
Evidence-Based Policy Evaluation: Focus on Micro-Insurance Operational Policy in Nigeria

Submitted 07/09/22, 1st revision 26/09/22, 2nd revision 11/10/22, accepted 30/10/22

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Abstract:

Purpose: This study assessed the impact of the implementation of micro-insurance operational policy, about a decade ago, on the insurance sector in Nigeria.

Design/Methodology/Approach: Annual insurance industry level data for the period 2004 to 2021, disaggregated into pre and post the micro-insurance implementation eras in Nigeria, was used for the study. A non-parametric model, Mann-Whitney U test, was used in the analysis to ascertain the significant difference in the insurance penetration rate and total gross premium before and after the implementation of the micro-insurance operational policy in Nigeria.

Findings: The results indicated that the insurance penetration rate was statistically significantly different between the two periods and the total gross premium of the insurance sector in Nigeria was not statistically significantly different between the two periods. The results suggest that the implementation of the micro-insurance operational policy had a significant impact on the insurance penetration rate and not on the total gross premium of insurance sector in Nigeria.

Practical Implications: These findings suggest the need to design micro-insurance products that align with the socio-economic characteristics of the target market in different regions in Nigeria as well as innovate ways to ease payment of premium by micro-insurance clients. Overall, important recommendations to inform practice and future policy for effectiveness of the micro-insurance market in Nigeria are raised in the study.

Originality/Value: This study is unique as it is an evaluation of an industry based policy with a potential to influence policy adjustment to inform efficiency in practice.

Keywords: Micro-insurance, insurance market, policy evaluation, non-parametric analysis, developing economy

JEL classification: C14, G22, G28.

Paper type: Research article.

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1. Introduction

Insurance, a risk transfer mechanism, is the most economically acceptable means of managing risk (Song *et al.*, 2012). Fundamentally, insurance provides financial protection to the insured in the event of loss or damage to the subject matter of insurance (Hoppe, 2012). However, the affordability of insurance products for individuals in the low-income class is challenged by the cost of cover. This price-induced outcome has undesirable impacts on the performance of the insurance sector in developing countries where a significant proportion of the population is in the low income class (Fofie, 2016).

In an attempt to reverse this undesirable trend, experts have called for the adoption of micro- insurance in developing economies. Specifically, micro-insurance schemes are designed to cater for the risk exposures of the low-income class as the underwriting requirements are tied to the unique socio-economic characteristics of the class (Nandru *et al.*, 2016).

Micro-insurance, which functions as low cost insurance, is seen as a veritable strategy that makes insurance products affordable with a knock-on on economic development (Nguyen *et al.*, 2010; Outreville, 2013; Akinlo and Apanisile, 2014). The affordability consideration of micro-insurance therefore makes it a targeted product at the most economically vulnerable class of individuals in any developing economy. Interestingly, according to the World Bank Group (2021), 71.9% of the population of Nigeria is either living in or exposed to poverty which suggests a significant proportion of the population of Nigeria is economically vulnerable.

To ensure the availability of insurance coverage for the significant proportion of the population which is made up of the economically vulnerable, the government of Nigeria implemented the micro-insurance operational policy in 2013. The launch of the micro-insurance operational policy officially granted micro-insurance firms the mandate to offer insurance products to low income earners with the main aim of stimulating the performance of the insurance sector in Nigeria (Okonkwo and Okeke, 2019).

Thus, the apriori expectation that guides this study aligns with the aim of the implementation of the operational guidelines of micro-insurance, that is, to enhance the performance of the insurance sector in Nigeria. The researcher thus adopts the public policy analysis theory⁴ as the theoretical framework and a non-parametric model to provide knowledge on the impact of the implementation of micro-insurance operational policy on the insurance sector in Nigeria through a pre and post eras assessment of the difference in two key insurance market indicators, insurance penetration rate and the industry's total gross premium covering the period 2004 to

⁴The public policy analysis theory was originally developed by Jones (1997) and undergone improvement by Smith and Larimer, (2009) and Anderson, (2011).

2021. The findings of the study will influence policy and practice of micro-insurance in Nigeria and other developing countries.

2. Review of Related Literature

2.1 Conceptual Review

2.1.1 Micro Insurance

Micro insurance is the generic name for insurance schemes or products offered to individuals in the low income group which provides protection against specific perils in exchange for a premium payment proportionate to the probability of occurrence and cost of the risk involved (Biener and Eling, 2012). Therefore, micro-insurance is an effective safety net in developing countries where a significant percentage of the population belong to the low income class with a much greater vulnerability to risk as there are fewer opportunities for recovery from a large loss (De Bock and Gelade, 2012).

Basically, micro-insurance products are designed according to the needs and risk appetite of persons excluded in the insurance market on account of inability to afford insurance products offered by the mainstream commercial and social insurance providers (Akotey *et al.*, 2011). Ideally, micro-insurance market is a pool of the segment of the population that is vulnerable to falling into poverty in the event of any loss indicating that micro-insurance is not for the poorest of the poor but for the economically viable poor on the poverty line with insurable risk exposures (Kishor *et al.*, 2013).

The rationale for targeting this segment of the population is the requirement to demonstrate sufficient financial capacity in any insurance contract through premium payment. Thus, micro-insurance products or schemes are designed to suite the low income market in the cost, terms, coverage and the mechanism of delivery. Thus, all micro-insurance products are designed to ensures simplicity, understanding, accessibility, value and efficiency (SUAVE) (Karadjova and Dicevska, 2018).

2.1.2 Micro-Insurance Schemes (Products) and Stakeholders

Micro-insurance schemes provide cover for such insurable risk as death, illness, accident, loss of income, loss of livestock, crop yield failure or property damage (Kishor *et al.*, 2013). As such, micro-insurance products are sub-divided into life micro-insurance products and non-life micro-insurance products. The uniqueness of micro-insurance products is that the risk procedure and scope of coverage must be simple, easy to understand, affordable and accessible to the target market with regards to price, premium payment and claims settlement (Okonkwo and Okeke, 2019).

To achieve this, micro-insurance products are designed in line with the need of the target market taking into consideration the benefits of the product to the buyer, the

fairness of the price of the product and coverage (Suarez and Linnerooth-Bayer, 2010). Designing micro-insurance products this way ensures the simplicity of policies, conditions, procedure and marketing of the scheme. The product design specification reduces ambiguity in the pooling method while also guaranteeing easy access to the products with respect to the cost, premium payment method as well as the claims settlement capacity of the micro-insurance providers (Karadjova and Dicevska, 2018).

Typically, micro-insurance schemes are designed and offered by micro-insurers, commercial insurers, mutual funds organizations, microfinance institutions, Non-Governmental Organizations, governments and semi-public bodies who are stakeholders in the micro-insurance market. Nevertheless, there are other stakeholders in the micro-insurance business with significant roles in product design, selling, delivery, servicing of claims and market research. Table 1 presents the major stakeholders in the micro-insurance market and their roles.

Table 1. Micro-insurance Stakeholders and their roles

Stakeholders	Roles
(Micro) – Insurer Public or private companies Cooperatives societies Mutual funds organizations	<ul style="list-style-type: none"> • Develop micro-insurance schemes • Provide Micro-insurance schemes to clients • Timely Settlement of claims. • educate clients on the schemes
Reinsurer	Provides insurance to the micro-insurer by taking up a portion of the risk the micro-insurer bears
Regulator Insurance regulators Insurance supervisors Other relevant financial sector regulators	<ul style="list-style-type: none"> • Stipulate requirements for products approval • Specify the roles and operational boundaries of micro-insurers • Identify and regulate the micro-insurance schemes delivery channels for effectiveness. Regulate the activities micro-insurance intermediaries
Delivery channel Agents Brokers Cooperative societies Social networks Individuals	<ul style="list-style-type: none"> • Contribute to micro-insurance schemes development • Active participants in the marketing micro-insurance schemes • Educate clients on micro-insurance schemes • Facilitate client’s enrolments on the schemes • Facilitate claims processing and claims dispute resolution.

