



**THE UNIVERSITY OF NAIROBI
SCHOOL OF MATHEMATICS**

ENTERPRISE RISK MANAGEMENT AMONG COMMERCIAL BANKS

MASTER OF SCIENCE IN SOCIAL STATISTICS

BY:

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DECLARATION

I the undersigned, declare that this project is my original work, and to the best of my knowledge and ability, has not been presented for the award of any degree in this university or any other university.

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Supervisor Approval

This research proposal has been presented for examination with my approval as university supervisor.

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Date:

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The University of Nairobi Msc. Lecturers year 2008/2009-2009/2010 and my project supervisor; Dr. Mwaniki Ivivi having played the bigger role through the guidance provided to ensure that this work met the required thresholds for the attainment of the Msc. Degree.

ABSTRACT

This project work majors on the effect of Enterprise Risk Management (ERM) adoption on a commercial bank's corporate reputation and its overall effect after adoption of the strategy. ERM may impact corporate reputation in a variety of ways. First, ERM is a management process that enables a firm to holistically manage all risks. This creates a process in which individual risks, including reputation risk, are identified, assessed, and managed in a unified manner so that the firm value is maximized. Second, ERM encourages disclosure of risks, so that stakeholders can better understand bank's risk appetite, which risks a bank is accepting and which it is avoiding. This greater disclosure is generally viewed positively by outside stakeholders because it allows them to better manage their own risk profiles. Finally, ERM provides a strategic response to a reputation damaging event.

From a thorough examination of a range of reputation proxies, it's evidenced that implementation of an ERM program may enhance corporate reputation, though more clearly felt in the long-term. This is more evidently explained by yearly time series plots on the relevant proxies found to contribute significantly to the expected results, an elaborate long-run effect as opposed to when absolute yearly proxy values are used. In addition, ERM adoption tends to occur during a period in which various reputation measures tend to be decreasing, suggesting the commercial banks may be implementing ERM as a response to a decline in corporate fortunes. The results obtained suggest that following ERM adoption, the decline in reputational measures appears reduced, and in some cases reversed.

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LIST OF ACRONYMS AND ABBREVIATIONS

ERM	Enterprise Risk Management
MDA	Multiple discriminant analysis
CRO	Chief Risk Officer
OCC	Office of the Comptroller of the Currency
DMA	Multiple discriminant analysis
ROA	Return on Assets
PoB	Probability of Bankruptcy
FINL	Financial Leverage
LIQ	Measures Liquidity
DSRI	Days sales in Receivable Index
GMI	Gross Margin Index
SGI	Sales Growth Index
AQI	Asset Quality Index
DEPI	Depreciation Index
SGA//SAI	Sales and General and Administrative Expenses Index
LVGI	Leverage Index
SDCF	Cash Flow Volatility (Standard Deviation)
AW	Average Wage
WG	Wage Growth
TATA	Total Accruals to Total Assets

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

An organization's reputation is the general estimation in which the organization is held by the public and other observers, based on what is known or said about it. Reputation is an asset just as real as our people and brands. It's the most important commercial mechanism for conveying information to the consumers (John Kay, 1993). Though totally intangible, reputation is likely to be critical for an institution's continuing success. Hence the big question that each Commercial Bank must ask is; 'How much do we value our reputation?'

It is very important that each bank understands the value of its reputation as to some extent it is a measure of the risk it is running. The concept of Reputational Equity as developed by Rory Knight and Deborah Pretty (1963) is a starting point for assessing the financial value for the reputation of a financial institution. In ascertaining the degree to which reputation of a commercial bank may affect its operation and how to put measures in place to avert negative reputation, this concept may be employed. The logic behind Reputational Equity is that a significant part of many successful commercial banks' share price is made up not from tangible assets such as property, stock and reserves, but from intangible, but from the goodwill element. This includes various intangibles such as the potential future profit stream, the value bands, but above all it's a factor of a bank's reputation. The greater the reputation contribution to the share price, more there is to lose. For some commercial banks, the value of the reputation is several times that of their tangible assets.

Loss of reputation with one stakeholder group can spread to others and damage the banking institution by erosion of what can be called reputational equity. Serious incidences that can cause major reputational damage can threaten a bank's future results, even its existence. Paradoxically, if an incident or issue is perceived to be well handled by the bank, recovery can be complete and, in rare cases, reputation may have been enhanced. The art of putting into place relevant measures to manage reputation is what shall be termed as Enterprise Risk Management adoption.

As the world become more and more networked, more and more companies especially commercial banks are exposed to a changing set of vulnerabilities, commercial banks not excluded. The landscape of risk has changed. No longer can any country or organisation ignore the Insurance Industry and countless scandals facing organisations. In this new world, incidences can damage a good reputation purely because an organisation can take too long to act decisively with problems. For instance a reputation damaging incident can become both local international news in a matter of seconds and destroy relationships and brand value in other countries where the incident did not even take place.

The reputation of a bank is both its most important asset, which is most difficult to recover once it is lost. Expectations of commercial banks' virtues have hardened to the point where the value of a bank's reputation is practically impossible to underestimate. This can be attributed to the fact that as some countries/regions are strategically located and offer promising business environments for being hub to most multilateral companies, for example Kenya in Africa, there is a huge corporate customer growth potential that every Kenyan Commercial Bank is willing to capture

This project aims to empower readers and parties with interest, knowledge, tools and techniques through which they can enhance and protect their bank's most fragile asset and its greatest risk – its reputation. Working towards protecting a bank's reputation is the act of 'insulating'. By reducing or preventing the transmission of wrong messages, incorrect actions and "flow" we can protect against Reputation Risk. The figures and surveys are there to support the need for sensitivity about reputation. Reputation has with time become as the number one risk in commercial banks.

Each bank is becoming more and more aware of the fact that their reputation in the eyes of their customers, shareholders, the regulator, the various world governments, competitors and the public at large can no longer be ignored as the sustenance, continuity and success of such banks depend largely on their reputation. To minimise reputation risk – the way a bank or a financial institution is viewed by its stakeholders, other commercial banks and/or financial institutions need to take a total view of the structure of the bank in question - from operations

and behaviours to policies and objectives - so that methods of securing and protecting the business can be worked out.

Creating a robust reputation protection framework necessitates a holistic view of the institution. This is why using a third party can be particularly beneficial. Because they are so familiar with their own businesses, commercial banks can make assumptions which outside consultants will question. Consultants will look at a bank from the top down and are able to bridge all the information and operational silos that a typical organisation's structure generally creates. For example, management may believe that reputation can be managed by a Public Relations or Communication department-which is also essential anyway. Yet the reality is that crisis do not hit in a departmental silo but impacts across boundaries. If a commercial bank wants to protect its reputation it will need to identify those smouldering crises – the unknowns that can cause unwanted publicity and destruction long before it appears or is mentioned in a blog, on a website or in mainstream media.

There is the need to constantly think what will affect stakeholder's perceptions. It means factoring reputation into decision making, to constantly talk about it and constantly try to impact upon it. As this is done two aspects should be borne in mind; economic aspect-economic agents rely on proxies such as reputation in order to infer competitors' behaviour, commitment to quality with respect to the different banking products offered in a given commercial bank. Strategic aspect – reputation is a strategic asset since it's difficult to duplicate or reproduce. It is inertial and constitutes a barrier to mobility and entry.

1.1.1 General View of Reputational Risk Profiling Approach

No matter a commercial bank's current reputation, there are constructive steps it can take to move in the right direction.

Generally, the below four broad steps suggest a strategy towards repairing reputation as a four-part process:

1. **Identify reputational risks.** Reputation Institute advises assessing the gap between stakeholder's perceptions/beliefs and the bank's actual performance. Nearly 60 percent of respondents indicated that assessing the perceptions and concerns of

stakeholders was an extremely or very significant issue, making it the highest-ranked challenge.

2. **Prioritize reputation risks and stakeholder.** I highly recommend assessing the probability of risks and the impact of the risk on reputation. Efforts are being made to quantify the value of reputation. A select group of companies is making progress in this area by working with specialist consulting firms to quantify the impact of reputation on share price, according to The Conference Board.
3. **Identify effective means for mitigating risks and executing the risk strategy.** To assess the best response strategy based on controllability of risk, the impact of risk on the business across stakeholders and the cost of implementing the strategy. A bank's reputation should be considered during the preparation and execution of strategy and new projects, which may have not been the case in most of our Kenyan Commercial banks.
4. **Monitor changing beliefs and expectations.** Closely monitoring changes in stakeholders' beliefs and expectations that may affect reputation is very essential. Media monitoring has become more sophisticated, providing more tools to assess good, bad or neutral coverage and its prominence. Social media are gaining influence, but most banks do ignore them. More customers, prospective customers/clients and other stakeholders are gathering information from blogs, online forums and social networking sites, yet very few, if any Kenyan commercial banks, extensively monitor such sites.

Risk management is about both anticipating strategic issues and leveraging opportunities to engage with the bank's key stakeholders around topics and initiatives that are most relevant to them. Effective risk management is about aligning perception and reality.

1.2 Statement of the problem

Quantifying Reputational Risk has been every researcher's headache. To enable an alternative way of mathematically approaching the problem, relevant measurable proxies as are explained below contributing to Reputation are quantified. This project work focuses majorly on the effect of Enterprise Risk Management (ERM) strategy adoption on a commercial bank's corporate reputation and its overall effect after adoption of the strategy. ERM is a management process that enables a firm to holistically manage individual risks, including reputation risk; are identified, assessed, and managed in a unified manner so that the firm value is maximized. Second, ERM encourages disclosure of risks, so that stakeholders can better understand bank's risk appetite, which risks a bank is accepting and which it is avoiding.

1.3 Objectives of the study

1.3.1 General Objective

To demonstrate how yearly proxy differences in regard to reputational risk, can be applied to elaborately explain the long-run effect on the reputation of a commercial bank when ERM is employed.

1.3.2 Specific Objectives

- i. To show the long-run consistent improvements on ERM adoption in the banking industry based on a one-step yearly differences time series plots on the major proxies.
- ii. To quantify Reputational Risk through the various proxies using Enterprise Risk Management approach, determining the level of contribution of each of the proxies to relevant desired results.
- iii. To review equivalent model(s) and practical remedies already being applied in the banking industry and show, using time series proxy changes, the degree to which the ERM approach is relevant a strategy for guarding against negative reputation among commercial banks in the long-run.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

I wish to employ Corporate Reputational Risk and Enterprise Risk Management (ERM) as a strategy; Donald Pagach (2009), in an attempt to show how this strategy aids in arresting commercial bank reputation risk challenge in the long-run, an analysis from the perspective of various stakeholders.

In the context of the wider corporate world, ERM is a broad process by which the portfolios of all risks facing an enterprise are analysed by the management. The main goal is to ensure that the risks taken by a bank are within its risk appetite and that the risks are managed holistically. Hence it's argued that if ERM is implemented properly, shareholders can benefit through lower products volatility and higher product value.

One component of a bank's portfolio of risks is reputation risk. From the introduction above, definitions of reputation are broad, and of wide range; though pegged on a common theme that a bank with a good reputation is committed to principled business practices and ethical accounting. Preserving a commercial bank's reputation is of great importance to most institutions. Conversely, damage to a bank's reputation can result into devastating effects on its shareholders value and the bank's performance.

The ERM is a broader, all encompassing view of risk, which aims to reduce the probability of large negative cash flows and that no single project risk will have an adverse effect on the overall performance of the bank. It also shifts strategic focus from specific tradable risks to all risks that a bank may face. Operational Risk, Reputational and Reputation Risk therefore become part of the management's focus in examining the total institution risk. Including Reputation Risk in ERM enhances a bank's ability to foster a cohesive culture of risk awareness and effective response to risk events that may arise from time to time.

Altman (1968) through multiple discriminant analysis (DMA) did an empirical study that applies multivariate approach to predicting firm failure using data examined 22 different financial ratios then settled on five with most explanatory power.

Zmijewski (1984) developed a weighted PROBIT bankruptcy prediction, an alternative method to use for financial entities. The probability of bankruptcy is one of the major proxies used under the ERM strategy. The Probability of Bankruptcy (PoB) generated by the model is negatively related to a firm's liquidity and return on assets, and positively related to a firm's financial leverage.

Another basic component of this analysis is the Probability of Earnings Manipulation, $Pr(\text{manip})$, where key financial variables are examined-Beinisch (1997). Banks that engage in earnings manipulation have high probabilities of losing their corporate reputation. The computations on $Pr(\text{manip})$ and the other parameters applied under ERM proxies are as explained in the next sub-chapter under data and methodology.

Events such as financial distress involve direct outlays to creditors, lawyers and courts. Indirect costs like inability to pursue profitable growth options, the loss of customer confidence and such can adversely affect the assurance that the bank will continue in existence in future. Most stakeholders may be reluctant to enter into long term contracts with a commercial bank, if the potential to honour such contracts in future is uncertain. All these problems can result from the possibility of costly outcomes, and represent value creating opportunities for a risk management program that can minimise such outcomes.

2.2 Stakeholders and Reputation Risk

Commercial banks with higher reputation among stakeholders (customers, shareholders, employees, investors, contractors, regulators, business partners and the public at large) tend to be more valuable. However it's a hill task to measure reputation and reputation risk. For this reason, we shall define of reputational risk as; 'Reputational Risk is the potential that negative publicity regarding an institution's business practices, whether true or not, will cause a decline in the customer base, costly litigation or revenue'.

Reputational risk is the result of management process as opposed to a specific event. All banks face the possibility of negative events but it falls on management to ensure that the events do not damage the bank's corporate reputation. Hence reputational risk is a function of all management areas under management's control including; bank strategy, customer interaction, employee treatment, leadership and compliance and incentive systems. Reputation-related losses ultimately reflect reduced expected revenues and cash flows and higher financing costs. If severe, such losses of reputation may cause financial distress, loss of investor/shareholder confidence and loss of customers.

In this study, the ERM impact is examined on bank reputation and reputational risk based on three stakeholders namely; financial statement users (investors, shareholders, regulators), customers and employees. This is pegged to the fact that these stakeholders play major roles in the bank's success and it is my belief also that differences and changes in the reputation of a commercial bank are distinguishable for the three personalities above. In addition, a strong positive reputation among the three stakeholders across the banking structure results in a strong overall reputation.

The main objectives of this study are being in line with those for ERM, hence adoption of the ERM approach widely, specialising in the banking sector and so focusing on yearly difference trends in addition to the absolute yearly figures. The specific d This is because corporate risk components may vary from one industry to another, hence providing differences show an inner view of the trends before, about time, and after ERM adoption. Hence clearly give a clearer picture compared to the absolute graphical trends of Pagach (2009), to further bring out ERM as an appropriate strategy for reputation improvement. The incorporation of Probability of Bankruptcy and Probability of Manipulation brings out the holistic analysis, considering a great number of variables that may impact on a bank's reputation, hence higher precision of estimates from which the conclusions are drawn.

As opposed to this mathematically analytical approach, in wide practice are historical theoretical reputational risk profiling as discussed below. This guide wishes to draw up guidelines for evaluating for an organisation's reputation risk profile.

2.3 Developing a reputation risk profile

Here is a useful. It is derived from the booklet Large Bank Supervision – a Comptroller's Handbook issued by the Office of the Comptroller of the Currency (OCC) in the USA. These are the guidelines used in supervising the largest and most complex national banks that are assigned to deputy comptrollers for Large Bank Supervision in Washington, D.C. and complex, mid-sized national banks that are assigned to district assistant deputy comptrollers.

This guidance also pertains to foreign-owned U.S branches and agencies, and international operations of both mid-sized and large banks. Because of the vast - and in some cases global - operating scope of large banks, the OCC assigns examiners to work full-time at the largest institutions. This enables the OCC to maintain an on-going program of risk assessment, monitoring, and communications with bank management and directors.

2.3.1 Reputation Risk

Examiners should consider the following assessment factors when making judgments about the aggregate reputation risk. These factors are the minimum **standards** that all examiners will consider when completing a risk assessment. At a minimum, using the standards as a guide, examiners should review, analyse, and monitor a bank's reputation risk during every 12-month cycle to ensure quality supervision. Examiners are required to judge, based on the review of the core assessment factors, whether the risk is low, moderate, or high.

a. Strategic Factors

Low/Moderate/High

- The volume and types of assets and number of accounts under management or administration.
- Merger and acquisition plans and opportunities.

- Potential or planned entrance into new businesses, product lines, or technologies (including new delivery channels), particularly those that may test legal boundaries.

b. External Factors

Low/Moderate/High

- The market's or public's perception of the corporate mission, culture, and risk tolerance of the bank.
- The market's or public's perception of the bank's financial stability.
- The market's or public's perception of the quality of products and services offered by the bank.
- The impact of economic, industry, and market conditions; legislative and regulatory change; technological advances; and competition.

c. Management, Processes, and Systems

Low/Moderate/High

- Past performance in offering new products or services and in conducting due diligence prior to start-up.
- Past performance in developing or implementing new technologies and systems.
- The nature and amount of litigation and customer complaints.
- The expertise of senior management and the effectiveness of the board of directors in maintaining an ethical, self-policing culture.
- Management's willingness and ability to adjust strategies based on regulatory changes, market disruptions, market or public perception, and legal losses.
- The quality and integrity of management information systems and the development of expanded or newly integrated systems.
- The adequacy and independence of controls used to monitor business decisions.
- The responsiveness to deficiencies in internal control.
- The ability to minimize exposure from litigation and customer complaints.
- The ability to communicate effectively with the market, public, and media.

- Policies, practices, and systems protecting information consumers might consider private or confidential from deliberate or accidental disclosure.
- Management's responsiveness to internal, external, and regulatory review findings.

A holistic reputation risk management profile can then be developed from the above extensive scrutiny, to determine whether a commercial bank's structures, systems and processes permit management to manage and control existing and prospective levels of risk.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Data source and assumptions

3.1.1 Data Source

This analysis focuses on financial institutions, that adopted the ERM program by hiring a Chief Risk Officer (CRO) or equivalent. This was done by focusing on hiring announcements of senior risk officers as a signal to an ERM process adoption. Most of such appointments of a CRO or its equivalent are aimed at adopting an ERM program to improve on the risk management approach. The announcements were obtained by searching the business library of LEXIS-NEXIS for announcements containing the words; ‘announced’, ‘named’, or ‘appointed’ alongside position descriptions; ‘Chief Risk Officer’ or ‘Risk Management’. A total of 83 announcements of the senior risk officer appointments were made among the sampled financial institutions from 1990 to 2005, sufficient for the required data for the desired tests.

Only announcements for publicly traded financial institutions are retained and in the case of multiple announcements for same company, only the first announcement is selected, assuming that it represents the initiation of the risk management program. However, in some cases, it may be possible some appointments although being the first ones within the period of data collection, are not actually the first appointments, considering periods before start of study. These announcements would be noise to the sample and reduce power of the tests. Therefore, data for all firms listed in the Compustat from 1990-2007 was collected. In this current study, we thin down to the financial institutions data as a representation data for the commercial banks’ case for the same period 1990-2007. The concentration on publicly traded institutions here ensures inclusion of bigger market players hence representative of the said market.

Table 3.1: Distribution of CRO Appointments by Year

Note: ‘CRO’ in this case refers to either of; Chief, Director, Vice President, Head, managing Director, Manager and General Manager.

Year	No. of CRO Appointments among Financial Institutions	Insight on appointment trends
1992	5	Almost constant/uniform no. of appointments
1993	3	
1994	2	
1995	3	
1996	8	May be a program other than ERM, being adopted, with positive but not sustainable in long run
1997	3	After depletion of benefits of other program(s), a consistent refreshed increasing no. of appointments, suggestion attempt to employ ERM strategy which indicates a longer term positive impact, hence reduced no. of appointments after on 2004.
1998	4	
1999	7	
2000	7	
2001	13	
2002	8	
2003	9	
2004	8	
2005	3	Abrupt decrease of no. of appointments points at long-term reputation improvement hence minimal necessary appointments.
Total	83	

3.1.2 Assumptions

- The Data on First CRO appointments suggest contribution of the first appointments, ignoring any successive CRO appointments. This could be another research item to evaluate deeper in to ascertain how much contribution the successive appointments have on the ultimate changes that result into improved Reputation profile of the studied sample.
- ERM adoption can as well be done with competent existing CRO's, as it may not necessitate new appointment to apply the strategy for better reputation proxy measures.
- The respondents are sincere and therefore do not favour or respond in bad faith, hence high precision-for Fortune's most admired and Standard Poor's ranking. Only a subset of the sampled firms was covered in the determination of Fortune's Most Admired Bank.

3.2 Methodology adoption and proxies employed

Based on the three stakeholders discussed on literature review above, we extract the various measures applicable to our study as follows;

3.2.1 Reputation Measures

Reputation proxies are grouped into three categories; financial, customer and employee measures. It is important to note that the interest in some of these measures will span over all the three groups. For instance, a customer concerned about the bank's existence in the long run will be interested in financial measures, hence the interactions.

3.2.1.1 Financial Measures

These will include;

- a) Profitability, where

$$\text{Profitability} = \frac{\text{Net Income}}{\text{Sales}} \quad (3.01)$$

- b) Return on Assets,

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \quad (3.02)$$

- c) Probability of Bankruptcy (PoB)

Banks with greater PoB are likely to have declining reputation among its stakeholders. We adopt the Zmijewski (1984)'s method; an updated approach to the classic method of Altman (1968). The Altman's 1968 multiple discriminant analysis (MDA) is an empirical study that applied multivariate approach to predicting firm failure using data examined 22 different financial ratios then settled on five with most explanatory power. He defined the Z-score as;

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 \quad (3.03)$$

Where,

X_1 = Working capital/Total Assets (as a percentage)

X_2 = Retained Earnings/Total Assets (as a percentage)

X_3 = Earnings before interest and taxes/Total Assets (as a percentage)

X_4 = Market Value of Equity/Book value of Total Assets (as a percentage)

X_5 = Sales/Total Assets (a turnover ratio)

In 1984, Zmijewski developed a weighted PROBIT bankruptcy prediction, an alternative method to use for financial entities. He argued that the empirical work is based on non-random probability of bankruptcy, hence normality of samples lacking. Second, Altman's Z-score is industry-specific, and cannot be used in case of financial institutions. He explores the sampling issue on non-randomness in detail then uses COMPUSTAT and CRSP data to examine the ability of a PROBIT model to estimate the probability of bankruptcy among the sampled firms.

The Probability of Bankruptcy (PoB) generated by the model is negatively related to a firm's liquidity and return on assets, and positively related to a firm's financial leverage per below.

$$\text{PoB} = -4.803 - 3.599\text{ROA} + 5.406\text{FINL} - 0.1\text{LIQ} \quad (3.04)$$

$$B^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \quad (3.05)$$

Where,

B^* is probability of Bankruptcy.

$X_1 = \text{ROA} = \text{return On Assets}$

$$X_2 = \text{FINL} = \text{Financial Leverage} = \frac{\text{Total Assets} - \text{Book Equity}}{\text{Total Assets}} \quad (3.06)$$

$$X_3 = \text{LIQ} = \text{Measures Liquidity} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (3.07)$$

$$\beta_0 = - 4.803, \beta_1 = - 3.599, \beta_2 = 5.406 \text{ and } \beta_3 = - 0.1$$

d) Restatement of Financials

If viewed negatively by statement users, banks that engage in restatements may suffer a decline in their corporate reputation due to less confidence in future disclosures. This variable is captured in ERM by comparing Compustat items; income before extraordinary items (restarted), with income before extraordinary items. If the two items differ in a given year, index 1 is used as the variable. Otherwise, 0 as an index is used as the variable. 1 means it is assumed that, a restatement of some type took place, and zero nil restatement.

e) Probability of earnings manipulation.

Banks that engage in earnings manipulation have high probabilities of losing their corporate reputation. To test for the presence of earnings manipulation, the method of Beneish (1997) is employed. It examines changes in key financial variables, i.e.

$$\text{DSRI} = \frac{\text{Receivables}}{\text{Sales}} \quad (3.08)$$

$$\text{GMI} = \text{Sales} - \text{Cost of Sales} \quad (3.09)$$

$$\text{AQI} = \frac{\text{Total assets} - \text{Current Assets} - \text{Net PPE} - \text{Investment}}{\text{Total Assets}} \quad (3.10)$$

Where, Net PPE refers to the Net Plant Property Equipment, which is calculated after accumulated depreciation is subtracted. It is fixed assets less depreciation and investment.

$$\text{SGI} = \frac{\text{Sales}_t}{\text{Sales}_{(t-1)}} \quad (3.11)$$

$$\text{DEPI} = \frac{\text{Depreciation and Amortization}}{\text{Net PPE}} \quad (3.12)$$

$$\text{SGA} = \frac{\text{SGA Expense}}{\text{Sales}} \quad (3.13)$$

$$\text{LVG} = \frac{\text{Total Liabilities}}{\text{Total assets}} \quad (3.14)$$

$$\text{TATA} = \text{Income Before extraordinary Items} - \text{Net CF from Operations} \quad (3.15)$$

Thus, Probability of Earnings manipulation is computed as;

$$\text{Pr (manip)} = \Phi [-4.84 + 0.920\text{DSRI} + 0.528\text{GMI} + 0.404\text{AQI} + 0.892\text{SGI} + 0.115\text{DEPI} - 0.172\text{SAI} - 0.327\text{LVGI} + 4.670\text{TATA}] \quad (3.16)$$

$$\text{M}^* = \Phi [c_0 + c_1X'_1 + c_2X'_2 + c_3X'_3 + c_4X'_4 + c_5X'_5 + c_6X'_6 + c_7X'_7 + c_8X'_8] \quad (3.17)$$

$$\text{M}^* = \mathbf{C}'\mathbf{X}_i + \tilde{\boldsymbol{\varepsilon}} \quad (3.18)$$

Where,

M* is Probability of Manipulation of financial statements.

$c_0 = -4.84$, $c_1 = 0.920$, $c_2 = 0.528$, $c_3 = 0.404$, $c_4 = 0.892$, $c_5 = 0.115$, $c_6 = -0.172$,

$c_7 = -0.327$ and $c_8 = 4.670$

$X'_1 = \text{DSRI}$, $X'_2 = \text{GMI}$, $X'_3 = \text{AQI}$, $X'_4 = \text{SGI}$, $X'_5 = \text{DEPI}$, $X'_6 = \text{SAI}$, $X'_7 = \text{LVGI}$,

$X'_8 = \text{TATA}$

and Φ is the normal density function, acronyms having been defined as above.

M^* is a dichotomous variable coded 1 for manipulators and 0 otherwise.

C is a vector of coefficients of explanatory variables.

X is a matrix of explanatory variables.

$\tilde{\epsilon}$ is a vector of residuals.

Table 3.2: Demonstrative data

PARAMETERS		
YEAR	2008 (USD '000000)	2009 (USD '000000)
Net Sales	93823	93685
Cost of Goods	51255	49193
Net Receivables	1174	1373
Current assets, CA	73717	67991
Property, Plant and Equipment	2532	2058
Depreciation, Dep	1696	1716
Total assets, TA	86291	84832
SGA expense	32426	33013
Net Income	5741	9888
Cash flow from Operations, CF	8416	2877
Current Liabilities	26297	26275
Long-term Debt, LTD	1232	1470

Table 3.3: Derived variables

Derived Variables	Computed Value
Other L/T assets = TA - CA + PPE, in millions of USD	10042
DSRI	0.854
GMI	1.069
AQI	0.668
SGI	1.001
DEPI	1.134
SGAI	0.981
TATA	-0.031
LVGI	0.975

M-score = -2.83, **Note: if M > -2.22, firm is likely to be a manipulator**

Where:

$$DSRI = (\text{Receivables}_t / \text{Sales}_t) / (\text{Receivables}_{t-1} / \text{Sales}_{t-1}) \quad (3.19)$$

$$GMI = [(\text{Sales}_{t-1} - \text{Costs of Goods Sold}_{t-1}) / \text{Sales}_{t-1}] / [(\text{Sales}_t - \text{Costs of Goods Sold}_t) / \text{Sales}_t]$$

$$AQI = [1 - (\text{CA}_t + \text{PPE}_t) / \text{TA}_{s_t}] / [1 - (\text{CA}_{t-1} + \text{PPE}_{t-1}) / \text{TA}_{s_{t-1}}] \quad (3.20)$$

$$SGI = \text{Sales}_t / \text{Sales}_{t-1} \quad (3.21)$$

$$DEPI = [\text{Dep}_{t-1} / (\text{Dep}_{t-1} + \text{PPE}_{t-1})] / [\text{Dep}_t / (\text{Dep}_t + \text{PPE}_t)] \quad (3.22)$$

$$SGAI = (\text{SGA Expense}_t / \text{Sales}_t) / (\text{SGA Expense}_{t-1} / \text{Sales}_{t-1}) \quad (3.23)$$

$$LEV = [(\text{LTD}_t + \text{CL}_t) / \text{TA}_t] / [(\text{LTD}_{t-1} + \text{CL}_{t-1}) / \text{TA}_{t-1}] \quad (3.24)$$

$$TATA = [(\text{CA}_t - \text{CF}_t) - (\text{CL}_t - \text{Current Maturities of LTD}_t - \text{Income Tax Payable}_t) - \text{Depreciation and Amortization}_t] / \text{TA}_t \quad (3.25)$$

f) Cash Flow Volatility (SDCF)

This is the standard deviation of the error term from a regression of a firm's quarterly cash flow on the prior quarters' cash flow. The operating Income before Depreciation is used here as a measure of quarterly cash flows. The regression is run for eight quarters. Greater cash flow volatility may signal a lower reputation among investors (shareholders, contractors and customers) who may prefer smooth earnings.

g) Tobin's Q (Market to Book Ratio)

Measures growth options of a firm/bank and overall valuation. Higher Tobin's Q signals higher growth options; a greater proportion of a bank's value is derived from its future cash flows and not assets in place. Short-run changes in Q are mostly attributed to changes in bank valuation.

$$Q = \frac{\text{Market Value Equity} + \text{Book Debt}}{\text{Book Assets}} \quad (3.26)$$

h) Credit Ratings

Thus is taken as a measure of a bank's ability to be able to stand future obligations. Both shareholders and customers alike have interest in the credit ratings of commercial banks. The Standard and Poor's credit ratings are obtained from Compustat, and then recorded in such a manner that a higher number indicates a better credit rating, as below;

- 23 – Signifies AAA
- 22 – Signifies AA+
- 21 – Signifies AA
- .
- .
- .
- 1 – Signifies D, and so on.

i) Stock Rating

The Standard and Poor's stock ranking is used as a broad measure of bank's quality. The quality rank is an appraisal of past performance of a stock earnings and dividends and the stock's relative standing as of a bank's current fiscal year-end. Growth and stability of earnings and dividends are key elements in establishing Standard and Poor's earnings and dividends rankings for common bank stocks.

It's recorded so that;

9 – A+, 8 – A, and so on

Hence higher score is better.

3.2.1.2 Customer Measures

a. Fortune's Most Admired Bank

The industry of executives, directors and financial analysts were rated using Fortune Magazine annual surveys. The ratings were based on eight criteria from social responsibility to investment value. The voters (high rank officials within the firm) rate their own institutions, to determine the Most Admired Score, based on;

- i) The ability of the institution to attract and retain talented people
- ii) The quality of the institution's management
- iii) The quality of the institution's products or services
- iv) The institution's innovativeness
- v) The institution's long-term investment value and financial soundness
- vi) The institution's wise use of corporate assets and social responsibility to the community and environment.

The Most admired Score over period 1991 to 2008 ranged from a low of 1.06 to a high of 9.36. The challenge is that only a subset of the sampled firms were covered by this variable; as being in the Fortune 1000 is a requirement for inclusion in the survey. The Fortune list has been used by other researchers to evaluate corporate policy in 2008, 2006, 2003 and 1999. This data from the Fortune website was collected and matched with the Compustat to counter this above challenge.

b. Market Share

The larger the market share enjoyed by a commercial bank, the higher the responsibility of better reputation with its customers. This being not a very reliable proxy, the changes in reputation through changes in market share is a remedy. Rapid declines in market share of a bank are obtained from its percentage of the total sales of its four digits SICC in a particular year. Here, of lone interest are the changes on market share hence any bias in overstatement of market share should not be a huddle to the conclusions to be drawn.

3.2.1.3 Employee Measures

In this case, a study by Ballou, Godwin and Shortridge (2003) on a correlation between firm value and employee attitudes is employed. In this study, the Fortunes’ “100 Best Places to Work” list is a proxy for employees’ attitudes. To cover and overlap with the sample sufficiently, other employee attitude proxies, and indirectly, were constructed for a firm’s reputation among its employees and potential employees.

$$AW = \frac{\text{Total Wage in a Year for a Financial Institution}}{\text{Number of Employees}} \tag{3.27}$$

$$WG = AW_{Yr2} - AW_{Yr1} \tag{3.28}$$

But since wages grow over time, the WG is adjusted by the average wages firm’s 2-digit SICC.

CHAPTER FOUR

ANALYSIS AND RESULTS

4.1 Introduction

The summary statistics are presented for financial institutions in the sample year of ‘CRO’ appointment. Market value is the market value of equity. Market to book is computed as the Tobin’s Q. Return in Assets is net income divided by Assets. Leverage is debt divided by assets. Debt rating obtained from Compustat. Fortune’s score obtained from Fortune’s Magazine’s ranking of most admired companies, with higher being better.

Table 4.1: Summary Statistics

VARIABLE	MEAN	MEDIAN	STANDARD DEVIATION
Market Value (millions USD)	11,643	2,719	23,655
Q (Market to book)	1.16	1.08	0.38
Return on Assets	0.59%	0.01%	6.05%
Leverage	0.85	0.92	0.18
Liquidity	0.14	0.00	0.52
Debt Rating	(A-)	A	NA
Fortune Score	6.37	6.18	1.07

4.2 Tests of Changes in the Reputational Proxies

Comparisons of the key reputation proxies before and after ERM adoption are given attention. These are obtained by computing the average of each variable 2 years before and after 2 years after ERM adoption year. Then a t-test is done of the difference in the two averages. It is found that only five of the measures computed, have statistically significant changes around ERM adoption.

After ERM adoption, the S.D. of cash Flows increases significantly, which is consistent with either a firm taking on more risk after adopting ERM, or entering a more risky period in its history. The cause of the change may not be of much interest in this case, since bank risk increased is more likely to be viewed negatively by customers and contractors. From the shareholders' point of view, the level of risk depends on the investor's ability to hold stock in a diversified portfolio; as capital market theory states that shareholders are unconcerned with idiosyncratic risk.

Table 4.2: Tests for Changes in Reputational Proxies-Financial Firms

Note: Financial firms would be assumed to represent the banking institutions.

VARIABLE	Mean 2 yrs Before ERM adoption yr	Mean 2 yrs After ERM adoption yr	Difference $\mu_2 - \mu_1$	T-Statistic
Profit (USD '000000)	11.520	12.024	0.504	0.375
ROA	1.024	1.714	-0.111	-0.415
Pr (Bankruptcy)	0.100	0.083	-0.017	-0.662
Restatements	0.124	0.111	-0.012	-0.304
Pr (Manip)	0.981	0.981	0.000	0.001
SD (Cash Flow)	74.964	154.154	79.190	1.721*
Market to Book	2.188	2.107	-0.081	0.725
Debt Rating	17.184	16.605	-0.579	-2.847***
SP Rank	6.342	6.260	-0.082	-0.628
Fortune Score	6.398	6.232	-0.0166	-1.227
Market Share	0.062	0.065	0.003	0.742
Employees	17.193	18.067	1.877	1.580
Wage Growth	62.328	80.796	18.468	8.894***
Relative Wage g	-0.044	-0.138	0.094	1.521

4.2.1 Observations

There is significant drop in the debt on the score due to ERM adoption. This may be realistically explained that the firm is experiencing a decline in its credit quality at the same time it chose to adopt ERM; hence ERM adoption may have only been a response to the declining credit quality.

The Standard and Poor's stock rank score also decreases significantly, which indicates a decline in the financial strength of a firm. Hence, it's also correlated with the debt rating.

Almost Admired Company Score is the most direct measure of reputation, for which a significant decline has been recorded as above. The result of which is attributed to the period of reputation decline, hence the call for ERM adoption. Although wages seem to have grown, it is expected in economy with positive labour inflation. Examining 'relative wage growth' which compares a firm's wage growth to that of its industry, there's no significant difference, hence the tag of economy with positive labour inflation.

Generally, the test results above indicate that ERM is frequently adopted in the midst of declining measures of reputation of a financial institution, commercial banks being direct members of this group. Our main objective is to establish as to whether ERM adoption is able to improve the reputational situation of a commercial bank. We therefore examine the trends in the key variables covered below on graphical analyses.

4.2.2 Graphical Representation of the Changes

The graphical presentations play a big role in assisting in the interpretation of the above tabled results. For instance, a decline in a mean variable may be misinterpreted as a trend if the prior time period is showing a decline, and the following time period is flat. To obtain the plots, raw data for Table 3 figures are presented. The raw data is normalised by the year zero (year of CRO appointment) value to provide an indication of relative magnitude of any change.

Table 4.3: Time Series Changes in Key variables (USD ‘000000)

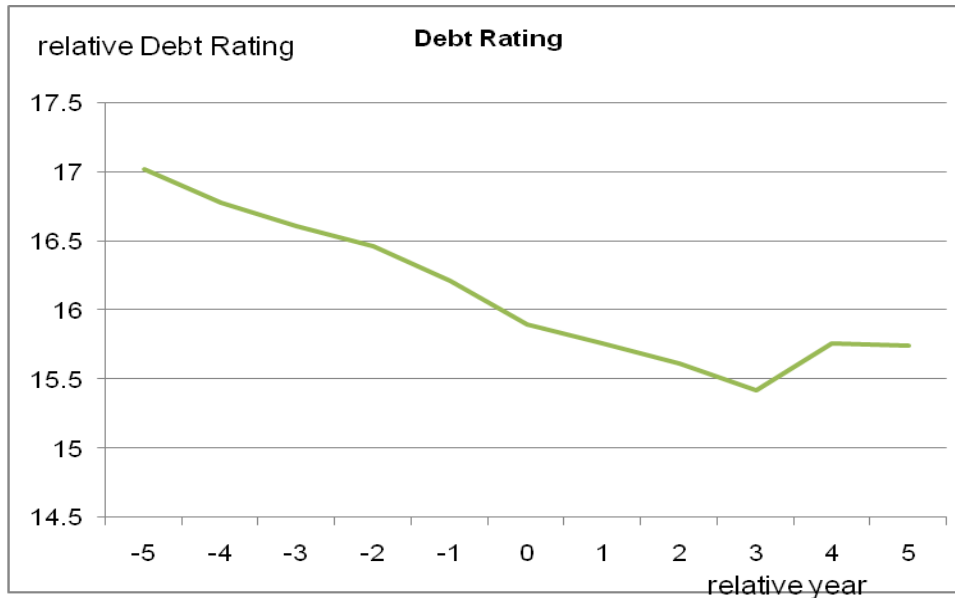
	Year Relative to the CRO Appointment										
	-5	-4	-3	-2	-1	0	1	2	3	4	++
Debt Rating	17.02	16.78	16.61	16.46	16.21	15.9	15.76	15.61	15.42	15.76	15.74
SP Ranking	6.39	6.2	6.2	6.01	5.92	5.84	5.8	5.86	5.89	5.82	5.9
Pr(Manipulation)	0.91	0.91	0.93	0.92	0.92	0.94	0.93	0.93	0.95	0.95	0.95
SD of cash Flow	42.69	47.21	77.2	85.48	82.08	126.87	141.15	130.35	152.15	229.35	179.68
Fortune Ranking	6.47	6.6	6.4	6.18	6.25	6.14	6.12	6.13	6.28	6.1	6.36

We plot Debt Rating, Standard and Poor’s Ranking, Pr (manipulation), Restatements, SD (Cash flows) and Fortune ranking scores and one year step differences as below;

Table 4.4: Time Series Changes in Key variables- one year step differences (USD ‘000000)

	Year Relative to the CRO Appointment										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
	Year _t -Year _{t-1}										
Debt Rating	0	-0.24	-0.17	-0.15	-0.25	-0.31	-0.14	-0.15	-0.19	0.34	-0.02
SP Ranking	0	-0.19	0	-0.19	-0.09	-0.08	-0.04	0.06	0.03	-0.07	0.08
Pr(Manipulation)	0	0	0.02	-0.01	0	0.02	-0.01	0	0.02	0	0
SD of cash Flow	0	4.52	29.99	8.28	-3.4	44.79	14.28	-10.8	21.8	77.2	-49.67
Fortune Ranking	0	0.13	-0.2	-0.22	-0.07	-0.11	-0.02	0.01	0.15	-0.18	0.26

Figure 4.1: Debt Rating



A monotonic decrease in the debt rating is described prior to ERM adoption. The decrease appears to be arrested once ERM is adopted. Hence adoption of the ERM becomes a remedy for a bank experiencing a decline in its performance. Plotting differences ($Year_t - Year_{t-1}$), the results in the long run shows the monotonic decrease experienced from the fourth year relative to the base year, hence long-run consistent improvement on Debt rating.

