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DECLARATION

I hereby declare that this project is my original work and has not been presented for a degree in any university.
FAILURE PREDICTION OF INSURANCE COMPANIES IN KENYA

BY:

NG'ANG'A ISAAC KIBANDI

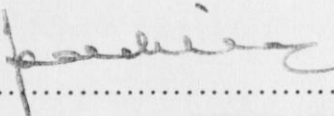
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**A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS OF DEGREE OF MASTERS
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DECLARATION

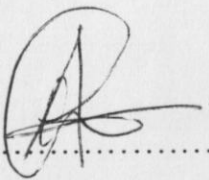
This Management Project is my original work and has not been presented for a degree in any other University.

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ACKNOWLEDGEMENT

The MBA program has been a very fulfilling and although challenging, its completion has been the result of support and encouragement received from many quarters. To all who in one way or the other gave me support kindly appreciate my heartfelt thanks. Specifically I am grateful to my Supervisor Mrs. Angela Kithinji of the School of Business Studies, University of Nairobi who patiently and conscientiously guided me through this research providing the necessary criticism, suggestions and encouragements. I am convinced that without her assistance this project would have taken longer to complete. My thanks too

DEDICATION

This study is dedicated to my parents Mr. and Mrs. Ng'ang'a, my wife Irene Muthoni Kibandi and son Ng'ang'a Kibandi.

May God bless them. the following: staff of Madison Insurance Company Kenya Limited, Office of the Commissioner of Insurance for the support given, Antony, Charles, Joel, Joyce and other colleagues who gave me the morale and support during the project preparation.

I am also deeply grateful to members of my family for the support, love and encouragement in the course of this journey.

May God bless you.

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LIST OF ABBREVIATIONS

UPR	-	Unearned Premium Reserve
UK	-	United Kingdom
ICI	-	Imperial Chemical Industries
CEO	-	Chief Executive Officer
UN	-	United Nations
PDD	-	Poverty and Development Division
KNAC	-	Kenya National Assurance Co. Ltd
SIC	-	Stallion Insurance Co. Ltd
AKI	-	Association of Kenya Insurers
AIBK	-	Association of Insurance Brokers of Kenya
IARS	-	Institute of Adjusters and Risk Surveyors
AAISA	-	Association of Africa Insurance Supervisory Authorities.
AIO	-	Africa Insurance Organization
IAIS	-	International Association of Insurance Supervisors
OESAI	-	Organization of Eastern and Southern Africa Insurers.
IIK	-	Insurance Institute of Kenya
KENYA –RE	-	Kenya Reinsurance Corporation Ltd
UNCTAD	-	United Nations Conference on Trade and Development
MDA	-	Multi Discriminant Analysis
LA	-	Logit Analysis
PA	-	Probit analysis

ABSTRACT

Shareholders, policyholders and other stakeholders invest their capital for a return, guarantee of compensation when disaster falls or a policy matures among other objectives. The ability to sustain positive returns and promise to honor claims obligations as they fall due is critical for the insurance industry and other investment ventures. However, business failure is unavoidable, but what is important is the ability to detect such failures well in advance and avoid unnecessary economic losses.

In this paper, the aim was to expose and explore possible indicators of impending failure and develop a failure prediction model for insurance companies in Kenya.

Investigation reports of various Kenyan insurance companies and other scholarly research studies were reviewed and at least possible indicators of business failure were identified. These included high labor turnover, CEOs resignations, negative earnings, heavy debts, weak corporate governance practices and financial mismanagement .

A failure prediction model was derived for both composite and general insurance businesses. The data used to develop the model was derived from financial statements submitted to the Commissioner of Insurance (Kenya) annually. The MDA technique was used to come with the coefficients using the SPSS program.

The model was at least able to classify failing and non-failing companies in at least the period of the study (1989- 2004) for the companies in the study. The model indicated a 100% correct classification of the initial failed companies and at least 80% of the non-failed.

The model was at least able to detect failure two years before closure of the affected companies commenced. The results were slightly different between the models for composite insurance companies basis and general insurance companies.

The results show that business failure indicators can be identified and failure prediction for insurance companies can be developed.

The Kenyan insurance industry scene has not been any better and for the years 1987 to 2005, six insurance companies were declared insolvent in an industry of forty three as at 31st December 2005. These were; Access, Kenya National, Stallion, Lakesur, Liberty and United Insurance companies. The largest of these failures was Kenya National Assurance Company Limited (KNAC) in 1995. KNAC was a market leader in both life and general insurance business with total assets of KShs 3.5 billion representing 20% of the total industry assets in 1992 (COI Annual Reports, 1992-2005).

Richardson et al (1994) define business failure as a situation where a business runs short of money, usually because they have failed to remain competitive and to attract sufficient

CHAPTER ONE

INTRODUCTION

1.1. Background

Business failures have been prevalent and elicited concern from various parties viz: governments, businessmen, members of the public and scholars among others. One of these concerns was from the President of the United States of America –George W. Bush who expressed his concern on the increasing business failure rates and in particular the savings and loans crisis (ERisk Regulatory Workshop, 2002). The paper also cited the case of the failure of HIH, one of the largest insurance companies in Australia. The losses realized ranged between \$3.6 to \$5.3 billion (ERisk Regulatory Workshop, 2001). It is further noted that between the years 2002 and 2003 forty one insurance companies were declared insolvent in America (National Association of Insurance Commissioners, 1983-2003).

The Kenyan insurance industry scene has not been any better and for the years 1987 to 2005, six insurance companies were declared insolvent in an industry of forty three as at 31st December 2005. These were; Access, Kenya National, Stallion, Lakestar, Liberty and United Insurance companies. The largest of these failures was Kenya National Assurance Company Limited (KNAC) in 1995. KNAC was a market leader in both life and general insurance business with total assets of Kshs 3.5 billion representing 20% of the total industry assets in 1992 (COI Annual Reports, 1992-2005).

Richardson et al (1994) define business failure as a situation where a business runs short of money, usually because they have failed to remain competitive and to attract sufficient

contributions from customers and other resource suppliers. They further note that such companies will become insolvent unless appropriate management actions are taken to effect a turn around in their financial performance. Van Horne (1991) refers to failure as technical insolvency, the inability of a firm to meet its current obligations, but is quick to note that such a situation may be temporary and is remediable. Ross et al (2002) define financial distress as a situation where a firm's cash flows are insufficient to satisfy their current obligations. Altman (1983) distinguished between stock based and flow based insolvency: the former referring to mismatch between assets on one hand, and liabilities and owners equity on the other, and the latter to mismatch in cash flows and the contractual obligations.

Business failure can be caused by internal or external factors. Richardson et al (1994) documents various internal causes of business failure. These include management and leadership styles with examples such as; complacency, top management blindness, hierarchy orientation, entrenchment of existing status quo, one man rule, non participating board, unbalanced top team and weak financial function among others.

Esmeralda et al (2005) observed that weak corporate governance structures are prime ground for the on-set of financial distress and further firms with weak governance structures take long to recover from financial distress.

The UNECSC PDD (2002) publication in their documentation of the East Asia Crisis noted that lack of properly functional monitoring mechanisms, rapid growth, poor corporate governance, imprudent investment decisions and the overall break down in the exchange rate

regime as the causes of the economic crisis that faced Korea, Thailand, Malaysia and Indonesia.

Browne et al (1994) in their study on insolvencies in the life health insurance industry 1972–1994 in the United States observed that the overall macroeconomic environment has greater significance and impact on the number and size of insolvencies. Exogenous factors have significant implications on the viability of firms in financial services industry. They noted the presence of limited liability creates incentive for insurers to implement riskier underwriting and investments strategies than would otherwise be warranted; firms with relatively little capital are likely to pursue riskier strategies. They further noted that insolvencies then should be approached from factors that are external to the firm. Factors that affect the success of risky investment strategies and risky underwriting are likely to lead to the insolvency of insurers.

The Commissioner Of Insurance Reports, document cases and causes of failure in the Kenya insurance industry (COI Report, 2002). The causes of business failure in the insurance industry as documented therein include; low pricing of their products to avert competition, poor financial management, poor corporate governance, imprudent investment decisions and poor underwriting. The commissioner of insurance also noted that the number and size of insurance companies in operation, has a bearing on business failure rate in the industry and as a way of averting these failures advocated for mergers. This observation is consistent with Browne et al (1995) findings that a 10% reduction in the number of property - liability insurers results in 82% reduction in the insolvency rate.

In response to these business experiences there have been varied reactions both locally and internationally. In Kenya, Sessional Paper No. 1 of 1986 on Economic Management and Renewed Growth was set out to address monetary and fiscal policies that aimed at regulating the finance sector in response to the bank and other business crisis. The paper noted the need for resource mobilization in order to enhance and hasten economic development. In regard to the insurance sector, amendments to sections 32, 41 and 50 of the Insurance Act (Cap 487) were proposed and subsequently amended requiring additional investments in government securities and amounts retained by the Central Bank of Kenya in a bid to enhance levels of long- term savings. In the international scene reviews on capitalization levels of insurance companies and guidelines on prudent underwriting guidelines have been formulated by AISA and other international insurance bodies.

Aryeetey (2004), underscored the need for African nations to develop financial and monetary cooperation arrangements that help to strengthen their own financial institutions and complement their effort to reach out to a fast globalizing world. These arrangements he noted, are not only intended to help in improving the mobilization of resources (domestic and foreign) but also to help improve the regulation of institutions in order to avert crises in the financial and exchange rate systems. He noted that there is need for strong financial systems so as to access greater financial resources from varied sources, particularly as countries pursue macro economic reform.

Mwega (2001), noted that there has been a resurgence of interest on factors that influence economic growth and for the policies that would reduce poverty and promote economic

development in Sub Saharan Africa. He further states that the region's growth performance in the last three decades has been described as a tragedy. The paper further underscores the important role the financial sector plays in resource mobilization among savers and allocation to borrowers as well as transformation and distribution of risks and maturities over time.

Aiyabei (2000), commenting on the Kenyan situation observed that prediction and analysis of corporate financial performance is crucial in a developing country like Kenya in light of recent closure of businesses such as banks and insurance companies. He noted other firms have been put under receivership and even individuals declared bankrupt. He observed that there was an increasing trend of failure of Kenyan businesses and quoted KCC and KENATCO companies as examples.

Carson (1994), in his studies of strengths of bankruptcy prediction models of the Life Insurance Industry in United States, and in response to the two major life business failures; Mutual Benefit Life and Executive Life in 1991, noted that there was need for re-examination of the risk profiles of life insurers.

It is worth noting these business failures have arisen despite the presence of stringent regulation. Regulators have come up with revisions to the existing regulations, but this has not deterred business failure. The Insurance Act, Cap 487 of the Laws of Kenya, has had major revisions affecting solvency margins, capitalization levels and even underwriting guidelines. However, this did not prevent the failure of United Insurance Company Limited as late as the year 2005.

1.2 Statement of the Problem

The insurance industry is one volatile industry in the financial services sector. It has unique characteristics that make it vulnerable to changes in the operating environment.

The insurance business has had downturns consequently affecting the capital structure. Cornett et al (1999) observed that in 1996 policy reserves of the life insurance industry in America accounted for 52% of the total liabilities and capital surplus. In the property and casualty insurance, losses reserves accounted for 37.6%, UPR at 13.5% and loss adjustment expenses reserves 7.9% of the liabilities. This liability composition is basically to ensure adequate reserves are maintained to protect policyholders arising from past business experience. They noted that the trend has been brought by business downturns; frequent and major catastrophes. Between the years 1987 and 1996, the American insurance industry has had over twenty catastrophes, the main ones being Hurricane Hugo (1989), San Francisco earthquake (1991), Hurricane Andrew (1992), Northridge earthquake (1994) and Hurricane Katrina (2005). These catastrophes amidst other calamities have had major impact on business profitability and survival of the US insurance industry. This is reflected by the combined ratio of the American insurance industry for the period 1987 to 1996 which increased gradually from 104% to 107% respectively. A combined ratio exceeding 100% implies that the insurance business is making technical losses (Cornett et al 1999).

The traditional response to poor profits has been noted to be exit from the industry of less profitable firms as a result of business failure leading to an increase in demand for insurance products and services. The remaining insurers raise the premiums of insurance products due

to the increase in demand. The increase in premium income results in a fall in the loss ratio and ultimately improvement in the industry profitability. However this phenomenon is short lived because with the increase in profitability, new entrants into the industry emerge, and the aftermath is cut throat competition and ultimate reduction in profits and the cycle repeats itself (Cornett et al 1999)

In the Kenyan scene a similar situations has faced the industry. The industry has had its toll in terms of tragedies and catastrophes. Case examples include; the Marsabit plane crash, Kathekaini bridge train tragedy, frequent flooding, fires and motor vehicle accidents resulting in loss of lives and damage to properties (Daily Nation, 2006). These events have had impact on the financial performance of the insurance industry. The underwriting results for six years 1995 to 2000 decreased from an underwriting profit of Kshs.139 million to a loss of Kshs. 580 million (Commissioner of Insurance Reports 1995 – 2000).

This study sets out to investigate indicators of business failure and develop a failure prediction model for insurance companies in Kenya.

1.3 Objectives of the Study

1. To ascertain indicators of companies exhibiting characteristics of impending failure.
2. To develop a business failure prediction model for insurance companies in Kenya.

1.4 Importance of the Study

This study is likely to be of interest to several classes of people. Insurers and the security therefore afforded. In the event of failure, it is the policyholders who lose most, because

Corporate Managers or Chief Executive Officers

The study will enable them assess and monitor their performances and take corrective action before the onset of financial distress. Managers are seen as agents of shareholders and therefore whatever they (managers) do should ideally be seen to be in the interest of shareholders (Jensen and Meckling, 1976). The chief executive officers need to know whether their organizations are likely to operate as going concerns over a period of time so as to realize the objectives of shareholders.

Insurance Agents

Investors

The study will enable them understand early warning signs of a company in or about to be in financial distress. This will enable them make investment decisions on whether to invest or divest.

Regulatory Authorities

The study will be used to enhance existing legal and regulatory policies and procedures of supervising insurance companies in Kenya.

Academicians and Researchers

It will serve as a “ground-breaker” for future research especially in the field of corporate failures.

Policyholders

The research will enable them assess the credibility of their insurers and the security therefore afforded. In the event of failure, it is the policyholders who lose most, because auctioneers hound them in the event that their insurers cannot step into their shoes and rescue them.

Trade Partners

The research will also help insurance companies' management in assessing inter trade relationships and in particular when it comes to co-insurance.

Insurance Agents

They will be in a position to assess the strength of their principals and advice their clients appropriately.

2.1.1 Approaches to Financial Distress

Financial distress linked to insolvency can be approached from two themes: stock based or flow based. Altman (1983) is documented as one of the first scholars to distinguish between

CHAPTER TWO

LITERATURE REVIEW

2.1 Financial Distress

Financial distress has been defined as a situation where a firm's operating cash flows are not sufficient to satisfy current obligations and the firm is forced to take corrective action. It may lead a firm to default on a contract and financial restructuring between the firm's creditors and its equity investors. Financial distress can further be linked to insolvency, defined as inability to pay one's debt or lack of means of paying one's debt (Ross et al, 2002). Black and Law dictionary defines insolvency as "such a condition of a woman's (or man) assets and liability that the former made immediately available would be insufficient to discharge the latter".

Firms experiencing financial distress will inevitably be unable to honor their contractual creditor obligations. This may culminate into creditors enforcing their debts through the legal process. The prolonged experience of financial distress may force a firm out of business. In the Kenyan insurance industry six insurance companies have been declared insolvent in a span of thirteen years having been placed under statutory management with the objective of probable resuscitation. However to date none has been salvaged. It is therefore paramount that appropriate business failure prediction models be developed.

2.1.1 Approaches to Financial Distress

Financial distress linked to insolvency can be approached from two themes: stock based or flow based. Altman (1983) is documented as one of the first scholars to distinguish between

“stock based” and “flow based” insolvency. Stock based approach to financial distress focuses on the balance sheet. The assets are weighed against liabilities and owners’ equity. In the event liabilities and owners’ equity exceed the assets, the company is deemed to be experiencing financial distress. Flow based approach on the other hand, refers to a situation in which the cash flows are insufficient to meet current obligations.

2.1.2 Indicators of Financial Distress

Financial distress indicators can be categorized under various heads such as prevailing macroeconomic environment, management practices, financial and the legal and regulatory framework.

El-Shazly (2002) observed that indicators like level of exports, imports, trade balance, net international reserves (NIR), M2/NIR, interest rate differential, real exchange rate (RER), domestic credit/GDP and stock price index can be used to signal financial distress at macroeconomic level.

Ross et al (2002) documents that events befalling a firm experiencing financial distress include; dividend reductions, plant closings, losses, layoffs, CEO resignations and plummeting stock prices.

The rate of labor turnover has also been documented as possible sign of impending failure and further that financial distress may act as a catalyst for organization change. Glison 1989-1990, observed that non-distressed firms have a 12-19% rate of annual labour turn over while

distressed firms experienced 52% turn over. Gibson (1990) documents the tendency for firms to adjust the governance structure after restructuring their debt.