Micro-insurance intermediary Agents Brokers Institutions that intermediate	<ul style="list-style-type: none"> • linking insurers to delivery channels • Active in micro-insurance markets where delivery channels may not have the capacity or interest in actively participating but are willing to offer their schemes to clients. • Operate in low-income market where micro-insurers can provide risk taking capacity but are not interested or not capable of working directly with delivery channels.
Service provider Healthcare providers End-of-life care providers (Funeral homes)	<ul style="list-style-type: none"> • Liaise with micro-insurance to provide quality service as specified in the micro-insurance policy to the client.
Customer Policyholders Beneficiaries	<ul style="list-style-type: none"> • Ensure premium is paid and on time. • Report unsatisfactory service to the regulators
Donor and promoter Private (domestic or multinational) donors Governments	<ul style="list-style-type: none"> • Provide financial support to the micro-insurer • provide strategic guidance to the micro-insurance market • provide technical support to the micro-insurance providers • Support technical and human capacity building.

Source: Adapted from 2018 Micro-insurance operational guideline in Nigeria.

2.1.3 Micro-insurance Institutional Framework and Stylised Facts in Nigeria

To cater for the insurance services needs of individuals in the low income class and in a bid to enhance the performance of the insurance sector, the regulators of insurance industry in Nigeria, the National Insurance Commission, NAICOM, released the policy guidelines for micro-insurance operation in Nigeria in 2013. The policy guidelines are sets of regulations and standards for the conduct of micro-insurance business in Nigeria.

The policy guidelines described micro-insurance as insurance products designed for low income population with low valued policies provided by licensed institutions operated in accordance with generally accepted insurance principles and funded by premium. The 2013 micro-insurance operational policy guidelines were amended in 2018 in line with the market dynamics and evolution to enhance effectiveness of the (micro) insurance market in Nigeria.

The 2018 amended operational policy guidelines provide for the minimum paid up capital of micro-insurance to be determined by geographic coverage of the service provider. Accordingly, the paid up capital for a micro-insurance company that operates just a unit, that is a business outlet at only one location, is N40,000,000.00

(Forty million Naira), where a micro-insurance service provider concentrates operation in one state only, that is operating more than a business unit in one state, a paid up capital of N100,000,000.00 (One hundred million Naira) is applicable, while micro-insurance firms with presence in more than one state in Nigeria is to pay N600,000,000.00 (Six hundred million Naira) as minimum paid up capital. Licensed micro-insurance companies are at liberty to operate as a composite entity offering both life and non-life products.

Furthermore, the 2018 amended policy guidelines fix the maximum sum assured in a micro-insurance life policy at N2,000,000.00 (Two million Naira) per assured. The policy guidelines specify the tiered approach of operation which recognizes licensed micro-insurance firms as the sole provider of micro-insurance services. To ensure efficiency in the management of micro-insurance firms, the policy guidelines provide for the management of the micro-insurance companies to be constituted by insurance experts at a managerial level with five years of post associate-ship of the chartered institute of insurance qualification or seven years working experience in a technical department of an insurance firm.

The micro-insurance ecosystem in Nigeria appears to still be at the formative stage. Accordingly, as of the close of business year in 2020 only three companies were issued micro-insurance license in Nigeria with one permitted to operate nationally while the operational license of the other two were state based (Adesanya *et al.*, 2020). As a matter of operational convenience, the three licensed micro-insurers may concentrate their operations in the urban areas which will portend the challenge of availability of micro-insurance products touch points in rural areas in Nigeria where a significant population of the poor reside.

