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Effects of Knowledge Absorption, Technological Innovation and Employees' Task Performance on Firm Performance

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Abstract. The competition on the global stage is putting pressure on firms to keep acquiring technological innovation that will give them a competitive advantage over others. Currently, the key to a firm's survival is to employ staff who can deliver on tasks as scheduled, invest in technology and absorb knowledge from internal and external sources to influence performance. The study evaluates the effects of knowledge absorption, technological innovation and employees' task performance on firm performance using a quantitative method. A stratified sampling technique was adopted to select respondents from beverage-producing firms in Lagos, Nigeria and questionnaires were used to collect data. The results show that all three study constructs positively affect firm performance. Further analyses show that knowledge absorption positively affects technological innovation, as knowledge is needed to put technology to good use. Based on the findings, it was recommended that leaders of African countries develop comprehensive policies to influence the inflow of foreign direct investment to enable local firms to access technological innovations, which may be expensive for local firms to afford. Again, workers should be put in a position that will enable them to make good use of the knowledge brought by foreign experts to local firms. Finally, employees' task performance ability should be evaluated to identify skill gaps to fill them on time.

Keywords: Knowledge Absorption; Technological Innovation; Employees' Task Performance; Firm Performance; developing countries.

1. Introduction

The continuous demand for innovation and cheaper production methods is driving firms to acquire knowledge that will enhance their productivity as the time when a single company can dominate the market space is slowly fading [1]. With the competitive nature of today's market, companies need to develop the skills that will help them meet the changing customer demand if they want to maintain their market shares and be relevant in the industry [2].

Knowledge absorption is a key way for companies in developing countries to boost their skill [3]. For the past two decades, African countries have received a huge boost in foreign direct investment. This has affected not only their gross domestic product but the capacity of the local employees and firms to operate efficiently and effectively [4].

Knowledge absorption, which defines the transfer of skills and experience from foreign firms to local firms, has been a key tool for improving production in Africa [5].

The inflow of foreign direct investment to African countries needs to be evaluated since there are perceptions that developing countries in Africa are still not competitive enough compared to other countries in Asia [3]. Though huge foreign companies invest in African firms yearly, the domestic firms in Africa still produce at huge costs, making products expensive to consume; hence, many African countries are still recording huge balances in trade, with importation exceeding exportation [6]. The expectation of the influence of knowledge absorption affecting technical innovation seems less visible in many African firms where several methods used in production remained archaic and inefficient enough to meet the competition being thrown to the local markets by foreign firms [3].

Another expectation in developing countries is that knowledge absorption should transform employees' task performance in Africa [5]. Employees' task performance measures the ability of employees to fulfill a given task rightly within the stipulated time [7]. Studies have established that employee task performance in most African countries needs to be improved, as productivity on the continent is unmatched by productivity in other developing countries. Knowledge absorption can transform employees' abilities and organizational climate; hence, the expectation of knowledge absorbed through an inflow of foreign firms into developing countries is not farfetched [8]

Knowledge absorption is aimed at influencing inbound knowledge and acquiring external knowledge to either add to the prior knowledge of the local firms or transform the skills of the local firms and employees to close the gap between the foreign and local firms [9]. The major reason for knowledge absorption and technical innovation is to improve employees' task performance and boost firms' performance [10]. With the performance of firms in developing countries lagging behind that of Asia, Europe and others, the issues of the gains being made through knowledge absorption need to be reexamined to reveal how knowledge being absorbed through foreign direct investment are influencing efficiency and effectiveness in several firms in Africa [11]. Poor performance of firms in Africa is leading to the shrinking market share of the continent in the global space, with competition from international firms making domestic firms struggle in the domestic market [12]. Investigating the effects of knowledge absorption, technical innovation and employee task performance on firms' performance will provide insight into how to boost the performance of African firms and how to make them more competitive in the global market [13].

2. Literature review and hypotheses development

The following hypotheses have been developed based on previous studies. Literature was also used to create the basis for the hypotheses.

2.1. Effects of knowledge absorption on firms' performance

Knowledge absorption has been key in improving firms' productivity [14]. Though firms have their prior knowledge before the inflow of foreign direct investment, it is expected that any merger, acquisition or partnership between domestic and foreign firms should translate to domestic employees benefiting from some skill development that will lead to improved production [6]. Knowledge absorption sometimes happens through the conscious effort of firms to send employees to oversee firms to learn their ways of operation. But, in

most cases, foreign direct investment has been the surest model of knowledge absorption for firms without the funds to invest in employees' training [15].

