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Discriminant Analysis of the Socio-Economic variables for predicting insurance penetration rates in developing Countries

Ehiorobo, Osa Abraham
University of Lagos, Nigeria
Corresponding author Email: newdawnabraham@yahoo.com

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This study was conducted to predict insurance penetration rates in developing countries using discriminant analysis. Sixty (60) developing countries sampled from four continents of the world were included in the study. The continents from which samples were taken are Africa, Asia, Europe and the Americas. The dependent (categorical) variable of the research was insurance penetration rate divided into low and high insurance penetration rates as the grouping variable. The predictor variables were gross premium written, per capita GDP, literacy and unemployment rates. Research questions were formulated and hypotheses were drawn for the purpose of determining which factors best discriminate groups in insurance penetration rates in developing countries. The study made use of secondary data and SPSS version 22 was used for data analysis. Findings from the study indicate that gross premium written is the most important discriminating variable followed by literacy rate, per capital GDP, and the least, being unemployment rate.

Keywords: Insurance penetration, gross premium, per capita GDP, literacy, unemployment and discriminant analysis.

INTRODUCTION

The traditional role of insurance in every society is to hedge against risks, irrespective of their magnitude, and thus reduce the financial losses associated with disasters whenever they do occur. Such mitigation of losses creates a sense of security and absence of fear that encourage entrepreneurs to venture into business. By lubricating the wheel of business, insurance services foster economic growth and development in countries where the culture is imbibed. Thus, such countries with high insurance acceptance rates have continually enjoyed higher standard of living than others who still nurture negative perceptions of insurance as a government-imposed irritant. Insurance companies, together with mutual and pension funds are known globally to be among the biggest institutional investors in bonds, stocks and real estate (Oke, 2012).

According to Kavitha, Latha, and Jamuna, (2012), Insurance can be defined as the simple mechanism by which some people who are exposed to the same level of risks of suffering destruction of damage to their properties, that are likely to be caused by perils like fire, accident, floods, earthquakes, coming together and agreeing to share the loss sustained by any one of the members, that is, the loss of one or more members is shared by all.

Insurance is perceived by many people to be critical to a well-functioning economy (Pritchett, Schmit, Doerpinghaus, & Athearn, 1996). By indemnifying the insured in the event of the occurrence of an unexpected loss, there is a sense of security that encourages investors to take risks. And such risky adventures are the sine-qua-non for sustainable economic growth and development of any nation. The finance-growth nexus theory is predicated on the view that financial development promotes economic growth through channels of marginal productivity of capital, efficiency of channelling savings to investments, saving rate and technological innovation (Levine, 1997). Through financial intermediation, of which insurance is involved, funds are moved from surplus sectors of the economy to the deficit sector thus creating a steady flow of funds among all sectors, thereby enhancing economic growth. In addition, insurance provides the much needed hedge against any form of risk thus eliminating fear of the unexpected and hence, encourages entrepreneurs to venture into businesses.

Insurance penetration rate is a measure of the ratio of gross premium written in a particular year to a country's gross domestic product (GDP) (www.statistica.com). Insurance penetration indicates the level of acceptance of insurance as a major component of the financial industry of any nation. It is however noteworthy that the richest countries of the world are not necessarily the ones with the highest penetration rates. Cayman Island has 20.24 percent, Taiwan 18.97, Hong Kong 14.76 and South Africa 14.69 percent enjoy the highest insurance penetration rates in the world whereas it is 7.28 percent in the United States, 7.40 in Canada, 10.82 in Japan and 9.97 in the United Kingdom (Swiss-Re Sigma: World Insurance, 2015) and it is equally a reflection of the development of the insurance sector in those countries.

Per Capita GDP or gross domestic product per capita is a measure of the well-being of a nation which divides the gross domestic product by the population. It is used to rank countries in terms of wealth and productivity as countries with higher per capita gross domestic products are assumed to enjoy a higher standard of living than those countries with lower rates (*ceteris peribus*). It is noteworthy however, that unequal distribution of wealth in some countries with higher per capita GDP has not translated into higher standard of living for their citizens. Ibiwoye, Ideji and Oke, (2010) in their study of the determinants of the consumption of life assurance in Nigeria, concluded that that real GDP, Structural Adjustment Programme (SAP) and

Domestic Interest Rate (DIR) significantly affect the consumption of life insurance products in Nigeria.