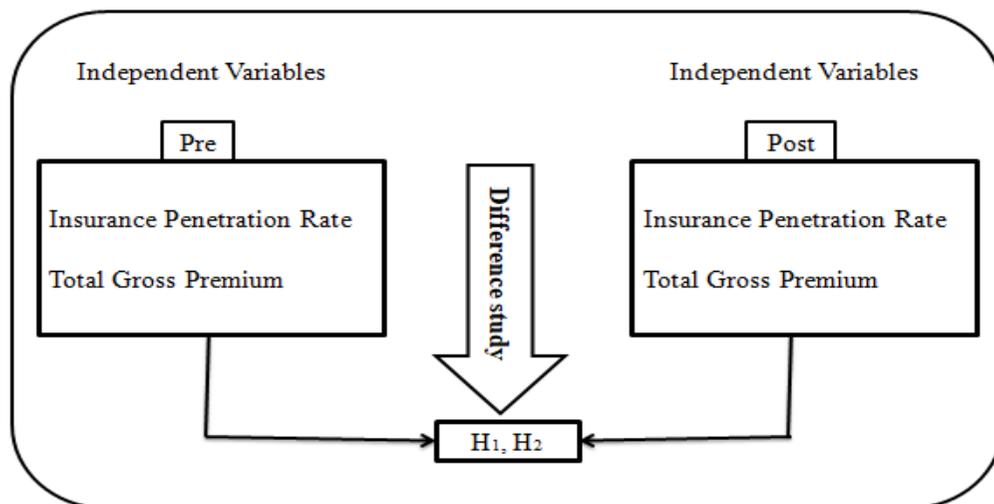
Furthermore, EFINA (2018) reported that 37 life and non-life micro-insurance products were offered in Nigeria with majority as bundled products – that is products that provide more than one type of coverage. For example, some primary micro-insurance life products provide health cover with point of service payment as well as property and accident with disability included as secondary coverage.

The EFINA study (2018) further indicates that the relatively high number of products is yet to translate to high coverage, even though credit-linked covers offered in a bancassurance arrangement through the Micro-finance banks as the distribution channel, accounted for about 83% of micro-life insurance covers in the period reviewed.

The EFINA study (2018) equally shows that the gross written premium for the micro-insurance market in Nigeria as at the time of the study was 1.5 billion Naira and the yearly premium per insured ranged from 400 Naira to 36 000 Naira.

The conceptual framework of the present study is presented in Figure 1.

Figure 1. Conceptual framework by the researcher



Source: Own study.

2.2 Empirical Review

2.2.1 Insurance Penetration Rate and the Performance of the Insurance Sector

Insurance penetration rate measures the ratio of the total insurance premium of a country to the country's gross domestic product the GDP (Feyen *et al.*, 2013). Therefore, insurance penetration rate indicates the contribution of the insurance sector to the economy of a nation. Insurance penetration rate is a tool that explains the contribution of different insurance markets to national growth which is critical to the development of evidenced-based policies.

Offiong *et al.* (2020) applied the vector error correction model on data on insurance penetration rate and insurance density for the period 1986 to 2018 as measures of the performance of the insurance sector to examine the effects of exchange rate volatility on insurance performance in Nigeria and found a significant and positive impact of exchange rate volatility on insurance performance in Nigeria.

Alhassan and Fiador (2014) investigated the relationship between insurance penetration rate and economic growth in Ghana using data covering the period 1990–2010 with autoregressive distributed lag (ARDL) model as the method of data analysis and discovered a unidirectional causality of aggregate insurance penetration to growth on one hand and life and non-life insurance penetration to growth on the other hand. Zouhaier (2014) study on the relationship between insurance business and economic growth in 23 OECD countries over the period 1990 to 2011 with a static panel data model used for analysis showed that insurance penetration rate had a positive and significant impact on economic growth.

