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PAPER

Demographics and Insurance Market Development in Nigeria

Onafalujo Akinwunmi Kunle Eke • Patrick Omoruyi

Abstract Insurance market development is often measured in terms of penetration which may depend on the prevailing demographics like life expectancy, fertility rate, income distribution and dependency ratios. Many of these demographics emerge as cohorts to savings and insurance behaviors. The matured economies are configuring development in terms of longevity risks as compared with developing economies that faces higher dependency ratios, lower life expectancy and high fertility rates and active young population but with high unemployment, morbidity rate, mortality rate poor Gini co-efficient. This paper adds to the literature on the implications of emerging demographics on Nigeria's insurance market development debacle. Using multiple regression technique, the level of causal relationship of insurance market development is tested on mortality rate, fertility rate, dependency ratio, unemployment rate, and Gini co-efficient. It is found out that insurance market development in both life and general insurance sectors is significantly negative to the explanatory variables. The study suggests that policy on health and education expenditure should be increased to mitigate high morbidity and mortality risks as well as generating employment opportunities in other to sustain savings and insurance culture.

Keywords Demographics - Insurance market development - Socio-economic policy

JEF Classification J11 - G22 - H300

1. Introduction

Potentially, Nigeria has the biggest insurance market in Africa, due to her population and Natural resources. Yet she has about worst insurance penetration. The Africa Business Special Report (2007) identifies that insurance services have historically not been popular with the Nigerian public. The report reveals that less than 1% of the country's population of 140 million people has any form of insurance policy. Those

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that have cover obtain only compulsory insurance. Insurance market development in Nigeria in recent years is premised on using several planks like compulsory insurance. According to Laguda (2010), the intensification of the awareness campaign by the National Insurance Commission for the compulsory insurances and the release of the 'Guidelines for the Insurance of Oil and Gas Business' to have a minimum percent local content were expected to boost aggregate premium growth rate

Prior to 2005, there was a significant fall in gross premium income of all insurance companies in Nigeria. From 1999 to 2000 premium fell from N14.79 billion to N1.58 billion (NIA, 2004). This rapidly skyrocketed to N233.75 billion and N200.38 billion respectively for the year 2011 and 2010 (Pan African Capital Research, 2014). According to the Swiss the Global Report for 2004, the Nigerian insurance industry had only 0.02% of the global market. The report also ranked Nigeria 62 out of 88 countries in terms of annual premium volumes; 69th in life funds and a dismal 86th on insurance density. Insurance reforms in 2005 pushed for recapitalization and consolidation which have boosted risk-taking capacity and premium growth rate (Chukwulozie ,2008).

Notwithstanding these efforts insurance penetration in Nigeria is one of the worst in Africa at 0.5% for life insurance and 1.5% for non-life insurance (Ojumah, 2013) which is 0.7% on the average compared to South Africa 16% and global average 7.5% (First Bank Capital, 2013). By the estimates stated by First Bank Capital (2013), 86% of Nigerians do not have any insurance cover. Others have attributed other reasons as awareness (Chikwelezi, 2008), low income (Ojumah, 2013) or income inequality (indicated by Gini-coefficient), or financial literacy (Onuoha, 2013) citing National Insurance Commission (NAICOM) Chief Executive's remarks at a conference. Most the practitioners and researchers in this area are focusing socio-economic parameters and not demographics. The impact of demographics on purchase of insurance was examined in India, and Negi and Singh (2012) find demographic factors influence the important factors that motivate purchase of life insurance. Demographic risks often appear as cohorts to economic behavior of the society of which insurance is a key to active risk management. Eaterlin argues that **"**high population growth and improved productivity both arise from the same source-the reduction in mortality and associated improvement in health and also if mortality reduction were accompanied by a fertility reduction, so that population growth did not accelerate, then the productivity increase would be higher, for the positive effects of better "quality" workers would not be partially offset by the tendency toward diminishing returns produced by a greater quantity of workers." This statement must have assumed moderate unemployment, dependency ratio and Gini-coefficient. Oxford Economics (2012) projects similarly that in the absence of mass immigration and catastrophic fatalities, UK will experience decline in dependency ratio-working population of 18-65 decreasing compared to dependants 0-18 and above 65. This is forecasted from longevity and reduced fertility/birth rates. On the other hand, Nigeria and other developing countries are contending with unemployment, high mortality rates, low life expectancy, non-directional population policy, and high fertility rate. Anecdotal perception conjure that high unemployment rate and high Gini co-efficient will significantly mediate late marriages and low birth rates which induces