The relationship between knowledge absorption and firms' performance has been given much attention in developed countries in America and Europe and developing countries in Asia[16]. Though knowledge absorption remains cardinal to improving firms' performance in Africa, fewer studies have explored the African perspective [17]. It must be stated that knowledge absorption has effectively promoted firm performance in some cases, but in other cases, it does not have statistically significant effects on firms' performance [18].

The key question asked by some researchers is how relevant the knowledge employees absorb is to the production needs of firms [19]. Knowledge does not operate in a vacuum; therefore, knowledge absorption must be accompanied by investment into tools and equipment that will enable employees to put their knowledge to productive use [17]. In developed countries, knowledge absorption most positively affects firms' performance because knowledge absorption is backed by capital investment [20]. Most firms that venture into developed economies for partnerships or acquisitions mostly provide detailed financial statements demonstrating their ability to improve these firms [19]. On the other hand, foreign firms that merge with domestic firms in developed countries overlook this financial scrutiny; hence, some hardly provide the needed capital, leading to employees absorbing the knowledge. Hence, knowledge absorption sometimes does not influence firms' performance in developing countries [21].

The huge gap in products between African firms and their counterparts in Asia is influencing new interest in studying the effects of knowledge absorption on firms' performance on the continent. Although knowledge is improving, there is no matching increase in productivity [22]. African firms hold less than 10% of the world market share [23]. There is a need to investigate if knowledge absorption positively affects firms' performance in developing African countries [20].

H1: Knowledge Absorption Has Positive Effects on Firms' Performance.

2.2. Effects of employees' task performance on firms' performance

Employees' task performance remains a vital determinant of firms' performance; organizations are looking for employees with the required skills who can meet the organization's demands on time [24]. The market's competitive nature means that workers must be assigned specific tasks and be able to perform these tasks with less supervision and fewer errors [25]. Employees' task performance measures their ability to fulfil tasks within a specific time. Sometimes, employees are expected to stand in for their colleagues when needed [26].

Studies investigating firm performance are drawing more attention to employees' task performance because of the demand for quality human resources today [27]. Though the issue of machines performing most tasks is growing through artificial intelligence development, human capital remains key to firms' performance [19]. Human beings need to monitor and control any automation forms at workplaces [28]. Skill levels of employees in developing countries have been questioned as some studies connected the low level of firms' performance in developing countries to the poor ability of the organizations to get the required human resources [29].

Employees' task performance has negative or positive effects on firms' output depending on the quality of the human resources and the enabling environment provided for employees to operate [30]. This study tested the effects of employees' task performance on firms' performance in developing African countries [31].

H2: Employees' task performance positively affects firms' performance.

2.3. Effects of knowledge absorption on technological innovation

Technological innovation is a critical success factor in many firms, with technology being one of the dynamic variables in the current industrial sector [32]. Firms are looking for technology to help them reduce production costs and meet the complex variety of customer demands [33]. Technological innovation is the steps organizations take to purchase or adopt key technological processes or equipment that increase their viability in the market [34]. Firms that embarked on technological innovations aimed to become market leaders by offering the lowest prices of goods or offering customers the highest quality of distinct products [35].

Knowledge absorption has remained a significant way for firms to achieve technological innovations, especially in developing countries where firms do not have the financial strength to achieve technological innovations that are very expensive in some cases [36]. Most firms in Africa rely on knowledge absorption, which is deduced chiefly through local firms being taken over by foreign firms through partnerships, mergers and others [37]. The technological strength of many domestic firms in Africa is far behind that of firms in emerging economies in Asia or Europe; hence, firms in Africa hardly produce products at competitive prices [38]. Though many African firms depend on foreign firms that operate on the continent in the form of foreign direct investment to meet technological innovation demands, more is left if products of the continent can compete with foreign products in terms of prices and quality [39].

Studies that draw relationships between knowledge absorption and technological innovation show that knowledge absorption positively influences technological innovation. Many African firms improve upon their technology by absorbing skills from foreign firms to merge with domestic firms [40]. Since the cost of most technological innovations was difficult for firms on the continent to purchase, absorption of these technological skills, equipment and tools through domestic firms collaborating with foreign firms that have technological capacity has become the medium of improving technological innovation in developing countries in Africa [41].