Rachel et al (2004) observed new CEOs at firms with moderate to high bankruptcy risk receive between 15% and 36% less compensation (total direct and cash) compared to new CEOs at low risk firms. This finding according to the study was consistent with higher risk firms choosing executives with less attractive alternative employment options rather than paying a risk premium to entice executives whose services are highly valued by other employers.

Firms experiencing financial distress have inadequate liquid assets to service hard contracts. Hard contracts in this instance defined as contractual obligations that have implied and explicit conditions that if violated the claim holders have specified and unspecified legal recourse to enforce the contracts. On the other hand soft contracts impinge on policy decisions at the discretion of management (Kose 1990).

The financial ratios derived from the financial statements can be used to determine the financial soundness of a particular institution. Liquidity, debt management, and asset utilization ratios have been documented as some of the important ratios that would indicate whether a firm is facing financial problems. These ratios and others have been used in developing bankruptcy prediction models. Beaver (1966) used a range of financial ratios and derived a univariate model that classified failing and non-failing firms. Altman (1968)

improved on the model applying multivariate discriminant analysis (MDA). Later developments have been on the conditional probability models.

The insurance industry has employed financial ratios to analyze and evaluate business performance to give an indication of how well a company is doing. The industry specific ratios used include; retention ratio, loss ratio, management expenses to net premium written ratio, net commissions to net premium written and the combined ratio. A later study on insurance financial ratios is the IPM (Insurance Performance Measure) by Calandro Jr. et al (2003). Calandro Jr. et al (2003) noted the weaknesses in the underwriting ratio and proposed a more encompassing measure of performance for the property and casualty insurance business. They observed that the underwriting ratio disregards other important operational parameters like the investment returns and risk distribution (reinsurance). The driving force to have an all encompassing measure of performance was sparked off by the large losses arising from the reversal in the capital markets, the tragic 11 September 2001 terrorist attacks, changing claims trends and change in regulation. The change in claims pattern and enhanced policy reserves requirements by regulators, has led to an increase in reserves. The increase in reserves in return has availed funds that are invested to generate income. Reinsurance on the other hand, has become a critical factor because of unforeseen catastrophes. Irrespective of this, the traditional underwriting ratio has been of much appeal to management because of: its focus on increased policy sales, expenses coverage and basis for incentive schemes. The traditional underwriting ratio is of the form:

$$U = (I + a)/E + x/W$$

Where U= Underwriting ratio

I = Loss payments

a = Adjustment loss expenses

E = earned premiums

x = operating expenses and

W= Written premiums

The proposed IPM by Calandro Jr et al (2003) is of the form:

$$IPM = (r_i + K_o - K_R) - h$$

Where r_i = investment return

K_o = [Cost of float (100% per cent + risk free rate)-
underwriting ratio]

K_R = Cost of reinsurance [per cent of premium
reinsured * (100 per cent – reinsurance;
underwriting ratio)] and

h = the insurance hurdle rate.

They noted that the IPM is an insurance economic profit framework where $(r_i + K_o - K_R)$ is the operating element, and h is the risk element or hurdle rate. The hurdle rate is the equivalent of weighted average cost of capital (WACC) and measures relative enterprise risk, or cost of equity. The diversionary view is that an insurance firm can maximize value even if the underwriting ratio is moderately above 100% as long as the underwriting loss is less than the market rates for money. The IPM can be segmented and used as a balanced scorecard for various operating units in an insurance firm: investments portfolio, policy sales, claims management, operations and cost control, risk distribution (reinsurance) and as an insurance hurdle rate. The IPM makes it possible to have one comprehensive index measure of performance for individual insurance companies that can be used to compare and gauge performance within the industry.

Bruce et al (2000) observed that some of the important financial and non-financial credit rating parameters for the insurance industry in UK include:

Leverage- High levels of financial leverage, they note are frequently associated with increased uncertainty about a firm's ability to meet its claims. Borde et al (1994) also observed that business risk can be influenced by the company's degree of leverage in that it tends to magnify corporate returns or losses. However the proposition that debt financing may have negative results in the performance of a company is controversial. The MM theory posits that capital structure is irrelevant to the value of the firm (Modigliani and Miller - 1958). Further and arising from the fact that interest expense is tax deductible, financing with debt maximizes the value of the firm. Trade-off models of capital structure indicate that there is an optimal capital structure, a combination of debt and equity. Myers (1984) static trade-off hypothesis posits that a firm's debt ratio is usually viewed as determined by a tradeoff on the costs and benefits of borrowing, holding the firm's assets and investment plans constant. The firm is portrayed as balancing the value of interest tax shields against various costs of bankruptcy or financial embarrassment. The firm is supposed to substitute debt for equity, or equity for debt, until the value of the firm is maximized. The signaling theory posits that financing with debt rather than equity may trigger outsiders to think that the firm is doing well (Myers 1984). Ross et al (2002) viewpoint is that there is no specific capital structure criterion; most corporations have low debt-asset ratios, a number of firms use no debt, changes in financial leverage affect firm value and that capital structures differ from industry to industry. They document that no formula can establish a debt equity ratio for all companies but there is evidence to the effect that firms behave as if they have target debt-

equity ratio. Factors affecting debt–equity ratio they point out include taxes: that firms anticipating taxable income will rely on debt financing to reduce tax paid and the others being types of assets and uncertainty on operating income. In view of the foregoing, it's apparent the capital structure of insurance companies will be aligned towards more equity financing than debt. The policyholders' funds and reserves for claims represent leverage on the assets of the company. This view is in line with the "information asymmetry hypotheses", that financing with debt will signal to the policyholders that the company has financing problems. However it could also signal that the firm is healthy and has the capacity to borrow.

Profitability – They note that it enables financial analysts and industry regulators to assess an insurer's ability to invest annual surpluses efficiently in order to generate new business. Further that profitability provides an indication of an insurer's ability to remain as a going concern, an of indicator management's ability to control expenses effectively and to set competitive rates of premium. In line with this argument, section 70 of the Insurance Act of Kenya has laid down the maximum allowable management expenses. Companies that exceed these limits are required to provide a proposal on how they intend to contain the expenses within the set limits (Insurance Act, Cap 487).

Liquidity - They observed that liquidity enables firms to settle policyholders' claims as they fall due and is a critical function of insurance companies. The authors observe that it is plausible that managers of highly liquid insurers will be keen to signal their claims-paying ability to the markets through the rating process in order to promote their reputation for

prudent management. Angelo et al (2001) in the case of financial distress and collapse of L.A. Gear observed that asset liquidity (broadly construed, not limited to excess cash) give managers substantial operating discretion during financial distress. The company L.A. Gear was able to subsist six years financial distress period through liquidation of inventory. In a bid to ensure an appropriate spread of the assets and in particular investments the Kenyan insurance Act stipulate amounts allowable as admissible assets and the mix of investments to be maintained at all times. The companies are further required to maintain 5% of their admissible assets in the form of government securities with the Central Bank of Kenya (Sec. 32, Cap 487).

Positive growth in annual surplus - Could be viewed as an indicator of a favorable financial condition. However growth arising from significant new business could emanate from low underwriting standards and under-pricing and could result in greater uncertainty about the adequacy of the insurer as a going concern.

The solvency margin as set out in the Kenyan Insurance Act (Cap 487) is used as an indicator of the financial soundness of the insurance companies operating in Kenya. Sections 41 and 42 of the Act define what are admissible assets and liabilities for purposes of determining the solvency margins. In the long-term business the admitted assets must exceed the admitted liabilities by over 5%. In short term business, the margin must greater than Kshs. 15,000,000 or 15% of the preceding year net premium whichever is greater. Six companies as noted in the introduction failed to meet the solvency margins.

2.2 Causes and Effect of Business Failure

Labomir (2002) study on determinants of financial distress, documented three causes of financial distress- trinity causes of financial distress. These are neoclassical, financial and bad management. Neoclassical is a situation where the allocation of assets is inappropriate. The assets are usually industry specific and bankruptcy is a way of their reallocation. The bankruptcy procedure is the inevitable way to allocate resources efficiently. Financial is a situation where the firm has the right structure of assets but its financial structure is bad with liquidity constraints. The firm though viable in the long run, will have to go bankrupt in the short run. The last of these is bad management and he notes that inefficiency drives the firm out of the market as a consequence of unsolved problems in corporate governance. He proposes that instead of declaring the firm bankrupt in this case, one would rather fire the managers.

Charitou et al (2004) document the causes of business failure as economic and industry specific. Economic causes include high interest rates, recession, squeezed profits and heavy debt burden. Industry specific characteristics include government regulation and nature of operations. They note that and in reference to UK, US, Canada and Australia, small privately owned and newly founded companies with ineffective control procedures and poor cash flow planning are more vulnerable to financial distress than large well established public firms. They note that the economic cost of business failure is significant and market value of the distressed firms declines substantially prior to their ultimate collapse (Warner, 1977: Charalambous et al 2000).

The suppliers of capital, investors and creditors, as well as management and employees, are severely affected by business failures. Auditors face the threat of lawsuits if they fail to provide early warning signals about failing firms through the issuance of qualified audit opinions (Charitou et al 2004).

2.2.3 Macroeconomics Failure

Richardson et al (1994) in his analogy of causes and process of business failures attributes failure to endogenous factors, which include management and leadership styles. They note the process of business failure in the large organizations is gradual. Catastrophes build up slowly while the existing management is busy looking after day-to-day business with due regard to competition and changes in technology. Finally when disaster is unavoidable, the management are too bogged down to know where to start in order salvage the operations. Johnson (1988) observed that in reference to organizations here before, that the process is that of 'strategic drift', a process he describes as that of organizations' leaders and their personnel adhering to traditional paradigms. The results are that over time a "strategic gap" develops with its associated financial shortfalls and demanding immediate action to avert organizational crisis.

Business failure can also be attributed to other factors other than endogenous factors.

2.2.1 Exogeneous Factors

Esmeralda et al (2005) in their studies of corporate governance observed that governance is an important aspect in averting financial distress. They uphold the view that corporate governance structure could help in avoiding the onset of distress. Their primary hypothesis

posits that firms with better governance, i.e. closer alignment between shareholder and manager interest, are unlikely to experience financial distress. Their second hypothesis posits that firms exhibiting superior governance structure will more efficiently resolve their distress.

2.2.3 Macroeconomics Failure

The UNECSO PDD Publication (2002) documents that lack of a properly functioning monitoring mechanism, excessive expansion of private investment, and poor corporate governance as some of the factors behind East Asia crisis of the 1990s. The results of the crisis were increase in non-performing loans (NPL) estimated at a range of 19% in the Republic of Korea and 64% in Indonesia. Other macroeconomic effects included sharp currency depreciation leading to deterioration in asset values and a strong down turn in economic activity. The aftermath was bankruptcies (PDD Publication 2002).

Aryeetey (2004) in his analysis of the experience of financial and monetary cooperation in Africa, noted that the interest in greater financial and monetary cooperation for the purpose of enhancing resource flows and regulating such flows, is partially linked to the turmoil that the world saw in the 1990s in relation to the financial crises in Asia and other parts of the world. The crises led to discussions for a new international financial architecture that was pinned on strengthening the surveillance of financial markets through requirement for greater transparency and the flow of information, strengthening financial regulation and supervision (Aryeetey 2004).

2.3 Business Failure in the Insurance Industry

2.3.1 Role and trend in the insurance industry

The insurers, who in this case are investors, have their underlying objectives as those of value maximization, social responsibility and prestige. Hence an insurance firm should also be seen as any other business firm with the objective of maximizing and delivering value to policyholders, shareholders, governments, society and the environment.

Investors place their funds in business for a return. These returns form the basis of the value so created in the deployment of capital. In the deployment of capital there is exposure to competition, different management practices and policies and the overall environment in which businesses operate. Insurance businesses have operated in this kind of environment just like any other business (Block and Hirt 1997).

The insurance industry has developed over time in response to changes occurring in the social, political and economic environment. Keller (1962) observed that the origin of insurance was necessitated by the development of man;

“....When capital broke away from its immemorial stagnation on land, and assets became fluid and hazardously placed, and the desire developed for some protection against sudden disaster” (Keller 1962).

The first insurances were on property and life followed thereafter. The first life insurance was on slaves. This was the most literal translation to humans of the principle of property protection. The author further documents the change in organizational and ownership structure in response to changing financial and economic environment. The prohibiting factor

in the formative years of the 17th, 18th and 19th centuries was the aspect of guarantee nature vis avis the limited liability clause. Hence insurance businesses started operating as partnerships, joint stock and mutuals and after realizing that individual capital was inadequate to sustain the business operations, incorporation was allowed. This development is accredited to Adam Smith who through his efforts, insurance firms were allowed incorporation as general utility companies (Keller, 1962).

Connett et al (1999), note that insurance businesses both life and property casualty insurance have as their priority role as that of protection of individuals and corporations from adverse events. They accept premiums and in return promise to compensate policyholders if certain events occur. However of late insurance businesses have ventured into investment linked products but such products are also sold with an insurance component. The challenge for the business is to live by its promise to compensate policyholders. In view of the above, insurance businesses are unique in the sense that they receive funds before rendering service (Gardner et al 1999)

2.3.2 Factors that affect the solvency of insurers

Browne et al in their study (1972-1994) on insolvencies in the life health insurance industry in the United States observed that the overall macroeconomic environment has substantial significance and impact on the number and size of insolvencies. Exogenous factors have significant implications on the viability of firms in financial services industry. They noted the presence of limited liability creates incentive for insurers to implement riskier underwriting and investments strategies than would otherwise be warranted; firms with relatively little

capital are likely to pursue riskier strategies. They noted that insolvencies then should be approached from factors that are external to the firm. They identified factors affecting the solvency of insurers as:

Disintermediation – Interest rates prevailing at a particular time have a direct impact on the value of insurers' assets. The example cited is that of bonds. Decline in interest rates increases the value of bonds and vice versa. Hence if there is a mismatch in assets/liability duration, an increase in interest rates dilutes the value of assets at a faster rate than liabilities and increases the chances of insolvencies. However, they note that the incidences of insolvencies could be cushioned by use of cash, premium income and other assets. Although interest rate factor may influence insolvency, on the other hand, high interest earnings facilitate insurers in meeting their obligations to policyholders and in such circumstances interest rates are hypothesized as being negatively related to the insolvency rate. The other negative side of interest rates is that high market interest rates may likely result in greater disintermediation for life-health insurers in the form of policy loans (Carson and Hoyt 1992) and guaranteed investment contract withdrawals (Carson and Scott 1996). Interest rate hypothesis presupposes that higher interest rates are likely to be related to policy surrenders (Cummins, 1973; Outreville, 1990), that is, when the value of insurers' assets is decreased due to high interest rates, disintermediation also may increase, thus leading to a liquidity crisis for life-health insurers. In such an incidence, interest rate would be positively related to the insolvency rate. Estrella and Hardouvelis (1991) provide evidence that the slope of the yield curve may contain useful information about the future prospects of the economy. The expectation hypothesis suggests that the long-term interest rates decline before an anticipated

recession in order to equalize holding-period returns. Since the performance of life-health insurers may be related to the state of the economy then important predictors of the economy may be related to the insurer insolvency. If insurer insolvency is more likely during recessionary periods then the slope of the yield curve is expected to be negatively related to the probability of insolvency.

Unanticipated inflation - The study revealed that unanticipated inflation may increase the

Disposable personal income per capita - They observed that sales are positively related to personal income while policy surrenders are negatively related to personal income. Hence when personal income is relatively high, cash flows to insurers are likely to increase and disintermediation is likely to be relatively low.

Competition/Regulation - They observed that the number of companies in the industry may

Unemployment – They noted that unemployment was positively related to insolvency. This they document is as a result of the “emergency fund hypothesis” which suggests that policy surrenders are likely to increase during period of economic duress. Hoyt (1994) observed that disintermediation in the form of policy surrenders activity is directly related to unemployment. Widespread increases in surrender activity also may be accompanied by a decrease in new sales, thereby exacerbating the decrease in insurer liquidity. Thus high unemployment is likely to be associated with a higher incidence of life insurer insolvency.

unemployment, the stock market, and the number of insurers are negatively related to real

Returns on insurer investments - Real estate – They observed that decline in returns from real estate may have debilitating effects on the financial soundness of an insurer and vice versa.

and Hoyt (1995) observed that in the property liability insurance business, combined

ratio and the number of insurers were positively related to insolvencies and were first

Stock returns – High stock returns increase value of the insurers and hence negatively related to insolvency. However high stock returns in the market may cause disintermediation. This is because policyholders with the option to surrender their policies may do so in order to invest in alternative financial instruments.

Unanticipated inflation - The study revealed that unanticipated inflation may increase the insolvency rate. Real returns on fixed rate bonds are lower than expected when unanticipated inflation is high, and profit margins are lower than expected. This places financial strain on insurers, which then increases the likelihood of insolvency.

Competition/Regulation – They observed that the number of companies in the industry may serve as a proxy for the degree of competition in the insurance market, and that increased competition could contribute to an increase in the rate of insolvency; competitive bidding may result in a “winner’s curse” and that it is positively related to the number of bidders (Harrington and Danzon 1994).