low saving's behavior and indeed insurance culture. Demographic profiles are used by marketers to develop marketing strategy and plans (Negi and Singh, 2012), and in particular can be used to predict demand of life insurance. On this basis, the study hypothetical predict negative correlations between insurance market development in Nigeria and emerging demographics. This study extends knowledge on why insurance is not attractive in low income countries theoretically. The future of Nigerian insurance market can be assessed and policy implications crafted to address demographic risks.

2. Review of Literature

Research works on demographics and insurance development are very scarce and the few available considered the impact of demographics on socio-economic factors affecting life insurance demand Curak, Dzaja and Pepur, (2013) in Croatia and by Negi and Singh, (2012 in India. Population dynamics are slow and it takes decades for the age structures to change significantly (Lassila and Valkonen, 2008). They assert that demographic changes are clearly easier to foresee than most economic changes. Demographic shift is also popularly referred to as population ageing (Bloom and McKinnon, 2013). The implications of emerging or shifts in demographics on insurance market development is yet to be the focus of researchers in Nigeria, apart from socio-economic factors affecting purchase of insurance. Nigeria has the largest population in Africa being projected to about 170 million people, 6th largest producer of oil in the world, and rich in Natural resources. The Gross Domestic Product (GDP) which from grew 34 trillion Naira to 42.4 trillion Naira, 2010-2013 was recently rebased 54.2 trillion-80.2 trillion for the same period Nigeria Bureau of Statistics (NBS), (2014) . Yet she has about the worst insurance penetration in Africa. The Africa Business Special Report (2007) stated that insurance services have historically not been popular with the Nigerian public. Going by First Bank Capital (2013), 86% of Nigerians do not have any insurance cover. Why do people purchase insurance? And how does insurance market develop?

The underpinning theories are found in actuarial and portfolio theories that were used in developing utility function for insurance. Insurance is used as protection instrument against life cycle events such as premature death, sickness, old age, retirement, accidents (fire, motor) and natural disasters (Casualty Actuarial Society, 2001). Actuarial theory uses the law of large numbers to predict that the sample mean converge in probability to population mean Seog (2008). Portfolio theory says that in an efficient portfolio the sum of the risk is less than the total risk. Hence, in pooling of risk the interest is in the average risk.

The variance of a sample sum $\sum_i^n X$ is denoted by $n\delta^2$ which goes to infinity as n tends to infinity. The implication is that as the pool of risk increases to infinity the value of each risk approaches zero. By actuarial theory, the pricing of each risk based on its value, the smaller it becomes the more insurable. Seog (2008) argues this implicit function of insurance market. Suppose that an insurer sells insurance to *n* individuals with independent and identical risks. From portfolio theory, the aggregate risk increases but smaller than the sum of the *n* risks. The basis of insurance management is that the

actual loss may exceed expected loss, and hence reserves are created as buffers (Casualty Actuarial Society, 2001). The law of large numbers posits that the reserve falls to zero as the coverage tends to infinity. The logic of attractiveness of insurance business is linked to a demographic cohort that can produce large numbers of risk averters. Risk-insurance hypothesis also suggest that high fertility and birth rates is traced to the propensity of use children as insurance (Robinson, 1986).