Unemployment is a condition where able-bodied men and women within the working age who are willing to work cannot get jobs. It is a global phenomenon which is more severe among highly populated developing countries. Data relating to unemployment is sometimes manipulated by government agencies for political reasons. Recently, the Federal Office of Statistics in their latest unemployment figures in Nigeria said the country's unemployment figure currently stands at 31 million persons. Unemployed people cannot make premium payments for insurance of any kind and hence unemployment is negatively correlated to growth in real premium (Bhatia & Jain, 2013).

Literacy is defined as the ability to read and write. In Scotland, literacy is defined as "The ability to read, write and use numeracy to handle information, express ideas and opinions, to make decisions and solve problems, as family members, workers, citizens and lifelong learners" (.wikipedia, 2017). People have to be aware to know about insurance. Literacy creates awareness through learning and information. It is only literate people that can access the information regarding the benefits of insurance hence literacy is crucial to insurance penetration in any society.

Insurance premium payment is what consumers of insurance contribute to the pool from which those who suffer losses are indemnified. In a culture where insurance is well imbibed and developed, gross premium income is in billions of dollars. For instance, the United States of America in 2013 contributed 27 percent of global insurance premium, Japan contributed 11 percent while the United Kingdom contributed 7 percent. Whereas in third world countries such as Algeria and Nigeria, their contribution to global insurance premiums in the same period was a paltry 0.03 percent and 0.04 percent respectively (International Insurance Factbook, 2015). The contribution of the insurance sector to the financial industry has continued to soar due to increasing gross premium funds made available for investment in stocks, bonds, real estate and other long-term investments with attendant contribution to growth in GDP.

Discriminant analysis was first developed by Sir Ronald Fisher in 1936 and this formed the basis of all linear discriminant studies which is equally employed in this research.

Discriminant analysis is a statistical tool used to predict a categorical dependent variable by one or more continuous or binary independent variables. It is used for group assignment or group membership. Discriminant analysis is the reverse of Anova or Manova which are used to predict one (Anova) or multiple (Manova) continuous dependent variable by one or more independent categorical variables. Manova looks at whether groups differ along a linear combination of outcome variables, and discriminant analysis breaks down the linear combination in more detail (Field, 2014).

Simply put, discriminant analysis is the act of classifying or distributing things or people or data into groups, classes or categories. It is equally like regression analysis in terms of dependent and independent variables just that in the case of discriminant analysis the dependent variable is a categorical variable whereas in regression analysis, the dependent variable is a metric variable (Uddin, & Hossain, 2013).

The aim of this research is to apply a discriminant function analysis to the socio-economic variables for predicting insurance penetration rates in developing countries. More specifically, the research intends to:

a. examine if gross premium written affects a country's insurance penetration rate;
b. access the extent to which per capita income (GDP per capita) affects insurance penetration rate;
c. identify the relationship between a country's literacy rate and insurance penetration; and
d. examine if unemployment level affects insurance penetration rate.

In order to address the research objectives, the following research questions were asked.

i. To what extent does gross premium written in a country contribute to insurance penetration rate?
ii. Does per capita income have any impact on insurance penetration rate?
iii. Is literacy level of a country important in predicting insurance penetration rate?
iv. Does unemployment affect insurance penetration rate?

In line with the research questions, the following hypotheses were formulated:

H_1: Gross premium written is not a significant predictor of insurance penetration rate in developing countries.

H_2: Per capita GDP is not a good predictor of insurance penetration rate in developing countries.

H_3: Literacy rate of a country has no significant relationship with its insurance penetration ratio.

H_4: Level of unemployment is not a good predictor of insurance penetration rate in developing countries.