In their conclusion they observed that for life insurers, insolvencies are positively related to increases in the average yield curve or long term interest rates, personal income per capita, unemployment, the stock market, and the number of insurers and negatively related to real estate returns.

Browne and Hoyt (1995) observed that in the property liability insurance business, combined ratio and the number of insurers were positively related to insolvencies and were first

reported predominantly in the first quarter of each year. Further, that product line mix, asset allocation and capital structure decisions interact with one another and with economic and market factors to determine the ultimate financial performance of the insurer.

Specific causes of business failure in the insurance industry have been noted to be rapid growth, fraud and greed, corporate governance, lax in supervision on the part of regulators. This was observed in the case of the collapse of HIH of Australia whose failure was attributed to rapid expansion, unsupervised delegation, expensive and complex reinsurance, under - pricing, reserving problems, false reports, incompetence, fraud, greed and self dealing (Erisk Regulatory Workshop, 2005). In a related study of HIH and Enron companies by Mardjono (2005), it was observed that complete lack of corporate governance on the part of HIH and Enron companies in terms of lack of accountability, integrity, efficiency and transparency were the causes of failure. He noted that there is no need to repeat the pain of the history created by Enron and HIH. What happened to these companies indicated that implementation of good corporate governance is a prerequisite to sustenance.

Commissioner of insurance reports, cite some causes of the Kenya's insurance companies business failure as: cash flow constraints, mismatch of assets and liability, imprudent investments decisions, excessive operating expenses, financial mismanagement amidst others. Access Insurance Company Limited was declared insolvent in 1993. Prior to its closure the company had experienced negative reserves ranging from Kshs. 32.4 millions to Kshs. 19.7 millions for three consecutive years 1990-1992. The reason cited for its fall were, severe cash flow constraint. Kenya National Assurance Limited (KNAC) closed down in

1995. Bell (1996) in his report attributed the failure to huge deficits in its ordinary and superannuation businesses. The profit business (General insurance business) had borrowed over Kshs. 300 million from the long - term business further aggravating the deficit in the long-term business. The causes of failure documented by Bell (1996) were; imprudent investment decisions, excessive management expenses and declarations of interest to the deposit administration schemes over and above the actual returns. Stallion Insurance Company Limited (SIC) closed down in year 2000. Deloitte and Touche (2000), in their report attributed failure to; cash flow constraints, bad claims experience, weak debt collection and credit control systems, poor business mix and financial mismanagement (COI Reports 1993-2004).

The consequence of insurer's failure is very devastating to both the industry and the insuring public. The Insurance Act Cap 487 requires that other operating insurers surviving in the market bear the liabilities of the failed insurers. In the case of co-insurance, the leading insurer shoulders the burden of claims. Failure is costly also because insurers' image is tainted. Failure leads to loss of confidence with the industry.

Carson (1994) notes that there is a difference between the cost of failure for an insurance customer and that of a non-insurer. That if a non- insurer becomes insolvent, its former customers stand to lose little or no more than the value of the product or service purchased. However when an insurer fails some policyholders will not only suffer the loss of premiums already paid but may have losses for which they will not be indemnified-“...precisely the contingency for which they had sought coverage”.

2.4 Financial Distress Resolution

2.4.1 Studies in Financial Distress Resolution

Brown et al (2005) study on the theory and evidence on the resolution of financial distress for an owner-managed project examined the cause and expected pattern of events in the distress situation. In this context, financial distress occurs when a shock to project value leaves the owner-manager with a reduced equity stake and hence weak incentives to manage the project. The cardinal issue is that, default is endogenous. The borrower makes the decision to default. This decision is based on the anticipated course of action by the lender. If the borrower anticipates a restructuring, he/she defaults and obtains debt forgiveness. On the other hand, if foreclosure is anticipated, the owner-manager does not default if the value of the equity stake exceeds the cost of keeping the loan current. However, if the value of the equity stake is sufficiently low, and foreclosure is anticipated the owner-manager defaults and foreclosure occurs. In the case of foreclosure, the lender either sells the assets immediately or manages it to be sold at a later date. Sale of the asset immediately or delay depends on the strength of the market and management capacity. Browne et al (2005) observed that borrower default is endogenous and the incidence of foreclosure occurred more frequently with loans that defaulted during the worst years of downturn – a time when it was difficult for the lender to sell foreclosed property. Restructuring becomes more prevalent as market conditions improve and there is a ready market for foreclosed properties. The explanation given is that of the sharp downturn in commercial real estate values, which simultaneously constrain potential buyers and make option-based default attractive to the borrower. While the lender may have preferred to restructure, given limited industry wealth, foreclosure rates were high because many borrowers were willing to walk away from the

assets. However, during the recovery period, continuation values were higher and borrowers defaulted only when they anticipated a restructuring.

On decisions to restructure or foreclose they observed that restructuring conditional to default, is negatively related project value shock and the strength of the market for foreclosed assets, and that it is positively related to the assets management specification. Further if buyers have limited wealth, the lenders prefer restructuring rather than foreclosure and delayed instead of immediate sale.

Projects that are foreclosed will on average have performed more poorly than projects that restructured. This occurs because borrowers who anticipate foreclosure default only when prospects very poor. Stromsburg (2000) also notes that foreclosed assets are badly managed, and liquidation transfers the asset to a more efficient operator.

Financially distressed borrowers significantly under invest in property maintenance or were unlikely to make necessary investments in the face of changing market conditions.

Stijn et al (2001) observed that approaches to financial distress resolution are controversial. On one hand actions by governments to assist specific companies and financial institutions may raise equity issues, as they require future taxation to service the additional public debt. There is also concern that private sector entities will come to expect such assistance in the future and may behave in imprudent ways leading to future crises. However no action by government may mean that significant sections of the economy remain distressed over a long

period of time with large and socially unacceptable losses in output and employment. This dilemma has led to the search for arrangements that would automatically trigger orderly processes for the resolution of systemic financial distress. The other observation is that there is dilemma on whether debtor or creditor friendly regimes aggravate financial crises and whether direct government support helps the resolution of a financial crisis or merely accelerates the coming of the next crisis. They note that financial crises allow government to introduce reforms that are otherwise stymied by political interest groups. The resuscitation of ailing companies and banks is of paramount importance to policy makers in times of financial distress as such periods provide a window of opportunity to pass legal and judicial reforms that enhance the long-term growth path of the economy.

Stijn et al (2001) provides the principles and practical approaches to address the difficult public policy trade off in systemic corporate and financial sector crises, and the lessons learnt from the evolving bankruptcy framework around the world. They identify three approaches to the resolution of financial distress.

The first of these approaches is on insolvency regimes. Insolvency regimes require the balancing of several objectives; protection of the rights of creditors and obviation of premature liquidation of viable enterprises. They are quick to note that regimes differ from region to region. However inspite of the differences in regime, they note that a working insolvency regime is an essential part of a market economy. Absence of one and in reference to the case of East Asia Crisis economies complicates and slows down the process of the corporate restructuring. The absence of as such in the East Asia economies led to a broader

re-evaluation of the goals of the insolvency mechanism in the market economy. They note that one of the lessons learnt (Stiglitz, 2001) was to turn the discourse away from whether bankruptcy codes are fair or not to the important question of what behavioral incentives they create; what matters to creditors most is that there be clarity concerning what happens when debtors default. As long as insolvency rules are predictable, lenders will charge an interest rate commensurate with the risk involved, and debtors in turn end up with access to capital paying the fair cost. Of great importance is the observation that the existence of effective and efficient insolvency regimes help in presenting the ongoing value of a firm in a financial restructuring. Regimes that are excessively creditor-friendly can result into increased number of liquidations.

The second approach from the authors is that of out of court settlements, which could be by asset sale or by cash auction. They noted that asset sales are empirically shown to fetch low prices while cash auction are reliant on liquid secondary market. Other options included in this category include sale of equity to foreign investors and renegotiation of debts out of courts.

From a corporate point of view, financial distress resolution can be approached through various strategies. The first strategy is to depend on economic recovery to release the constraint on demand, improving cash flow and the repayment ability of firms. According to Stijn et al (2001) such recovery can be engineered by increased government spending but may be limited by fiscal constraints, particularly in times of systemic distress. The recovery may also occur if the demand for exports is buoyant and case example quoted include

Mexico 1994-1995 crisis and Korea and Malaysia crisis. However they note that reliance on an economic upturn may be naive and the case cited is that of corporate sector in Japan. The authors noted that economic recovery by itself has proven to be insufficient in countries like Indonesia and Thailand and the reason cited is that the distress herein was as a result of imprudent investment decisions. Evidence shows that the distress of such firms and financial institutions persists for long periods of time, rendering the economy vulnerable to renewed financial pressures.

The second approach in regard to the corporate perspective is a variety of market-based measures. Under this approach the government set the rules under which creditors and debtors work out their claims in a decentralized manner. These rules include rules governing normal restructuring and bankruptcy, enhanced measures for rendering financial claims, reduction of barriers to transfer of ownership and redeployment of resources.

Stijn et al (2001) noted that the common feature of the two approaches here above are that they rely on incentives and penalties for restructuring rather than on either government fiscal stimuli or on the assumption by the government of financial liabilities of bankrupt firms and financial institutions. However in cases where economic recovery and enhanced incentives for restructuring are insufficient, government may face the assumption of financial liabilities or provide other forms of government support to shore up the financial or corporate sectors. Related is the degree to which government should exercise regulatory forbearance on financial institutions in distress. Where governments expend fiscal resources and assume

non-performing loans they seek to recover part of those resources through centralized asset management companies (AMCs).

2.4.2 Regulation

Regulation lays down the rules and procedures of resolving financial distress. The regulation of the Kenyan insurance industry is done through the government or by self regulation. The relevant legislation concerning the regulation of insurance companies is found within the Insurance Act, Cap 487 of the laws of Kenya. To facilitate supervision of companies, the Act requires production and submission of annual accounts and statutory returns in the prescribed format to the commissioner of insurance by 30th April of the year following. In addition, the act requires preparation of quarterly un-audited accounts which must be deposited with the commissioner of insurance within 45 days after the end of the quarter to which they relate. The returns submitted include, revenue accounts, profit and loss accounts, balance sheet, statement of assets and liabilities and actuarial report. These returns must be in the prescribed manner in the Insurance Act. The Act lays down powers of intervention vested in the commissioner of insurance and the conditions under which these powers are exercisable. The powers range from requiring a company to produce further information through the right to appoint a statutory manager or imposing sanctions on the nature of the insurer's investment. If the commissioner is concerned over the financial position of an insurer, he has at his disposal whatever powers he deems necessary to rectify the situation (Finsinger and Pauley, 1986). The methodology of assessing technical solvency of an insurer is spelt in the Act. The commissioner of insurance has a range of powers at his disposal to rescue or intervene if in his opinion a company exhibits signs of poor financial health. The ultimate last resort is to

place a company under statutory management to assess possibilities of reviving the company and restart operations.

One of the milestones in financial distress resolution in the Kenya insurance industry was the setting up of the policyholders' compensation levy with effect from 1st January 2005. The main function of this fund is to provide relief of up to Kshs.100,000 for legitimate policyholder claims that cannot be met by insolvent insurers (Njenga, 2005).

2.4.3 Self regulation

Self regulation from a financial distress resolution perspective in the Kenyan insurance industry is more of a peer review. The various bodies involved include: insurance companies -Association of Kenya Insurers (AKI), brokers - Association of Insurance Brokers of Kenya (AIBK) and loss adjusters, surveyors and arbitrators – Institute of Loss Adjusters and Risk Surveyors (IARS). These self-regulatory bodies are important in instilling discipline in its members, ensuring professionalism, representing members in negotiation with other parties and also shaping the industry's image in the eyes of the insuring public. The only unfortunate thing about the various self-regulatory bodies is that the law has not recognized them yet. However various sections of the Insurance Act address the conduct and affairs of their business.

2.4.4 Other regional bodies

The insurance companies collaborate with other regional and international bodies like; Association of Africa Insurance Supervisory Authorities (AAISA), Africa Insurance

Organization (AIO), International Association of Insurance Supervisors (IAIS) and Organization of Eastern and Southern Africa Insurers (OESAI). These bodies review the prevailing political, economic and social trends in the industry both at a regional and international level. A case in point is the discussions on “Insolvency Two” (Insurance Regulation, 2005).

2.5 Failure Prediction Models (Beaver 1966)

The signs of impending financial distress or failure usually manifest themselves prior to failure. Consequently and with appropriate mechanism of predicting failure creditors, investors, management and other stakeholders may be able to make corrective action before failure finally occurs. Horne (1991) notes the need to develop mechanisms that detect the impending failure early enough.

Various business failure prediction models have been developed:

2.5.1 Univariate analysis models as in Beaver's (1966) model as reliance on one variable

Horne (1991) notes that Beaver (1966) was the first to use statistical techniques to predict corporate failure. He applied a “univariate discriminant analysis” model on a number of financial ratios of a paired sample of failing and non-failing companies in order to predict company failure. Beaver applied a dichotomous classification test in order to identify those ratios that were best in classifying the companies as failing or non-failing; failure defined as the inability to meet financial obligations of any type. Beaver collected a large sample of firms that failed. Another firm was compared to each of these companies – a firm that did

not fail and that was in the same industry and was approximately the same size as the firm that failed. The data collected for the non - failed companies were for the same years as those for the failed firms. These samples were used to test the predictive abilities of 30 financial ratios. The mean values of the ratios for the two samples were compared over a five year period prior to failure. He observed that the mean ratio for the failed firms differed significantly from that for the non-failed firms. Not only was it lower, but it deteriorated markedly as failure approached (Beaver 1966).

Balcaen et al (2004) notes the advantages of the univariate models as; simplicity, less technical, ease of classification and its drawbacks as; linearity assumption, misclassification and inconsistency, difficulty in assessing the importance of any of the ratios in isolation, simplicity and lack of a multi-dimensionality approach.

2.5.2 Risk index models

Tamari (1966) noted the weaknesses in Beaver's (1966) model as reliance on one variable alone and the inconsistency in ratio application and came up with the risk index. This model involves the use of a simple "point system" which includes different ratios, generally accepted as measures of financial health. Each firm is attributed a certain number of points, between 0 and 100, according to the values of ratios for the firm. A higher total points indicates a better financial situation. The risk index takes account of the fact that some ratios are more important than others. Points are allocated in a way that most important ratios have higher weights. Tamari documented the ratios and their respective weights as under:

Ratio	Points
Equity capital/Total liabilities	25
Profits earned	25
Current ratio	20
Value of production/inventory	10
Sales/receivables	10
Value of production/working capital	10
	<u>100</u>

Adopted from Meir Tamari : Financial ratios as a means of forecasting bankruptcy; management international review, vol. 4, 1966 Pp 19.

Tamari found out that firms that attained 30 points and below had a higher probability of going bankrupt while firms with 60 points or more would not.

Moses and Liao (1987) presented a risk index that first requires a univariate analysis, which allows determining an optimal cut-off point for each of the financial ratios. Next, for each ratio, a dichotomous variable is created and these variables are assigned a score of one if a firm's ratio value exceeds the optimal cut-off point and a score of zero if the value is lower.

The major criticism of the risk index models is subjectivity. The weights are determined subjectively.

2.5.3 Multiple discriminant analysis

Multiple discriminant analysis (MDA) is a statistical technique used to classify an observation into one or several a priori groupings dependent on observed individual characteristics. It is used primarily to classify and or make predictions in problems where the

dependent variable appears in qualitative form, for example male or female, bankrupt or non-bankrupt. The steps involved are: establishing explicit group classification, in which case the number of groups could be two or more, and collection of data for the objects in the groups

Altman (1968) employed MDA to predict bankruptcy, using various financial ratios

MDA in its most simple form attempts to derive linear combination of these characteristics which “best” discriminates between the groups. If a particular object, for instance, a corporation, has characteristics (financial ratios) that can be quantified for all the companies in the analysis, the MDA determines a set of discriminant coefficients. When these coefficients are applied to the actual ratios, a basis for classification into one of mutually exclusive groupings exists. The MDA technique has the advantage of considering an entire portfolio of characteristics common to the relevant firms as well as interaction of these properties. Another advantage of MDA is the reduction of the analyst’s space dimensionally, that is, from the number of different independent variables to $G-1$ dimension(s), where G equals the number of original apriori groups. This analysis is concerned with two groups, consisting of bankrupt and non- bankrupt firms. Therefore, the analysis is transformed into its simplest form: one dimension. The discriminant function of the form :

$$Z = V_1X_1 + V_2X_2 + \dots + V_nX_n$$

transforms the individual variable values to a single discriminate score, or z value, which is then used to classify the object where:

$$V_1, V_2, \dots, V_n = \text{discriminate coefficients,}$$

$$X_1, X_2, \dots, X_n = \text{independent variables}$$

Source: Edward I. Altman , *Predicting Financial Distress Of Companies: Revisiting The Z-Score and Zeta Models*, July 2000)

The MDA computes the discriminate coefficients; V_i while the independent variables X_i are actual values.

Altman (1968) employed MDA to predict bankruptcy, using various financial ratios. Altman worked with a sample of corporations that filed for bankruptcy. He collected a paired sample of bankrupt and non- bankrupt firms on a stratified random basis. Starting with 22 financial ratios, he selected the five that did the best combined job of predicting bankruptcy. The ratios were used to discriminate between bankrupt and non- bankrupt firms using data from 1 to 5 years prior to bankruptcy. The predictive accuracy of the discriminant declined with the increase in years prior to bankruptcy; however the model was able to forecast failure quite well up to 2 years before bankruptcy.

The Z-score model derived by Altman has the discriminate function as below:

$$Z = 0.012x_1 + 0.014x_2 + 0.033x_3 + 0.006x_4 + 0.999x_5$$

Where

- x_1 = working capital/total assets
- x_2 = retained earnings/total assets
- x_3 = earnings before interest and taxes/total assets
- x_4 = market value of equity/ book value of total liabilities
- x_5 = sales /total assets
- Z = overall index

Source: Altman (1968)

Altman (1968) found out that companies with Z-Score below 1.81 including negative amounts always went bankrupt, whereas Z-scores above 2.99 represented healthy firms.

Firms with a Z-Score in between were sometimes misclassified, and this he noted represented an area of gray (Altman 1968)

The model here above described was for publicly quoted companies. Altman arising from the frequent inquiries from those interested in using the z-score model on the application of the model in private sector revisited the model and derived one for private firms and later for non-manufacturers. The model derived for private firms is of the form:

$$Z = 0.717x_1 + 0.847x_2 + 3.107x_3 + 0.420x_4 + 0.998x_5$$

$Z < 1.23$ indicates a bankruptcy prediction

1.23 to 2.90 indicates a gray area

$Z > 2.90$ indicate no bankruptcy.

The main change was in variable x_4 whereby instead of using the market value of equity he used the book value of equity. All the coefficients had significant changes except X_5 . Regarding X_4 the only variable that changed, had its coefficient reducing from 0.6 to 0.420 (based on conventional Z-score):

$$Z = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + 1.0x_5$$

The non-manufacturers model is of the form:

$$Z = 6.56x_1 + 3.26x_2 + 6.72x_3 + 1.05x_4$$

Where

- x_1 = Networking Capital to Total Assets
- x_2 = Accumulated Earnings to Total Assets
- x_3 = EBIT to Total Assets
- x_4 = Book value of equity to Total Liabilities

$Z < 1.1$ indicates a bankruptcy prediction

1.1 to 2.6 indicates a gray area

$Z > 2.6$ indicates no bankruptcy.

Source: Eidleman, Gregory J, CPA Journal , New York, Feb. 1995)

Altman et al (1977) later made improvements on the initial Z-score model due to changes in the bankruptcy environment and need for other improvements. This enhancement resulted in increase in the number of variables from five to seven. These ratios are; return on asset ratio, stability of earnings, interest coverage ratio, retained earnings to total assets ratio, current ratio, common equity to total capital ratio, and size of total assets

The predictive ability of the Zeta model (renamed from Zeta Services Inc.) as it now came to be known was improved from a predictive ability of two years to five years.

Balcaen et al (2004) document the advantages and drawbacks of the multivariate models (MDA) The advantages are noted as; multivariate and continuous scoring and drawbacks as; linearity assumption, assumption on dichotomous variable, restrictive assumptions (multivariate normality; equal dispersion matrices; prior probabilities and misclassification costs), classification model (not prediction model) ordinal scores, relative importance of ratios is unknown and not resistant to multicollinearity.

2.5.4 Conditional Probability Models

Balcaen et al (2004) in his review of the classical statistical methodologies and their related problems documents the methodologies of conditional probabilities models. The conditional probability models; Logit and Probit Analysis are used to estimate the probability of company failure conditional on a range of firm characteristics by a non-linear maximum likelihood estimation. The models are based on a certain assumption concerning the probability distribution. The logit models assume a logistic distribution while the probit

models assume a cumulative normal distribution. Ohlson (1980) pioneered in the use of Logit Analysis (LA) and Zmijewski (1984) the Probit Analysis (PA). They observe that LA has appeared to be a very popular model of failure prediction, PA being criticized of requiring more computation (Gloubos and Grammatikos, 1988; Dimitras et al 1996). The LA model is of the form:

$$P(x_1) = 1/[1+\exp-(B_0+B_1X_1+\dots+B_nX_n)] = 1/[1+\exp-(D_i)]$$

Where $P(x_1)$ = probability of failure given the vector of attributes X_{ij}

B_j = coefficients of attribute j with $j=1, \dots, n$ and B_0 = to intercept.

X_{ij} = value of the attribute j (with $j=1, \dots, n$)

For the firm i .

D_i = the "logit" for firm i

(Source Balcaen et al 2004

2.5.5 Applications of MDA

Carson (1994) studied the strength of three types of bankruptcy detection models; multiple discriminant analysis, logistic regression and recursive partitioning. The variables examined were real estate, separate accounts assets, leverage, and premium growth, amidst others. The study applied data from the National Association of Insurance Commissioners for a sample of insurers that either did (1380) or did not (40) remain solvent for the years 1990 and 1991. The results indicated that the empirical models do reasonably well in classifying solvent and insolvent insurers and significant differences exist between solvent and insolvent insurers with respect to the variables examined.

Trieschmann and Pinches (1973) applied MDA to financial data to identify property and liability insurers with a high potential for financial distress. They extended their previous research (1974) and observed that multivariate discriminant models are superior to univariate models in identifying firms with a high probability of distress. They found out that the best single variable for correctly identifying distressed property-liability insurer is (net premium written/surplus).

Keige (1991) applied the MDA in line with Altman's (1968) model on quoted companies in Kenya and observed that ratios that will best discriminate between failing companies and successful companies appeared to differ from place to place. She further observed that financial ratios like, current ratio, fixed charge coverage, retained earnings total assets, return on total assets, return on net worth, average collection period and sales to total assets can be used successfully in predicting failure for a period upto two years before it occurs. The model yielded overall correct classification of 95% in the first year, similar to results obtained by Altman (1968). However she was quick to caution that the ratios used are not the only ratios that can be used to predict failure successfully.

Caroline (2003) applied MDA to classify performing and non-performing loans and observed that the method could classify 75% and 81% correct classification for the two categories.

The data was classified into two categories namely:

- Data for failed firms over the period of study and
- Data for non-failed firms over the period of study

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The research design is a survey.

3.2 Population

The population of interest was all insurance companies. The population was therefore defined as all insurance companies, which have operated in the insurance industry from January 1989 to December 2004. Market data and other relevant information for these companies are readily available from the statutory insurance annual reports prepared by the Commissioner of Insurance. The insurance industry comprises of; forty three insurance Companies, two re-insurers, two hundred insurance brokers, two thousand registered agents, three hundred loss assessors, thirty loss adjusters, two insurance surveyors, five risk managers and two claims settling agents (Insurance Annual Report, 2004).

3.3 Sampling

All the insurance companies (failed and non-failed) during the period were subjects of the study. Secondary data was obtained from insurance companies' published annual financial statements over the period of study. Both qualitative and quantitative data was collected from the reports.

The data was classified into two categories namely:

- Data for failed firms over the period of study and
- Data for non-failed firms over the period of study

3.4 Data analysis and Model Specification

Qualitative data was used to discriminate the qualitative characteristics, which can predict financial distress.

Quantitative data on the other hand was used to work out a number of financial ratios relevant to insurance business. The ratios were averaged for the two sets i.e. failed vs. non - failed firms. From the many ratios calculated, some were selected which gave an indication of failure and non failure. These selected ratios were then combined to predict financial distress.

The selected ratios were used to discriminate between firms in financial distress from non-financially distressed firms using data for 3-15 years prior to financial distress.

A model was then developed equivalent to that of Altman Z score model and used to forecast financial distress up to a number of years before financial distress. The predictive accuracy of the model was tested using the classified data.

A linear predictive model was estimated as:

$$Z = V_1X_1 + V_2X_2 + V_3X_3 + \dots + V_nX_n$$

Where:

Z = discriminant score

$V_1 + V_2 + V_3 + \dots + V_n$ = are coefficients associated with the
the respective independent variable.

$X_1, X_2, X_3, \dots, X_n$ = independent variables

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

This study was conducted with the objective of ascertaining indicators of companies exhibiting characteristics of impending failure and to develop a failure prediction model for insurance companies in Kenya.

4.1 Characteristics of Companies Exhibiting Failure

As noted in the literature review a number of indicators of companies exhibiting features of failure were observed in the five failed companies.

Chief executive officers changes were noted in company "E". The long serving principal officer left in 2001 and was replaced with a new one who served for only one year and was also replaced by one of the directors (Insurance Reports 1995-2004). Chief executives resignations and high labor turnover have been noted by various authors as some of the characteristics of companies with impending failure. Ross et al (2002) observed that layoffs and chief executive resignations are some of the events befalling firms experiencing financial distress. A similar trend has been noted in the case of Uchumi Supermarkets Company Limited recently placed under receivership (Daily Nation, 2006).

Business failures resulting from weak governance structure was observed in some companies. The East African (2001) noted that failure of company "A" could partly have been attributed to political interference. The company experienced cash flow deficits prior to its closure as a result of capital diversion to non-core business. Esmeralda et al (2005)

observe that appropriate corporate governance structure help in avoiding the onset of financial distress. They posit that firms with closer alignment between shareholder and manager interest are unlikely to experience financial distress.

It was also observed that firms experiencing uneven growth and negative retained earnings were candidates for failure. Four of the companies that failed had negative retained earnings in the years preceding closure. The negative retained earnings are as a result of underwriting losses and inadequate investment income to cushion losses, implying that the combined ratio is above 100%. The combined ratio as noted in the caption on literature review implies that the premiums are inadequate to cover claim losses and management expenses. This is consistent with Browne and Hoyt (1995) observations on insolvencies in which they noted that the combined ratio amidst other ratios is one of the important predictors of insolvency. Company "A" and company "C" had negative net assets. In the case of company "C", Bell (1996) noted that the company was in deficit (life fund less than the actuarial liabilities) as early as 1992 three years prior to its closure.

The current ratio of the failed companies declined or was steady while the debt ratio increased over the period of financial distress. This is consistent with the observations of Bruce et al (2000) on financial and non-financial credit rating parameters for the insurance industry in UK. Bruce et al (2000) noted that leverage, profitability, liquidity, and positive growth in annual surplus as some of the parameters that can be used to gauge healthy and unhealthy firms.

4.2 The Failure Prediction Model

In order to develop the failure prediction model, data from financial statements of the forty three insurance companies existing as at 31st December 2004 was extracted. The data collected comprised of; current assets, current liabilities, total assets, equity, retained earnings, premium income (net), total liabilities, life funds and profit before tax for the applicable years in both life and general insurance businesses. However, it is worth noting that the two lines of businesses are different in that incomes derived by the two belong to different parties; policyholders in the case of life business and shareholders in the case of general insurance business. Shareholders accrue benefits from the life fund by way of a transfer to the Profit and Loss account. Such a transfer has to arise from the surplus arising from an actuarial valuation and has also to be in compliance with the limits stipulated in the Insurance Act (Insurance Act Cap. 487). The investment mix, capital requirements and the nature of the assets differ in the two lines of business.

In this study and in view of the features here above described, the life fund was treated as part of the long- term liabilities and included under total debt in computation of the debt ratio. Similarly the outstanding claims provisions and the unearned premium reserves of the general insurance business were also categorized as long - term liabilities. This is because it was not possible to age the outstanding claims. However, either way the effects on the debt ratio would have been transferred to the current ratio. It was also assumed that given that the transfers of income from the Life business to the Profit and Loss are done at year end, the balance of the fund belonged to policy-holders and hence a liability to the requisite assets in the balance sheet. The moderating factor is that the size of the life funds was very small for

eight of the companies in the sample. Their major business operations were in General insurance business (Appendix 3A and 3B).

The other notable feature is that the premium debtors appearing in the respective balance sheets were basically from general insurance business. This is because Life business in most cases operates on receipt basis as the terms and conditions of the policies require the accounts be current for the policy contract to be in-force.

The failed and non- failed companies were also matched based on the mean size of total assets (Appendix 3A and 3B). The financial ratios used by Altman (1968); working capital /total assets, retained earnings /total assets, EBIT/total assets, book value of equity/total book value of liabilities, Sales/total assets for non quoted companies were initially applied on these companies but did not yield consistent results. The working capital/total assets ratio was substituted with current ratio and an additional one other ratio, debt ratio applied.

Using the SPSS program the following discriminant function was estimated:

$$Z=0.109X_1-8.457X_2+30.602X_3-4.409X_4+17.31X_5+7.94X_6-8.502$$

Where:

X_1 = current ratio

X_2 =retained earnings to total assets

X_3 =profit before tax / total assets

X_4 = sales /total assets

X_5 =book value of equity /to book value of total liabilities

X_6 =debt ratio, and a

constant = -8.502.

The above ratios are discussed here below:

Current ratio: This ratio is calculated as current assets divided by current liabilities. It is worth noting that the claims outstanding and unearned premium provisions have been excluded in deriving the ratio for reasons explained above but included under in the long-term liabilities.

Retained profits /total assets: Represents the cumulative retained earnings divided by total assets.

Profit before tax over total assets: The ratio is derived by dividing profit before tax by total assets. This ratio is relatively close to the ratio used by Altman, (1968), EBIT/ Total assets. The only item disregarded is the interest expense which was considered to be insignificant in the case of insurance companies.

Sales to total assets: The equivalent of sales has been taken to be net premiums written and then divided by total assets to derive the ratio.

Book value of equity to total book value of liabilities: This represents the equity value in the balance sheet; retained earnings plus paid up share capital and other reserves excluding the life fund. The book value of liabilities includes the life fund.

Debt ratio: Comprises of total liabilities divided by total assets.

The current ratio X_1 coefficient V_1 derived was 0.109. It was positive for all the companies. However it was highest in company "B" at 0.939 and lowest in company "A" at 0.146. On review of the financial statements of company "B" it was noted that debtors accounted for 60% of the total assets in 1998, 54% in 1997, 51% in 1996, 61% in 1995. Deloitte and Touche (2000) noted the high debtors status and attributed it to lax credit policy.

The retained earnings coefficient V_2 , was -8.46 and its product with X_2 (Retained earnings/Total Assets) ranged between positive 2.92 and negative 1.30. The failed companies had positive results or almost zero results and the non-failed companies negative results.

Profit before tax divided by total assets coefficient V_3 , was 30.6 and its quotient ranged between negative 3.54 and positive 0.24. The failed companies had largely negative results and non-failed companies all positive results.

Sales divided by total assets coefficient V_4 , was at -4.41 and the quotients ranged between negative 3.45 and 0.68. The failed companies had the highest negative results.

Book value of net-worth divided by book value of liabilities coefficient V_5 , was 17.31 and ranged between negative 1.72 and positive 8.44. The non-failed companies had all positive results and failed companies mixed results but with the lowest quotient.

Total debt divided by total assets coefficient V_6 , was at 7.94 and ranged between 9.44 and 5.36. The failed companies had the highest debt ratio.

The coefficients were applied to the individual companies financial ratios as appropriate and Z-Scores derived (Appendix 3A). It was observed that companies with a Z-Score of less than zero were correctly classified as failed companies and those with a Z-Score greater than zero as non - failed companies except for company "J". The failed companies were 100% correctly classified as per the original data and the non-failed 80%. Company "J" was classified as a failed company (Appendix 3A).

In company "A" failure would have been detected one year before but for the rest of the failure was eminent in all the years of the study period.

The above discriminant function was derived from financial data on the combined businesses; life and general insurance businesses. A further discriminant function was derived now using financial data on general insurance business operations only. The function derived was as under (Appendix 3B):

$$Z = -0.004X_1 - 0.8X_2 + 21.95X_3 - 5.41X_4 + 9.94X_5 + 2.5X_6 - 2$$

Similar observations between the failed and non-failed companies as in the case of combined businesses were noted; companies with a Z-score of less than zero were correctly classified as per the original data and Z-score above zero as non-failed. However there was no misclassification in this instance as both sets were 100% correctly classified.

This later model could detect failure successfully at 80% and 60% one and three years before failure respectively.

In both functions the parameters with the greatest impact on the discriminant function were X_5 – book value of net worth divided by book value of liabilities, followed by X_3 – profit before tax divided by total assets, X_1 – current ratio and the least being X_4 – sales divided by total assets as per the Wilk's lambda (Appendix 2A and 2B).

4.3 Model Validation

The function derived was applied to both failed and non-failed companies. The failed companies were 100% classified as per the original set (Appendix 3A and 3B)). However in the case of non-failed companies, company (J) originally classified as non-failed was classified as failed on the combined businesses basis. This was consistent in both models (Appendix 3A and 3B).

The model was applied on ten of the non-failed companies outside the sample and they were all largely correctly classified in their status of non-failed. The results were consistent for more than five years consecutively (Appendix 3A and 3B). However in the case of failed companies the model achieved 80% and 100% correct classification one and two year(s) prior to failure in both cases.

