

HUMAN CAPITAL DIVERSITY AND PERFORMANCE CONSEQUENCES: A FIRM LEVEL ANALYSIS OF SUB-SAHARAN AFRICA

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Abstract

While human capital diversity research has attracted a tremendous growing interest and academic debates over the decades, most of the scholarship focuses on demographic observable human capital heterogeneity of gender, age, culture, ethnicity as diametrically opposed to cognitive and job-related managerial education, experience and skill diversity. Also, there is no scholarship of diversity with respect to top managerial teams in the African context. To bridge this knowledge vacuum, the paper aims to investigate human capital diversity and performance outcomes of firms. Data were drawn from the World Bank Enterprise Survey that spanned from 2013 to 2015. The World Bank survey targeted business owners and top managers from 2,676 firms in Nigeria, 270 firms in Ghana and 848 firms in Ethiopia across eight strata of manufacturing groups. This study applied the proportion of managerial skill, education and experience as surrogates of diversity indices of the variables and subjected the data to regression analysis to establish the link between human capital diversity of managerial education, experience, skill and firm performance consequences. In this study, we found that managerial skill, education and experience diversity indices had positive significant effect on sales and productivity growths in manufacturing firms in the three African countries. The study discussed valuable theoretical and managerial implications.

Keywords: human capital; diversity; performance; firm; Nigeria

1. INTRODUCTION

The concept of human capital is originated by Schultz (1961), who submits that investment in people improves their productive capacity which culminates in impressive growth of individual, firm and nations' real economic earnings. Consequently, human capital is conceptualized as the innate and acquired abilities, knowledge, competencies and skills embedded in individuals for economic value creation and addition to firms (Richard, 2000, and Armstrong, 2006). Over the past decades to the current decade, Sun, Li and Ghosal, (2020); Han, Han and Brass, (2014); Crooks, Toddy, Combs, Woehr and Ketchen, (2011); Bailey and Helfat, (2003), and Shrader and Siegel, (2000) as scholars acknowledge human capital as a catalyst and fundamental driver to firm and economic growth. Further, the stock of human capital fosters innovativeness and competitiveness of industries and economies of nations in the mainstream literature of human resources management and labour economics. Drawing on the perspectives of Roca-Puig, Beltran-Martin and Segrara-Cipres (2012) and Shrader and Siegel (2007), human capital is composed of skills, knowledge, experience, education, attitudes, social and personality attributes of workers in an organization and a country (Chen, Gao, Zhang & Zhu, 2017) and the heterogeneity in the set of worker skills, education, expertise and knowledge in a team or an organization is conceptualized as human capital diversity which contributes tremendously to the performance of firms, industries and economies (Tasheva & Hillman, 2018; Becker, 1964).

Multiple studies have been executed to ascertain the nexus between human capital diversity and growth at the firm and country economic levels. Ooi, Hooy and Som (2015) studied diversity in human and social capital of corporate board composition of tourism firms in Asia. The aim of the paper is to examine the effects of diversity in boards' human and social capital on firm performance. The scholars conclude that diversity in social capital has positive effect on firm performance while board human capital diversity negatively impacted the performance of firms in the tourism sector. In a related study of board diversity and firm performance of SMEs in the U.K, Shehata, salhin & El-Helaly (2017) reported that the binary dimensions of age and gender board

diversity has negative association with the performance of SMEs, and the finding runs counter to empirical evidence of previous studies in the context large scale firms. The authors argued that the necessity of increased board diversity is interrogated, and buttress that inconsistency of their finding with previous findings is attributable to variation in the size of the firms investigated. Ujunwa, Nwakoby & Ugbam (2012) in a study of corporate board diversity and firm performance in Nigeria, report that gender diversity negatively related to firm performance as opposed to nationality and ethnicity board diversity which positively predicted firm performance.

Lin (2013) in a study of diversity of R&D resources and human capital on industrial performance, lends empirical evidence that the relationship between diversity of human capital and industrial performance is nonlinear and further reported that the diversity of R&D sources and human capital both exhibit a curvilinear relationship with industrial performance. It has been documented that creative, technical and management skills influence firm performance and regional economic growth, Siepel, Camerani & Masucci (2019) further explores the mix of workforce skills and performance of firms, the study established a positive association between the combination of creative, technical and managerial skills and growth of UK firms as against the application of disparate skill sets.