Insurance penetration rates differ significantly among developing countries of the world. Several studies have linked higher penetration rates to higher economic growth and development but most of those studies have concentrated on establishing a relationship between insurance penetration and GDP growth using such predictor variables as per capita GDP, insurance density, inflation and gross premium written. This study is however going further by focusing on some other socio-economic variables such as literacy rates and unemployment and using a discriminant function analysis to identify which of these independent variables best discriminate between countries with high insurance penetration and those with low penetration rates. The research is organized into five distinct parts made up of introduction, literature review, methodology, analysis and discussion of findings, conclusion and recommendations.

LITERATURE REVIEW

Insurance Penetration Rates

Penetration rate indicates the level of development of the insurance sector of a given country or region. Insurance penetration rate is measured as the ratio of premium underwritten in a particular year to the gross domestic product (GDP) (statistica.com,). Within insurance, there is life insurance penetration which is the ratio of life insurance policies

underwritten to GDP as well as non-life insurance penetration which consists of the ratio of non-life policies underwritten to GDP. The global premium of insurance policies underwritten as at 2015 stood at $4,778 billion with the United States of America contributing 27percent of that amount. Global insurance penetration is a mere 6.2 percent and Africa penetration rate is just 2.8 percent.

Western Europe remains the region with the highest insurance penetration rate in the world at 7.1 percent in 2015. Gross premium written was EUR 1025 billion. North America is the region with the highest premium of about EUR 3220 billion though with a market penetration of 6.6 percent and the US alone accounting for 93 percent of the premium payments. Japan recorded EUR 354 billion making the country the second highest premium earner in the world. (Swiss-re Sigma, 2015).

The Insurance Sector in Developing Countries

The insurance industry in Africa and some other developing countries is still at the infancy stage and this provides a wide range of opportunities to be tapped either through mergers and acquisitions (M&A) or by international insurers. It is pertinent to note that Africa controls only 1.5 percent of the global insurance market share with a penetration rate of 2.9 percent (KPMG Insurance in Africa 2015).

With the growing progress being made in economic and corporate governance across the continent, the insurance sector is becoming more attractive as an investment haven to foreign investors. For instance, GDP in sub-Saharan Africa is expected to grow between 4.2 percent and 5 percent in 2017 (World Bank Global Economic Forecast June 2016). Another attraction to the sector is the growing middle class in most developing countries whose increased disposable incomes can be used for the purchase of life insurance products and some other property related insurance that can guarantee their peace of mind. This factor is equally aided by improved healthcare, education and literacy, as well as access to information and communication that have generally led to increase in standard of living. Coupled with the foregoing reasons are the improvements in capital standards, corporate governance and risk management capabilities in countries such as South Africa, Nigeria, Ghana and Kenya. South Africa for instance, has begun to implement the EU-type Solvency 11 which creates greater financial health for insurance companies (Geoffrey, Scoville, Lyon, & Ogundele, 2016).

Several reasons account for the low level of insurance penetration in Africa. For example, Africa is not a homogenous continent where you can apply a one-cap-fit-all strategy. This is largely due to political, regulatory, economic and religious factors which impact the perception and acceptance rate of insurance by the citizens. Recent economic challenges being faced by the continent is also a major factor and they include falling commodity prices, weakening local currencies and higher costs of borrowing. For example, Nigeria is a mono-cultural economy depending heavily on the sale of crude oil to finance over 70 percent of its annual budget. The global slump in oil prices, the devaluation of the country's currency, the Naira, the excessively high interest rate of 14 percent benchmark by the Central Bank of Nigeria have all combined to weaken purchasing power and disposable incomes which have equally affected premium renewals in the insurance sector.

Another obstacle to growth through M&A from international investors is that deal values are abysmally low in Africa compared to insurance deals in the developed markets. Perhaps the only fairly large deal on the continent was AXA SA of France acquisition of Mansard Insurance Plc in Nigeria in November, 2014 whereas total deal values for global insurance M&A in 2015 was $146 billion (Willis Towers Watson, Insurance M&A on the Rise January 2016).