The canonical correlation in both; life and general combined and general business(es) discriminant functions were above 90%. Keige (1991) derived a canonical correlation on Kenyan quoted companies of 95.7%.

The Wilk's Lambda differed between the two sets of functions at 16.3% and 9.7%. However the extent of unexplained proportion of the total variance based on both lambda values is still low (Appendix 2A and 2B).

The model was validated further using SPSS "leave-one-out cross validation" and achieved similar classification results as in the initial classification in both cases (Append. 2A and 2B)

The ratios used except for the debt ratio were all inclusive in the ratios used by Keige, (1991) and also Altman (1968). The application of the ratios in the MDA yielded almost similar results as those of the two studies herebefore referred; correct classification of the failed and non-failed companies and to a large extent failure prediction.

CHAPTER FIVE

SUMMARY FINDINGS, CONCLUSIONS, RECOMMENDATIONS, LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

5.1 Summary of Findings and Conclusions

5.1.1 Summary of Findings

The study revealed that financial ratios as also accredited by other researchers, Beaver (1966), Altman (1968) and others can be used to explore and establish the financial status of an institution when applied in the various financial analysis. This information is of valuable use by a diverse range of stakeholders. The capacity to establish that a company is bound to fail is of great importance to investors, as they will avoid sinking their investment. This implies that capital will only be deployed in projects that have a positive return and help in agglomeration of capital. Regulators will also be in a position to take corrective action and minimize losses.

The study also revealed that multi-discriminant analysis (MDA) technique can be applied in a varied number of financial ratios and yield useful results. The use of SPSS program was also useful as it is able to give summaries of findings of data. Such results as the unstandardised coefficients, structure matrix, standardized coefficients, Wilk's Lambda, canonical correlation assist in deriving the Z-score functions, interpreting the results and determining the validity of the research study.

The study revealed that it is possible to classify failing and non-failing companies. The consistency of the results on status (failed and non-failed) of the companies for a period of over five years and in at least 100% of the failed and 80% of the non-failed companies implies that it is possible to apply the MDA in developing a failure prediction model for the insurance industry in Kenya. This is almost consistent with Keige's (1991) results at 100% of the failed and 90% of the non-failed. However, and as observed by Keige (1991), financial ratios have to be applied selectively.

The study further revealed that effective and efficient management is critical to the survival of an organization. The investigation reports of Deloitte and Touche (2000) on company "B" and Bell (1996) on company "C", cited financial mismanagement, lax credit management policy, poor claims management, imprudent investments decisions and interdivision lending as some of the management malpractices that brought about business failure.

Business failure has no clemency for size. The mighty are as good victims as the small and medium companies. Company "C" used to be among the top three performers in the insurance industry, but failed despite its market share and size of total assets and so was company "B" and "E" in the medium category. Hence failure covered the entire spectrum. This phenomenon is not limited to the Kenyan industries. Business failures of large corporations like Enron, World Com and the giant Australian insurance company, HIH are still fresh in our memories (Amerta et al, 2005).

The Z-score of the combined businesses life and general insurance businesses differed with the one of general insurance business companies taken separately. Failure was delayed in one of the failed companies on the combined basis. This phenomenon may arise because of the Life fund being considered as part of liabilities.

5.1.2 Conclusion

Business failure prediction can be predicted using discriminant analysis technique given the application in this study and others. However, the ratios differ from industry to industry. Hence Altman's Z-Score models cannot be wholly adopted on face value. Keige (1991) observed that the Z- Score ratios used by Altman could not be wholesomely applied to the Kenyan quoted companies. Caroline (2003) in her studies of failed and non-failed cooperative societies observed the same pattern.

Liquidity, profitability, activity and leverage ratios can be used in the insurance industry to predict business failure.

In most of the investigation reports reviewed incidences of financial mismanagement, weak corporate governance, imprudent investment decisions were noted. This implies and as noted in the caption on literature review that it is necessary for management adhere to good governance, good financial and accounting practices, make prudent investment decisions among other management practices.

Cases of prolonged failure even for periods exceeding five years were noted in the results. This has negative effects on the economy and the industry. This may point out failure on part of the regulator to take corrective action in time to avert continued deterioration of assets and loss of confidence with the industry.

The validity of the model on failure prediction can be said to be successful in the sense that on testing with at least ten other non-failed companies, it yielded similar of non-failure for more than ten years consecutively. Further that even in the sample companies classified as failed, failure would have been predicted at least at an accuracy of 80% and 100% one to two and three years before failure respectively, combined and general insurance business. The results are within the same range of failure prediction as those of Keige (1991) at 95% one year, 85% two years classification prior to failure in quoted companies. An almost similar result is to be found in Altman's (1977) model on unquoted companies.

5.2 Limitations of the Study

The study dwelt on the insurance companies that failed within the period 1993-2004. Whereas a model for general insurance companies was derived, that of life insurance companies was not. The features of these businesses differ in terms of investment mix and type, capital structure requirements and provisions among other differences. It may be appropriate to develop a model for life insurance companies. However most of the companies that failed had their major operations in general insurance business as noted elsewhere except for company "C" that had a major stake in the life business. Research studies on separate

lines of business have been conducted elsewhere and parameters for failure differ between the two lines of businesses (Browne et al, 1999 and Browne et al, 1995).

The models derived are subject to the weaknesses of the MDA technique; linearity assumption, misclassification and inconsistency among others (Balcaen et al 2004).

The model did not consider other parameters like economic factors that may also affect business survival. It is modeled within financial parameters. Hence factors like prevailing inflation, unemployment, and interest rates among others have not been considered. Browne et al (1995) in their studies of life insurance insolvencies observed that; disintermediation, disposable income, unemployment among others were some of the factors that may lead life business insolvencies and that the overall macroeconomic environment had greater significance and impact on the number and size of insolvencies. Browne and Hoyt (1995) in their study of the Property and Casualty business (General Insurance business) observed that; the number of companies, combined ratio and regulation had significant influence on the insolvency rate. It is therefore necessary also to develop a model based on macroeconomic parameters.

Research studies on financial distress in the Kenyan economy are limited in number. This limits the comparability of the results obtained, as the studies have to be modeled on those of developed economies. Factors affecting insolvencies differ from one region to the other as the level of regulation, general political and economic infrastructure may not be the same. However the economic impact of business failure remains the same.

5.3 Recommendations *Further Studies*

There is need to monitor the performance of companies by all stakeholders as business failure has serious social, economic and political implications. It affects the livelihood of people, reduces credibility of the industry, creates bad-will to the legislators and other stakeholders.

The application of credit control and monitoring mechanisms by regulators using standardized Z-Scores for the specific industries should be encouraged. This information could be made readily available on timely basis. This may instill discipline on the incumbent management to ensure the companies survive and remain competitive. Stijn et al (2001) noted that a working insolvency regime is an essential part of market economy.

The use of standardized financial statements across the industries should be encouraged as this may in future allow cross industry comparisons. In the insurance industry this is already on course with the introduction of IFRS 4. This will facilitate ease of extraction of financial data relevant in arriving at the ratios.

As noted in the study the use of financial ratios is helpful in making certain financial decisions. However, the ratios should be used cautiously as they can lead to misleading conclusions.

5.4 Suggestions for Further Studies

The research study limited itself to six ratios and there could be need to explore other ratios. Ratios based on revenue statements could also be applied like combined ratio, retention ratios (Calandro Jr, et al 2003). It may also be worth considering actuarial liabilities in further studies so as to isolate the element of shareholders equity in the life funds.

Studies on prediction models based on separate lines of business, that is short term and long - term businesses may also be appropriate. Similar studies have been done elsewhere (Browne et al, 1995 and 1999).

Failure prediction studies using non-financial parameters could be undertaken. Studies using economic and market predictors in both life and general insurance business have been undertaken in the United States (Browne et al, 1995 and 1999).

In view of the critical role of corporate governance, specific studies on the effects of corporate governance in insurance industry could be done. Studies on corporate governance have been done elsewhere, whereby indices and weights are applied to specific parameters of corporate governance (Esmeralda et al, 2005).

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9. CORPORATE INSURANCE COMPANY LIMITED
10. GEMINIA INSURANCE COMPANY LIMITED
11. HERITAGE ALLIANCE INSURANCE COMPANY LIMITED
12. INSURANCE COMPANY OF EAST AFRICA LTD
13. JUBILEE INSURANCE COMPANY LIMITED
14. KENINDIA ASSURANCE COMPANY LIMITED
15. KENYAN ALLIANCE INSURANCE COMPANY LIMITED
16. MADISON INSURANCE CO. KENYA LTD
17. MERCHANT LIFE AND GENERAL ASSURANCE COMPANY LIMITED
18. OLD MUTUAL INSURANCE COMPANY LIMITED
19. PAN AFRICAN LIFE ASSURANCE COMPANY LIMITED
20. PIONEER ASSURANCE COMPANY LIMITED
21. THE MONARCH INSURANCE COMPANY LIMITED

APPENDIX 1

LIST OF INSURANCE COMPANIES 31-12-04

1. AIG KENYA INSURANCE COMPANY LIMITED
2. AMACO INSURANCE COMPANY LIMITED
3. APOLLO INSURANCE COMPANY LIMITED
4. CFC-LIFE ASSURANCE COMPANY LIMITED
5. BLUE SHIELD INSURANCE COMPANY LIMITED
6. BRITISH AMERICAN INSURANCE CO. (K) LTD
7. CANON ASSURANCE COMPANY KENYA LIMITED
8. COOPERATIVE INSURANCE COMPANY OF KENYA LIMITED
9. CORPORATE INSURANCE COMPANY LIMITED
10. GEMINIA INSURANCE COMPANY LIMITED
11. HERITAGE A I I INSURANCE COMPANY LIMITED
12. INSURANCE COMPANY OF EAST AFRICA LTD
13. JUBILEE INSURANCE COMPANY LIMITED
14. KENINDIA ASSURANCE COMPANY LIMITED
15. KENYAN ALLIANCE INSURANCE COMPANY LIMITED
16. MADISON INSURANCE CO. KENYA LTD
17. MERCANTILE LIFE AND GENERAL ASSURANCE COMPANY LIMITED
18. OLD MUTUAL INSURANCE COMPANY LIMITED
19. PAN AFRICAN LIFE ASSURANCE COMPANY LIMITED
20. PIONEER ASSURANCE COMPANY LIMITED
21. THE MONARCH INSURANCE COMPANY LIMITED

22. UAP PROVINCIAL INSURANCE COMPANY LIMITED
23. TRINITY LIFE INSURANCE COMPANY LIMITED
24. UNITED INSURANCE COMPANY LIMITED
25. CONCORD INSURANCE COMPANY LIMITED
26. FIDELITY SHIELD INSURANCE COMPANY LIMITED
27. FIRST ASSURANCE COMPANY LIMITED
28. GATEWAY INSURANCE COMPANY LIMITED
29. GENERAL ACCIDENT INSURANCE COMPANY KENYA LIMITED
30. INTRA AFRICA ASSURANCE COMPANY LIMITED
31. INVESCO ASSURANCE COMPANY LIMITED
32. LION OF KENYA INSURANCE COMPANY LIMITED
33. OCCIDENTAL INSURANCE COMPANY LIMITED
34. PHOENIX INSURANCE COMPANY LIMITED
35. ROYAL INSURANCE COMPANY LIMITED
36. STANDARD ASSURANCE COMPANY (K) LIMITED
37. TAUSI ASSURANCE COMPANY LIMITED
38. TRIDENT INSURANCE COMPANY LIMITED
39. MAYFAIR INSURANCE COMPANY LIMITED
40. PASCIS INSURANCE COMPANY LIMITED
41. DIRECT INSURANCE CO. LTD
42. KENYA ORIENT INSURANCE CO. LTD
43. KENYA NATIONAL ASSURANCE CO. (2001) LIMITED

APPENDIX 2A
Summary of Canonical Discriminant Functions

**Canonical Discriminant
Function Coefficients**

	Function
	1
x1	0.109
x2	-8.457
x3	30.602
x4	-4.409
x5	17.310
x6	7.940
(Constant)	-8.502

Unstandardized coefficients

**Standardized Canonical
Discriminant Function
Coefficients**

	Function
	1
x1	0.364
x2	-0.978
x3	1.249
x4	-0.858
x5	2.245
x6	0.949

Structure Matrix

	Function
	1
x3	0.461
x2	0.444
x5	0.439
x6	-0.375
x4	-0.208
x1	0.137

Pooled within-groups correlations between discriminating variables and
standardized canonical discriminant functions
Variables ordered by absolute size of correlation within function.

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	5.151	100.0	100.0	0.915

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

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	0.163	9.083	6	0.169

Functions at Group Centroids

Case Number	Function
	1
1	-2.030
2	2.030

Unstandardized canonical discriminant functions evaluated at group means

Casewise Statistics

Case-wise Statistics											
Case Number	Actual Group	Predicted Group	Highest Group					Second Highest Group			Discriminant Score
			2		P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1	
			0	5							
Original	1	1	1	4.000	5	1.000	1	2	0.000	24.047	-2.87
	2	1	1	0.000	100	0.998	0	2	0.002	13.028	-1.58
	3	1	1	80.000	100	0.993	1	2	0.007	10.477	-1.21
	4	1	1	0.000	5	1.000	0	2	0.000	18.283	-2.25
	5	1	1	4.000	5	1.000	0	2	0.000	18.262	-2.24
	6	2	2	0.000	100	1.000	0	1	0.000	20.599	2.51
	7	2	2	80.000	100	1.000	0	1	0.000	16.627	2.05
	8	2	2			1.000	1	1	0.000	23.390	2.81
	9	2	2			1.000	1	1	0.000	24.522	2.92
	10	2	1			0.634	4	2	0.366	4.687	-0.14
Cross-validated(a)	1	1	1	5.000	5	1.000	60	2	0.000	112.739	
	2	1	1	10.000	10	0.866	12	2	0.134	15.531	
	3	1	1	10.000	10	0.787	9	2	0.213	11.384	
	4	1	1	10.000	10	0.988	42	2	0.012	51.033	
	5	1	1	10.000	10	0.998	22	2	0.002	34.526	
	6	2	2	10.000	10	1.000	38	1	0.000	59.278	
	7	2	2	10.000	10	0.994	12	1	0.006	22.440	
	8	2	2	0.000	6	1.000	43	1	0.000	82.558	
	9	2	2	0.000	6	1.000	84	1	0.000	153.919	
	10	2	1	0.019	6	1.000	15	2	0.000	62.711	

For the original data, squared Mahalanobis distance is based on canonical functions.
 For the cross-validated data, squared Mahalanobis distance is based on observations.

** Misclassified case

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

Classification Results(b,c)

	Case Number	Predicted Group		Total
		1	2	
Original	Count	1	5	0
		2	1	4
	%	1	100.0	0.0
		2	20.0	80.0
Cross-validated(a)	Count	1	5	0
		2	1	4
	%	1	100.0	0.0
		2	20.0	80.0

- Cross validation is done only for those cases in the
- 90.0% of original grouped cases correctly classified.
- 90.0% of cross-validated grouped cases correctly

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
x1	0.911	0.779	1	8	0.403
x2	0.496	8.125	1	8	0.021
x3	0.477	8.768	1	8	0.018
x4	0.818	1.778	1	8	0.219
x5	0.502	7.944	1	8	0.023
x6	0.580	5.801	1	8	0.043

x1	21.343
x2	2.359
x3	2.354
x4	2.354
x5	2.354
x6	2.354
Constant	2.354
Unstandardized Coefficients	

Standardized Canonical Discriminant Function Coefficients

	Function
x1	-0.000
x2	0.000
x3	0.000
x4	0.000
x5	0.000
x6	0.000

Structure Matrix

	Function
x1	0.000
x2	0.000
x3	0.000
x4	0.000
x5	0.000
x6	0.000

Partial within-group means and between-group means variables and standardized canonical discriminant functions

Variables ordered by absolute value of correlation with function

Discriminant

Function	Discriminant	% of Variance	Constant	Correlation
1	0.000	100	0.000	0.000
a. First 1 canonical discriminant functions were used in the analysis.				

Wilks' Lambda

Test of	Wilks' Lambda	Chi-Square	df	Sig.
Function 1	0.000	0.000	1	1.000

Flattened in Group Canonical

Function	Flattened
1	0.000
2	0.000

Partial within-group means and between-group means variables and standardized canonical discriminant functions

Summary of Canonical Discriminant Functions

Canonical Discriminant Function Coefficients

	Function
	1
x1	-0.004
x2	-0.798
x3	21.949
x4	-5.409
x5	9.944
x6	2.501
(Constant)	-1.992
Unstandardized coefficients	

Standardized Canonical Discriminant Function Coefficients

	Function
	1
x1	-0.009
x2	-0.163
x3	0.87
x4	-0.891
x5	1.495
x6	0.702

Structure Matrix

	Function
	1
x3	0.452
x5	0.443
x2	0.32
x6	-0.163
x4	-0.125
x1	0.048

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

Variables ordered by absolute size of correlation within function.

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	9.283(a)	100	100	0.95

a First 1 canonical discriminant functions were used in the

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	0.097	11.653	6	0.07

Functions at Group Centroids

case number	Function
	1
1	-2.725
2	2.725

Unstandardized canonical discriminant functions evaluated at group means

Casewise Statistics

	Case Number	Actual Group	Highest Group	Second Highest Group			Discriminant Scores
			Predicted Group	Group	$P(G=g D=d)$	Squared Mahalano	Function 1
Original	1	1	1	2	0	48.659	-4.25
	2	1	1	2	0	22.473	-2.015
	3	1	1	2	0	27.315	-2.501
	4	1	1	2	0	33.59	-3.071
	5	1	1	2	0	20.372	-1.788
	6	2	2	1	0	26.487	2.421
	7	2	2	1	0	51.918	4.48
	8	2	2	1	0	23.014	2.072
	9	2	2	1	0	22.383	2.006
	10	2	2	1	0	28.853	2.646

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
x1	0.979	0.168	1	8	0.693
x2	0.512	7.619	1	8	0.025
x3	0.346	15.14	1	8	0.005
x4	0.873	1.163	1	8	0.312
x5	0.354	14.58	1	8	0.005
x6	0.802	1.979	1	8	0.197

APPENDIX 3A

SUMMARY LIFE AND GENERAL BUSINESS COMBINED

Status	Company name	Current Ratio X1	Ret. earnings Total Assets X2	Profit before Tax X3	Sales/ Total Assets X4	Bk val. of net worth Book val. of liab X5	Debt Ratio X6
1	A	1.344	(0.345)	(0.116)	0.364	(0.099)	1.188
1	B	8.614	0.036	0.008	0.686	0.130	0.859
1	C	3.573	(0.067)	(0.010)	0.217	(0.047)	1.060
1	D	2.314	(0.080)	(0.050)	0.782	0.211	0.838
1	E	2.883	0.057	(0.021)	0.533	0.141	0.879
2	F	2.831	0.133	0.094	0.349	0.234	0.811
2	G	2.241	0.146	0.023	0.268	0.348	0.755
2	H	11.543	0.154	0.032	0.154	0.269	0.806
2	I	4.444	0.138	0.022	0.534	0.487	0.675
2	J	7.0237	0.0719	0.0221	0.4567	0.1541	0.8667

Z- Scores computed
in the final year

								Z SCORES
1	A	0.146	2.92	(3.54)	(1.61)	(1.72)	9.44	(2.8687)
1	B	0.939	(0.30)	0.24	(3.02)	2.26	6.82	(1.5731)
1	C	0.389	0.57	(0.30)	(0.96)	(0.81)	8.42	(1.1870)
1	D	0.252	0.68	(1.52)	(3.45)	3.65	6.66	(2.2352)
1	E	0.314	(0.48)	(0.64)	(2.35)	2.43	6.98	(2.2452)
2	F	0.309	(1.12)	2.86	(1.54)	4.05	6.44	2.5019
2	G	0.244	(1.23)	0.71	(1.18)	6.03	5.99	2.0591
2	H	1.258	(1.30)	0.98	(0.68)	4.66	6.40	2.8135
2	I	0.484	(1.17)	0.66	(2.35)	8.44	5.36	2.9098
2	J	0.766	(0.61)	0.68	(2.01)	2.67	6.88	(0.1342)
	V1	V2	V3	V4	V5	V6	CONSTANT	
	COEFFICIENTS	0.109	(8.46)	30.60	(4.41)	17.31	7.94	(8.50)

STATUS

- 1- Failed
- 2- Non-failed

APPENDIX 3A(1)

YEARLY Z-SCORES

A	Year	Current	Ret. earnings	Profit	Sales/	Book value	Debt	Z- SCORE
		Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	
1	1989	1.657	(1.240)	(0.527)	0.312	(0.477)	1.9120	(8.4205)
2	1990	1.193	(0.119)	0.005	0.669	0.072	0.9331	(1.5089)
3	1991	1.906	(0.134)	0.042	0.406	(0.028)	1.0291	0.0035
4	1992	1.009	(0.058)	0.014	0.117	0.001	0.9989	(0.0374)
5	1993	0.952	(0.175)	(0.112)	0.317	(0.064)	1.0686	(4.3801)
Mean		1.344	(0.345)	(0.116)	0.364	(0.099)	1.188	

B	Year	Current	Ret. earnings	Profit	Sales/	Book value	Debt	Z- SCORE
		Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	
1	1989	1.840	0.004	0.063	0.504	0.182	0.846	1.2560
2	1990	3.517	0.013	0.019	0.842	0.109	0.902	(2.3105)
3	1991	22.430	0.030	0.013	0.772	0.089	0.918	(0.4773)
4	1992	24.535	0.024	0.018	0.738	0.091	0.692	(1.6610)
5	1993	13.785	0.044	0.002	0.700	0.086	0.876	(1.9540)
6	1994	4.198	0.074	0.007	0.761	0.118	0.830	(3.1843)
7	1995	4.345	0.092	0.039	0.794	0.191	0.765	(1.7365)
8	1996	5.214	0.095	0.004	0.636	0.229	0.918	(0.1668)
9	1997	4.833	0.038	0.009	0.650	0.162	0.861	(1.2631)
10	1998	4.475	0.040	0.006	0.626	0.150	0.870	(1.4389)
11	1999	5.578	(0.05905)	(0.094)	0.519	0.027	0.973	(4.3675)
Mean		8.614	0.036	0.008	0.686	0.130	0.859	

C	Year	Current	Ret. earnings	Profit	Sales/	Book value	Debt	Z- SCORE
		Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	
1	1989	4.619	0.002	0.013	0.213	0.010	0.990	(0.5103)
2	1990	4.403	0.008	0.015	0.229	0.015	0.985	(0.5627)
3	1991	2.972	(0.005)	(0.010)	0.209	0.001	0.999	(1.4027)
4	1992	3.169	(0.039)	(0.030)	0.202	(0.032)	1.033	(1.9734)
5	1993	2.703	(0.302)	(0.037)	0.233	(0.228)	1.296	(1.4860)
Mean		3.573	(0.067)	(0.010)	0.217	(0.047)	1.060	

D	Year	Current	Ret. earnings	Profit	Sales/	Book value	Debt	Z- SCORE
		Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	
1	1997	1.988	(0.164)	(0.164)	0.511	0.428	0.700	(1.194)
2	1998	2.707	(0.060)	(0.005)	0.871	0.106	0.904	(2.675)
3	1999	2.247	(0.018)	0.019	0.965	0.098	0.911	(2.837)
Mean		2.314	(0.080)	(0.050)	0.782	0.211	0.838	

E	Year	Current	Ret. earnings	Profit	Sales/	Book value	Debt	Z- SCORE
		Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	
1	1989	3.137	0.012	0.013	0.571	0	0.928	(1.7721)
2	1990	5.297	0.007	0.014	0.834	0.073	0.932	(2.5754)
3	1991	5.056	0.046	0.015	0.579	0.104	0.906	(1.4514)
4	1992	2.366	0.043	0.011	0.494	0.088	0.919	(1.6318)
5	1993	3.051	0.118	0.016	0.654	0.173	0.852	(1.7922)
6	1994	3.491	0.050	0.016	0.733	0.183	0.845	(1.3958)
7	1995	2.438	0.044	0.012	0.642	0.159	0.863	(1.4678)
8	1996	1.626	0.049	0.012	0.521	0.140	0.877	(1.2840)
9	1997	1.039	0.046	0.011	0.448	0.117	0.895	(1.2750)
10	1998	1.009	0.036	0.009	0.460	0.098	0.911	(1.5105)
11	1999	2.195	0.067	(0.026)	0.560	0.185	0.844	(2.2041)
12	2000	2.697	0.130	(0.216)	0.354	0.249	0.800	(6.8005)
13	2001	3.150	0.110	(0.019)	0.388	0.215	0.823	(1.1252)
14	2002	3.459	0.092	0.018	0.496	0.178	0.849	(0.7087)
15	2003	3.436	0.093	0.004	0.447	0.176	0.850	(0.9522)
16	2004	2.684	(0.033)	(0.224)	0.339	0.037	0.964	(7.9769)
Mean		2.883	0.057	(0.021)	0.533	0.1406	0.879	

APPENDIX 3A(2)
YEARLY Z-SCORES

F

F					Book value of net worth/ Book value of liabilities	Debt Ratio	Z- SCORE
	Current Ratio	Ret. earnings Total Assets	Profit before tax/ Total Assets	Sales/ Total Assets			
1 1989	2.639	0.108	0.095	0.445	0.214	0.824	2.0638
2 1990	2.189	0.110	0.098	0.254	0.196	0.836	2.7307
3 1991	2.517	0.146	0.130	0.313	0.256	0.796	3.8747
4 1992	3.500	0.158	0.099	0.356	0.279	0.782	3.0424
5 1993	3.309	0.141	0.046	0.375	0.225	0.816	0.7981
	2.831	0.133	0.094	0.349	0.234	0.8107	

G

G		Book value of net worth/ Book value of liabilities					
Year	Current Ratio	Ret. earnings Total Assets	Profit before tax/ Total Assets	Sales/ Total Assets	Debt Ratio	Z- SCORE	
1 1989	3.3453	0.0274	0.0168	0.4170	0.1387	0.878	(0.319813)
2 1990	2.3596	0.0476	0.0268	0.3385	0.1406	0.877	0.073751
3 1991	1.8677	0.0800	0.0385	0.1117	0.1943	0.837	1.722867
4 1992	1.8632	0.0854	0.0070	0.1814	0.2075	0.828	0.561802
5 1993	2.0411	0.1014	(0.0015)	0.3450	0.2110	0.826	(0.494694)
6 1994	2.6426	0.1275	(0.0577)	0.3703	0.3588	0.736	(0.636402)
7 1995	1.7528	0.1100	0.1019	0.2598	0.3125	0.762	4.190032
8 1996	1.9973	0.2100	0.0183	0.2187	0.4648	0.683	3.001658
9 1997	2.2339	0.2479	0.0299	0.2664	0.5324	0.653	3.783234
10 1998	2.1711	0.2892	0.0666	0.2221	0.6534	0.605	6.459947
11 1999	2.3724	0.2749	0.0086	0.2156	0.6151	0.619	4.308258
	2.2406	0.1456	0.0232	0.2679	0.3481	0.7548	

H

H							Book value of net worth/ Book value of liabilities	Debt Ratio	Z- SCORE
Year	Current Ratio	Ret. earnings Total Assets	Profit before tax/ Total Assets	Sales/ Total Assets					
1 1989	24.8585	0.0650	0.0291	0.1671	0.1383	0.878	3.180		
2 1990	10.1445	0.0590	0.0404	0.1508	0.1208	0.892	1.852		
3 1991	5.7482	0.2056	0.0207	0.1512	0.3247	0.755	1.966		
4 1992	9.9700	0.0685	0.0374	0.1659	0.1161	0.896	1.543		
5 1993	6.9941	0.3700	0.0328	0.1373	0.6454	0.608	5.526		
	11.5431	0.1536	0.0321	0.1544	0.2691	0.806			

I

I	Year	Current	Ret. earnings	Profit	Sales/	Book value	Debt	Z- SCORE
		Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities		
1	1997	3.909	0.084	0.015	0.604	0.375	0.727	1.289
2	1998	3.603	0.155	0.033	0.553	0.494	0.669	3.030
3	1999	5.819	0.177	0.016	0.446	0.593	0.628	4.411
		4.444	0.138	0.022	0.534	0.487	0.675	

J

J					Book value of net worth/ Book value of liabilities	Debt Ratio	Z- SCORE
	Current Ratio	Ret. earnings Total Assets	Profit before tax/ Total Assets	Sales/ Total Assets			
Year	Ratio						
1 1989	9.7712	0.0794	0.0391	0.4261	0.1476	0.871	0.6832
2 1990	9.0336	0.0516	0.0131	0.4644	0.1211	0.892	(0.4209)
3 1991	8.3062	0.1157	0.0738	0.4159	0.1919	0.839	1.8322
4 1992	8.0851	0.0831	0.0337	0.4176	0.1624	0.860	0.5074
5 1993	7.0311	0.0634	0.0312	0.4218	0.1428	0.875	0.2425
6 1994	7.1318	0.0478	0.0730	0.4105	0.1345	0.881	1.6220
7 1995	6.8577	0.0538	0.0140	0.3956	0.1647	0.859	0.1438
8 1996	6.8244	0.0953	0.0085	0.4621	0.1830	0.845	(0.4619)
9 1997	8.0511	0.0835	0.0097	0.4280	0.1556	0.865	(0.3581)
10 1998	10.0557	0.0784	0.0208	0.4688	0.1385	0.878	(0.1281)
11 1999	6.9015	0.0697	0.0154	0.4565	0.1507	0.869	(0.3700)
12 2000	3.9063	0.0921	0.0057	0.4249	0.1727	0.853	(0.7931)
13 2001	5.8441	0.0656	0.0011	0.5150	0.1757	0.851	(0.8630)
14 2002	4.9977	0.0581	0.0099	0.5247	0.1473	0.872	(0.9898)
15 2003	5.9026	0.0570	0.0014	0.5745	0.1408	0.877	(1.4325)
16 2004	3.6795	0.0563	0.0027	0.5012	0.1359	0.880	(1.3611)
Mean	7.0237	0.0719	0.0221	0.4567	0.1541	0.8667	

APPENDIX 3A(1)
FINANCIAL STATEMENT DATA USED TO DERIVE RATIOS

FAILED (1)														
1 A	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib	
1 1989	23,335	14,082	26,091	2,756	35,805	49,887	(23,796)		(32,346)	8,550	(13,756)	8,131		
2 1990	44,135	37,000	97,285	53,150	53,777	90,777	6,508		(11,532)	18,040	510	65,084		
3 1991	113,848	59,720	182,050	68,202	127,626	187,346	(5,296)		(24,436)	19,140	7,566	73,947		
4 1992	71,813	71,158	340,606	268,793	269,066	340,224	382		(19,618)	20,000	4,819	39,864		
5 1993	60,315	63,346	330,104	269,789	289,412	352,758	(22,654)		(57,654)	35,000	(37,037)	104,724		
Mean	62,689	49,061	195,227	132,538	155,137	204,198	(8,971)		(29,117)	20,146		58,350		
2 B	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib	
1 1989	44,718	24,309	49,890	5,172	17,894	42,203	7,687		187	7,500	3,166	24,145	1,002	
2 1990	101,628	28,894	118,003	16,375	77,527	106,421	11,582		1,582	10,000	2,264	97,307	1,994	
3 1991	164,412	7,330	193,628	29,216	170,401	177,731	15,897		5,897	10,000	2,553	144,055	5,371	
4 1992	200,079	8,155	255,827	55,748	168,750	176,905	16,031	7,202	6,031	10,000	4,696	180,309	8,544	
5 1993	252,846	18,342	323,828	70,982	265,187	283,529	24,259	16,039	14,259	10,000	738	206,990	19,585	
6 1994	329,376	78,457	422,863	93,487	272,641	351,098	41,450	30,315	31,450	10,000	2,888	297,716	24,151	
7 1995	447,066	102,884	555,249	108,183	321,865	424,749	81,117	49,383	51,117	30,000	21,639	412,221	28,782	
8 1996	427,619	82,011	562,280	134,660	434,058	516,069	118,255	72,044	53,255	65,000	2,137	323,953	33,438	
9 1997	511,315	105,790	643,975	132,660	448,548	554,338	89,637	108,631	24,637	65,000	5,674	372,387	46,498	
10 1998	586,738	131,105	721,274	134,536	496,349	627,454	93,820	138,132	28,820	65,000	4,183	401,152	50,323	
11 1999	617,486	110,704	759,045	141,559	628,160	738,864	20,181	164,824	(44,819)	65,000	(71,608)	330,140	63,675	
Mean	334,844	63,453	418,715	83,871	300,125	363,578	47,265		15,674			253,670	25,760	
3 C	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity		Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib	
1 1989	1,924,616	416,660	2,465,233	540,617	2,023,579	2,440,239	24,994	1,507,283	4,994	20,000	32,878	177,307	348,062	
2 1990	1,998,325	453,873	2,677,210	678,885	3,973,223	2,637,054	40,156	1,790,042	20,156	20,000	39,298	230,017	383,637	
3 1991	2,292,314	771,174	3,443,029	1,150,715	4,820,741	3,438,764	4,265	2,153,151	(15,735)	20,000	(33,075)	243,696	475,530	
4 1992	2,120,536	669,122	3,280,612	1,160,076	4,939,060	3,387,537	(106,925)	2,220,645	(126,925)	20,000	(97,151)	180,309	482,059	
5 1993	2,300,393	850,990	3,426,661	1,126,268	6,666,701	4,440,019	(1,013,358)	3,077,672	(1,033,358)	20,000	(127,300)	266,030	534,077	
Mean	2,127,237	632,364	3,058,549	931,312	4,484,661	3,268,723	(210,174)		(230,174)	20,000		219,472	444,673	
4 D	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity		Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib	
1 1997	66,596	33,496	107,938	41,342	42,096	75,592	32,346		(17,654)	50,000	(17,654)	55,180		
2 1998	298,901	110,406	321,263	22,362	180,062	290,468	30,795		(19,205)	50,000	(1,550)	279,783		
3 1999	262,591	116,846	467,399	204,808	308,807	425,653	41,746		(8,254)	50,000	9,091	450,912		
Mean	209,363	86,916	298,867	89,504	176,988	263,904	34,962		(15,038)	50,000		261,958		
5 E	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib	
1 1989	73,616	23,466	82,939	9,323	53,473	76,939	6,000		1,000	5,000	1,053	47,337		
2 1990	143,194	27,033	163,812	20,618	125,667	152,700	11,112		1,112	10,000	2,266	136,641		
3 1991	168,173	33,260	207,057	38,884	154,299	187,559	19,498		9,498	10,000	3,038	119,916		
4 1992	187,402	79,220	258,519	71,117	158,284	237,504	21,015		11,015	10,000	2,727	127,605		
5 1993	173,565	56,890	330,877	157,312	225,092	281,982	48,895		38,895	10,000	5,272	216,462		
6 1994	257,298	73,706	525,802	268,504	370,663	444,369	81,433		26,433	55,000	8,614	385,556		
7 1995	418,436	171,630	853,923	435,487	564,886	736,516	117,407		37,407	80,000	10,132	548,467		
8 1996	603,316	371,133	1,362,334	759,018	823,798	1,194,931	167,403		67,403	100,000	16,412	710,319		
9 1997	703,935	677,222	1,694,118	990,183	838,877	1,516,099	178,019		78,019	100,000	18,916	759,542		
10 1998	775,434	768,536	1,874,482	1,099,048	938,723	1,707,259	167,223	2,640	67,223	100,000	17,639	860,961	2,205	
11 1999	437,397	199,301	1,677,546	1,240,149	1,216,335	1,415,636	261,910	3,398	279,932	150,000	(44,382)	934,833	5,137	
12 2000	491,192	182,095	2,153,577	1,662,385	1,541,550	1,723,645	429,932	4,329	242,799	150,000	(42,779)	843,220	16,811	
13 2001	599,163	190,212	2,216,803	1,617,640	1,633,792	1,824,004	392,799	15,242	236,265	150,000	47,297	1,257,436	12,135	
14 2002	1,168,317	337,767	2,560,796	1,392,479	1,836,764	2,174,531	386,265		248,452	150,000	11,785	1,180,815	8,313	
15 2003	1,255,197	365,280	2,661,968	1,406,771	1,898,236	2,263,516	398,452	19,093	(72,184)	150,000	(489,820)	743,070		
16 2004	961,417	358,188	2,189,614	1,095,030	1,753,610	2,111,798	77,816							
Mean	526,066	244,684	1,300,885	766,497	883,378	1,128,062	172,824		86,574	86,250		601,783	3,220	

