CREDIT RISK MODELLING TECHNIQUES FOR LIFE INSURERS

Background Of The Study

This study examines the factors that influence the techniques of credit risk modeling for life insurers in Nigeria – a major developing economy of sub-Sahara Africa. Credit riskis the risk of default on a debt that may arise from a borrower failing to make required payments.In the first resort, the risk is that of the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs. The loss may be complete or partial and can arise in a number of circumstances

Life insurance provides risk protection for low income earners and is part of the growing international micro-finance industry that emerged in the 1970s (Churchill, 2006, 2007; Roth, McCord and Liber, 2007; Matul, McCord, Phily and Harms, 2010). Approximately, 135 million people worldwide currently hold life-insurance policies with annual rates of growth in some emerging markets estimated to be up to 10% per annum (Lloyd's of London, 2009). However, this number of life-insurance policies represents only about 2% to 3% of the potential market (Swiss Re, 2010 p.9). By protecting low income groups from the vulnerability of loss and shocks, life-insurance is increasingly being spouted as a formalized risk management solution to world poverty and a key driver of economic growth and entrepreneurial development in low income countries such as those of west Africa (Churchill, Phillips and Reinhard, 2011).

Over the last decade, a number of the world's major banks have developed sophisticated systems to quantify and aggregate credit risk across geographical and product lines. The initial interest in credit risk models stemmed from the desire to develop more rigorous quantitative estimates of the amount of economic capital needed to support a bank's risktaking activities. As the outputs of credit risk models have assumed an increasingly large role in the risk management processes of large banking institutions, the issue of their potential applicability for supervisory and regulatory purposes has also gained prominence. This review highlighted the wide range of practices both in the methodology used to develop the models and in the internal applications of the models' output.

This exercise also underscored a number of challenges and limitations to current modeling practices. From a supervisory perspective, the development of modeling methodology and the consequent improvements in the rigor and consistency of credit risk measurement hold significant appeal.

These improvements in risk management may, according to national discretion, be acknowledged in supervisors' assessment of banks' internal controls and risk management practices. From a regulatory perspective, the flexibility of models in responding to changes in the economic environment and innovations in financial products may reduce the incentive for banks to engage in regulatory capital arbitrage. Furthermore, a models-based approach may also bring capital requirements into closer alignment with the perceived riskiness of underlying assets, and may produce estimates of credit risk that better reflect the composition of each bank's portfolio. However, before a portfolio modeling approach could be used in the formal process of setting regulatory capital requirements, regulators would have to beconfident that models are not only well integrated with banks' day-to-day credit risk management, but are also conceptually sound, empirically validated, and produce capital requirements that are comparable across institutions.

Literature Review

The quantitative credit analysis literature began with Altman (1968), where the author proposes discriminant analysis to determine combinations of observable characteristics that may best differentiate between defaulted and non-defaulted firms. This paper was one of the first examples of a quantitative, "credit-scoring" approach to credit assessment. This approach has fallen out of favor in recent decades, in part because of the descriptive focus. Discriminant analysis characterizes a firm's likely observable characteristics given the current default status, while a credit analyst is generally interested in the converse: a firm's likely default status given its observable characteristics. In addition to this point, Lo (1986) proves that discriminant analysis is consistent in a much more limited set of circumstances relative to other, more modern approaches. One such approach is logistic regression models that afford a methodology to estimate directly the effects of particular variables on default probabilities (or in the case of logistic regression, the log odds-ratios of the default probabilities).The 1970s saw the broad application of stochastic calculus into the theoretical finance toolkit. This led to many breakthroughs throughout the field, including in the assessment of credit risk. Merton (1974) is the canonical example. In this paper, Merton applies the option-pricing framework from Black