Technological innovation is deemed successful when it positively impacts firms' performance since the investment in technology is primarily measured in improving the speed of production, lowering the cost of production or improving the quality of products [42]. Based on all these assumptions, studies mostly established positive relationships between technological innovation and firms' output which is technically referred to as firms' performance [43]. Though many studies have acknowledged that technological breakthrough in Africa is not as topnotch compared to Europe and Asia, the continent is seeing some level of improvement which is positively impacting production, though the pace is slow because technologies are being introduced at the speed of light [44] .

H3: Technological innovation positively affects firms' performance.

H4: Knowledge Absorption has a positive influence on Technological innovation.

2.4. Mediating effects of technological innovation on the relationship between knowledge absorption and firms performance

Technological innovation, though, directly influences firms' performance; some studies have used it to mediate other relationships [42]. Technological innovation directly affects knowledge absorption and firms' performance, hence its suitability for mediating the relationship between these variables [32]. Studies have demonstrated that the impact of knowledge absorption on firms' performance mostly changes when technological absorption is introduced into the relationship [35]. Studies in Europe and Asia have established a positive pact of technological innovation in other relationships [36]. Mediation effects of technology on the influence of other variables on firms' performance is yet to receive the needed attention in studies conducted in developed countries, which mostly test direct effects [40]. The above explanation is the major reason for exploring the mediating role of technological innovation in the relationship below.

H5: Technological innovation mediates the relationship between knowledge absorption and firms' performance.

H6: Employees' Task Performance Moderates the Relationship between Knowledge Absorption and Firms Performance.

Conceptual Framework

Figure I below shows the effects of various on the other as stated in the hypothesis.

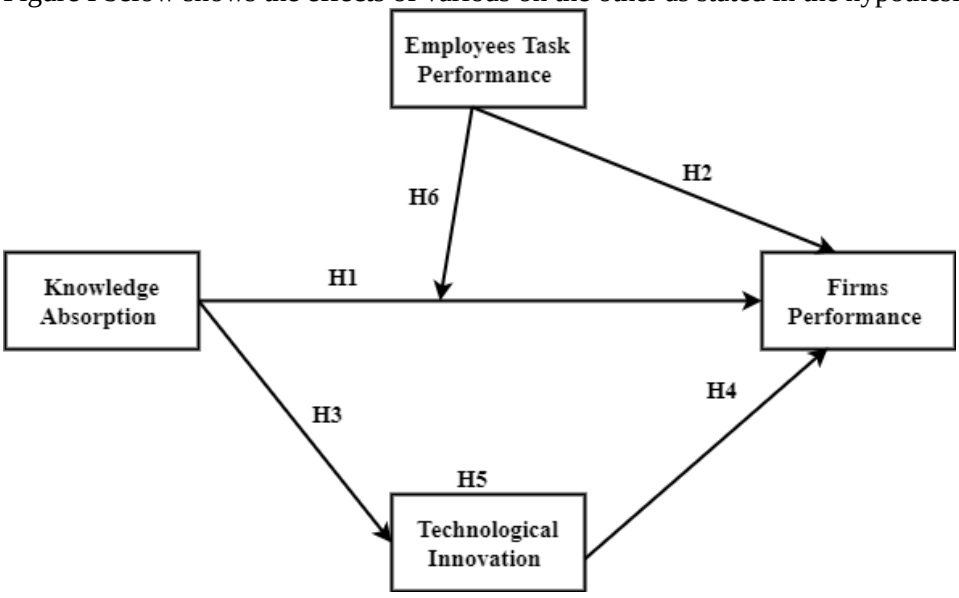

Figure I. A conceptual framework

3. Research methodology

A quantitative cross-sectional study procedure was adopted as the study methodology; questionnaires were used to collected data from workers of beverage producing firms in Lagos Nigeria.

3.1. Measures

The four constructs used in the study were measured using tools adopted from previous studies; separate tools were used to measure each construct. Employees' task performance was measured with five instruments developed by Williams and Anderson [45]. Technological innovation was measured with tools developed by Yang [46]. Other studies have used the same tool to measure the digital capability of firms. Firm performance was also measured with tools adopted Agbényiga [47]. All tools were measured using a 5-point Likert scale from 1=strongly disagree to 5= strongly agree.

3.2. Sampling and data collection

The researcher contacted seven well-established food and beverage firms in Legos, Nigeria, for the study. Two turn down the offer to participate, citing busy work schedules. The remaining five food and beverage firms agreed to participate based on anonymity. Online data collection processes were adopted to send the questionnaires to the respondents.

A stratified sampling technique was used to select respondents from the five beverage firms. In each firm, the departments were classified as a stratum, enabling the research to select workers from every department [48]. Selection criteria were adopted to select the respondents representing the research population. In each department, senior-most employees were given priority and employees with the longest duration. Again, employees sent on refreshment programs and attachments on other firms were considered ahead of others.

The questionnaires were sent to respondents through their emails and WhatsApp; the respondents were given seven days to respond to the questions. Out of 836 questionnaires sent, 693 were responded to successfully and used for the analyses.

3.3. Data analysis

SPSS and AMOS version 21 were used to analyze data. Correlation analysis was used to check relationships between the constructs, while hierarchical modeling was used to test the hypotheses.

4. Results

The demographic characteristics of respondents are as follows, out of the 693 respondents, 528 (76.2%) were male and 165 (23.8%) were female. The ages of respondents are classified as follows, majority of 349 (50.4%) were aged 26-35years, 187(27.8%) of respondents were aged 18-26years, while 96 (13.9%) were aged 46-55years and 61 (8.8%) of respondents were aged above 55years. A total of 107 (15.4%) respondents hold a first degree, 268 (38.7%) respondents hold diploma certificates and the remaining 318 (46.8%) were educated at the secondary school level. The duration of respondents at their workplaces is as follows 107 (15.4%) respondents have been working in their companies for the past 5years and above, 246 (35.5%) of respondents have been working in their

companies for the period between 4-2years while the remaining 340 (49.1%) have been working in their companies for less than 2years. The majority of 478 (69.7%) respondents hold no managerial or supervisory positions at their workplace, 126 (18.2%) hold various supervisory positions, while 89 (13.4%) Hold managerial positions

4.1. Data validation

The data used for the study were validated by conducting Exploratory Factor Analyses test to evaluate how each variable measures the construct. All variables that loaded below the threshold of 0.6 were removed [49]. Cronbach alpha was also conducted to evaluate the internal consistency of data and the Cronbach alpha of the constructs were measured beyond the minimum threshold of 0.6, signifying the finiteness of data [50]. The results of factor loading and Cronbach alpha of variables are presented in the table below.

Table I: CFA Factor Loading Of Variables According To Constructs

Variables	**Codes**	**Estimates**	**P-Value**	**Chronbach alpha**
Firm performance	FP4	0.782	***	0.782
	FP 2	0.763	***	
	FP 5	0.753	***	
	FP 3	0.699	***	
	FP 1	0.673	**	
Knowledge absorption	KA3	0.944	***	0.865
	KA 5	0.913	***	
	KA 4	0.881	***	
	KA 2	0.862	***	
	KA 1	0.833	***	
	KA 6	0.831	**	
Employees task performance	ETP1	0.922	***	0.863
	ETP2	0.902	***	
	ETP3	0.873	***	
	ETP5	0.845	***	
	ETP6	0.822	**	
	ETP4	0.754	***	
Technological innovation	TI1	0.961	***	0.863
	TI 3	0.943	***	
	TI 2	0.852	***	
	TI 5	0.764	***	
	TI 4	0.733	***	
	TI 6	0.691	**	

* FP= firms performance, KA= knowledge absorption, ETP= employees task performance, TI = technological innovation.

4.2 Initial analysis

Correlation analysis was conducted to evaluate how variables are correlated. Table 2 shows positive relationships between knowledge absorption, employee task performance, technological innovation and firm performance. This indicates that knowledge absorption, employee task performance and technological innovation may positively influence firms' performance.

Table II: Inter-Factor Correlation

	variables	Mean	STD	1	2	3	4	5	6	7	8	9
1	Gender	4.10	1.83	1								
2	Age	3.65	1.74	.181**	1							
3	Edu	3.39	1.83	.225**	.294**	1						
4	Duration	3.52	1.59	.784**	.211**	.184**	1					
5	Position	3.65	2.10	.034	.053	.191**	.009**	1				
6	FP	3.5524	.85267	.121*	.114*	.072*	.125*	.064	1			
7	KA	2.9980	.53887	.069*	.037*	.064*	-.005	.139*	.572**	1		
8	ETP	2.98	1.297	.149**	.088*	.087*	.158**	.053	.826**	.453**	1	
9	TI	3.5628	.84683	.069*	.001*	.098*	.006*	.114*	.630***	.851**	.375**	1

* *= $p<0.05$, **=$p<0.01$, ***= $p< 0.001$, FP = Firms Performance, KA= Knowledge on Absorption, ETP= Employees Task Performance, TI= Technological Innovation.

4.3. Hypotheses testing

Hierarchical linear regression analysis was conducted to test the hypotheses as the demographics of respondents were contrrroled. The results are shown in the model in Table 3. Model 1 contains the results of control variables. From the model2 in Table 3, the results show that knowledge absorption positively affects firm performance; results from the model3 in Table 3 show that employees' task performance positively affects firms' performance. Again, results on model 4 on the same table indicate that technological innovation has positive effects on task performance. Finally result from the model5 in Table 3 indicates that knowledge absorption positively affects technological innovation. In summary, the results show that hypotheses 1,2,3 and 4 are supported.

Variables	**Firms Performance**	**Firms Performance**	**Firms Performance**	**Firms Performance**	**Technological Innovation**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
	B*(t)	**B*(t)**	**B*(t)**	**B*(t)**	**B*(t)**
(Constant)	1.563***(6.784)	1.018***(8.795)	.091* (2.022)	.028**(.449)	1.990**(2.972)
Gender	.051(1.070)	.018(.726)	.016* (1.733)	.016(.027)	.052(2.972)
Age	.066(1.102)	.068* (2.154)	.014(1.276)	.003* (.767)	.175** (2.972)
Edu	.011(.327)	.018(1.064)	-.012* (-1.982)	-.007(.153)	.021(2.972)
Duration	-.031(-.711)	.003(.124)	-.011(-1.397)	-.011(.101)	.007(2.972
Position	.094(1.269)	-.007(-.182)	.018(1.331)	.017(136)	.209** (2.972)
KA		.376*** (9.243)			.109* (2.972)

ETP			.542*** (29.922)		
TI				.466*** (12.049)	
R^2	*.254***	*.745***	*.972****	*.893****	*.083***
Change in R^2	*.254****	*.745****	*.975***	*.008****	*.083***
F	*14.532****	*142.066****	*1659.211****	*2170.075****	*3.888****

* B= unstandardized coefficient, t= value in parenthesis, *= *p<0.05*, **=*p<0.01*, ***= *p< 0.001*, KA= Knowledge on Absorption, ETP= Employees Task Performance, TI= Technological Innovation.

4.4. Testing mediating and moderating effects

The results of the mediating effects of technological innovation on the relationship between knowledge absorption and firms' performance are shown in Model2 of Table 4. The result demonstrated that technological innovation mediates the relationship between knowledge absorption and firms' performance. While on model3 in Table 4, the results indicate that employees' task performance moderates the relationship between knowledge absorption and firms' performance.

Table IV: Testing For Mediating And Moderating Effects.

Variables	**Firms Performance**	**Firms Performance**	**Firms Performance**
	Model 1	**Model 2**	**Model 3**
	B(t)	**B(t)**	**B(t)**
(Constant)	2.434(10.096)***	2.071(7.411)***	2.566(10.013)***
Gender	.105(1.908)*	.095(1.738)*	.110(1.999)*
Age	.069(1.043)	.040(.600)	.084(1.258)
Edu	.017(.467)	.013(.364)	.020(.552)
Duration	-.079(-1.593)	-.079(-1.604)	-.076(-1.527)
Position	.118(1.420)	.083(.989)	.134(1.604)
KA		.071* (2.101)	
TI		.161* (2.504)	
ETP*KA			.574**(2.172)
R^2	*.075***	*.908**	.828***
R^2*Change*	*.075***	*.834**	.644***
F	*2.181**	*2.798***	*2.197**

* B= unstandardized coefficient, t= value in parenthesis, *= *p<0.05*, **=*p<0.01*, ***= *p< 0.001*, KA= Knowledge on Absorption, ETP= Employees Task Performance, TI= Technological Innovation.

5. Discussion

The competitive nature of the global market is sending the signal to developing countries that they need to adopt strategies to achieve growth targets of their firms as studies are pointing to the fact that firm performance, which is measured by comparing firms' inputs to output, is key to investors channeling their funds into firms [51]. The speed of growth in technology in Asia, Europe and America is making it difficult for firms in Africa to actively compete in the world stage as the entire continent of over 50 countries holds less than 10% of the world market shares [52]. Knowledge absorption, which explains how firms in the local industry acquire knowledge and skill from foreign partners, has been established as the medium that is helping to boost productivity on the continent [53].

The study examined the effects of knowledge absorption on the performance of firms in the Nigerian beverage industry and established that knowledge absorption influences firms' performance positively. This finding is in line with studies conducted in East Asia and Pacific countries, which established a strong connection between the inflow of firms from the United States of America and other European countries at the early stages of their industrial revolution, which helped to improve the skill levels of the domestic employees [54]. The relationship between knowledge absorption and firms' performance has been the driver of foreign direct investment policies in several African countries, as the major benefit aimed at partnering with foreign firms is to enable the domestic employees to absorb knowledge from the expatriate workers to help boost the production of the domestic firm [55]

Studies have established that knowledge absorbed from foreign firms is helping several organizations in sub-Saharan Africa access technology and production skills, which would have been challenging to acquire without absorbing it from other firms [54]. Researchers are encouraging African firms to implement mechanisms that enable them to access knowledge from foreign firms and augment knowledge gaps on the domestic front [55].

The studies explored the effects of technological innovation on firms' performance and established that technological innovation positively influences firm performance in the beverage industry of Nigeria [56]. The essence of technological innovation in firms' performance has been demonstrated by several studies, with technological innovation helping in the reduction of the cost of production, speeding up the production process and bringing customers and firms to common platforms where the needs of customers are becoming the foundations for product design [57]. Technological innovation is notable as the driving force behind the speedy growth of industries in Asia; hence, technological innovation can help improve the fortunes of African firms when they can finance cutting-edge technological innovations, which must come at a high cost [58].

Nonetheless, technological innovation positively impacts firms' performance; studies have pointed out that the initial stage of acquiring technological innovation can negatively impact firms' performance as it comes with a huge cost [3]. Technological innovation helps firms grow when workers can put technology to good use to provide a competitive advantage over other firms in the industry [59].

Knowledge absorption and technological innovation are reflected through the ability of employees to use these variables to improve their task performance; hence employees' task performance highlights the usefulness of knowledge and technology acquired by firms [60]. The researchers explored the effects of employees' task

performance on firms' performance in the beverage industry and established that employees' task performance has positive effects on firms' performance [61]. Studies about the effects of employee task performance in developing countries, especially in Africa, have not been straightforward, as some studies report positive while others report negative relationships [62]. The reporting of positive relationships between employees' task performance and firms' performance in this study may be traced to knowledge absorption and technological innovation improvement acquired by firms in the beverage industry in the past few years [57]. To improve employees' task performance, African firms must focus on constant training of talents on the continent and invest more in current technology and partner with foreign firms from East Asia and other developed countries to help them fill the technological and skill gap facing African countries [63].

Knowledge absorption may be a deliberate act or not deliberate; hence skill levels of employees is key in enabling them to absorb skills from their partnering firms [64]. According to studies, organizations must prepare employees to pick skills from other firms through on-the-job training or organized workshops [65]. The study investigates this situation by using employees' task performance to moderate the relationship between knowledge absorption and firms' performance and the result indicates that employees' task performance moderates the relationship between these two variables [60]. It must be stated that merely merging or partnering with bigger firms is not enough for firm employees to absorb knowledge, but the task performability of employees is key to them acquiring the needed skills from other employees [56].

6. Conclusion

The study evaluated the effects of Knowledge Absorption, Technological Innovation and Employees' Task Performance on Firm Performance and concluded that all the variables positively influence firms' performance. While developing countries in Africa are deemed lacking in technological innovation, studies have proved that knowledge absorption through merging or partnering with foreign firms can help employees acquire skills and cutting-edge innovations that are sometimes too expensive for African firms to afford. The variables studied in this article are vital to the productivity of firms in developing countries' especially in Africa. Since all these variables have positive effects on firms performance. Four recommendations have been outlined in this study. The first is that African firms must focus on merging with foreign firms to help them finance cutting-edge technological innovations that may be too expensive for them to acquire. Secondly, employees of African firms must be positioned to absorb knowledge from foreign firms at the least opportunities they get to work with them. Thirdly African leaders should develop a comprehensive policy that attracts foreign direct investment. Efforts must be input into evaluating firms that come to Africa in the name of foreign direct investment to enable African nations to attract firms that can help improve the skill levels of workers within the continent. Lastly, Africa must focus on developing technology needed for industry growth to reduce over-reliance on other countries for every little technological innovation needed for firm growth.

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