APPENDIX 3A(2)
FINANCIAL STATEMENT DATA USED TO DERIVE RATIOS

NON-FAILED (2)

F											
	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib
1 1989	142,048	53,824	147,033	121,098	25,935		15,935	10,000	13,981	65,425	-
2 1990	175,636	80,250	184,174	153,955	30,219		20,219	10,000	18,108	46,830	
3 1991	159,285	63,274	172,794	137,601	35,193		25,193	10,000	22,381	54,025	
4 1992	152,693	43,631	165,206	129,128	36,078		26,078	10,000	16,330	58,806	
5 1993	219,656	66,377	232,807	189,994	42,813		32,813	10,000	10,698	87,407	
	169,864	61,471	180,403	146,355	34,048		24,048	10,000		62,499	-
G											
	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib
1 1989	190,470	56,937	211,926	186,109	25,817	6,788	5,817	20,000	3,560	85,363	3,001
2 1990	194,522	82,439	264,552	231,947	32,605	8,922	12,605	20,000	7,081	84,814	4,728
3 1991	162,536	87,026	241,961	202,599	39,362	17,156	19,362	20,000	9,322	20,527	6,494
4 1992	150,858	80,965	231,278	191,535	39,743	18,517	19,743	20,000	1,626	32,880	9,078
5 1993	183,676	89,988	274,403	226,586	47,817	14,821	27,817	20,000	(413)	85,424	9,249
6 1994	243,531	92,156	366,226	269,524	96,702	(16,551)	46,702	50,000	(21,126)	122,658	12,964
7 1995	246,387	140,570	390,261	297,339	92,922	6,779	42,922	50,000	39,755	82,243	19,133
8 1996	318,806	159,619	521,665	356,123	165,542	36,537	109,542	56,000	9,532	95,969	18,114
9 1997	297,080	132,985	562,632	367,149	195,483	55,005	139,483	56,000	16,826	122,513	27,378
0 1998	217,445	100,152	528,514	319,659	208,855	65,809	152,855	56,000	35,202	92,079	25,298
1 1999	212,455	89,551	528,377	327,141	201,236	71,192	145,236	56,000	4,540	94,954	18,976
	219,797	101,126	374,709	270,519	104,189		65,644	38,545		83,584	14,038
H											
	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib
1 1989	1,395,210	56,126	1,769,513	1,554,484	215,029	1,402,670	115,029	100,000	51,418	48,474	247,216
2 1990	1,437,107	141,664	2,050,230	1,829,183	221,047	1,586,012	121,047	100,000	82,826	44,586	264,496
3 1991	1,781,733	309,961	2,529,244	1,909,265	619,979	1,882,584	519,979	100,000	52,268	45,716	336,694
4 1992	1,927,361	193,317	2,814,992	2,522,098	292,894	2,198,823	192,894	100,000	105,374	68,580	398,453
5 1993	3,028,959	433,072	4,491,208	2,729,564	1,761,644	3,359,290	1,661,644	100,000	147,119	140,776	475,811
	1,914,074	226,828	2,731,037	2,108,919	622,119	2,085,876	522,119	100,000		69,626	344,534
I											
	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib
1 1997	204,941	52,432	264,742	192,537	72,205		22,205	50,000	4,060	159,815	
2 1998	147,319	40,886	284,146	190,207	93,939		43,939	50,000	9,474	157,104	
3 1999	183,165	31,475	255,846	160,572	95,274		45,274	50,000	4,069	114,031	
	178,475	41,598	268,245	181,105	87,139	-	37,139	50,000		143,650	-
J											
	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000	KSHS. 000
Year	Current Assets	Current Liabilities	Total Assets	Total Liabilities	Equity	Life Fund	Retained Earnings	Share capital	Profit before tax	Premium Income gib	Premium Income lib
1 1989	171,768	17,579	233,331	203,314	30,017		18,517	11,500	9,119	33,367	66,064
2 1990	292,120	32,337	354,446	316,157	38,289	214,175	18,289	20,000	4,652	70,760	93,841
3 1991	358,353	43,143	441,999	370,842	71,157	221,945	51,157	20,000	32,618	83,728	100,115
4 1992	443,879	54,901	529,506	455,530	73,976	280,754	43,976	30,000	17,819	78,357	142,756
5 1993	539,310	76,703	650,072	568,838	81,234	335,190	41,234	40,000	20,280	99,169	175,061
6 1994	550,867	77,241	707,008	623,189	83,819	401,255	33,819	50,000	51,621	107,448	182,810
7 1995	602,676	87,883	798,765	685,814	112,951	435,066	42,951	70,000	11,203	143,243	172,753
8 1996	784,163	114,905	1,179,321	996,916	182,405	646,203	112,405	70,000	10,041	231,810	313,135
9 1997	959,607	119,189	1,370,269	1,185,815	184,454	734,925	114,454	70,000	13,261	261,031	325,497
10 1998	1,146,572	114,022	1,616,580	1,419,904	196,676	911,438	126,676	70,000	33,586	327,286	430,569
11 1999	1,092,459	158,293	1,631,374	1,417,662	213,712	878,900	113,712	100,000	25,201	306,809	437,980
12 2000	1,152,044	294,921	1,814,318	1,547,175	267,143	819,268	167,143	100,000	10,424	280,632	490,258
13 2001	1,117,109	191,150	1,790,132	1,522,651	267,481	932,265	117,481	150,000	1,954	347,292	574,693
14 2002	1,429,952	286,124	2,133,170	1,859,300	273,870	1,011,325	123,870	150,000	21,020	543,528	575,696
15 2003	1,545,278	261,796	2,259,320	1,980,544	278,776	1,098,518	128,776	150,000	3,259	692,801	605,113
16 2004	1,654,215	449,581	2,367,010	2,083,754	283,256	1,078,847	133,256	150,000	6,400	630,077	556,210
Mean	865,023	148,736	1,242,289	1,077,338	164,951	625,005	86,732	78,219		264,834	327,659

APPENDIX 3(B)

SUMMARY -GENERAL INSURANCE BUSINESS

Status	Company Name	Current Ratio X1	Ret. earnings Total Assets X2	Profit before tax/ Total Assets X3	Sales/ Total Assets X4	Bk val. of net worth/ Book val. of liab X5	Debt Ratio X6	
1	A	1.344	(0.345)	(0.116)	0.364	(0.099)	1.188	
1	B	8.061	0.048	0.006	0.697	0.158	0.845	
1	C	0.039	(0.613)	(0.079)	0.321	(0.150)	1.585	
1	D	2.314	(0.080)	(0.050)	0.782	0.211	0.838	
1	E	2.777	0.047	(0.021)	0.532	0.140	0.879	
2	F	2.831	0.133	0.094	0.349	0.234	0.811	
2	G	1.726	0.184	0.029	0.261	0.568	0.701	
2	H	5.021	0.218	0.031	0.513	0.467	0.683	
2	I	4.444	0.138	0.022	0.534	0.487	0.675	
2	J	3.5636	0.1642	0.0520	0.4771	0.3200	1.2158	
Z- Scores computed in the final year								
		X1	X2	X3	X4	X5	X6	Z SCORE
1	A	(0.005)	0.28	(2.54)	(1.97)	(0.99)	2.97	(4.2473)
1	B	(0.032)	(0.04)	0.14	(3.77)	1.57	2.11	(2.0123)
1	C	(0.000)	0.49	(1.74)	(1.73)	(1.50)	3.96	(2.5104)
1	D	(0.009)	0.06	(1.09)	(4.23)	2.09	2.10	(3.0665)
1	E	(0.011)	(0.04)	(0.46)	(2.88)	1.39	2.20	(1.7942)
2	F	(0.011)	(0.11)	2.05	(1.89)	2.33	2.03	2.4146
2	G	(0.007)	(0.15)	0.63	(1.41)	5.64	1.75	4.4719
2	H	(0.020)	(0.17)	0.68	(2.77)	4.65	1.71	2.0717
2	I	(0.018)	(0.11)	0.47	(2.89)	4.85	1.69	1.9977
2	J	(0.014)	(0.13)	1.14	(2.58)	3.18	3.04	2.6468
COEFFICIENTS								
		V1 (0.004)	V2 (0.80)	V3 21.95	V4 (5.41)	V5 9.94	V6 2.50	CONSTANT (1.99)
STATUS 1- Failed 2- Non-failed								

APPENDIX 3B(1)

YEARLY Z SCORES

A

		Current	Ret. earnings	Profit	Sales/	Book value of net worth/ Book value	Debt	
	<u>YEAR</u>	<u>Ratio</u>	<u>Total Assets</u>	<u>before tax/ Total Assets</u>	<u>Total Assets</u>	<u>of liabilities</u>	<u>Ratio</u>	<u>Z-Score</u>
1	1989	1.657	(1.240)	(0.527)	0.312	(0.477)	1.9120	(14.2284)
2	1990	1.193	(0.119)	0.005	0.669	0.072	0.9331	(2.3592)
3	1991	1.906	(0.134)	0.042	0.406	(0.028)	1.0291	(0.8847)
4	1992	1.009	(0.058)	0.014	0.117	0.001	0.9989	0.2368
5	1993	0.952	(0.175)	(0.112)	0.317	(0.064)	1.0686	(4.0010)
Mean		1.344	(0.345)	(0.116)	0.364	(0.099)	1.188	

B

		Current	Ret. earnings	Profit	Sales/	Book value of net worth/ Book value	Debt	
	<u>YEAR</u>	<u>Ratio</u>	<u>Total Assets</u>	<u>before tax/ Total Assets</u>	<u>Total Assets</u>	<u>of liabilities</u>	<u>Ratio</u>	<u>Z-Score</u>
1	1989	1.840	0.004	0.063	0.484	0.182	0.846	0.6996
2	1990	3.517	0.013	0.019	0.825	0.109	0.902	(2.7182)
3	1991	22.430	0.030	0.013	0.744	0.089	0.918	(2.6557)
4	1992	23.651	0.024	0.019	0.725	0.094	0.683	(2.9677)
5	1993	12.911	0.046	0.002	0.673	0.091	0.869	(2.5902)
6	1994	4.028	0.082	0.008	0.773	0.121	0.892	(2.6595)
7	1995	4.045	0.102	0.043	0.822	0.219	0.740	(1.5643)
8	1996	4.677	0.109	0.004	0.666	0.269	0.905	(0.6694)
9	1997	3.806	0.046	0.011	0.696	0.201	0.833	(1.4917)
10	1998	3.680	0.095	0.007	0.701	0.264	0.791	(1.1081)
11	1999	4.089	(0.02240)	(0.121)	0.556	0.095	0.913	(4.4098)
Mean		8.061	0.048	0.006	0.697	0.158	0.845	(2.012)

C

		Current	Ret. earnings	Profit	Sales/	Book value of net worth/ Book value	Debt	
	<u>YEAR</u>	<u>Ratio</u>	<u>Total Assets</u>	<u>before tax/ Total Assets</u>	<u>Total Assets</u>	<u>of liabilities</u>	<u>Ratio</u>	<u>Z-Score</u>
1	1989	0.616	0.006	0.041	0.222	0.032	0.969	0.4472
2	1990	0.459	0.023	0.044	0.259	0.047	0.955	0.4171
3	1991	0.180	(0.012)	(0.026)	0.189	0.003	0.997	(1.0420)
4	1992	(0.150)	(0.120)	(0.092)	0.170	(0.092)	1.101	(2.9856)
5	1993	(0.913)	(2.961)	(0.365)	0.762	(0.744)	3.904	(9.3885)
Mean		0.039	(0.613)	(0.079)	0.321	(0.150)	1.585	

D

		Current	Ret. earnings	Profit	Sales/	Book value of net worth/ Book value	Debt	
	<u>YEAR</u>	<u>Ratio</u>	<u>Total Assets</u>	<u>before tax/ Total Assets</u>	<u>Total Assets</u>	<u>of liabilities</u>	<u>Ratio</u>	<u>Z-Score</u>
1	1997	1.988	(0.164)	(0.164)	0.511	0.428	0.700	(2.218)
2	1998	2.707	(0.060)	(0.005)	0.871	0.106	0.904	(3.456)
3	1999	2.247	(0.018)	0.019	0.965	0.098	0.911	(3.525)
Mean		2.314	(0.080)	(0.050)	0.782	0.211	0.838	(3)

APPENDIX 33(2)

YEARLY Z SCORES

E

		Current	Ret. earnings	Profit	Sales/	Book value	Debt	
	YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1	1989	3.137	0.012	0.013	0.571	0.0723	0.928	(1.7832)
2	1990	5.297	0.007	0.014	0.834	0.073	0.932	(3.1718)
3	1991	5.056	0.046	0.015	0.579	0.104	0.906	(1.5602)
4	1992	2.366	0.043	0.011	0.494	0.088	0.919	(1.2963)
5	1993	3.051	0.118	0.016	0.654	0.173	0.852	(1.4312)
6	1994	3.491	0.050	0.016	0.733	0.183	0.845	(1.7168)
7	1995	2.438	0.044	0.012	0.642	0.159	0.863	(1.5081)
8	1996	1.626	0.049	0.012	0.521	0.140	0.877	(1.0070)
9	1997	1.039	0.046	0.011	0.448	0.117	0.895	(0.8071)
10	1998	1.006	0.036	0.009	0.460	0.098	0.911	(1.0527)
11	1999	2.176	0.064	(0.027)	0.558	0.181	0.846	(1.7331)
12	2000	2.157	0.130	(0.216)	0.352	0.250	0.800	(4.2712)
13	2001	3.133	0.110	(0.019)	0.383	0.217	0.822	(0.3766)
14	2002	3.459	0.047	0.018	0.491	0.178	0.849	(0.4041)
15	2003	2.002	0.049	0.004	0.449	0.176	0.850	(0.4927)
16	2004	3.002	(0.099)	(0.227)	0.345	0.024	0.977	(6.0956)
Mean		2.777	0.047	(0.021)	0.532	0.1397	0.879	

H

		Current	Ret. earnings	Profit	Sales/	Book value	Debt	
	YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1	1989	5.0394	0.2887	0.0739	0.3735	0.5832	0.640	4.074
2	1990	4.1419	0.2275	0.0314	0.4584	0.4643	0.674	2.950
3	1991	3.5864	0.2150	0.0114	0.5027	0.4789	0.575	1.510
4	1992	3.3675	0.1827	0.0368	0.5015	0.4105	0.708	1.389
5	1993	10.8069	0.1894	0.0154	0.7240	0.3851	0.717	(0.043)
Mean		5.0210	0.2176	0.0308	0.5127	0.4674	0.683	