and Scholes (1973) to a firm's balance sheet. Given standard assumptions governing frictionless markets, full information, and the assumption that firms will default when and if their asset value falls below their liabilities, Merton demonstrates how one can calculate a default rate for any firm. These assumptions about the nature of the markets and the nature of economic behavior cause these models to be called "structural models." The additional structural assumptions allow the analyst to calculate credit risk given relatively parsimonious data requirements (one needed only the risk-free rate, and firm-level leverage, value of assets and volatility of assets), and the theoretical appeal of the assumed structure led to this model's wide acceptance and the development of further "structural" models of credit risk. Of course, further developments in the literature investigated the reasonableness of the key structural assumptions with fairly disappointing results (Shumway and Bharath (2008)). With this foundation, the literature began to apply credit risk in new arenas and relax some key assumptions. Hull and White (1995) discuss how one can incorporate counterparty credit risk in derivative securities, while Duffie and Singleton (1999), and Jarrow and Turnbull (1997) focus on the dynamic nature of credit risk through credit spreads. Duffie and Singleton prove the uniqueness of credit spreads and apply them to a variety of contexts, including term structure models and derivative products; Jarrow and Turnbull develop a model that allows for dynamic credit spreads and calculate the associated impacts on pricing. Lando (1998) demonstrates how risk-free interest rates can be incorporated into quantitative credit analysis. This generalization dramatically increased the potential for quantitative default modeling: now, one can reasonably look at a variety of inputs or "state variables" when characterizing credit risk rather than asset value, volatility and leverage as in Merton
(1974).

Statement Of The General Problem

Credit risk for life insurers in Nigeria has generated a lot of misconceptions and misinterpretations as regards its importance, the best techniques in its modeling, its benefits to life insurers and most importantly in the socio economic development of Nigeria.The confusion of methods to employ in reducing the risk involved with credits to life insurers both on the part of the insurers and the financial institution in question Credit availability to

insurers have also been a very controversial issues as most insurers complain of not been assisted with credits.

Objectives Of The Study

The following are the aims and objectives of the study
1.To know the best techniques of credit risk modeling for life insurers.
2.To examine the impact of credit risks on life insurers.
3.To examine the benefits of credit to life insurer.
4.To examine the relationship between credit and performance of insurers.
5.To know if credit facilities are readily made available to insurers.

Significance Of The Study

This study will be important to insurance companies in the management of credit risks when it comes to life insurers. This study also will be of importance to Nigerians in unraveling the importance of credit to their profitability. The study will be important to the government and insurance stakeholders on the best method of credit risk modeling techniques for life insurers. This study will be important to insurers in knowing the best method of repaying their loans or credits.

Scope And Limitation Of The Study

This study is on the techniques of credit risk modeling for life insurers with the Nigerian insurance company serving as its case study.
Limitation Of The Study Financial Constraint– Insufficient fund tends to impede the efficiency of the researcher in sourcing for the relevant materials, literature or information and in the process of data collection (internet, questionnaire and interview).
Time Constraint– The researcher will simultaneously engage in this study with other academic work. This consequently will cut down on the time devoted for the research work.

Research Questions

1.What are the best techniques of credit risk modeling for life insurers?
2.What impactdo credit risks have on insurance companies?

3.What are the benefits of credit to the life insurer?
4.What is the relationship between credit and performance of insurers?
5.Are credit facilities readily made available to insurers?

Research Hypotheses

Hypothesis 1

H0: credit risks negatively affect insurance/financial institutions.
H1:credit risks positively affect insurance/financial institutions.

Hypothesis 2

H0: credit risks taken by insurance/financial institutions are low.
H1: credit risks taken by insurance/financial institutions are high.

Definition of terms

1. **Credit risks:** A credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments. In the first resort, the risk is that of the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs.
2. **Model:** a thing used as an example to follow or imitate.
3. **Insurance:** an arrangement by which a company or the state undertakes to provide a guarantee of compensation for specified loss, damage, illness, or death in return for payment of a specified premium.
4. **Life insurance:** insurance that pays out a sum of money either on the death of the insured person or after a set period.

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COURSE CODE: FBA321

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CONTENT: