

THE RELATIONSHIP BETWEEN TECHNOLOGY AND ATTRITION OF SMALL AND MEDIUM TEXTILES IN NIGERIA



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Abstract

The purpose of this paper is to investigate if technology influences attrition in small and medium enterprises in Nigeria. Attrition in the textile industry led to a job loss of approximately 280,000. Public commentators have blamed the dwindling fortune of the textile sector on a number of factors including technology, whilst on the other part, government has also been blamed for its apathy towards textile industry; but no serious empirical investigation has tested these factors. Based on this premise the hypothesis tested is: H_2 : There is no relationship between technology and attrition of textiles SMEs in Nigeria. H_2 : Government policy moderates the relationship between technology and attrition of textiles in Nigeria. The population of the study comprised 80 failed and 30 standing firms in the textile cities of Kaduna, Kano in the North, Lagos, Asaba, Aba and Onitsha in the South. Using a snowballing technique, structured and unstructured questionnaires were distributed to 356 owners and general managers of the firms. A total of 232 questionnaires were retrieved and analysed using correlation and regression statistical tools. The result showed that absolute correlation between technology and attrition in Nigeria is 0.709 indicating a strong linear relationship. The coefficient of determination R^2 is 0.503 indicating that 50.3% of the variation in attrition in textiles in Nigeria is caused by technology. Government policy is not a mediating factor since the relationship with the independent variable is close to zero. It is recommended that the Textile Manufacturers Association in conjunction with Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) should pay more attention to issues of technology in textile industries and for the textile manufacturers to follow technology government should initiate policies that will assist the textile industries to be able to compete with textile manufacturers from other countries.

Keywords: *Relationship, Technology, Attrition, Textiles*

Background to the Study

This paper seeks to investigate if technology influences attrition in small and medium textile firms in Nigeria. Attrition has been defined as a reduction or decrease in numbers size or strength (Dictionary.reference.com/browse/attrition). Nigeria once occupied the third position in textile production just behind Egypt and South Africa. (Eneji, Kennedy & Rong, 2012). Nigeria's textile fortune has since changed, and therefore can longer take advantage of the opportunity thrown open by the African Growth and Opportunity Act (AGOA) and other preferential trade concessions. As at today, there are only about 30 standing textile firms, and these are mostly in the medium category. The sector produces a variety of fabrics which range from African prints, shirting's, embroideries, guinea brocade and wax prints. These products are marketed within the country and in the West African Sub-regional markets. This textile sector has developed to incorporate fibre production, spinning, weaving, knitting, lace and embroidery, mat and carpet production, packaging, printing and finishing (Mohammed, 2011).

In Nigeria, the textile and garment manufacturing industry is targeted as key to reducing poverty, promoting growth and generating employment. However, evidence abounds, to show that the target is far from being realized. Statistics indicate that those who have lost their jobs as a result of the attrition/closure of these textile mills is estimated at about 280,000 (Umar, 2008). If the multiplier effect of the labour loss is calculated the figure will run to several more thousands of idle labour either in primary raw material production such as the cotton growers or in other associated by-products production in the textile sector. Public commentators have often blamed the dwindling fortune of the sub-sector on a number of perceived factors, technology being one. But despite such commentaries, empirical study is still scanty and the nation cannot continue to rely on guess work, which will not in anyway contribute to the revival of the industry.

This study purpose therefore seeks to find answers to this dilemma by isolating the factor of technology and to carefully employ research tools using questionnaires and depth interviews on both failed and standing textile in order to find a solution. Based on the above premise, the hypothesis is presented as:

H₂: There is no relationship between technology and attrition of textile in Nigeria.

H₃: Government policy moderates the relationship between technology and attrition of textile.

Literature Review

According to one major school of thought, theory should come before research (Nachmias & Nachmias 2009: 46). Causes of small business failures have been approached from different perspectives. The multiple origins and causes of failure theory is based on the assumption that in the final analysis, SME businesses that suffer from inefficiencies will exit the market place. The inefficiencies in failed SMEs are indicated to emanate from the confluence of the three key entrepreneurial process elements (entrepreneur, organization, and environment) whose interactions result in the inefficiencies between resources and opportunities that ultimately lead to the failure of the small business (shepherd, 2009). Researchers have been isolating factors and

subjecting them to empirical studies to determine the significance of the factors as causatives in firm failure, this present research being one, isolating technology, while government policy is the moderating factor as Nigeria's economy is public led.