Regulatory activities in countries like Nigeria where banks are not allowed to own insurance companies is also a hindrance to growth. In well developed markets there is increasing use of bancassurance due to banks' +established infrastructure and a huge client base. It is however noteworthy that bancassurance is well embraced in Kenya. The Financial Services Model which allows a holding company with a bank and insurance company as subsidiaries are becoming quite popular in East Africa.

Conceptual Framework

The research makes use of four predictor variables only (Gross premium, Per capita GDP, Literacy and Unemployment rate) as depicted in the conceptual model. The aim of this study is to examine which of these variables best discriminate insurance penetration rates in developing countries grouping different nations into high and low insurance penetration. It is however worthy of note that the richest countries of the world are not necessarily those with higher insurance penetration rates.

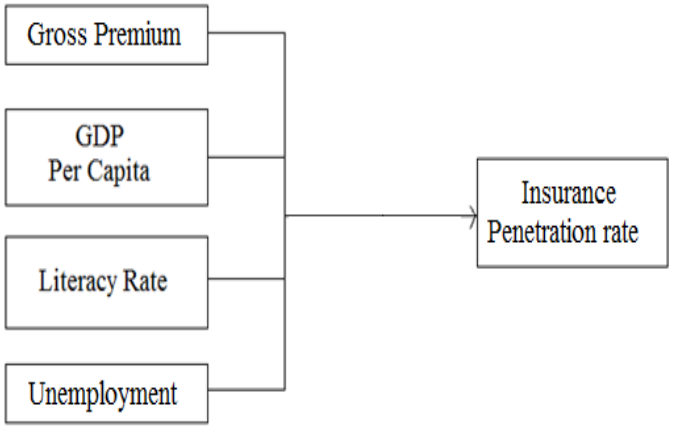

Figure 1. A Conceptual Model showing dependent and predictor variables. *Source: Author (2017)*

Empirical Review

A study conducted by Bhatia and Jain, (2013) on the relationship of macroeconomic variables and growth of insurance in India: A diagnostic study. It was observed from the result of a correlation analysis that GDP growth, population growth and per capita GDP growth exhibit a positive relationship with insurance penetration in India whereas unemployment and inflation exhibit negative relationship. Feyen, Lester, and Rocha (2011) concluded in their finding that demographic factors such as population size and density affect per capita GDP and this in turn affect the demand for insurance products.

Jahromi and Goudarzi (2014) conducted a study in Iran on "The study of Co-integration and Causal Relationship between macroeconomic variables and insurance penetration ratio" using GDP, inflation and per capita income as study variables as they relate to insurance penetration. The researchers used the Johannsen and Juselius co-integration and Granger Causality tests to analyse the data. The results obtained showed that the macroeconomic variables and insurance penetration were co-integrated. In the short term, there is bi-directional causal relationship between per capital income and insurance penetration and there is also a unidirectional relationship between GDP and insurance penetration. However, there was no proof of any causal relationship between inflation and insurance penetration. But with a combined test, there existed a causal relationship between inflation, GDP and national per capita income to insurance penetration ratio.

Oke (2012) in his study of insurance sector development and economic growth in Nigeria used the Fixed Effect Model for analysis. Pooled data for the period 1985 to 2009 were collected for the study. His findings revealed that insurance sector growth and development positively and significantly affect economic growth in Nigeria.

Haiss and Sumegi, (2006) in their research on the relationship of insurance and economic growth, a theoretical and empirical analysis presented at the EcoMod conference in Hongkong carried out a study of 29 European countries during the 1992 to 2004 period. The researchers applied cross-country panel data of annual insurance premium obtained from the 29 countries. The result of their research found a weak evidence for a growth-supporting role of life insurance and explained this with similarities to bank and stock market findings at the same period.

Park, Borde and Choi, (2002) conducted a study on the linkage between insurance penetration and gross national product (GNP) and some socio-economic factors adopted from Hofstede (1983). Cross-sectional data was obtained from 38 countries in 1997 showed a significance for GNP, masculinity, socio-political instability and economic freedom. All other factors lacked importance and masculinity was dropped after checking for heteroscedasticity of unknown form. Deregulation was found to support the growth of the insurance industry but socio-political instability proved to be a proxy for poverty than an indicator of the need to insure.

METHODOLOGY

Research Design

The study adopts a quantitative design based on the positivist philosophy. The ontological orientation of the research is objectivism. The choice of research philosophy and design are based on the fact that insurance penetration and the socio-economic variables that determine the rate of penetration in developing countries can be objectively determined and quantitatively estimated with substantial degree of accuracy using discriminant analysis.

Data Analysis Technique and Software Used

The methodology adopted for this study is the direct method of discriminant analysis. According to this method, all the predictor variables are entered into the model simultaneously. SPSS Version 22 was used for the analysis.

Sources of Data

The research was conducted based on secondary data collected from records of several organisations which include the World Bank, UNESCO, and websites of data collection agencies such as the CIA, Find the Data, and Sigma Re. The data relates to 60 developing countries that cut across four continents of the world including Africa, Asia, Europe and the Americas.

Model Specification

The discriminant function takes the form of a linear combination of coefficient of variables and these are expressed as equation 1. The variable coefficients are estimated in such a way that the function maximizes the distance between the two centroids. It should be noted however that the larger the coefficient, the better the independent variables in discriminating between the groups. Therefore the discriminant function is given thus as:

$$Z= \alpha + w_1 x_1 + w_2 x_2 + w_3 x_3 + w_4 x_4 = \alpha + \Sigma^4_{i=1} w_i x_{i.....} \quad (1)$$

Where Z = Discriminant score, α = constant, w = the discriminant coefficient or weight of the variable, x_i = predictor variable, I = number of predictor variables, i.e i=1,2,3,4. As this is a two-group discriminant analysis, only one function is estimated i.e.

$$NDF \leq Min\ (G-1, P) \quad (2)$$

The number of discriminant functions (NDF) that can be estimated from a discriminant analysis is less than or equal to the minimum number of categories (G) in the dependent variables minus one or the number of predictor variables (P).

Description of the Variables

The variables used for this study are categorical and predictor variables. The status of the countries in terms of insurance penetration rates was the dependent (categorical) variable. The dividing line for defining where each country falls to is 2.30 percent of insurance penetration, using a median value to have equal number of countries for low and high penetration rates. Those countries with penetration rates equal to or above 2.30 percent (30) are tagged as high insurance penetration and denoted by (2) while those countries whose insurance penetration rates are below 2.30 percent (30) are tagged low penetration and denoted by (1). The predictor variables are gross premium written, per capita GDP, literacy rates and unemployment rates in each country sampled for the study.

Assumptions

The use of discriminant analysis is subject to certain assumptions that must be observed (Klecka, 1980; Tabachnick & Fidell, 1989).

When using a nominal categorical variable, the choice is to use either logistic regression or discriminant analysis. But when the data are normally distributed, discriminant analysis is adopted. Discriminant analysis has very similar assumptions with MANOVA though discriminant analysis is more robust to violations due to skewness rather than outliers.

- Multivariate Normality: Predictor variables are normal for each level of the grouping (categorical) variable.

- Equal variance-covariance matrix: The groups in a discriminant analysis must have equal variance-covariance matrices, even if their means are substantially different. This assumption is tested by using the transformed value of Box M which compares the equality of log determinants of the different categories in the grouping variables called F-Ratio.
- No Multicollinearity: There should be no multicollinearity in the predictor variables. The correlation matrix should be used to check for multicollinearity of the independent variables.
- Independence: Random sampling of the participants in the study is assumed. A participant's score on one variable is assumed to be independent of scores on that variable for all other participants.
- Linearity: Unlike a regression analysis, the dependent variable in a discriminant analysis is categorical, and therefore, non-metric. Hence there is no relationship between the dependent variable and the independent (numerical) variables which are metric. The only linear relationship that is observed is between the predictor variables.
- Outliers: researchers must identify and eliminate outliers in a discriminant analysis due to extreme sensitivity of the tool to outliers.

ANALYSIS AND DISCUSSION

Test of Equality of Group Means

Table 4.1 Showing Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Gross Premium written	.910	5.732	1	58	.020
LITERACY	.948	3.173	1	58	.080
UNEMPLOYENT	.999	.054	1	58	.818
Per Capita GDP	.989	.664	1	58	.418

Table 4.1 shows the test of equality of group means. In the test of the equality of group means, the result of the Univariate Anova is carried out for each predictor variable. It can be seen that gross premium differ at (Sig.=.02) for the two groups. The Wilk's Lambda and the F ratio are also used to analyse means of the groups for the same variable. The Wilk's Lambda for each predictor variable is equal to the ratio of the within group sum of squares to the total sum of squares. The range of the Wilk's Lambda value is between 0 to 1. If a variable's Wilk Lambda is less than 0.95, it is assumed that the group means are significantly different. From Table 4.1, Gross premium written and literacy rates show this difference. It is also clear that the predictor variable with the lowest Wilk's Lambda (.910) which is gross premium written presents the highest level of significance in the discriminant function. This is followed by literacy with (0.948). The P-value of the F-test equally support this assertion as P-values are higher for gross premium and literacy rates.

Box's M Test of Equality of Covariance Matrices

Rank 4 in table 4.2a indicates that the size of the covariance matrices is 4 x 4 which also shows the number of independent variables used in the discriminant function. The covariance metrics are the same if the log determinants of low insurance penetration covariance matrix and the log determinant of high insurance penetration covariance matrices are the same.

4.2a: Showing Log Determinants of covariance matrices

Insurance penetration rate	Rank	Log Determinant
Low penetration rate	4	45.362
High penetration rate	4	46.560
Pooled within-groups	4	47.332

The ranks and natural logarithms of determinants printed are those of the group covariance matrices.

4.2bShows the Test Results of Box M

Box's M		79.531
F	Approx.	7.358
	df1	10
	df2	16082.869
	Sig.	.000

Tests null hypothesis of equal population covariance matrices.

Source: (Author's computation, 2017).

The transformed F-ratio is calculated in order to test the equality of both covariance matrices. The F-ratio is the ratio of between group variability to within group variability. In this research, the P-value is significant at 0.000 means that there is a violation of Univariate normality. But this value can be explained to be caused by skewness rather than outliers and therefore, cannot lead to the cancellation of the estimated discriminant function. Again, given a fairly large sample size, this violation is not a serious problem as the model can still retain a high rate of accurate forecasting power.

Summary of Canonical Discriminant Function

Table 4.3a: Showing the Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.179[a]	100.0	100.0	.390

a. First 1 canonical discriminant functions were used in the analysis.

Table 4.3a shows the eigenvalues of the discriminant function while table 4.3b shows the wilks lambda. The eigenvalue shows the proportion of variance explained. It is a ratio of between group sum of squares to within group sum of squares. A large eigenvalue is associated with a strong function. Thus, with a low eigenvalue as shown in table 4.4a (0.179), it is an indication of a weak function. Also complementing this assumption is the canonical correlation of 0.390 which does not indicate a very strong relationship and thus less than 16 percent (15.21 percent) of the variation in group membership of the dependent variable is explained by the discriminant function.

4.3b: Showing the Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1	.848	9.228	4	.056

The Wilk's Lambda is the ratio of within groups sum of squares to the total sum of squares. This indicates the proportion in the discriminant score not explained by differences among groups. A Lambda of 0.848 shows that much of the variance is explained by factors other than differences between the means. Thus the Lambda given above is an indication that the group means appear to differ.

Canonical Discriminant Function Coefficient

The canonical discriminant function coefficient shown in table 4.4 indicates the unstandardized scores concerning the predictor variables. It equally shows the list of the unstandardized discriminant equation.

Table 4.4: Shows Standardized Canonical Discriminant Function Coefficients

	Function 1
Gross Premium written	.795
LITERACY	.646
UNEMPLOYENT	.340
Per Capita GDP	.110

Source: (Author's computation, 2017).

Structure Matrix

The structure matrix shown in table 4.5 displays the arrangement of the independent variables in order of importance in the determination of group membership from the highest to the lowest. From the structure matrix , it can be observed that gross premium written is the highest predictor at 0.743, followed by literacy rate at 0.553, and per capita GDP at 0.253 and lastly unemployment which is 0.072.

Table 4.5: Structure Matrix

	Function 1
Gross Premium written	.743
LITERACY	.553
Per Capita GDP	.253
UNEMPLOYENT	.072

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

Source: (Author's computation, 2017).

Canonical Discriminant Function

Table 4.6 shows the canonical discriminant function coefficients. The goal of every discriminant analysis is to estimate a discriminant function that helps to predict the group membership of the dependent variable. In this study, the aim is to predict insurance penetration rate in developing countries between low and high penetration rates using gross premium written, literacy rates, per capita GDP and unemployment as predictor variables. Table 4.6 shows the coefficients of the independent variables in the unstandardized discriminant function. Thus by using equation 1 which is the real discriminator, we have:

$$Z = -6.598(Cons) + 0.000\,(GP) + 0.062\,(LIT) + 0.046(UNEM) + 0.000(GDP\ Per\ Cap) \quad \text{(ii)}$$

Table 4.6: Canonical Discriminant Function Coefficients

	Function 1
Gross Premium written	.000
LITERACY	.062
UNEMPLOYENT	.046
Per Capita GDP	.000
(Constant)	-6.598
Unstandardized coefficients	

Source: (Author's computation, 2017).

Table 4.7: Functions at Group Centroids

Insurance penetration rate	**Function 1**
Low penetration rate	-.416
High penetration rate	.416

Unstandardized canonical discriminant functions evaluated at group means

Source: (Author's computation, 2017).

Functions at Group Centroids

The centroid for low insurance penetration rate is given in table 4.7 as -0.416 while the centroid for high penetration rate is 0.416. The high insurance penetration rate with a higher Z-value is a better estimator for future prediction of insurance penetration rate in developing countries.

For group membership it can be observed that 12 cases under high penetration rate and 9 cases under low penetration rate were misclassified.

SUMMARY AND CONCLUSION

This research was undertaken to identify the factors that discriminate group membership of insurance penetration rates in sixty (60) developing countries randomly selected from four continents of the world: namely Asia, Africa, Europe and the Americas.

The study presented some key variables that discriminate between low and high insurance penetration rates using gross premium written, literacy rates, per capita GDP and unemployment as independent variables. The penetration rates of 2.3 percent and below represented countries denoted as low while figures above 2.3 percent were denoted as high. From the findings, it was observed that gross premium written was the best variable in discriminating between the two groups, followed by literacy and per capita GDP. The least discriminating and as such, the least important variable in discriminating between the two groups is unemployment rate. This is consistent with the findings of an earlier research by Bhatia & Jain (2013) which found that GDP growth, population and per capita GDP growth exhibited a positive influence on insurance growth but unemployment and inflation had negative effect.

Based on the foregoing, the following recommendations are made:

i. That developing countries must as a matter of urgency do more to promote insurance awareness among their citizens to promote the growth of the sector.
ii. There should be a robust transformation of the financial sector to boost higher GDP growth as well as improvement in per capita GDP.
iii. Promote literacy through investment in the educational sector and encouraging non-formal education among adults to improve literacy rates.
iv. Create an enabling environment that will improve micro insurance to make it more inclusive rather than see insurance as being elitist.
v. Improve on the regulatory framework by making it less cumbersome to conduct insurance business through flexible policies that make mergers, acquisitions and fresh start-ups easy for any international investor.
vi. Reduce unemployment rate as much as possible as unemployed people cannot contribute to insurance.
vii. Improve on the disposable incomes of individuals through tax rebates to create more room for investing in the savings and life insurance products.
viii. Encourage bancassurance practices that will help deepen and diversify the distribution network of insurance companies.
ix. Governments should lead by paying annual premiums promptly to encourage higher premium receipts that can improve penetration.

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