Previous scholarship centres largely on demographic diversity variables of age, gender, ethnicity, race, and culture as observable composition of human capital and human capital heterogeneity at corporate boards, teams and individual employee levels (e.g., Kunze, Boehm & Bruch, 2010; Campbel & Miguez-vera, 2007; Richard, 2000). The studies provide mixed empirical evidence with inconsistent and unresolved findings (e.g., Ujunwa, Nwakoby & Ugbam, 2012; Nielson, 2010). In this paper, there is a diversion from the prior studies by considering cognitive skills, experience and educational background of managerial human capital diversity and the growth nexus of manufacturing firms. Human capital diversity in the context of skill, experience and education of managers remains an underexplored intellectual territory while research studies for human capital diversity and firm growth are sparse and fragmented in Africa. These circumstances account for the justification to interrogate human capital diversity and firm performance in sub-Saharan Africa. Accordingly, the specific objectives of the study are to: (1) determine the effect of managerial skill, education and experience diversity on sales growth of firms, (2) examine the effect of managerial skill, education and experience diversity on productivity growth of firms. The structure the article is as follows. The author reviewed literature in line with the concepts, presented theory and hypotheses developments, the methodology, results, discussion and conclusion.

1. LITERATURE REVIEW

Human capital diversity possesses several fundamental dimensions as examined by previous scholars but this article focuses on functional and job-related variables of managerial education, experience, skill diversities and performance at the firm level.

1.1. Managerial Diversity Education

In view of Harjoto, Laksmana and wen Yang (2019), educational diversity means the highest level of educational attainment and the different educational backgrounds of managers. Gottesman and Morey (2006) affirm that educational quality of managers and chief executives is a determinant of firm performance. The educational quality of managers and chief executive officers (CEOs) influences managerial behaviours, and promotes social capital to business entities. The educational quality is analysed from the bifocal context of graduate education from universities and the prestige associated with a particular university. The authors contend that managers who possess higher educational attainment develop sound cognitive abilities and acquire training, which enable them to effectively perform managerial responsibilities. In line with the argument of Gottesman et al (2006), Datta and Guthrie (1994) accentuate that the knowledge and skill repertoire of managers originates from their educational background. The cognitive abilities and skills possessed by managers through higher educational attainment enhance information processing, tolerance for ambiguity and propensity for innovation (Datta & Guthrie, 1994; Gottesman and Morey, 2006). Additionally, Martelli and Abels (2010) assert that managers and CEOs educational attainment and credentials are fundamental to firm success in the turn of the industrial age based on the knowledge requirements for firms to experience growth. In support of this contention, the scholars studied educational profiles of managers and CEOs in Fortune 500 companies in the US. The study offers critical insights, indicating that over 55% of CEOs and managers had Master

degrees and greater than 93% of them had at least Bachelor degrees from diverse disciplines. However, 66% of the number possesses a Master of Business Administration (MBA) in the US. Drawing from the literature, we argue that managers at different levels of an entity with heterogeneity of educational and professional backgrounds, becomes a mix and pool of managerial knowledge, skill and ability (KSA) intertwined from cross and multi-disciplinary dimensions. The diversity in the managerial education enhances the collective capacity of CEOs and other company executives to perform organizational responsibilities.

1.2. Managerial Experience Diversity

Knowledge, skills and abilities are shaped and derived by work experience of managers and workers. As a consequence, Tesluk and Jacobs (1998) assert that work experience is a critical success factor to a number of organizational performance outcomes. The authors further argue that promotion, selection and compensation decision making depend also on work experience of managers and workers. The construct of work experience applies diverse metrics such as length of time spent on a job, number of times a task is performed, context and complexity of jobs among others. With respect to managerial experience, Datta and Cuthrie (1994) acknowledged managerial functional experience as a critical factor to executive succession and strategic decision making in organizations. Furthermore, Acquah (2012) contends that firm-specific managerial experience facilitates social networking and firm performance. In sympathy with the resource-based view, Acquah (2012) in addition posits that managerial experience garnered over time in a particular industry is a bundle of intangible resources and capabilities, and that experiential knowledge and expertise of top management engender effective and efficient utilization of other resources leading to firm performance and competitive advantage. Accordingly, top management of firms with diversity of work experience is crucial to sound decision making and performance outcomes of sales and productivity growth.

1.3. Managerial Skill Diversity

Managerial skills refer to a generic and task-oriented collection of capabilities and resourcefulness of managers. Managers perform several functions which require a set of multiple and diverse skills to effectively and efficiently execute organizational responsibilities through intelligent cognitive information processing and selection of decision alternatives (Burgoyne & Stuart, 1976). Kanungo and Misra (1992) state that the requirement for person-job fit stimulated by Taylor in 1911 to first theorize a tenet of scientific approach in recruiting workforce that possess appropriate skill to occupy a job position. In consonance with the diverse forms of managerial job and role requirements, Rao (2012) highlighted that Katz in 1974 categorizes conceptual, human relations and technical skills which are important to managers while Mintzberg (1973) in Kanungo and Misra (1992) proposed extensive list of managerial roles with corresponding skills composed of leadership, information processing, decision making, resource allocation and conflict resolution among others. Drawing on the literature, managerial skill heterogeneity becomes pivotal to firm productivity and sales growth (Kanungo & Misra, 1992).

1.4. Firm Performance

Performance consists of multidimensional analysis of accounting returns such as profitability and liquidity, growth outcomes, and stock market performances; and multilevel analyses of individual employees, units or teams, organization and industrial performances (e.g., Hamann, Schiemann, Bellora & Guenther, 2013; Brayfield & Crockett, 1995; Anitha, 2014; Bass, Avolio, Jung & Berson, 2003; Ujunwa, Nwakoby & Ugbam, 2012). The importance of performance has attracted attention of managers, policymakers and generated extensive academic debates among scholars (Hamann et al., 2013; Hailey, Farndale & Trus, 2005). Accordingly, several measurement indices have been employed to ascertain performance of employees, units and firms using objective-subjective, financial and non-financial, triple bottom approach metrics (Harris, 2001; Haslam, Ryan, Kulich, Trojanowski & Atkins, 2010).

In keeping with the view of Porter's value chain model in 1985, Combs, Crooks and Shooks (2005) propose that organizations and business entities are composed of different operational activities which are interlinked and intended to create value. The chains of operational activities are marketing, operations, procurements, human resources, logistics, technology, customer service and infrastructure of entities. The assessment of value chain activities and their operational outcomes culminates in operational performance of firms, which is the realization of operational goals of entities. Crombs et al (2005) categorized operational performance outcomes and subsumed them into three dimensions of accounting returns, growth and stock market

performance. The antecedents and the three dimensions of performance, which overlap, are referred to as organizational performance. Accordingly, Crombs et al (2005: 261) conceptualize organizational performance as “the social and economic outcomes resulting from the interplay among organization’s attributes, actions and environment.” The use of social and economic outcomes to gauge performance presupposes that organizational performance is synonymous with organizational effectiveness, albeit with nuances. As firms are established with purposes to be satisfied ranging from financial to non-financial, meeting of the broad goal expectations of diverse stakeholders is organizational effectiveness, which encompasses all ramifications. However, to empirically measure and investigate social and environmental goals is challenging (Hamann et al, 2013; Crombs et al, 2005; Onwuka, Okoro, Onodugo, 2019). To focus on firm performance, we conceptualize firm performance as the sum of overarching and ancillary economic and non-economic outcomes of an entity’s activities that satisfy expectations of stakeholders

As earlier stated, and to further shed light on the trinity dimension of economic outcomes of performance, Hamann et al (2013) advance a four-sided framework of stock market and growth performance of firms and decomposed accounting return into profitability and liquidity dimensions of organizational performance. The scholars argue that accounting returns applied historical data published in annual reports to ascertain firm performance in retrospect, stock market utilizes capital market indicators of shareholder returns which reflect investors’ perceptions about the future performance of firms while the growth dimension of organizational performance measures change of firm size (sales, employees, asset and productivity) over time, and this aspect of firm performance is inherent with dynamic property. Consequent upon available data and in the context of this paper, the employed sales and productivity growth to proxy firm performance. From extant and current body of the existing literature, firm performance is stimulated by multiple predictors. In this article, the study examines the influence of human capital diversity such as the managerial education, work experience and skill diversity on sales and productivity growth in manufacturing sub-Saharan Africa.