A Nigerian study by Okonkwo and Eche (2019) that examined the effect of insurance penetration rate on economic growth by applying multiple regression analysis on data covering the period 1981 to 2017 showed no significant relationship between insurance penetration rate, as a measure for insurance sector performance, and economic growth. A study involving a panel data for the period 1988 to 2012 from South East Asian Nations (ASEAN) Regional Forum (ARF) countries by Pradhan *et al.* (2016), using multivariate analytical framework indicates a causal connection between insurance penetration rate and economic growth in the ASEAN region.

However there is known study that assesses the impact of the introduction of a new insurance sub-market on the insurance sector with insurance penetration rate as the major market indicator. The present study fills this gap by addressing the null hypothesis stated thus:

Ho: *There is no significant difference in the insurance penetration rates considering the pre and post eras of the implementation of micro-insurance operational policy in Nigeria.*

2.2.2 Total Gross Premium and Performance of Insurance Sector

Akinlo and Apanisile (2012) adopted an ex post facto research design to examine the effects of insurance business sector on economic growth sub-Saharan Africa for the period 1986 to 2010 using the error correction model and co-integration technique and reported a positive significant influence of economic growth by the proxy of insurance business sector in the study, the total gross premium.

Using total gross premium as a measure for insurance practice for the years 1990 to 2011, Eze and Okoye (2013) examined the impact of insurance practice on the growth of the Nigerian economy using co-integration test and error correction model and reported a positive but non-significant impact of insurance practice on economic growth in Nigeria. Similarly Yinusa and Akinlo (2013) analyzed the relationships between insurance development and economic growth in Nigeria over the period 1986-2010 using an error correction model (ECM) and found that insurance development with total gross premium as proxy exhibited a statistically significant relationship with economic growth in Nigeria.

A study of 10 OECD countries for the period 1979 to 2006 by Chien-Chiang (2011) on the interrelationship between insurance market activities and economic growth using panel unit-root tests, heterogeneous panel co-integration tests and panel causality techniques with total gross premium disaggregated into life premiums and non-life premiums as a measure of insurance market activities indicated a greater relationship between the non-life insurance market and economic growth when compared with the market-to-economic growth relationship for the life insurance market.

İlhan and Taha (2011) examined the role of insurance business in economic growth of 29 countries involving Australia United States and selected countries in Europe using correlational technique on data covering the period 1999 and 2008 and the results showed a positive and significant relationship between insurance business captured by total insurance gross premium and economic growth in the countries studied.

Nevertheless, studies that focus on the evaluation of the impact of the implementation of a sub-market like the micro-insurance on the industry using gross premium as the indicator are scarce. This study fills this gap by empirically addressing the null hypothesis stated thus:

***Ho:** There is no significant difference in the total gross premium of the insurance sector before and after the implementation micro-insurance operational policy in Nigeria.*

3. Materials and Methods

3.1 Population and Source of Data

The data that drives this study is the annual insurance industry level data from life and non-life insurance companies in Nigeria making all licensed insurance companies in Nigeria the population of the study. In this regards secondary data on insurance penetration rate and total gross premium for the period 2004 to 2021 was gathered from Insurance Digest, an annual publication of the Nigerian Insurers Association (NIA), and the National Insurance commission (NAICOM) annual reports.

As a policy evaluation study, which typically anchors on pre versus post policy implementation eras assessment data collated which covered a total of 18 years comprised nine years before the implementation of the policy and nine years after the implementation (Karan et al, 2017). Aside from estimation concerns of balancing the number of pre and post implementations periods, this decision was guided by the availability of data (Selvaraj and Karan, 2012).

3.2 Test of Normality

Shapiro-wilk test was used to test if the variables of interest were normally distributed (Razali and Wah, 2011). Shapiro-wilk test is most appropriate for studies with small sample size which informs the choice of this test by the researcher. The null hypothesis for Shapiro-wilk test is that the variable is normally distributed if the p-value is not less than 0.05 being one of the standard p-values adopted in many other studies (Hanusz and Tarasińska, 2015). Table 2 presents the results of Shapiro-wilk test of normality with p-values for both insurance penetration rate and total gross premium being less than 0.05 providing enough evidence to conclude that both

variables are not normally distributed. The rationale for the test of normality is that the normality of the variables of interest informs the choice of the method of data analysis (Ghasemi, and Zahediasl, 2012).

Table 2. Shapiro-wilk test of normality results

Variable	Observations	V	P-value
Insurance penetration Rate	18	4.849	0.01
Total Gross Premium	18	2.921	0.03

Source: Own study.

3.3 Method of Data Analysis

Descriptive statistics will be used to provide an insight to the variables of interest for the period 2004 to 2021. It has been statistically established that the variables of interest in the study are not normally distributed and makes a non-parametric method of estimation the most appropriate method for testing the hypothesis of the study. In this regards Mann-Whitney U test a robust non-parametric estimation method that uses two independent samples to test hypothesis, found to be most appropriate in policy evaluation was adopted in this study (McKnight and Najab, 2010; Rochon *et al.*, 2012).

Mann-Whitney U test was used to investigate if significant differences exist in the insurance penetration rate and Total gross premium after the implementation of the micro-insurance operational policy with the pre implementation years as the basis. Apart from its suitability for this study on the grounds of non-normality of the variables of interest in the study Mann-Whitney U test is most appropriate in the estimation of small samples of continuous variables. The estimation model used in the study states thus:

$$U_i(n_i R_i) = \beta_i \tag{1}$$

where, U_i is the Mann Whitney test statistics and $i = 1, 2$. Practically, $i = 1$, captures the pre policy implementation period and $i = 2$, captures the post policy implementation period. In this regards, β_i can be further expressed as:

$$\beta_1 = n_1 n_2 + \frac{n_1(n_1+1)}{2} - R_1 \tag{2}$$

and

$$\beta_2 = n_1 n_2 + \frac{n_2(n_2+1)}{2} - R_2 \tag{3}$$

From (2) and (3):

- $\beta_1 =$ Estimate for the pre policy implementation period
- $\beta_2 =$ Estimate for the post policy implementation period

- n_1 = Sample size for the pre policy implementation period
- n_2 = Sample size for the post policy implementation period
- R_1 = Rank sum for the pre policy implementation period
- R_2 = Rank sum for the post policy implementation period

However, the acceptable estimate from the analyses is the smaller of the estimates obtained from U_1 or U_2 expressed as:

$$U_1 = \beta_1 \tag{4}$$

and

$$U_2 = \beta_2 \tag{5}$$

In line with Chan *et al.* (2011), the null hypothesis that there no significant difference in the insurance penetration rate and total gross premium in Nigeria pre and post the implementation of the micro-insurance operational policy in Nigeria will be rejected if the p-values of β_1 and β_2 are less than 0.05. Stata 13 statistics software was used in the data analysis which churned out the estimates reported in this study.

4. Presentation of Results and Discussion of Findings

4.1 Summary Statistics

Table 3 presents the summary statistics of the variables by the policy implementation periods. A total of 18 years, disaggregated into 9 years before and 9 years after the implementation of the micro-insurance operational policy, was used in the study. The average insurance penetration rate was higher after the implementation of the policy (0.44%) when compared to the period considered in the study as the pre implementation period (0.35%).

The standard deviation of insurance penetration rate after the implementation was observed to be higher (0.16) than the standard deviation of insurance penetration before the implementation of the policy (0.05) suggesting a faster growth after the policy implementation. Furthermore, the insurance penetration rate, post policy implementation, grew from 0.16% to 0.72% against 0.29% to 0.43% for the pre implementation period indicating a positive effect of the policy on the performance indicator.