I

		Current	Ret. earnings	Profit	Sales/	Book value	Debt	
	YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1	1997	3.309	0.084	0.015	0.604	0.378	0.737	0.546
2	1998	3.603	0.185	0.031	0.593	0.404	0.689	2.197
3	1999	5.819	0.177	0.016	0.445	0.393	0.628	3.892
Mean		4.444	0.135	0.022	0.534	0.407	0.675	1.993

APPENDIX 3B(2)

YEARLY Z SCORES

F

	Current	Ret. earnings	Profit	Sales/	Book value	Debt	
YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1 1989	2.639	0.108	0.095	0.445	0.214	0.824	1.7807
2 1990	2.189	0.110	0.098	0.254	0.196	0.836	2.7368
3 1991	2.517	0.146	0.130	0.313	0.256	0.796	3.5683
4 1992	3.500	0.158	0.099	0.356	0.279	0.782	2.8454
5 1993	3.309	0.141	0.046	0.375	0.225	0.816	1.1419
Mean	2.831	0.133	0.094	0.349	0.234	0.8107	

G

	Current	Ret. earnings	Profit	Sales/	Book value	Debt	
YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1 1989	3.2261	0.0284	0.0174	0.4161	0.1440	0.874	(0.279554)
2 1990	2.2514	0.0493	0.0277	0.3318	0.1462	0.872	0.408776
3 1991	1.6705	0.0861	0.0415	0.0913	0.2123	0.825	2.522647
4 1992	1.6345	0.0928	0.0076	0.1545	0.2297	0.813	1.577253
5 1993	1.8764	0.1072	(0.0016)	0.3291	0.2258	0.816	0.385723
6 1994	2.8222	0.1220	(0.0552)	0.3204	0.3380	0.747	0.185217
7 1995	1.7045	0.1119	0.1037	0.2145	0.3198	0.758	4.102351
8 1996	1.7684	0.2258	0.0196	0.1978	0.5180	0.659	3.980438
9 1997	1.8203	0.2748	0.0331	0.2413	0.6263	0.615	4.968951
10 1998	0.0858	0.4782	0.1101	0.2881	1.8849	0.347	18.095508
11 1999	0.1253	0.4440	0.0139	0.2903	1.5983	0.385	13.244045
Mean	1.7259	0.1837	0.0289	0.2614	0.5676	0.7010	

H

	Current	Ret. earnings	Profit	Sales/	Book value	Debt	
YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1 1989	3.0384	0.2687	0.0789	0.3769	0.5632	0.640	4.674
2 1990	4.1436	0.2275	0.0314	0.4584	0.4843	0.674	2.520
3 1991	3.5984	0.2100	0.0114	0.5027	0.4789	0.676	1.810
4 1992	3.3675	0.1927	0.0169	0.5015	0.4156	0.706	1.398
5 1993	10.9569	0.1894	0.0154	0.7240	0.3951	0.717	(0.043)
Mean	5.0210	0.2176	0.0308	0.5127	0.4674	0.683	

I

	Current	Ret. earnings	Profit	Sales/	Book value	Debt	
YEAR	Ratio	Total Assets	before tax/ Total Assets	Total Assets	of net worth/ Book value of liabilities	Ratio	Z-Score
1 1997	3.909	0.084	0.015	0.604	0.375	0.727	0.545
2 1998	3.603	0.155	0.033	0.553	0.494	0.669	2.197
3 1999	5.819	0.177	0.016	0.446	0.593	0.628	3.252
Mean	4.444	0.138	0.022	0.534	0.487	0.675	1.998

J						Book value of net worth/ Book value of liabilities		
		Current	Ret. earnings	Profit	Sales/		Debt	
YEAR		Ratio	Total Assets	before tax/ Total Assets	Total Assets		Ratio	Z-Score
1	1989	0.9406	0.2371	0.1168	0.4272	0.1476	2.603	6.0459
2	1990	2.3574	0.1545	0.0393	0.5976	0.1211	2.670	3.3876
3	1991	4.6745	0.2575	0.1642	0.4214	0.5580	0.642	6.2615
4	1992	8.0851	0.0831	0.0337	0.1480	0.1624	0.860	1.6140
5	1993	3.5892	0.1486	0.0731	0.3574	0.1428	2.050	4.0931
6	1994	3.5351	0.1177	0.1797	0.3740	0.1345	2.169	6.5842
7	1995	4.1097	0.1272	0.0332	0.4241	0.1647	2.030	3.0401
8	1996	3.9249	0.2364	0.0211	0.4876	0.6226	0.616	3.3620
9	1997	4.8902	0.2227	0.0258	0.5080	0.5600	0.641	2.8012
10	1998	4.6735	0.2114	0.0558	0.5435	0.4872	0.672	2.6315
11	1999	3.1351	0.1807	0.0400	0.4875	0.4123	0.708	1.9637
12	2000	1.7697	0.1631	0.0141	0.3802	0.3475	0.742	1.4359
13	2001	2.3919	0.1365	0.0029	0.5228	0.4026	0.713	0.9127
14	2002	3.0216	0.1218	0.0232	0.5994	0.3022	0.768	0.0909
15	2003	3.5510	0.1160	0.0034	0.7302	0.2843	0.779	(1.1987)
16	2004	2.3681	0.1134	0.0063	0.6242	0.2698	0.788	(0.6764)
Mean		3.5636	0.1642	0.0520	0.4771	0.3200	1.2158	

APPENDIX 3B(1)
FINANCIAL STATEMENT DATA USED TO DERIVE RATIOS

1 A

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	23,335	14,082	26,091	2,756	35,805	49,887	(23,796)	(32,346)	8,550	8,131	(13,756)
2	1990	44,135	37,000	97,285	53,150	53,777	90,777	6,508	(11,532)	18,040	65,084	510
3	1991	113,848	59,720	182,050	68,202	127,626	187,346	(5,296)	(24,436)	19,140	73,947	7,566
4	1992	71,813	71,158	340,606	268,793	269,066	340,224	382	(19,618)	20,000	39,864	4,819
5	1993	60,315	63,346	330,104	269,789	289,412	352,758	(22,654)	(57,654)	35,000	104,724	(37,037)
	Mean	62,689	49,061	195,227	132,538	155,137	204,198	(8,971)	(29,117)	20,146	58,350	(7,580)

2 S

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	44,718	24,309	49,890	5,172	17,894	42,203	7,687	187	7,500	24,145	3,166
2	1990	101,628	28,894	118,003	16,375	77,527	106,421	11,582	1,582	10,000	97,307	2,264
3	1991	164,412	7,330	193,628	29,216	170,401	177,731	15,897	5,897	10,000	144,055	2,553
4	1992	192,877	8,155	248,625	55,748	161,548	169,703	16,031	6,031	10,000	180,309	4,696
5	1993	236,807	18,342	307,789	70,982	249,148	267,490	24,259	14,259	10,000	206,990	738
6	1994	295,474	73,348	385,045	89,571	270,247	343,595	41,450	31,450	10,000	297,716	2,888
7	1995	411,528	101,732	501,443	89,915	269,211	370,943	81,117	51,117	30,000	412,221	21,639
8	1996	371,983	79,527	486,369	114,386	360,631	440,158	118,255	53,255	65,000	323,953	2,137
9	1997	402,684	105,790	535,344	132,660	339,917	445,707	89,637	24,637	65,000	372,387	5,674
10	1998	475,113	129,107	572,326	97,213	323,608	452,715	119,611	54,611	65,000	401,152	4,183
11	1999	452,662	110,704	594,221	141,559	431,828	542,532	51,689	(13,311)	65,000	330,140	(71,608)
	Mean	286,353	62,476	362,971	76,618	242,905	305,382	52,474	20,883		253,670	(1,970)

3 C

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	256,845	416,660	797,462	540,617	355,808	772,468	24,994	4,994	20,000	177,307	32,878
2	1990	208,283	453,873	887,168	678,885	2,183,181	847,012	40,156	20,156	20,000	230,017	39,298
3	1991	139,163	771,174	1,289,878	1,150,715	2,667,590	1,285,613	4,265	(15,735)	20,000	243,696	(33,075)
4	1992	(100,109)	669,122	1,059,967	1,160,076	2,718,415	1,166,892	(106,925)	(126,925)	20,000	180,309	(97,151)
5	1993	(777,279)	850,990	348,989	1,126,268	3,589,029	1,362,347	(1,013,358)	(1,033,358)	20,000	266,030	(127,300)
	Mean	(54,619)	632,364	876,693	931,312	2,302,805	1,086,866	(210,174)	(230,174)	20,000	219,472	(37,070)

4 D

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1997	66,596	33,496	107,938	41,342	42,096	75,592	32,346	(17,654)	50,000	55,180	(17,654)
2	1998	298,901	110,406	321,263	22,362	180,062	290,468	30,795	(19,205)	50,000	279,783	(1,550)
3	1999	262,591	116,846	467,399	204,808	308,807	425,653	41,746	(8,254)	50,000	450,912	9,091
	Mean	209,363	86,916	298,867	89,504	176,988	263,904	34,962	(15,038)	50,000	261,958	(3,371)

5 E

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	73,616	23,466	82,939	9,323	53,473	76,939	6,000	1,000	5,000	47,337	1,053
2	1990	143,194	27,033	163,812	20,618	125,667	152,700	11,112	1,112	10,000	136,641	2,266
3	1991	168,173	33,260	207,057	38,884	154,299	187,559	19,498	9,498	10,000	119,916	3,038
4	1992	187,402	79,220	258,519	71,117	158,284	237,504	21,015	11,015	10,000	127,605	2,727
5	1993	173,565	56,890	330,877	157,312	225,092	281,982	48,895	38,895	10,000	216,462	5,272
6	1994	257,298	73,706	525,802	268,504	370,663	444,369	81,433	26,433	55,000	385,556	8,614
7	1995	418,436	171,630	853,923	435,487	564,886	736,516	117,407	37,407	80,000	548,467	10,132
8	1996	603,316	371,133	1,362,334	759,018	823,798	1,194,931	167,403	67,403	100,000	710,319	16,412
9	1997	703,935	677,222	1,694,118	990,183	838,877	1,516,099	178,019	78,019	100,000	759,542	18,916
10	1998	772,794	768,536	1,871,842	1,099,048	936,083	1,704,619	167,223	67,223	100,000	860,961	17,639
11	1999	433,762	199,301	1,673,911	1,240,149	1,217,500	1,416,801	257,110	107,110	150,000	934,833	(44,382)
12	2000	485,445	225,013	2,146,751	1,661,306	1,491,806	1,716,819	429,932	279,932	150,000	756,343	(464,689)
13	2001	589,545	188,185	2,201,143	1,611,598	1,620,159	1,808,344	392,799	242,799	150,000	843,220	(42,779)
14	2002	1,168,317	337,767	2,560,796	1,392,479	1,836,764	2,174,531	386,265	121,265	265,000	1,257,436	47,297
15	2003	1,224,281	611,664	2,631,052	1,406,771	1,625,938	2,237,602	393,450	128,450	265,000	1,180,815	11,785
16	2004	1,071,037	356,789	2,155,551	1,084,514	1,748,186	2,104,975	50,576	(214,424)	265,000	743,070	(489,820)
	Mean	529,632	262,551	1,295,027	765,394	861,967	1,124,518	170,509	62,696	107,813	601,783	(56,032)

1 F

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	142,048	53,824	147,033	6,412	67,274	121,098	25,935	15,935	10,000	65,425	13,981
2	1990	175,636	80,250	184,174	8,538	73,705	153,955	30,219	20,219	10,000	46,830	18,108
3	1991	159,285	63,274	172,794	13,509	74,327	137,601	35,193	25,193	10,000	54,025	22,381
4	1992	152,693	43,631	165,206	12,513	85,497	129,128	36,078	26,078	10,000	58,806	16,330
5	1993	219,656	66,377	232,807	13,151	123,617	189,994	42,813	32,813	10,000	87,407	10,698
	Mean	169,864	61,471	180,403	10,825	84,884	146,355	34,048	24,048	10,000	62,499	16,300

G

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	183,682	56,937	205,138	21,456	122,384	179,321	25,817	5,817	20,000	85,363	3,560
2	1990	185,600	82,439	255,630	70,030	140,586	223,025	32,605	12,605	20,000	84,814	7,081
3	1991	145,380	87,026	224,805	79,425	98,417	185,443	39,362	19,362	20,000	20,527	9,322
4	1992	132,341	80,965	212,761	80,420	92,053	173,018	39,743	19,743	20,000	32,880	1,626
5	1993	168,855	89,988	259,582	90,727	121,777	211,765	47,817	27,817	20,000	85,424	(413)
6	1994	260,082	92,156	382,777	122,695	193,919	286,075	96,702	46,702	50,000	122,658	(21,126)
7	1995	239,608	140,570	383,482	143,874	149,990	290,560	92,922	42,922	50,000	82,243	39,755
8	1996	282,269	159,619	485,128	202,859	159,967	319,586	165,542	109,542	56,000	95,969	9,532
9	1997	242,075	132,985	507,627	265,552	179,159	312,144	195,483	139,483	56,000	122,513	16,826
10	1998	8,590	100,152	319,659	311,069	10,652	110,804	208,855	152,855	56,000	92,079	35,202
11	1999	11,219	89,551	327,141	315,922	36,354	125,905	201,236	145,236	56,000	94,954	4,540
	Mean	169,064	101,126	323,975	154,912	118,660	219,786	104,189	65,644	38,545	83,584	9,628

H

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	240,188	79,051	449,378	209,190	28,597	287,466	161,912	120,731	41,181	169,358	35,435
2	1990	268,192	64,724	500,189	231,997	37,416	336,997	163,192	113,777	49,415	229,263	15,693
3	1991	266,869	74,164	520,909	254,040	31,369	352,232	168,677	109,380	59,297	261,861	5,925
4	1992	292,267	86,791	587,825	295,558	328,464	415,255	172,570	113,273	59,297	294,795	9,925
5	1993	382,298	34,891	631,964	249,666	67,446	452,988	178,976	119,679	59,297	457,564	9,737
	Mean	289,963	67,924	538,053	248,090	98,658	368,988	169,065	115,368	53,697	282,568	15,343

I

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1997	204,941	52,432	264,742	59,801		192,537	72,205	22,205	50,000	159,815	4,060
2	1998	147,319	40,886	284,146	136,827		190,207	93,939	43,939	50,000	157,104	9,474
3	1999	183,165	31,475	255,846	72,681		160,572	95,274	45,274	50,000	114,031	4,069
	Mean	178,475	41,598	268,245	89,770	-	181,105	87,139	37,139	50,000	143,650	5,868

J

	YEAR	Current Assets	Current Liabilities	Total Assets	Fixed Assets	Long term Liabilities	Total Liabilities	Equity	Retained Earnings	Share capital	Premium Income GIB	Profit Before Tax
1	1989	16,535	17,579	78,098	61,563	185,735	203,314	30,017	18,517	11,500	33,367	9,119
2	1990	56,077	23,788	118,403	62,326	292,369	316,157	38,289	18,289	20,000	70,760	4,652
3	1991	167,940	35,927	198,686	30,746	91,602	127,529	71,157	51,157	20,000	83,728	32,618
4	1992	443,879	54,901	529,506	85,627	400,629	455,530	73,976	43,976	30,000	78,357	17,819
5	1993	240,725	67,070	277,487	36,762	501,768	568,838	81,234	41,234	40,000	99,169	20,280
6	1994	241,619	68,348	287,260	45,641	554,841	623,189	83,819	33,819	50,000	107,448	51,621
7	1995	285,365	69,437	337,763	52,398	616,377	685,814	112,951	42,951	70,000	143,243	11,203
8	1996	360,229	91,781	475,387	115,158	201,201	292,982	182,405	112,405	70,000	231,810	10,041
9	1997	351,177	71,812	513,838	162,661	257,572	329,384	184,454	114,454	70,000	261,031	13,261
10	1998	380,178	81,348	602,186	222,008	323,564	404,912	197,274	127,274	70,000	327,286	33,586
11	1999	373,238	119,053	629,333	256,095	326,567	445,620	183,713	113,713	70,000	306,809	25,201
12	2000	401,919	227,109	738,063	336,144	320,611	547,720	190,343	120,343	70,000	280,632	10,424
13	2001	350,612	146,586	664,352	313,740	327,085	473,671	190,681	90,681	100,000	347,292	1,954
14	2002	662,639	219,302	906,833	244,194	477,100	696,402	210,431	110,431	100,000	543,528	21,020
15	2003	698,436	196,689	948,784	250,348	542,079	738,768	210,016	110,016	100,000	692,801	3,259
16	2004	760,051	320,952	1,009,423	249,372	473,976	794,928	214,495	114,495	100,000	630,077	6,400
	Mean	361,914	113,230	519,713	157,799	368,317	481,547	140,953	78,985	61,969	264,834	17,029