A translog analysis of insurance economies in Nigeria

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Abstract

Recapitalization process that has recently become an imperative process in the Nigerian Financial industry has implications for the survival of insurance sector, especially on their service delivery efficiency. This study therefore seeks to investigate the problem of inefficiency in the Nigerian Insurance market from the perspective of their cost structures. The study takes advantage of secondary data of financial reports of thirty randomly selected insurance firms which span over a period of ten years and applied transcendental logarithm model to evaluate their performance from the cost structures strategy. The results indicate that only large scale firms enjoy cost saving advantages. Twenty percent firms sampled belong to this category. The result suggests that premium income would contribute to insurance firm's performance, only when a sound investment decisions are made.

Background to the Study

Insurance companies as a service firm, attract a different class of policies from the economy, pool the premium together to help bear risk whenever the holder of an insurance policy suffers genuine loss. The roles of insurance company as risk taker, saving mobilizer and financial intermediary of sorts affects not only the pace but also the pattern of economic activity particularly in developing countries. The way and manner in which a financial system functions determine to a large extent the capital shortage problems often experienced in the less developed countries (Soyode, 1983). This is because entrepreneurship in the business activity of any economy can be enhanced better when insurance companies help bear losses that are often more severe, where both internal and external business environments are hostile to the extent, that it stifles rather than encourage business enterprises. Consequent upon restructuring, especially deregulation of interest rates in the finance sectors of the Nigeria economy, most financial institutions have had to operate in an increasingly competitive environment.

Insurance companies, like banks, also operate in a competitive environment where issue of cost has become a critical element of survival. Cost efficiency estimates how production costs of an individual company differs from the production costs of a best-practiced company under the same condition and producing same outputs. Efficiency of production is measured with regards to cost function that is normally constructed from the observation of all companies considered within the sample set. Cost functions are derived from the production function which describes the best available efficient methods of production at any point in time. Total cost is a multivariable function as it is determined by many factors. Such factors might include the quantities and qualities of factor inputs, the efficiency of the entrepreneur as regards the optimum choice and combination of both technical and economic inputs to produce the

maximum output (Kwan, 2001).

Statement of the Problems

Insurance companies engage in the production of various classes of services and hardly have there been any particular service where they have performed optimally, as there are inadequacies in the production cost of insurance services of some companies which in any case affects proper insurance practice (NAICOM, 2004). Insurance companies much like banks are suppose to mobilize funds through pooled premiums in order to be able to indemnify their policy holders who might have suffered genuine losses. The other crucial financial intermediation role is when insurance companies reinvest pooled premiums into investment in reinsurance or other sectors of the economy. The inability of many insurance firms arising from poor performance to indemnify their suffered clients has also discouraged prompt payment of premiums on the part of existing clients and lack of interests for insurance policies on the new and would-be clients (Chukwulozie, 2007). The implication of this problem is that premium mobilization which is the backbone of an insurance business has suffered a great deal. This problem is coupled with high cost of operation arising from large number of branches, overhead cost among other costs (Bouno and Eakin, 1990). High cost of producing insurance services and low premium rates have both tampered with operational efficiency and business performances of Nigerian insurance sector, as many of them find it difficult to take high risk businesses in the economy. The public attitude towards insurance policy and other services in Nigeria is generally not encouraging. The aggregate view centers on the observed inadequacy in the payment of compensation indemnity to the holders when they have suffered losses.

Justification for the study

The general disenchantment and disregard for insurance services among insuring public in Nigeria, arising from inefficient firms requires a closer examination and proactive measures in order to ensure the continued usefulness of the industry as conduit for economic stabilization which this study intends to examine.

The ability of the government to implement consistent policy that will lead to realization of net economic benefits could only be assisted by empirical studies of this nature. This study attempts to predict the quantitative effects of cost, scale and scope on performance that may possibly arise from structural and behavioural changes induced by the regulatory agency. In a situation where the empirical evidence reported for the banks production characteristics is to be taken for cost estimation in the finance industry as a whole, proper attention will have to be directed at devising relevant concepts in the factor input cost analysis for the insurance industry, as it has not attracted much attention in Nigeria. Afolabi and Osota (2001) has made use of translog model to analyze production characteristics in the banking industry .This effort is therefore an attempt to employ the translog models to evaluate performances in the Nigerian Insurance sector.