Various demographics are reported in literature to affect demand for life insurance. Young couples are known to have greater demand for life insurance through their wives (Anderson and Nevin, 1975). Burnett and Palmer (1984) and Truett and Truett (1990) found that purchase of life insurance is related to the level of education, income and large families. An indirect inference is that high youth dependency ratio or age dependency ratio from large families should result in higher demand for insurance or insurance market development. Fertility and birth rates are well known correlates. The extant literature on fertility links improved education to lower fertility and birth rates and this is expected to improve insurance market (Li *et al*, 2003) more so that children can no longer be used as insurance (Robinson, 1986). The emergence of two-child family discussed by Russel (1948) is almost a reality in Nigeria. Similarly, Risk aversion is important reason why people decide to buy insurance in general despite the fact that they have to pay for insurance premium more than mathematical expectation of loss. Outreville (1996) argues that risk aversion has positive effect on life insurance purchase as well and used education as proxy for risk aversion.

Mortality and Life Expectancy patterns in Nigeria

Mortality patterns in Nigeria have not been linear over the years but have improving slowly in recent years. Rogers *et al* (1996) report social characteristics in the mortality pattern of Black Americans and observe that they lag behind other ethnic nations because of their disadvantaged social index. They categorize them as not likely to be married, employed or wealthy which are associated with lower mortality (Schoenborn, 1986 and Potter, 1991). The worsening of these social variables will likely aggravate the demographic variables in a simple logic. Life expectancy from birth also fluctuates between 51.6 and 52 from 2000-2012 (World CIA, 2013). This implies there is a youth bulge in Nigeria. While annuities can manage longevity risk, it could boost the life insurance market while low life expectancy will make life insurance costly.

Dependency ratio and insurance Market Development

Dependency ratio depends on the employment rate. Since age and youth dependency assume that those in the working age bracket (18-65 years) will be employed and therefore buy some insurance to protect their dependants. Hammond *et al* (1967) and Mantis and Farmer (1968) find influence of employment on life insurance consumption since employment provides income. The demographic shift in Nigeria is suggested to be occurring due to age at first employment. Many graduates do not have employment 5-10 years after leaving school which may also affect age at first marriage. This generation

should seek more insurance.

Income inequality and Insurance Market

The focus on mortality and fertility decline by developed economies as vectors of economic development was questioned by (Davis, 1963), but remains topical issues as to the demographic risks that must be managed for optimal saving structure and productivity. The identified difficulties make it more difficult to recommend a single generalization for demographic risks on economic development. It is presumed that economic development is vectored by insurance development as reported in extant literature (Beck and Webb, 2003). The structure of the family affects the way income is generated and distributed (Ben-Porath, 1982). It is therefore assumed that family and demographic process are in principle affected by income distribution. Since insurance is risk-pooling and risk-sharing devices, Ben-Porath (1982) argues that the redistribution of intra-family networks will prevail in undeveloped insurance markets. Thus, high income-inequality generated by demographics will adversely affect the need to buy insurance.

3. Theoretical framework, Data and Methodology

The time series model is implicitly specified in line with utility function predicated on actuarial theory (Casualty Actuarial Society, 2001). One of the few recent studies Negi and Singh (2012) used factor analysis. Functionally, the relationship that insurance market development is a function of gross domestic product, average life expectancy, gini coefficient, dependency ratio is stated as follows:

$$Linsdv = f(drtio, lxpcy, gini, lg\ dp) \qquad (1$$

$$\quad - \quad + \quad - \quad +$$

The *a-priori* signs are presented underneath. Explicitly, the elasticity model is appropriately stated in double- log form as follows:

$$Linsd_t = \gamma_0 + \gamma_1 drtio_t + \gamma_2 lxpcy_t + \gamma_3 gini_t + \gamma_4 lg\ dp_t + \varepsilon_i \qquad (2)$$

The logical expectations are *drtio, gini* <0; *lxpcy*,lg *dp* >0

Where the stochastic error certifies the standard conditions as follows:

$$E(\varepsilon_i) = 0,\ Var(\varepsilon_i) = \delta^2 \qquad (3)$$

The 32 years (1981-2012) data were sourced from the following institutions: the Central Bank of Nigeria (CBN) statistical bulletin for the insurance gross premium, which is a proxy for insurance market development; National Bureau of Statistics (NBS) for the gross domestic product (GDP) at current prices; the United Nations Population Division's World Population agency is source for dependency ratio (Drtio) while life expectancy age (Lxpcy) and gini coefficient (Gini) are derived from World Bank Atlax/ Statistics. Eview 7 software package was used.

Augmented Dickey-Fuller unit root technique was applied to test the stationarity properties of the variables. This was achieved at first difference for all but Gini coefficient (see table 2). It suggests that while majority of the variables are intergrated at I(1), the

non intergration of gini coefficient variable at I(1) denies the model of cointegration study.

The variables were also tested for directions of causality. The granger causality test (see table 3) reveals that bi-directional causality exists between Drtio and Linsdv; and between Lxpcy and Drtio. Unidirectional causality runs from Lgdp to Linsdv; from Lgdp to Drtio, and from Lxpcy to Gini. The rest variables were found to be independent (Gujarati and Porter, 2009: 653-4).

Regression Results

Table 1 Summary of Results

$$Linsdv_t = 19.332 - 0.054drtio_t + 0.1lxpcy_t - 0.05gini_t + 0.04lg\ dp_t \quad (4$$

Std error =	(2.6283)	(0.0238)	(0.0199)	(0.0032)	(0.0329)
T.stat. =	7.3555	-2.2626	5.3903	-1.4828	1.2427
Sig =	0.0000	0.0319	0.0000	0.1497	0.2247

R^2= 0.913, adj. R^2= 0.900, F-Stat.= 70.837 Sig.= 0.00000, D.W Stat.=1.11, Obser.=32

The regression's diagnostic statistic result (see table 1) suggests that the coefficient of determination (R^2) is appropriately high at 91%, the F- statistics is significant at less than one percent. This indicates that the explanatory variables effectively relates or determine the value of insurance market development in Nigeria, though with elements of serial autocorrelation in the model. The result of the regression reveals that the variables tested generally agree with the *a-priori*. The dependency ratio and gini coefficient are negatively related to insurance market development in Nigeria. This suggests that a one percent rise in the Nigeria's dependency ratio reduces insurance market by 5.4% *ceteris paribus*. Similarly, a one percent rise in the gini -coefficient reduces the insurance market development marginally by 0.47% *ceteris paribus*. The life expectancy and the gross domestic product are positively related with insurance market development. The result suggests that a one percent rise in gross domestic product increases insurance market development by 4.1% *ceteris paribus*, and similarly, a percent rise in life expectancy increases the insurance market by 11percent.

Implications and Discussion

Nigerian Insurance market growth may have been stunted due to the negative relationship with income inequality as measured by gini-coefficient. Gini-coefficient in Nigeria is one of the worst in the world (Bakare, 2012 and CIA World Fact book, 2012). Likewise dependency ratio which reflects the family structural economic redistributions and size is negative which *a-priori* means they are disadvantaged to low income- a factor known to affect low attractiveness to use insurance. The GDP is positively related to insurance market development which has been well reported in extant literature but 4.1 % is considered low for a country with insurance penetration of 0.6-0.7%. The life expectancy positivity is a surprising outcome because of the current low life expectancy in Nigeria at 52 compared with developed nations ranging from above 65.

Life expectancy increases is positively related to education and may have contributed to the direction of this relationship.