2. THEORY AND HYPOTHESIS DEVELOPMENT

The theoretical foundation of our research is rooted in the resource-based view of the firm. The resource-based theoretical model gained prominence following the Barney (1991) seminal work. The notion of the theory proposes that the differentials in the performance outcomes of entities partly originates from firms’ internal resources, which are rare, valuable, inimitable and non-substitutable leading to sustainable competitive advantage (Wright, Dunford & Snell, 2001).

In the view of Barney and Clark (2007) and Barney (1991), firms’ internal resources are diverse and composite, categorized into physical capital, financial capital, human capital and organizational capital resources. Further, the authors explain that human capital resources constitute managers and workers training, experience, judgment, intelligence, relationships and insights in a firm. Drawing on the resource-based theoretical paradigm, human capital diversity of managerial education background, experience and skills is strategic resource to manufacturing firms in Nigeria (Wright, Dunford & Snell, 2001; Barney, Wright & Ketchen, 2001).

We contend that the formulation and implementation of corporate, business and functional strategies of firms hinge on the accumulated knowledge base of managers and workers. As a consequence, human capital structure of education, experience, skill and their diversity are a bundle of intangible critical resource to firms (Barney, Wright & Ketchen, 2001). The diverse knowledge base of managers is garnered from educational background, work experience and skills to pursue firm growth strategies which engender performance consequences of innovation, productivity and sales of firms (Barney & Clark, 2007; Yang & Konrad, 2011 and Barney, 1991).

2.1. Managerial Diversity Education and Firm Performance

Carpenter (2002) state that the diversity in education is a predictor of firm performance, reporting that top management team education diversity has positive effects on firm performance. In regard to top management team, the author affirmed that there is a positive relationship with firm performance both at high and low levels of internationalization. Contrasting with management team cognitive heterogeneity, Bogers, Foss and Lyngsie (2018) studied employee diversity and open innovation performance at the firm level. In connection with the empirical evidence of the study, educational diversity is positively and significantly associated with firm openness to innovation; educational background and work history (experience) diversity are both directly and indirectly linked with open innovation of firms. The educational background and work history of employees is

akin to education and experience respectively, but their study only differs in the research subject rubric of managers and locale context in our research investigation. Of the study by Hayton and Zahra (2005) on venture team capital and absorptive capacity in high technology new ventures, several findings are documented. With focus on human capital diversity, top management team human capital significantly moderates the association with alliances, acquisition and innovation. They asserted that knowledge and experience diversity as components of human capital do not influence innovation. Furthermore, the gamut of knowledge and experience at the disposal of top management team as a whole is more significant for innovation than the individual education and experience.

2.2. Managerial Experience Diversity and Firm Performance

The heterogeneity of management team is a critical driver of firm performance. This has been asserted by Carpenter (2002) that work experience and tenure of management team are predictors of firm performance. The findings of the work of the scholar advanced empirical evidence, reporting that top management team experience and tenure diversity have positive effects on firm performance at low level of internationalization contrasting with negative effect on firm performance at high level of internationalization of firms. Examining effects of educational diversity in regard to top management team, the author affirmed that there is a positive relationship with firm performance both at high and low levels of internationalization.

Wiersema and Bantel (1992) pointed out that top management team demographic heterogeneity possess capacity to originate disparate information sources, vantage points, creativity and innovativeness in decision making. As indicated from the research outcomes of the study, demographic diversity in lower average age, shorter organizational tenure, higher team tenure, higher educational level, higher educational specialization and academic training account for change and corporate strategic decision making. Experiences in the functional areas of accounting, sales, information system as well as average educational background among other demographic factors promote management team innovativeness (Bantel & Jackson, 1989). In their study of 199 banks selected from 460 state chartered and national banks in six Midwestern states in the US, findings from the study indicate that more innovative banks are managed by more educated teams who are diverse in view of functional areas of expertise.

2.3. Managerial Skill Diversity and Firm Performance

Peterson and Van Fleet (2004) posit that managers require conceptual, human relation and technical skill composition to effectively and efficiently perform duties in business entities as identified by Katz in 1995 and these skills are fundamental for managers to plan, direct, control and assess many other activities. In the light of experience-related skill diversity of human capital, Spanjer and Wittleloostuijn (2017) explore the link between entrepreneur's experiential diversity and entrepreneurial performance. The scholars contend that entrepreneurial and industry-based experiences and performances have a nexus. Drawing from the US National Labour Survey Youth in 1999, the study provides empirical evidence that industry experience is of positive association with performance while entrepreneurial experience has a negative association with performance. Examining the experience diversity and performance, skill-related experiences have positive link with performance but with increased skill related experience diversity of entrepreneurs, there is downward turn of performance. As part of further investigation and finding by the authors, experience diversity in relation to skills and knowledge positively impacted entrepreneurial performance (Spanjer & Wittleloostuijn, 2017). The diversity literature largely demonstrates that human capital diversity of managers produces performance outcomes of innovativeness and competitiveness, return on asset, profitability but less of increased sales and productivity growth of firms. Firm performance outcomes are consequential to managers, policy makers and scholars. In the context of our paper, sales and productivity growths as performance outcomes and managerial human capital diversity of private firms are investigated. From the conceptual review and theoretical developments of human capital diversity and performance consequences, we hypothesize that:

H₁: Managerial skill, education and experience diversity has a significant effect on sales growth of firms.

H₂: Managerial skill, education and experience diversity has a significant effect on productivity growth of firms.

3. METHODOLOGY

3.1. Managerial Skill Diversity and Firm Performance

The data utilized in this study were drawn from the World Bank Enterprise Survey, which was conducted in April 2014 to February, 2015. The World Bank elicited the data by focusing on top managers and owner managers of 2,676 private firms across 19 states in Nigeria (The World Bank Nigeria Enterprise Survey (ES), 2014). A number of scholars have applied coefficient of variation(V) to determine diversity index of demographics (Carroll & Harrison, 1998; Wiersema & Bantel, 1992; Sørensen, 2002) .As the data of the variables were at the firm level, the set of scores for managerial education, skills, experience were extracted, computed and transformed into coefficients of variations using the transform function of Statistical Package for Social Sciences, (SPSS) version 22. The performance of the transform function arrived at coefficients of variations by dividing standard deviation by mean statistics. In this context, we have scores from the proportions of skilled and unskilled, formal education and non-formal education, industry and non-industry-based experience of managers. Accordingly, skilled, formal training (Education) and experience scores of managers of firms serve as diversity indices for managerial education, skill and experience. The justification for the use of set score is that because the aggregates consist of managers of different diverse educational backgrounds, managerial skills and experiences. Accordingly, the coefficient of variation is applied to determine the diversity indices of the independent variables. These set of sores were applied for regression analysis.

3.2. Independent, Dependent and Control Variables

Human capital diversity of managers is measured with the proxies of managerial skill diversity index (*SDI*), managerial education diversity index (*EDI*) and managerial industry-based experience diversity index (*IEDI*).

Performance consequences as a dependent variable at the firm level are measured by the proxies of sales growth (*SG*) and productivity growth (*PG*). Sales growth is a widely applied performance measure as against accounting metrics at the firm and industry level (Barbera & Hasso, 2013). Jaiswall and Raman (2019) assert that sales growth is annual growth rate of sales and the proportion of change in sales from the prior year to the current year, divided by the prior year. In view of productivity growth, it is documented as a measure of firm performance in the body of existing literature (Croce & Marti, 2016; Lee, Sosin & Hong, 2005). As stated by Mare, Hyslop and Fablings (2016), productivity measures labour inputs in firm production through the application of total number of workers, weighted average of full-time and part-time workers and the total of number of hours worked. In this study, we applied the proportion of real productivity growth as computed by the World Bank.

To eliminate bias in the regression outcome, firm size (*FS*) and industry structure (*IS*) (*industry effect*) are included in the model as a control variable, which is determined on the basis of the proportions of managers in the firms while manufacturing industries were dummy coded. The use of firm size and industry effects as control variables in regression model have been noted and employed by scholars (Acquaah, 2012; Robertson & Park, 2007).

3.3. Analitical Methods and Regression Models

The data collected were analysed with descriptive statistics and Ordinary Least square regression (OLS). The models are presented below.

Model 1

$$SG = \beta_0 + \beta_1 SDI + \beta_2 EDI + \beta_3 IEDI + \beta_4 IS + \beta_5 FS + U_i$$

Model 2

$$PG = \beta_0 + \beta_1 SDI + \beta_2 EDI + \beta_3 IEDI + \beta_4 IS + \beta_5 FS + U_i$$

4. RESULTS

4.1. Descriptive Results

TABLE 1- MEANS, STANDARD DEVIATIONS AND CORRELATION MATRIX OF HUMAN CAPITAL DIVERSITY INDICES AND PERFORMANCE CONSEQUENCES OF MANUFACTURING FIRMS

S/N	Variables	M(SD)	COEFFICIENTS						
			1	2	3	4	5	6	7
1	Skill diversity index	4.45(.19)	1						
2	Education diversity index	3.39(.17)	.42	1					
3	Experience diversity index	2.37(.14)	.22	-.10	1				
4	Industry effect	2.01(.42)	.34	.12	.02	1			
5	Firm size	15.03(4.08)	.50	.22	.01	.13	1		
6	Sales growth	-3.56(13.84)	.21*	.28*	.47*	.01	.22	1	
7	Productivity growth	-8.73(8.68)	.32*	.37*	.35*	.08	.09	.73	1

Source: SPSS computed output presented by the Authors, 2020

*Significant at the 0.05 level for a 2-tailed test, Mean (M), Standard Deviation (SD)

Table 1 presents summary statistics and correlation matrix of explanatory variables, control variable, human capital diversity indices and the performance outcomes of manufacturing firms in Nigeria. Among the predictors, managerial skill diversity index has the highest mean value of 4.45 and a corresponding standard deviation of .19 while industry-based experience diversity index has the least mean value of 2.37 with corresponding standard deviation of .14. For the performance outcomes, sales growth indicates an average negative value of -3.56 with the respective data spread of 13.84 while real productivity growth averages a negative value of -8.73 with the respective standard deviation of 8.68. The dependent variables indicted on the average a negative growth in sales and productivity within the year 2015 in the manufacturing industries in Nigeria. Further, a control variable of firm size has mean value of 15.03 and the variability of data points stood at 4.08. The diagonal statistics indicate correlation coefficients of human capital diversity indices of managerial skill, education and experience, industry size, sales and productivity growths. By observation of the coefficients, the results show that managerial skill diversity index has positive relationship with sales and productivity growth respectively ($r = 0.21$, $r = 0.32$); managerial education diversity index has a positive relationship with sales and productivity growth ($r = .28$, $r = .37$), and managerial experience diversity index has a positive relationship with sales and productivity growth ($r = .47$, $r = .35$).

4.2. Inferential Results

H₁: Managerial skill, education and experience diversity has a significant effect on sales growth of firms

TABLE 2 - REGRESSION OUTPUT FOR SALES GROWTH WITH OTHER PREDICTORS

Model 1: Dependent Variable is sales Growth (SG)						
Variables	Coefficients					
	Unstandardized	Standardized (β)	S.E	t-Test	P-Values	VIF
Constant	7.402		33.87	-0.22	0.83	
Skill Diversity Index	0.392	0.26	0.40	1.09	0.29	1.13
Education diversity index	0.339	0.37	0.24	1.42	0.18	1.23
Experience diversity index	0.975	0.20	1.29	.75	0.41	1.19
Industry effect	4.96	.19	2.41	2.06	0.31	2.32
Firm Size	1.13	.34	2.31	.49	.043	2.41
	R ² = 0.34	R _a ² = 0.17,	F=2.63	F (Pvalue .16)		

Source: SPSS computed Output presented by the authors, 2021. Standard Error (S.E) Variance Inflationary Factor (VIF)

Reject H₀: if p value < 0.05, Accept H₀: if p value ≥ 0.05

Table 2 demonstrates the regression output of human capital diversity indices and performance consequence of sales growth. The results indicates that R² = 0.34, R_a² = 0.17, F value =2.63, F (p-value) = 0.16. The R square adjusted (R_a²) of .17 indicates that 17% change in sales growth is accounted for by the explanatory

variables of managerial skill, education and experience diversity included in the model. Examining the overall fit of the model, the probability value generated is greater than the chosen alpha of 5%. (The F-computed = 2.63, $p < 0.05$.) This means that the model is not a good predictor. In view of the individual predictors and their corresponding contributions to sales growth, the standardized beta coefficients for managerial skill diversity index ($\beta = 0.26$), managerial education diversity index ($\beta = 0.37$), and managerial experience diversity index ($\beta = 0.19$). The beta coefficients show that a unit change in managerial skill diversity accounts for 0.26 increase in sales growth while other predictors are held constant; educational diversity of managers is responsible for 0.37 increase in sales growth when the other predictors are held constant; industry-based experience diversity of managers accounts for the 0.19 increase in sales growth while other explanatory variables are held constant. However, considering the individual t tests, the results indicate that managerial skill, education and experience diversity indices has positive and no significant effect on sales growth of manufacturing firms in Nigeria respectively ($t = 1.09$, $p > 0.05$; $t = 1.42$, $p > 0.05$; $t = 0.76$, $p > 0.05$). Further, the estimated variance inflation factor (VIF) values were much lower than the typical threshold value of 10, indicating that multicollinearity did not adversely influence the regression results as Chatterjee and Hadi(2012) and Levine, Stephan, Krehbiel and Bereson (2008) state that VIF above 10 should be of concern.

H₂: Managerial skill, education and experience diversity has a significant effect on productivity growth of firms.

TABLE 3 - REGRESSION OUTPUT FOR PRODUCTIVITY GROWTH WITH OTHER PREDICTOR VARIABLES

Model 2: Dependent Variable is Productivity Growth (PG)						
Variables	Coefficients					
	Unstandardized	Standardized (β)	S.E	t-Test	P-Values	VIF
Constant	27.55		23.03	1.20	.255	
Skill Diversity Index	0.51	0.42	0.24	2.08	.059	1.32
Education diversity index	0.411	0.55	0.16	2.54	.026	1.03
Experience diversity index	0.133	0.03	0.87	0.15	.882	1.23
Industry effect	1.07	.19	.52	2.05	.021	2.32
Firm Size	1.39	.34	.62	2.42	.20	2.41
	$R^2 = 0.54$	$R_a^2 = 0.42$	$F=4.96$	$F(Pvalue .02)$		

Source: SPSS computed Output presented by the authors, 2021

Reject H_0 : if p value < 0.05 , Accept H_0 : if p value ≥ 0.05

Table 3 shows the regression output of human capital diversity indices and performance consequence of productivity growth. The results indicates that $R^2 = .54$, $R_a^2 = .42$, F value = 4.69, F (p-value) = .022. The R square adjusted (R_a^2) of = .42 indicates that 42% change in productivity growth is explained by managerial skill, education and experience diversity included in the model. Examining the overall fit of the model, the probability value generated is less than the chosen alpha of 5%. (The F computed = 4.69, $p < 0.05$.) This means that the model is a good predictor. In view of the individual predictors and their corresponding contributions to productivity growth, the standardized beta coefficients for managerial skill diversity index ($\beta = 0.42$), managerial education diversity index ($\beta = 0.55$), and managerial experience diversity index ($\beta = 0.03$). The beta coefficients show that a unit change in managerial skill diversity accounts for 0.42 increase in productivity growth while other predictors are held constant; educational diversity of managers is responsible for 0.55 increase in productivity growth when the other predictors are held constant; industry-based experience diversity of managers accounts for 0.03 increase in productivity growth while other explanatory variables are held constant. However, considering the individual t tests, the results indicate that managerial skill, education and experience diversity indices has positive significant effect on productivity growth exception of managerial skill and experience which did have positive but non-significant effect of manufacturing firms in Nigeria respectively ($t = 2.08$, $p > 0.05$; $t = 2.53$, $p < 0.05$; $t = 0.15$, $p < 0.05$). In addition, the variance inflation factor (VIF) values were below the commonly accepted threshold of 10, showing the absence of multicollinearity which would have produced spurious regression results. As argued by Chatterjee and Hadi (2012) and Levine, Stephan, Krehbiel and Bereson (2008) that VIFs above the commonly accepted threshold of 10 bias the regression results and demonstrates potential problem of multicollinearity which should be of concern.

5. DISCUSSIONS, IMPLICATIONS AND LIMITATIONS OF STUDY

Drawing from the data analyzed, we found that managerial skill diversity had positive but non-significant effect on sales growth, managerial education diversity had positive but non-significant effect on sale growth and experience diversity had a positive but non-significant effect on sales growth of the firms in the manufacturing industry. In view of productivity growth of the manufacturing industry, all the predictors of managerial skill diversity and managerial experience diversity had positive but non-significant effect on productivity growth while the managerial educational diversity had positive significant effect on productivity growth of firms in the manufacturing industry.

Our research finding that human capital managerial skill diversity had positive but non-significant effect on sales and productivity growth of firms partly concurs with the previous scholarship of Siepel, Camerani & Musucci (2019), who empirically established the link between workforce skill diversity and growth performance of firms in the UK. Although the two studies are not completely similar, for the prior study examines creative, technical and managerial skills of workforce while the current study exclusively explored managerial skill diversity and firm performance in Nigeria. Notwithstanding the nuances, Siepel et al's prior empirical evidence corroborated the finding of our study.

Further, our finding of managerial human capital education and experience diversity which positively influenced firm performance of sales and productivity growth was underpinned by previous empirical evidence (Carpenter, 2002). Carpenter's study which lends credence to our finding by reporting that managerial team diversity in regard to education and experience positively predicted the performance of firms with low level of internationalization. However, the study in addition buttressed our findings in terms of firms with both low and high internationalization, that top management team educational diversity had positive effect on firm performance. The prior study underscored degrees of firm internationalization as opposed to our article which does not disaggregate local or international firms, and degrees of internationalizations. However, the variables of both studies possess some level of similarity indices.

5.1. Theoretical Implications and Contributions

Our findings offer salient contributions to the existing body of diversity literature by advancing theory building and empirical foundations. The findings lend credence to the upper echelons theoretical foundation that managerial heterogeneity and background characteristics of formal education, functional track, career experiences and *inter alia* enhance strategic choices and firm performance outcomes (Hambrick & Mason, 1984), and also supported that of the resource-based theoretical root of Barney (1991), who articulated that skills, abilities and competence of managers acquired through education and experience serve as a bundle of intangible resources with rare, valuable and inimitable characteristics, leads to firm performance and competitive edge.

Multiple prior studies concentrated on board diversity, team diversity, gender diversity, age diversity and other observable demographic diversity. Further, previous scholars considered diversity at employee, board and team levels (Miller, DelCarmen Tariana, 2009; Ararat, Aksu, Cetin, 2015; Marinova, Plantenna, Remery, 2015; Nielsen & Nielsen, 2013; and Li, Chu, Lam, Liao, 2011). The current study focuses exclusively on managers and examined the cognitive dimensions of human capital, specifically skill, education and experience heterogeneity of managers. Contextually, to date and to the best of my knowledge, diversity studies in Nigeria were concerned with general workforce and board diversity to the neglect of managers of manufacturing organizations in Nigeria. This is extremely surprising in consideration of the vital role of managers and the consequential nature of managerial skill, education and experience to performance of firms. Accordingly, our findings undoubtedly generate fundamental knowledge and provide substantial contribution to the management scholarship in the context of Africa.

5.2. Practical and Managerial Implications

The findings of the study are of significant practical and managerial practice. From the findings, managers are to consider human capital as a critical determinant of the performance of firms. Thus, managers are to invest in the human capital, formulate and implement human capital diversity programmes to create a climate to harness the potentials of managerial human capital heterogeneity that foster firm performance. Further, in attracting and utilizing managers and workers, succession planning and career development, firms and human

resource managers should take into cognizance of managerial skill, education and experience diversity to bring about productivity and sales growth of manufacturing firms.

5.3. Limitations and Direction for Future Studies

The findings of the study provide penetrating insights into theory and managerial implications but the study possess few limitations. The investigation is circumscribed in the manufacturing industry in Nigeria. Therefore, there is need to exercise caution to make generalizations in service sectors and other African economies in Sub Saharan region. Consequent upon these limitations, further studies can investigate manufacturing and service sectors of Nigeria and extend to other African economies.

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