To the insurance business, it enables it to carry out comparative analysis of performance among competitors, operating within the same market environment, especially as firms use differently entrepreneurial efforts as a key for marketing insurance policies. This evaluation could be done in terms of aggregate results and in terms of the major indices of performance evaluation. It helps insurance business in planning both the technical and economic allocation of resources as a basis for required adjustment over immediate and future periods.

Objectives of the study

The broad objective of this study is to examine cost efficiency of the insurance industry in Nigeria.

The specific objectives are to:

(i) examine cost efficiency characteristics across various sizes of insurance companies vis-à-vis large, medium and small sizes.

(ii) investigate optimal production scale in the Nigeria Insurance Industry

Literature Review

In order to make an assessment of the effects that cost structures are likely to have on efficiency, there is a need to define a framework over which costs can be analyzed. Economists generally assume that firm minimizes the cost of producing every level of output, based on the prices paid for factors of production and the technology available to the firm, (Bitzan, 2000). Although Cobb-Douglas production function has been widely used for many empirical studies, especially as it is well behaved in terms of monotonicity and convexity. This function has been tactically criticized on two grounds. The first criticism borders on the assumptions of additivity and homogeneity, suggesting that factor shares are constant. The second criticism has to do with the elasticity of substitution and the cross-partial elasticity of substitution being limited to unity. In a bid to find a leeway and create flexibility so as to take care of the difficult restrictions imposed by the Cobb-Douglas production function; (Christensen, Jorgenson and Lau 1975) came up with an alternative representation of the production possibility frontier, called transcedental logarithms, (Translog function).

Rosko, Proenea and Zinn (2002), examined the relationship between membership in different types of systems and hospital cost inefficiency. They made use of stochastic frontier analysis to measure hospital efficiency vis-à-vis different systems. The study reported that a decreased inefficiency was associated with centralized and decentralized systems whereas an independent system was associated with increased inefficiency. One particular issue of interest was the fact that cost structure, employing capital was used to determine operational efficiency in a hospital system. In the contention of these researchers, there was an argument to suggest that a system may be in position to achieve greater efficiency because of multi product nature of services being provided in the hospital which allows the employment of a more richly specialized group of personnel in big organization than in a small one (Conrad and Shortfell, 1996); (Carey, 2003) and (Bazzoli, Shortfell and Baunno, 2000). This is in line also with the views of (Ermman and Gabel 1985) on the cost saving advantage of marketing and business advertisement cost of large organizations. The difference in system characteristics is important as different system stands to have different impact on business performance. This position however was a clear contrast from the work of Becker and Sloan (1985), which reported less than significant result ($\square < 0.05$) on the study that related systems to performance.

Almost similar to the above studies on hospital efficiency, Evans (1999) examined the significance of quality in the specification of hospital cost function, scale economies effect on hospital cost efficiency and reported that cost increases with the desires for quality. Like many previous studies on hospital efficiency and much like Evans, Bays (1980) work addressed the need to introduce physician variable in order to measure size. Bays in his work estimated two regressions on cost functions: one with physician service as one of the inputs and another without physician service as one of the inputs. Bays findings however suggested a decrease in average cost for a medium sized hospital but that average cost will start to increase as the size of the hospital becomes larger. Not only this, although there was a difficulty in obtaining physician

input data, Bays work concluded that managing physician inputs might become unmanageable as the size of the hospital grows larger. Because insurance firm is also a multiproduct in production of services, much like hospital, similar approach can be used to study it.

In addition to the conventional inputs such as capital, labour and intermediate input, the financial intermediation activity of insurance carriers use an extra input, premium reserve which needs to be accounted for in the production function. The output of this activity, measured by the investment is derived in a large part from the premium reserve. These are in effect lent to the company by policyholders and for which they do not receive any explicit interest revenue (Harchaous 2005). To achieve earlier stated objectives therefore, this study, therefore adopts the unrestricted, functional translog form which has been typically used for several studies on production.

Research Methodology

Sources of Data for the Study

The insurance financial data were obtained from Annual Reports and Accounts of each of the sampled Nigeria insurance companies. The Annual Reports and Accounts of each of the insurance company comprises sufficient data that measure all the variables of the cost, economies of scale and economies of scope that are necessary for this study.

The specific data for this study were assembled from the followings:

(i) Returns of Assets and liabilities
(ii) Returns of current year's profit and loss account
(iii) Annual analysis of policy and provisions for indemnities.

The above data and information sourced from insurance companies; regulatory authority and the Central Bank yearly bulletin are adjudged, in the literature, to be sufficient enough to elicit necessary data and information needed to estimate the production in the financial industry variables (Afolabi and Osota,2001).

Sample Size

NAICOM (2003), reported that apart from about thirty (30) insurance companies whose operations were partial, insurance companies in Nigeria could be segmented into three major sizes; twenty (20) belong to large size firms, twenty nine (29) to the medium size firms, while forty-six (46) belongs to the small size category. This study therefore randomly selected one-third of each of this categories such that six (6) was chosen for the large size firms, nine (9) for the medium size and fifteen (15) for the small size firm

Analytical techniques

The cost and production functions can be specified by estimating a stochastic cost frontier (Leigh, 2001). It allows modeling of a multi-input, multi-output production process. For translog flexible functional form, Young's theorem requires that the second order parameters of the cost function must be symmetric.

Translog cost function is a logarithmic regression model a seemingly unrelated system of equations that is effective to determine coefficients. Many of the standard regression techniques were used to determine the fit of the model. F-tests and t-tests were used to determine the significance of the model and coefficients. The r-squared value will describe how well the model explains the true cost function. Also Durbin Watson statistic was used to explain if the model has a problem with serial correlation. These tests and values verified the effectiveness of the model and the model's ability to explain cost structure in the insurance industry. This study

therefore attempts to study Nigerian insurance firms using stochastic cost frontier analysis of a translog model.

Model Specification

Translog is a local, second-order approximation to an arbitrary cost function. It places no *a priori* restriction on the elasticities of substitution and allows the economies of scale estimate to vary with the output level. For the approximation of the underlying cost function to be made at local point, this study normalize all independent variables at their median point.
The translog function could be specified as follows:

$$\ln C = a_0 + \sum \alpha_r C_n \ln \gamma_r + \tfrac{1}{2} \sum j \sum i \alpha_{ri} \ln \gamma_r \ln \gamma_i + \ln W + \tfrac{1}{2} \sum_i \beta_i \ln W_i \ln W_j + \delta_z \ln Z$$

$$+ \tfrac{1}{2} \sum \sum \delta_z \ln Z_i \ln Z_j + \delta_{ms} \ln Ms + \tfrac{1}{2} \sum \sum \delta_{ms} \ln Msi \ln Msj + \sum_i \sum r \delta_{ri} \ln \gamma_r \ln W_i$$

$$+ \sum r \sum i \delta_{ri} \ln \gamma_r \ln Z_i + \sum r \sum ms \delta_{rms} \ln \gamma_r \ln Ms + \sum_j \sum ir \delta_{iz} \ln W_i \ln Z_{iz}$$

$$+ \sum i \sum ms \delta ims \ln W_i \ell(_n M_S + \sum \sum \delta_{zms} \ln Z \ln Ms + \psi Cn + \sum_n$$

Where In – logarithm; C – Total cost, Output are indexed by = total indemnities (CL) and Investment (I) and inputs are indexed by W, j = capital input price (Kp), Labour Input price (Lp) and Entrepreneurial price (Ep). The following parameters α, β, δ and ψ are expected to be estimated. The subscript depicts coefficient of the variable to be estimated δMs for instance, is the coefficient estimated for Market share variable and δ_z is the coefficient estimated for the size variable. Where there are two letters in the subscript, it implies measurement of cross-product relationship such as δ_{zms} is the $$coefficient of the cross product of size and the market share. In which case, the cross elasticities are easier to compute from Translog regression results. For instance, the cost elasticity of output can be represented as $\sum_{cn} \delta \ln / \delta \ln Yr$ (Greene, 1993) (Evans, 1999).

Empirical Results Analysis

The quadratic terms generated which are specified with the cross products and squares allows for elasticity of factor substitution to be unrestricted (Green, 1993). The basic translog model works well or even better than Cobb-Douglas in terms of describing Nigerian Insurance cost function in a manner that produce the cost structures in the Nigerian Insurance Industry (Usman, 2007). To confirm this, insurance firm is conceived to maximize profit and increase efficiency by selecting an optimal mix of production technologies such as capital, labour, entrepreneurial skills, premium income and market share that minimizes production cost of indemnity and investment services. The result of this study has shown that output/input price combination in this study is capable of reducing costs by 0.2%. So also the interaction between firms' size and market share is capable of reducing total cost by approximately 0.3%. However, a 1 percent increase in the output will on the average increase the total cost by 0.13 percent.

The cost elasticities under translog estimation, total output, premium income, have positive results of 0.134232 and 0.253644 respectively which denotes that holding other factors constant, a 1 percent increase in the total output leads on the average to about 0.1 increases in the total cost and 0.3 increases in the total cost for premium income. However, both factor input

price and market share have negative signs meaning that a 1 percent increase in the use of these inputs reduces total cost of production of insurance services by 0.1 percent for market share and 0.5 percent for factor input prices. By this result, market share reduces total cost in both models.

The square input prices contribute to total cost by 0.3 percent. Looking at Table A which reports Translog model result for the entire sample, it can be noted that variables such as output, square of output, square of input prices and firm size all have positive signs except for market share and square of market share which have negative signs. While the former (variables with positive signs) have a strong corollary in the Varian conditions for cost estimation, the latter (variables with negative signs) have failed to meet up with our *apriori* expectations in this study. The own price elasticity is even inelastic. By this result, a 1 percent increase in the market share on the average reduces total cost of operating an insurance branch in Nigeria by 11 percent. Interactions between output/firm size and output market share are all cross substitutes but the figures are very small when compared with the theoretical limit of infinity for perfect substitution. On the other hand, the cross interaction between output and input prices; input prices and firm size; firm size and market share are all complements. If the price of the substitutable product increases, then there is a proportionally higher fall in the quantity demanded as consumers shift to the nearer available substitutes. The same result is reported for input price and firm size and firm size and market share. The adjusted $\mathbf{R^2}$ is indicative of the magnitude of usefulness of the explanatory variables to explain changes in total cost variable

Table A: Translog function result for the entire firms

DEPENDENT VARIABLE	VARIABLE	PARAMETER	CO-EFFICIENT	t-STATISTICS
Total Cost TC	Constant	C(1)	10.73992 (5.368676)	2.000478**
	Output	LNY	0.134232 (0.066783)	2.009974**
	Square Output	5*(LNY)^2	0.209768 (0.028690)	7.311585**
	Input price	LNW	-0.464710 (0.522953)	-0.888627
	Square of Input price	5*(LNW)^2	0.267907 (0.037819)	7.083971**
	Firm size	LNZ	0.253644 (0.317417)	0.799088
	Square of Firm size	5*(LNZ)^2	-0.007736 (0.0119288)	-0.401072
	Market share	LNM	-1.110858 (2.187336)	-0.507859
	Square of market share	5*(LNM)^2	-0.560056 (0.470132)	-1.191275
	Cross elasticities of output and input prices	LNY*LNW	-0.240280 (0.021215)	-11.3617**
	Cross elasticities of output and firm size	LNY*LNZ	0.040801 (0.009804)	4.161795**
	Cross elasticities of output and market share	LNY*LNM	0.215863 (0.090790)	2.377594**

	Cross elasticities of input price and firm size	LNW*LNZ	-0.016105 (0.011901)	-1.353178
	Cross elasticities of input price and market share	LNW*LNM	0.267354 (0.091880)	2.909827**
	Cross firm size and market share	LNZ*LNM	-0.286334 (0.075687)	-3.783116**
	Pre and post consolidation	CN	-2.455003 (1.119750)	-0.192456
	R- square	R^2	0.817914	
	Adjusted R-square		0.807910	
	Durbin-Watson		0.682227	

** and * significant at 1%, 5% and 10% respectively

Factor input prices has statistically negative relationship with medium and small firms. A one percent increase in the cost of factor inputs reduces total cost for medium firm by 7.06 percent and small firm by 3.58 percent. Market share reduces total cost by 22.38% for large firm, by 9.60% for medium firm and by 10.5% for small firms. In Table B below, firm size measured by the premium income does not have significant contribution to total cost. However, interactions between output and input prices are negative and significant only for small size firms but positive for medium size firms. Interaction between output and firm sizes is positive for all categories and significant only for medium and small size firms. While the interaction between output and market share shows a negative relationship with total cost and significant only for the medium size firms. Input prices/firms size is not significant for all categories. Input prices and market share is positively significant only for medium size firm. Firms size/market share is significant for small category of firms. Result of R^2 coefficient of determination obtained for large firms is significant at 96% confidence level whereas the R^2 determination for medium firms is 97% and 85% for small firms. These results have shown that explanatory variables employed in this model have been able to account for changes in total cost of providing insurance services in Nigeria at very high percentage. Similar result has been obtained for the adjusted R^2.

Durbin Watson result has indicated a minimum serial correlation among variables employed in this analysis. However, it is pertinent to note here that out of the three categories of insurance firms in this work, the result obtained for medium is best behaved both in terms of economic and statistical criteria of the analysis. Cost efficiency gains have been indicated for medium size firms especially in factor combination of output and market share. This result suggests that insurance companies could save costs by 1.9% if their business expansion strategies could be pursued side by side with opening of more branches.

TABLE B: Translog Model results for Large, Medium and Small Firms

			Large firm		Medium firm				Small firm
Dependent Variable	ndependent Variable	Parameter	Co-Efficient	T-Statistics	Co-Efficient.	T-statistics	Prob.	Coefficient	T-statistics
Total Cost Tc	Constant	C(1)	428.7688 (266.1137)	1.611216*	137.6461 (54.74269)	2..514419**	0.0139	-124.2944 (35.71281)	-3.480388**
	Output	LNY	-10.17656 (9.302529	-1.093956	5.227706 (1.62978	3.207611**	0.0019	3.8424471 (1.788550)	2.148373**

			)		2)				
	Squared Output	5*(LNY)²	0.634473 (0.528838)	-1.199749	0.095776 (0.048969)	1.955858 **	0.0538	-0.205672 (0.064852)	-3.171380 **
	Input price	LNN	3.462090 (5.825450)	0.594304	-7.065864 (1.349885)	-5.234421 **	0.0000	-3.587788 (1.556265)	-2.305384 **
	Squared of Input price	5*(LNN) ²	-0.097096 (0.465272)	-0.208685	0.148045 (0.053879)	2.747718 **	0.0074	0.323499 (0.063804)	0.507218
	Firm size	LNZ	1.077517 (8.976571)	0.120037	1.290537 (1.195277)	1.079697	0.2834	3.346507 (1.557607)	2.148492 **
	Squared of Firm size	5*(LNZ) ²	-236.3053 (138.4283)	-0.894571	-0.076865 (0.030834)	-2.492844 **	0.0147	-0.087400 (0.041848)	-2.088494 **
	Market share	LNM	-223.8151 (138.4283)	-1.616831 *	-96.08422 (42.44795)	-2.263577 **	0.0262	10.56499 (22.27637)	4.742691 **
	Squared of premium income	5*(LNM) ²	49.11057 (33.51489)	1.465336	33..37694 (16.83590)	1.982486 **	0.0507	-48.70695 (7.442249)	-6.544654 **
	Cross elasticities of output and input prices	LNY*LNW	0.481371 (0.519404)	0.926777	0.136315 (0.051797)	-2.631712 **	0.0101	-0.103506 (0.027849)	-3.716735 **
	Cross elasticities of output and firm size	LNY*LNZ	0.346052 (0.423929)	0.816297	137.6461 (54.74269)	1.726276 *	0.0880	0.072997 (0.024858)	2.936551 **
	Cross elasticities of output and market share	LNY*LNM	2.601419 (3.191857)	0.015017	-1.940962 (0.645027)	-3.009118 **	0.0035	0.291463 (0.741091)	0.393289
	Cross elasticities of input	LNW*LNZ	-0.418519 (0.281254)	-1.488012	0.009050 (0.018212)	0.496890	0.6206	0.019120 (0.019827)	-0.964328

	price and firm size								
	Cross elasticities of input price and market share	LNW*LNM	-0.944089 (1.875659)	-0.503337	2.940124 (0.536907)	2.940124 **	0.0000	0.560146 (0.586245)	0.955481
	Firm size and market share	LNZ*LNM	1.799462 (2.602822)	0.691350	-0.468867 (0.500211)	0.937338	0.3513	-1.466101 (0.533556)	-2.747791 **
	Pre and post consolidation	CN	0.105347 (0.413979)	0.254475	-0.299697 (0.148422)	-2.019217	0.0469	-0.273399 (0.320729)	-0.852429
	R-square	R^2	0.964032		0.973936			0.857331	
	Adjusted R-square		0.947683		0.969226			0.839933	
	Durbin-Watson		-51.77957		1.404951			0.840977	

** and * significant at 1%, 5% and 10% respectively Output elasticity with respect to total cost is positive and implies that a 1% increase in the production of total output (indemnity and investment) *ceteris peribus,* will on the average increase the total cost by approximately 0.4%. This result indicates the presence of operational functions derived from managing multiple outputs. The cost elasticity of investment is highly significant and it is almost perfectly elastic. However cost elasticity of indemnity is inelastic but significant. The implication of this result is that investment product has a very high significant relationship with total cost of producing insurance services in Nigeria. However, the outcome of this result follows Caves (1984); Filippini and Luchsinga (2005) which reported economies of scale as a proportional increase in total cost brought about by a proportional increase in output holding all other factors constant. Both cost elasticity of total output and cost elasticity of indemnity indicates increasing return to scale whereas cost elasticity of investment indicates constant return to scale. Increasing returns to scale is when a larger quantity of the firms' output is produced at a lower average cost than are smaller quantity of the output. The implication of this result is that insurance firms in Nigeria enjoy economies of scale in the production of the output and more importantly in the provision of indemnity product.

Table C: Calculation of elasticities and scale economies (SCE) from Translog regressions

Elasticities	Elasticities Value	SCE
Cost Elasticity of output	0.36	1 – 0.36 = 0.64
Cost Elasticity of Investment	0.99	1 – 0.99 = 0.01
Cost Elasticity of Indemnity	- 0.83	1 + 0.83 = 1.83

Further, firms in the large category performed best in terms of efficiency and results

generated from Translog indicates that well over 90 percent changes in the cost have been explained by the specified explanatory variables.

The translog model results for the three categories have similar and dissimilar results. For instance in table B, in the case of large firm, the coefficient result is -10.1766 which implies own-price inelastic and that holding all other factors constant, a 1 percent increase in the total output, would on the average reduces the total cost by 10 percent which is cost efficiency gains. Similar result was reported by (Wuyts and Cayseele, 2004) on cost efficiency in the European security settlement and safekeeping industry. Although, this result must be interpreted with caution as it does not conform to Varian Cost conditions (which expects cost function to be linearly homogenous, increase in output and price but concave in all input prices). But in another case, the economies of scale suggest a cost saving advantage as the production goes into large scale. It can on the strength of this result posit that there exist economies of scale for large scale insurance firms in Nigeria. The R^2 is significant at 96 percent confidence level, implying that the explanatory variables used in this model are almost perfect. When viewed, the result with medium and small scale, which reported 5.223 and 3.8425 respectively, one can simply conclude and in line with economic theory that economies of scale could only be enjoyed by large scale producing firm. Also in the medium and small firms both the input prices and market share own prices elasticities are inelastic. However, in all the three categories, the results have shown, *ceteris paribus,* that market share reduces total cost. This might be true as more branches create opportunity for more businesses and capacity to mobilize larger premium income which on the long run reduces cost of operation.

Conclusion

The strict analysis of cost structures in Nigerian insurance industry suggest that factor input prices contributed mostly to total cost. Over the period of study it is evident that Nigerian Insurance sector was characterized by increasing returns to scale, hence insurance market stands to reduce cost of production when it is well recapitalized.

Based on the results of the estimated model, it could be reported that most Nigerian insurance firms operations are still cost inefficient. Of all the three categories, the coefficients results obtained for large firm in the model reported high significances. The implication of this is that economies of scale is achievable by larger insurance firms, hence performance can be enhanced through cost minimization advantages associative of large scale business. It is also pertinent to conclude that there is a need to retain the best suitable experts/ personnel in insurance industry through attractive remuneration packages that is comparable with bank workers, since both operate in the same finance industry. This issue becomes more pertinent in the light of universal banking system which tries to create a level playing ground for all financial products in the financial supermarkets.

The study also concluded that mobilization of premium income is not enough to enhance insurance performance what is much more important is the ability to reinvest pooled premium income into high yielding investments, such that the rate of returns obtainable supersedes the level of risks associative of such mobilized premium income. This firm size represented by premium income would contribute to firm's performance only when a sound and suitable investment decision are made.

The result also implied that optimal production scale from production of insurance services in Nigeria is attainable when they grow into larger scale firm. As it is presently constituted, more than 80 percent of Nigerian insurance firms are either in medium or small scale

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