The mean total gross premium for the pre and post policy implementation periods are 152.31 billion Naira and 443.18 billion Naira respectively showing an increase after the implementation of the policy. However, the standard deviation of 80.94, minimum of 50.10 billion Naira and maximum of 283.94 billion Naira for the pre policy implementation period and standard deviation of 97.15, minimum of 317.77 billion Naira and maximum of 630.36 billion Naira, suggest a slower growth of the

total gross premium after the implementation of the policy when the two periods are considered.

Table 3. Summary statistics of the variables by the policy implementation periods N=18 years

Variables	Policy implementation periods	
	Pre (n = 9 years)	Post (n = 9 years)
Insurance Penetration Rate (%)		
<i>Mean</i>	0.35	0.44
<i>Std dev.</i>	0.05	0.16
<i>Min.</i>	0.29	0.16
<i>Max.</i>	0.43	0.72
Total Gross Premium (Billion Naira)		
<i>Mean</i>	152.31	443.18
<i>Std. Dev.</i>	80.94	97.15
<i>Min.</i>	50.10	317.77
<i>Max.</i>	283.94	630.36

Source: Own study.

4.2 Data Analysis Results

Mann Whitney u test was conducted on the data with the use of stata 13 statistical software. Table 5 presents the results of the data analysis. The output in table 5 shows that data for the 18 years disaggregated into nine years before and nine years after the implementation of the policy was used in the analysis. As practice demands the two estimates of interest that will be used in testing the hypothesis of the study, the z-score and the p-value of the z-score are equally reported in Table 4.

Table 4. Results of the data analysis

Variables	Observation (pre, post)	Z	p-value
Insurance Penetration Rate	18 (9, 9)	-3.576	0.00
Total Gross Premium	18 (9, 9)	-1.558	0.06

Source: Own study.

4.3 Test of Hypotheses

(1) Hypothesis One

H0: There is no difference in the insurance penetration rates, pre and post the implementation of micro-insurance operational policy eras, in Nigeria.

HA: There is a difference in the insurance penetration rates, pre and post the implementation of micro-insurance operational policy eras, in Nigeria.

Decision rule:

If the p-value of the test statistics estimate of insurance penetration rate is less than 0.05 level of significance ($p\text{-value} \leq 0.05$), then reject the null hypothesis (H_0) and accept the alternate hypothesis (H_A).

Accordingly the p-value of the test statistics estimate of insurance penetration rate in Table 4 is less than 0.05 level of significance, then the null hypothesis (H_0) which states that there is no difference in the insurance penetration rates, pre and post the implementation of micro-insurance operational policy eras, in Nigeria. However, the alternate hypothesis (H_A) which states that there is a difference in the insurance penetration rates, pre and post the implementation of micro-insurance operational policy eras, in Nigeria is accepted.

(2) Hypothesis Two

H₀: There is no difference in the total gross premium of the insurance sector before and after the implementation micro-insurance operational policy in Nigeria.

H_A: There is a difference in the total gross premium of the insurance sector before and after the implementation micro-insurance operational policy in Nigeria.

Decision rule:

If the p-value of the test statistics estimate of total gross premium is less than 0.05 level of significance ($p\text{-value} \leq 0.05$), then reject the null hypothesis (H_0) and accept the alternate hypothesis (H_A). Since the p-value of the test statistics estimate of total gross premium in Table 4 is not less than 0.05 level of significance, the null hypothesis (H_0) which states that there is no difference in the total gross premium of the insurance sector before and after the implementation of micro-insurance operational policy in Nigeria is not rejected. Nevertheless the alternate hypothesis which states that there is a difference in the total gross premium of the insurance sector before and after the implementation micro-insurance operational policy in Nigeria is not accepted.

4.4 Discussion of Findings

(a) Micro-insurance operational policy and Insurance penetration rate in Nigeria

Result from the first hypothesis reveals a statistically significant difference in the insurance penetration rate when the pre and post eras of the implementation of micro-insurance operational policy in Nigeria are considered. This finding provides sufficient evidence that the true mean of insurance penetration rate is different between the pre and post micro-insurance operational policy implementation eras.

Furthermore, negative z-score showed that the insurance penetration rates after the implementation of the micro-insurance operational policy are greater in value when compared to those in the period before the implementation of the policy which is indicative of a greater mean value in the post era in relation to the pre era. Thus, the finding suggests that the implementation of the micro-insurance operational policy does have a significant progressive impact on insurance penetration rate in Nigeria.

This find is in line with Cole *et al.* (2012) that reported a significant impact of indexed-based micro-insurance on the management of weather related risk by smallholder farmers in selected countries in Africa and Asia. Also the finding of this study aligns with Gupta, (2016) who discovered a significant impact of micro-insurance on the vulnerability of the low-income residents of Varanasi district in India.

(b) Micro-insurance operational policy and total gross premium in Nigeria

The finding from the second hypothesis shows no significant difference in the total gross premium considering the pre and post periods of micro-insurance policy implementation in Nigeria. Even though the negative z-score indicated a greater mean value of total gross premium in the era after the implementation of the policy compared to the period before the implementation of the policy, the result indicates that there is no sufficient evidence of a difference in the true mean of total gross premium before and after the implementation of micro-insurance operational policy in Nigeria.

Therefore the finding suggests that the implementation of micro-insurance operational policy does not have significant impact on the total gross premium of the insurance sector in Nigeria. This finding corroborates Gosemi and Meka, (2021) who found inability to pay premium by clients with a possible knock-on on low total gross premium as one of the challenges of micro-insurance business in Albania.

5. Conclusion and Recommendations

5.1 Conclusion

This study assessed the impact of the implementation of micro-insurance operational policy on the insurance sector in Nigeria. Specifically, a Mann-Whitney U test was conducted on 18 years secondary data obtained from NIA digest and NIACOM annual reports to determine if the implementation of the micro-insurance operational policy led to a difference in the insurance penetration rate and total gross premium of the insurance sector in Nigeria.

The pre and post policy implementation periods had nine years each. The results indicated that the mean insurance penetration rate was statistically significantly different between the two periods ($Z = -3.576$, $p\text{-value} = 0.00$) at a significance level of 0.05. The result further showed that the mean total gross premium of the insurance sector in Nigeria was not statistically significantly different between the two periods ($Z = -1.558$, $p\text{-value} = 0.06$) at a significant level of 0.05.

Based on these results, it can be concluded that the implementation of the micro-insurance operational policy had a significant impact on the insurance penetration. However, there was no sufficient evidence to conclude that the policy equally had a significant impact on the total gross premium of the insurance sector in Nigeria.

5.2 Recommendations

From the findings, the following recommendations are made:

- i. To increase the number of micro-insurance service providers which will increase activities in the sector stakeholders in the insurance sector particularly NAICOM and other relevant bodies should embark on a road show and other investment sensitization programmes in Nigeria and abroad to increase investments in the micro-insurance market in Nigeria.
- ii. Government and development support agencies should subsidize the premium of selected micro-insurance products like life and health micro-insurance to encourage enrolment by the target market of micro-insurance, the low income group, which will support the development of the insurance sector in Nigeria.
- iii. Micro-insurance providers should design micro-insurance products that suit the socio-economic characteristics of the different regions in Nigeria to support patronage.
- iv. Stakeholders in the micro-insurance market, particularly the micro-insurance companies, should adopt premium payment options like mobile payment channels to make payment of premiums easier.
- v. The micro-insurance products touch points should be increased particularly in the rural areas by providing incentives to existing businesses in this area to become agent micro-insurers in their localities.

Since a non-parametric model was adopted to examine the difference in the variables of interest in this study, future study can adopt a parametric method of data analysis upon availability of sufficient data.

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