(FTSER)	199.611426	70.901720	2.815326	0.0183
D(FTSER(-1))	-172.549265	106.184746	-1.624991	0.1352
D(FLFPR)	1686.420625	911.911499	1.849325	0.0941
D(FLER)	-2301.085132	327.856692	-7.018570	0.0000
D(FLER(-1))	-4930.132692	964.659025	-5.110752	0.0005
D(FLER(-2))	2334.733557	1262.082019	1.849906	0.0941
D(BCM)	0.512867	0.514702	0.996434	0.3425
CointEq(-1)	-0.482016	0.131894	-3.654571	0.0197

Cointeq = MSO - (480.2787*FSSER + 2149.4236*FTSER + 9265.2313 *FLFPR -5261.3771*FLER -2.9091*BCM -206499.7526)

Source: Computed from E-view

4.4 ARDL Long-Run Regression Result

Table 4.4: ARDL Long Run Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FSSER	480.278714	309.465064	1.551964	0.1517
FTSER	2149.423568	1364.768274	1.574937	0.1463
FLFPR	9265.231279	10075.953848	0.919539	0.3795
FLER	-5261.377122	7032.556324	-0.748146	0.4716
BCM	-2.909071	4.902136	-0.593429	0.5661
C	-206499.752647	166406.998806	-1.240932	0.2430

Source: Computed from E-view

4.5 DISCUSSION OF FINDINGS

ADF and Philips-Perron Unit Root Test

Table 4.1 shows the result of unit root test conducted with both Augmented Dickey Fuller test (ADF) and Philips Perron Test (PP). To get a robust result for this empirical work, we adopted the outcome of Philips perron statistic due to the robustness of the result in point of structural breaks. In line with the propositions of Jarkins and Box (1978), variable that are not stationary at levels will be made stationary after first difference. All variables in the model were not stationary at levels except FLFPR. The variable were made stationary after first differencing as shown in table 4.1

ARDL Bounds Test

The results in table 4.2 reveals that the calculated F-statistics of 13.05027 is higher than the upper bound critical values of 3.79 at 10% significant levels. Based on this result, it is concluded that a long run relationship exists for the estimated ARDL models. Thus, the null hypothesis of no co-integration is rejected, implying long-run co-integration relationships amongst the variables.

ARDL-ECM Short-run Test

In the short-run, the regression result in table 4.3 indicates that in the short run, most lags of the variables have negative effects on manufacturing sector output. However, female secondary school enrolment, female tertiary enrollment, and female labour force participation in the current period and female life expectancy rate in the second lag period, had positive influence on manufacturing sector output. A value of -0.482016 for the ECM coefficients suggests 48% speed of adjustment. This means that approximately 48% of discrepancy in the previous year is adjusted for the current year.

Long-run Result Test

The result of the long run regression as presented in table 4.4 indicates that female secondary school enrolment rate, female tertiary school enrolment rate and female labour force participation rate are positively signed. But female life expectancy rate and bank credit to manufacturing sector are negatively signed. This indicates that in the long run, female secondary school enrolment rate, female tertiary school enrolment rate and female labour force participation rate increased manufacturing sector output in Nigeria. However, female life expectancy rate and bank credit to manufacturing sector reduced manufacturing sector output in Nigeria. This may be attributed to poor investment of fund. That is, investment of funds on less efficient profitable project that yield poor output. Most manufacturing outfits in Nigeria are sole proprietary in nature. Hence increased life expectancy may introduce poor management of the organization and hence reduced output.

Finally, Female education in the short run is positively significant and therefore promotes increase in manufacturing sector output. However, in the long-run although there is no evidence of statistical significance, female enrollment in education increases output in the manufacturing sector. This is in agreement with the findings of Thévenon, Ali, Adema, Salvi del Pero, (2012) in which they concluded that women human capital measured by educational attainment contributed positively to output per capita growth. This is because contrary to agriculture that requires physical strength and energy, manufacturing sector employs more machine operation process. This is preferred by females and hence their contribution based on knowledge from school is preferably given in the manufacturing, hence their increased contribution to manufacturing output. Moreso, in the short run, Bank Credit and female life expectancy contribute positively to the manufacturing output. Of course, this is expected as banks would like to recover their capital and interest as fast as possible.

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Based on the finds of the study, the following conclusion are done

i. The impact of women education on manufacturing sector output is positive and significant in the short run.

ii. Also, women education has positive impact though not significant on manufacturing sector output in the long run. It simply means that women education contributed more in the short run in the manufacturing sector output than in the long run.

5.2 Recommendations

Based on the conclusions drawn from the study, the following policy measures are recommended.

i) Given that female education especially up to the tertiary level promotes output of the manufacturing, it is recommended that incentives be extended to encourage more females to pursue their education. Gender equality should be promoted to give equal opportunity to females in the sector.
ii) It is also recommended that bank credit to the manufacturing sector be enhanced as it promotes increase in output.
iii) Also, secondary and tertiary education levels should as a matter of policy, discourage early marriage and unwanted pregnancy to reduce the incidence of school dropouts in Nigeria.

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