Technology is defined as the process by which human beings fashion tools and machines to increase the control and understanding of the materials environment. (Encyclopedia Encarta 2009). Linking technology and organizational failure however, has no grand theory (Mellahi & Wilkinson N/d). Researchers have however, attempted to explain how technology affects the survival of firms. Technology models such as (TAM) technology acceptance model by Davis (1985) emphasize how acquisition of technology will not only increase productivity, but also improve quality of service by cutting down costs (Legris, Ingham & Collertter, 2003). A sore aspect of Nigerian firms and especially textiles, as gathered through public commentaries is the over reliance on machineries which have long been discarded by their counterparts in Europe and Asia.

The definition of technology is encompassing, bringing into its ambit, Research and Development (R & D), innovation and ICT, because progressive firms must focus on R & D, exploring ideas and development of such ideas into prototypes, which will subsequently lead to commercialization and that is the innovation connection. The literature on innovation generally affirms that technological innovation is a key factor in a firm's competitiveness (Subra, Math & Krish 2010; Gakure, 2011).

Evidence by and large abounds to show the linkage of new products development to profits and good returns on investment (Ebrahimi, Ahmed & Taha, 2010). A study on the impact of technology on textile industry survival in other countries using India and Pakistan as case studies show that without R & D, the market for fabrics will shrink. Thus, to stay competitive, multinationals have been increasing their R & D investments in foreign countries (Reger 2004).

SMEs can also successfully enter and remain in both domestic and global markets if they can meet the expectations of customers in terms of features and quality of goods and to remain competitive in the market place, "SMEs must be able to continue in product innovation". (Lafront, 2008:110; Hargadon, A. 2009). A study carried out by Apulu & Ige (2011) on drivers for information using Nigerian small and medium sized enterprises in Apapa, Lagos; came out with findings that suggest that the adoption of ICT will result in saving of costs. The study also indicated that computer applications by such firms covered activities such as word processing and E-mail services, leaving important manufacturing applications such as production and process planning which can enhance firm survival. A textile firm can use ICT in enterprise resource planning, material sources and as a tracking mechanism of an order through the production link.

Government policy plays a role in ensuring enterprise growth and by its actions can cause enterprise failure. As a mediator, Ayo (2010) indicates that it acts as a business regulator with the overall aim of helping to sanitize and to stimulate the activities of the enterprises so that they can have the respect for the rule of competition. On the other hand, where the policies of government fail to build enterprise culture, building the capability for small enterprise growth and improving access to growth, the enterprises witness shorter life cycle (Demirgue Maksimovic, Beck & Laeven, 2006). There are emerging indications that government machineries are unable to directly implement or run private entities successfully, but rather public private collaboration for SMEs development are ever seen as critical dimension for the success of these effects (Lukascz 2005). There is therefore a growing consensus that institutional framework and policy specifications are important factors in helping the education and success of SMEs across the globe (Ekwem, 2011).

An empirical study on the causes of business failure in Iran was carried out by Arasti (2011). Interviews were conducted with 13 Iranian entrepreneurs whose businesses failed. Questionnaires using 5 point likert scale were completed by 51 managers of failed SMEs. The result indicated, that one of the main causes of failure was insufficient government policy.

Conceptual Framework

The review of literature in the preceding section suggests a linkage between technology and firm productivity but no definite position can be assigned to it in this study on its causal link with attrition. Thus, this present study purposes a conceptual framework illustrating the theoretical relationship between technology, government policy and attrition.

This conceptual framework lists the exogenous variable (technology) one moderating variable, the government policy and one endogenous variable which is attrition.

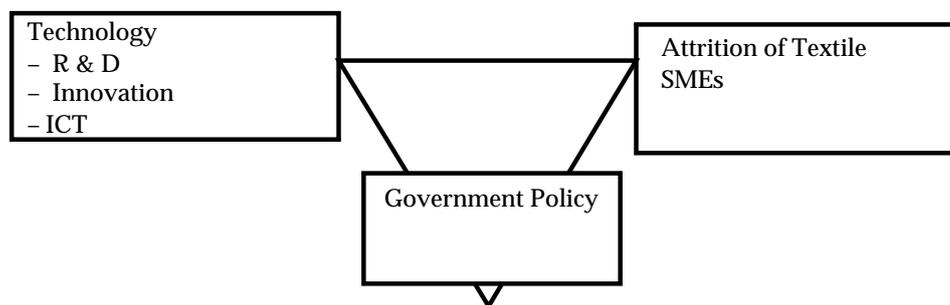


Figure 1: Conceptual Model

Methodology

The population comprised of 80 failed textiles and 30 standing that were registered in the identified zones of Kano, Kaduna, Lagos, Aba and Onitsha. The study population comprised of 66 failed and 30 standing firms (Krejcie & Morgan sample size table). Triangulation method employing structured and unstructured questionnaire were supplemented with in-depth interviewing (Nachmias & Nachmias 2009: 206). The responses from the depth interview were used to validate responses from the questionnaire. In order to ensure both internal and external validity of the instruments, a pilot study was undertaken, thus opinion of experts in the textile department of Kaduna Polytechnic was sought, by vetting the instrument. For surveys, a small part of the sample say 20 people should be contacted and interviewed (Monette, Sullivan and Deyong 2002: 98). In this study, a pilot test was carried out by administering a questionnaire on fourteen identified senior, executives of failed firms and six identified senior executives of standing firms in Kaduna. The reliability of the instruments was further tested through the Cronbach's alpha method (Cronbach, 1951). A reliability co-efficient of 0.8 and above was considered adequate (Odhiambo 2011; Orwa 2015). A total of 356 questionnaires were distributed, and of this number, a total of two hundred and thirty-two (232) questionnaires were duly completed and retrieved and were used for analysis. This represents 65% of total questionnaires distributed.

The results of the study were analyzed by descriptive and inferential methods as shown in the tables.

Table 1: Whether R & D Contributed to Attrition in Nigeria's Textiles

Question		Count	Column N%
Did you conduct research and development in your firm?	Yes	11	5
	No	221	95
	Total	232	
How did you consider the amount?	Adequate	70	30
	Inadequate	162	70
	Total	232	
Would you say the R & D you conducted helped you to improve profitability?	Yes	162	70
	No	70	30
	Total	232	
Did you think without R & D a textile firm could?	Succeed	35	15
	Fail	197	85
	Total	232	

95% of the sample conducted R & D in their firms but as high as 70% of that group felt the amount allocated was inadequate 70% of the entire sample agreed that R & D could help to improve profitability and a further 85% affirmed that without R & D a firm could fail.

Table 2: Whether innovation contributed to attrition in Nigeria's textiles?

Did you encourage contribution of new products ideas from staff?	Yes	172	71
	No	60	29
	Total	232	
Did you have any new products development team?	Yes	60	29
	No	172	71
	Total	232	

From table 2: 71% of the sample encouraged contribution of new product ideas from staff; while 29% never did. A total of 71% of the sample did not have new product development team which is very essential in products development.

Table 3: Did ICT contribute to attrition?

Did you use ICT equipments in your firm?	Yes	200	86
	No	32	14
	Total	232	
What did you use the ICT for?	Production planning	35	15
	Word processing & office routine	197	85
	Total	232	

A total of 86% of the sample used ICT facilities with only 14% saying they did not. Of the number that used ICT 85% used it for routine office work, with only 15% using it for production planning.

Table 4: Whether Institutional Framework Influenced Attrition in SME Textiles

Question		Count	Column N %
Did you consider the legal environment which the textile firm operated as favourable?	Yes	65	24%
	No	167	72%
	Total	232	

From table 4 72% of the sample did not consider the legal environment as favourable with only 24% agreeing that the legal environment was alright.

Table 5: Did Support Institutions Influence Attrition in SME Textiles

Question		Count	Column N %
Were you aware of institutions that provided support for SME textiles	Yes	52	22%
	No	180	78%
	Total	232	
Did you ever receive assistance from government to hedge you against foreign competition?	Yes	60	26%
	No	172	74%
	Total	232	

From table5: 78% of the sample never knew about the existence of institutions that provided support for SMEs; with only 22% saying they did know. Similarly, 74% of the sample never received any form of assistance from government, while 26% said they had.

Table 6: Trade Intervention

Question		Count	Column N %
Did you encounter any unfair trade practices by foreign countries that hurt your textile business	Yes	232	100%
	No	0	
	Total	232	
What is the form of unfair trade practices?	Tied selling	0	-
	Dumping	232	100%
	Total	232	

From table 6: the entire respondents 100% said they encountered unfair trade practices from foreign textile producers, as they all cited dumping as the form of unfair trading.

Government Policy
Correlation between technology and attrition

Correlations	Attrition	Technology
Pearson correlation	1	-.709
Attrition sig. (Z - failed)		
N	232	232
Pearson correlation	-.709**	1
Technology sig. (2 - failed)		
N	232	232

** Correlation is significant at the 0.01 level (2 - failed)

From table 4.2, the analysis shows that the correlation between technology and the attrition of textile in Nigeria is -0.709 , implying a strong negative relationship between technology and the attrition of textiles industries in Nigeria, signifying that as technology is improving, the textile industries are declining in Nigeria.

Model summary

Mode	R	R square	Adjusted R square	Std. error of the estimate
1	.709*	.503	.501	.08658

Dependent Variable: Attrition

The above analysis in Table 4.3 shows that the absolute correlation between technology and the attrition of textile industries in Nigeria is 0.709 , implying a strong linear relationship between technology and attrition of textile industries in Nigeria. The coefficient of determination R^2 is 0.503 indicating that 50.3% of the variation in attrition of textiles industries in Nigeria is expressed by technology.

ANOVA^a

Mode	Sum of squares	df	Mean square	F	Sig
1 Regression	1.746	1	1.746	232.927	.003
Residual	1.724	230	.007		
Total	3.470	231			

- a. Dependent variable: Attrition
- b. Predictors. (constant) technology

Table 4.4 shows that the p-value of the ANOVA of this regression model (0.000) is less than 0.05 . it is concluded that the model is significant and therefore fit for use.

Coefficients

Model	Un-standardized coefficients		Standardized coefficients	t	Sig
	B	Std. error	Beta		
(constant)	.880	.023		38.402	.000
1 Technology	– .651	.043	– .709	–15.262	.000

a. Dependent Variable: Attrition
 $y = 0.880 - 0.651x_1$

Table 4.5 shows that the linear relationship between technology and attrition of textile industries in Nigeria is $y = 0.880 - 0.651x_1$. Where y is the attrition of textile industries in Nigeria and x_1 is technology.

Hypothesis Testing

The P – value of the slope of the model (0.000) is less than 0.05, we therefore reject H_0 , and conclude that technology has a significant role in the attrition of textile industries in Nigeria. The negative sign of the slope in the model implies that lower level of technology is associated with high risk of attrition.

Correlation analysis of government policy as a mediating variable

Correlation analysis is carried out to investigate the effect of government policy on the independent variable to determine if government policy is a mediating factor in the study.

Table 4.6: Did Government Policy Moderate Attrition in Nigeria's Textiles?

	Government	
	R	Sig
Attrition	.008	0.11
Technology	.001	.000

From table 4.6 above, it shows that government policy is not a moderating factor since its relationship with the independent variable is close to zero.

Discussion of Result/Conclusion

The findings of this research support the general contention in the literature that inability to follow technology in textile production can spell doom for the entrepreneurs (Legris, Ingham & Collerter, 2003; Ebrahimi, Ahmed & Taha 2010; Lafront 2008:110). Similarly, the findings of this research concurs with other-research outcomes, that government's perceived role as a mediating variable is questionable since most often, the impact of such role is hardly felt thus a causal factor in business failure (Arasti, 2011).

Conclusion

Technology was at a very low level in the textile industry and since technology is central in textile production, and customers try to keep pace with fashion, the textile industry succumbed to attrition

Recommendations

1. SME textile firms should seek to acquire technologies that accelerate the improvement in the various processes of textile technology and such technologies are available in China and India. This will enable Nigeria's fabrics to compete favorably in terms of features and quality.
2. Local textile entrepreneurs should be guided by small and medium enterprises development agencies of Nigeria (SMEDAN) against the purchase of used machineries to avoid buying used equipments and avoid short life span.
3. SMEDAN and the textile manufacturers association should jointly mount regular workshops and seminars to enlighten entrepreneurs about changing technologies in textiles.

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