Recommendations and Conclusion

A study of demographic shifts or risks can be used as a marketing strategy by insurers to attract unwilling purchasers of insurance. Government policy makers are to understand the import of demographic shifts on insurance market regulation and the relationship between socio-economic factors and demographics. Otherwise, the role of insurance in economic and financial development will be difficult to realize. In particular improvement in education and health care can promote positive demographic shift like life expectancy and reduce dependency ratio and birth/fertility rates. The study evinces that the Nigerian demographics have contributed significantly to the low penetration of insurance market in the economy.

References

http://newafricanmagazine.com/archive/images/pdfs/Nigeria/ab_nigeria_insurance_0407.pdf accessed on 05/06/2014

Anderson DR, Nevin JR (1975) Determinants of young married life Insurance purchasing behavior: an empirical investigation, Journal of Risk and Insurance, Vol. 42, pp. 375-387

Ang A, Madalloni A (2005) Do Demographic Changes Affect Risk Premiums? Evidence from International Data, NBER Working Paper No. 9677.

Bakare AS (2012) Measuring the Income Inequality in Nigeria: the Lorenz Curve and Gini

Co-efficient Approach, American Journal of Economics, 2(1): 47-52

Beck T, Webb I (2003) Economic, Demographic, Institutional Determinants of Life Insurance Consumption across Countries, The World Bank Economic Review, 17: 51-88

Ben-Porath Y (1982) Economics and the Family -match and mismatch? A review of Becker's treatise on the family, Journal of Economic Literature, 20:1, 52-64

Bloom DE, McKinnon R (2013) The design and implementation of public pension

systems in developing countries: Issues and options, PGDA Working Paper No. 102

Burnett JJ, Palmer, B. A. (1984) Examining life insurance ownership through demographic and psychographic characteristics, Journal of Risk and Insurance, 51: 453-467.

Casualty Actuarial Society (2001) Foundations of Casuality Actuarial Science, 4th ed, USA, United Book Press

Chilekezi B (2005) Outline of the Reformed Pension scheme in Nigeria, Lagos International Training and Educational Services

Chukwulozie O (2008) Benefit of Insurance Recapitalization to the Economy, Lagos Organizational Review, 11, pp 53-60

World CIA (2013) Central Intelligence Agency, https://www.cia.gov/library/publications/the-world-factbook/fields/2172.html, accessed on 05/06/2014

CIA World Fact book (2012) Central Intelligence Agency, https://www.cia.gov/library/publications/the-world-factbook/fields/2172.html accessed on

Curak M, Dzaja I, Pepur S (2013) The Effect of Social and Demographic Factors on Life Insurance Demand in Croatia, International Journal of Business and Social Science vol.4 (9) pp 65-72

Davis EP (1993) The Structure, Regulation, Performance of Pension Funds in Nine Industrial countries, Policy Research Working Paper No.1229.

First Bank Capital (2013) FBN Holdings 2013 Annual Report,

http://46.38.182.253/Portals/2/pdf/Reports/Annual%20reports%202013/FBN%20Holdings%202013%20Annual%20Report.pdf accessed on 05/06/2014

Hammond JD, Houston DB, Melander ER (1967) Household Life Insurance Premium Expenditures: An Empirical Approach, Journal of Risk and Insurance, 34, 3, 397-408.

Gujarati DN, Porter DC(2009) Basic Econometrics, fifth edition, McGraw Hill, 652-658

Kingsley D (1963) The Theory of Change and Response in Modern Demographic History, Population Index, 29(4) pp. 350-351

Laguda SA (2010) Chairman's Statement, Continental Reinsurance, Annual Report

Lassila J, Valkonen T (2008b) Longevity adjustment of pension benefits. Uncertain Demographics and Fiscal sustainability, ed. by Alho, J. M. et al Cambridge, Cambridge university press

Li D, Moshirian F, Nguyen P, Wee T (2007) The demand for life insurance in OECD Countries, Journal of Risk and Insurance, 74 (3): 637-652.

Mantis G, Farmer R (1968) Demand for life insurance, Journal of Risk and Insurance, 35 (2): 247-256.

Negi D, Singh P (2012) Demographic Analysis of Factors Influencing Purchase of Life Insurance Products in India, European Journal of Business and Management, vol. 4, No.7

Nigerian Bureau of Statistics (2014) Methodology Notes on Gross Domestic Product (GDP)

Rebasing Exercise, NBS, Abuja

NIA (2004). Nigeria Insurance Digest. A statistical Journal of the NIA.

OjumahV (2013) Insurance penetration in Nigeria still very low,

http://www.premiumtimesng.com/business/147261.html accessed on June 5th, 2014

Onuoha, R. (2013) Financial literacy cause of low insurance penetration – NAICOM,

www.vanguardngr.com/2013/10/financial-literacy-cause-low-insurance-penetration-naicom, retrieved on 5th June, 2014.

Oxford Economics (2012) Changing Sutton final Report November 2012, https://www.sutton.gov.uk/CHttpHandler.ashx?id=19908&p=0 accessed on 12/01/2014

Outreville JF (1996) Life Insurance Markets in Developing Countries, Journal of Risk and

Insurance, 63 (2): 263-278

Pan African Capital Research (2014) Insurance Industry: A Review. www.panafricancapitalplc.com/downloadi.php *accessed on 12/01/2014*

Potter Uoyd B (1991) Socioeconomic Determinants of White-Black Male Life Expectancy, Demography 28 :303-21

Robinson WC (1986) High Fertility as Risk Insurance, Population Studies, Vol. 40 (2): 289-298, July

Rogers GR (1996) Mortality Differentials in a Diverse Society. Forthcoming in American

diversity: A Demographic Challenge forth e Twenty-First Century, edited by Nancy A. Denton and Stewart E. Tolnay. SUNY Press**:** 129-158

Russell JC (1948) Demographic Pattern in History Population Studies, Vol. 1, (4) 388-

404, Taylor & Francis, Ltd. on behalf of the Population Investigation Committee

Schoenborn CA (1986) Health Habits of US. Adults, 1985: The 'Alameda 7' Revisited, Public Health Reports 1, 01:571-80.

Seog H (2010) The Economics of Risk and Insurance, 1st edition, United Kingdom, John Wiley and Sons Ltd

Truett DB, Truett LJ (1990) The Demand for Life Insurance in Mexico and the United States: A Comparative Study, Journal of Risk and Insurance, 57: 321-328.

APPENDIX

Table 2 Unit root test

Variable	ADF & DF @ First Difference(Intercept and Trend)	Remark: Order of Integration
Linsdv	-7.741148*	I(1)
Drtio	-9.607235*	I(1)
Lgdp	-4.411347*	I(1)
Lxpcy	-2.533035**	I(1)

Source: authors' estimation using E-view 7.0; MacKinnon (1996) one-sided p-value
Note:*; ** indicate variables that are significant at 1 and 5 percent levels, with critical values been -4.309824 and -3.574244 respectively ADF, while for DF, the significance levels are -2.647120 and -1.952910 respectively.

Table 3 Granger causality test

Pairwise Granger Causality Tests
Date: 07/15/14 Time: 06:36
Sample: 1981 2012
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DRTIO does not Granger Cause LINSDV	30	3.80107	0.0362
LINSDV does not Granger Cause DRTIO		3.19576	0.0581
LGDP does not Granger Cause LINSDV	30	12.3924	0.0002
LINSDV does not Granger Cause LGDP		0.39518	0.6777
LGDP does not Granger Cause DRTIO	30	22.9084	2.E-06
DRTIO does not Granger Cause LGDP		1.49846	0.2429
LXPCY does not Granger Cause DRTIO	30	14.2903	7.E-05
DRTIO does not Granger Cause LXPCY		3.34713	0.0515
GINI does not Granger Cause LXPCY	V	0.41850	0.6626
LXPCY does not Granger Cause GINI		3.72665	0.0383