Figure 4.2: Debt rating one year step differences

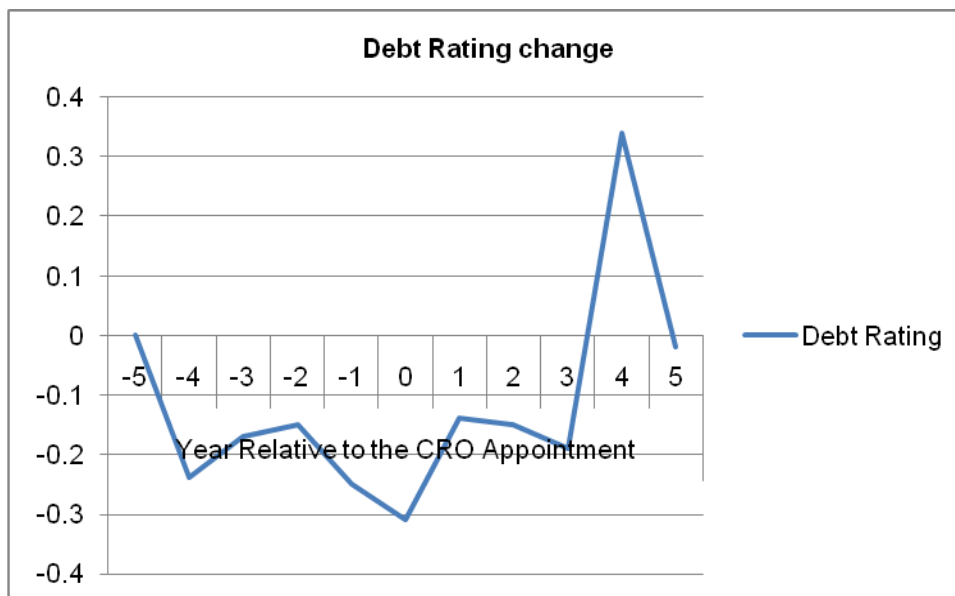
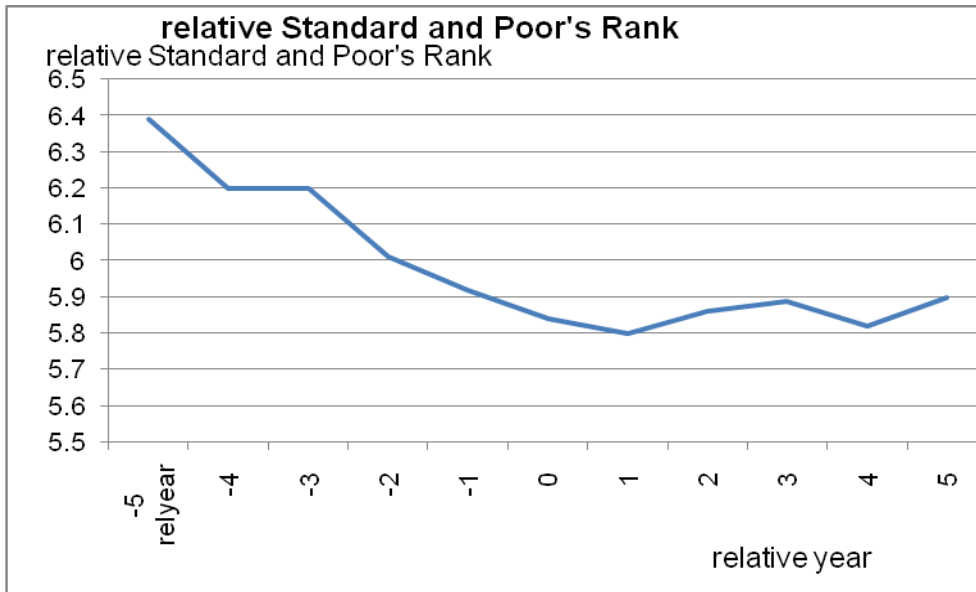


Figure 4.3: Standard and Poor's Ranking



There is monotonic decrease in Standard and Poor's stock rating and seems arrested after ERM adoption. Hence ERM becomes a remedy for a bank experiencing decline in its S and P ratings. Plotting differences ($Year_t - Year_{t-1}$), there is a very sharp consistent and promising positive difference in the Standard and Poor's Ranking score from the 4th relative year, showing success of ERM adoption in the long run.

Figure 4.4: Standard and Poor's Ranking one year step differences

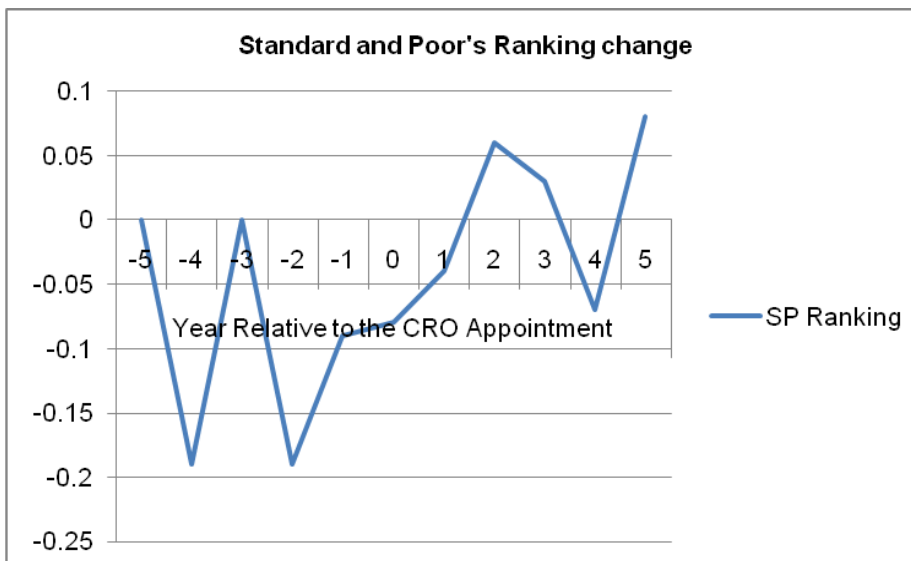
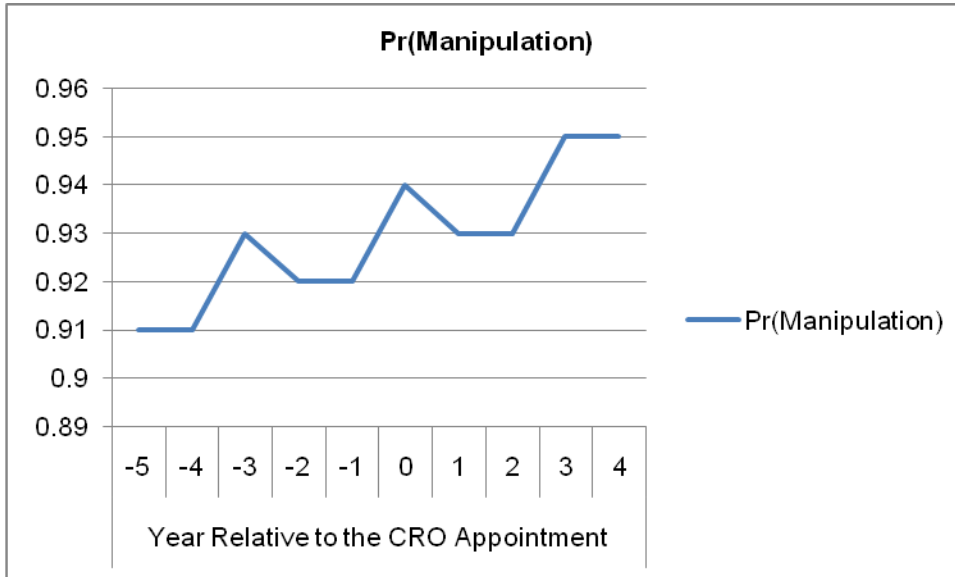


Figure 4.5: Probability of manipulation



A broad upward trend over the longer time horizon is evidenced (though not within the -2, +2 year range). Hence positive effect of ERM adoption improves on a bank's probability of manipulation on financial reporting.

Figure 4.6: Probability of manipulation one year step differences

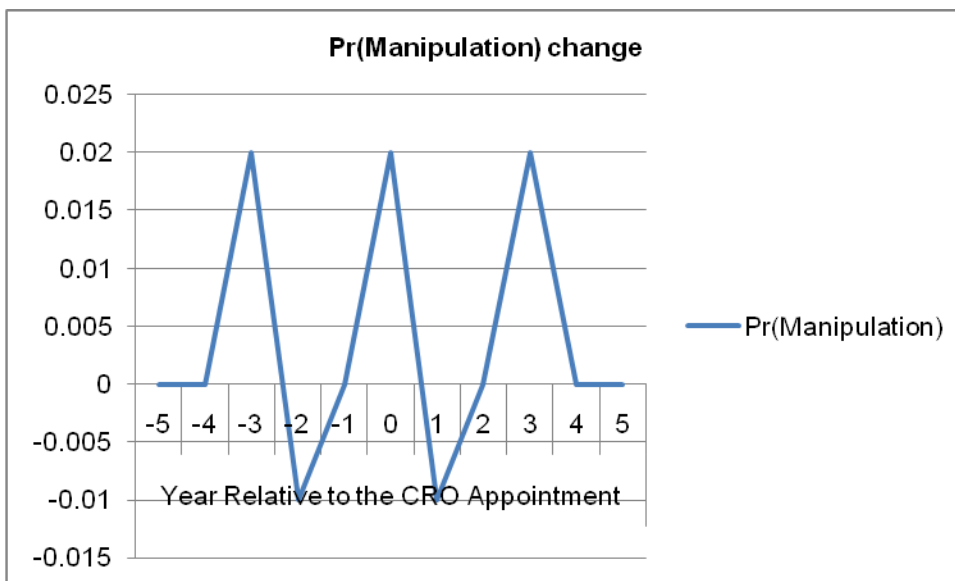
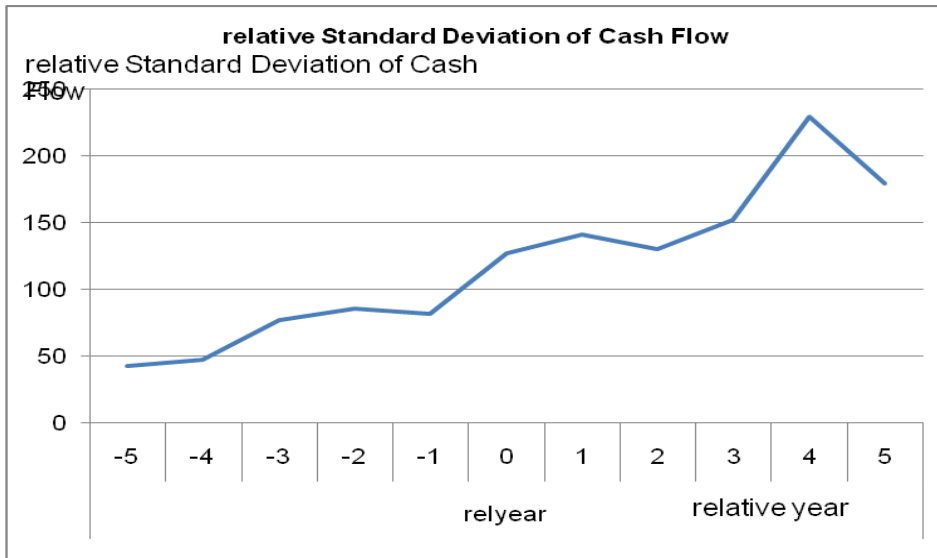
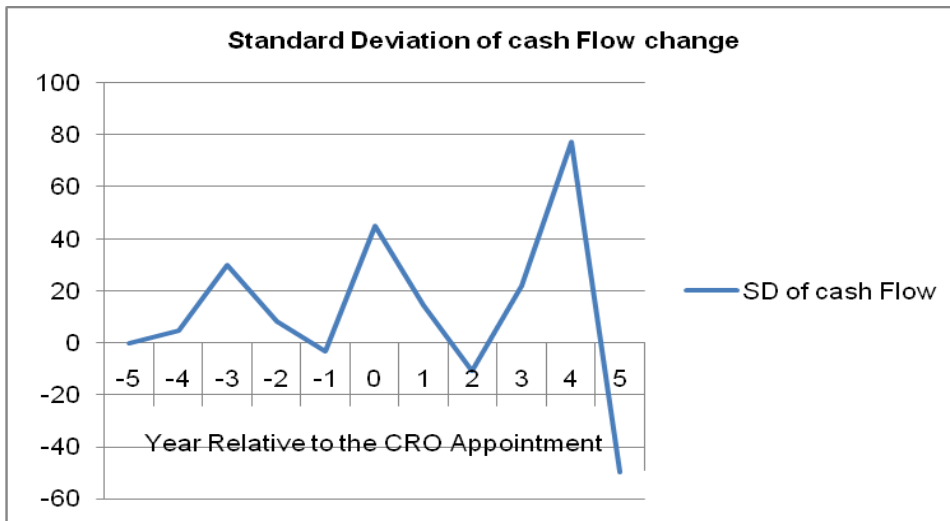


Figure 4.7: Standard Deviation of cash Flows



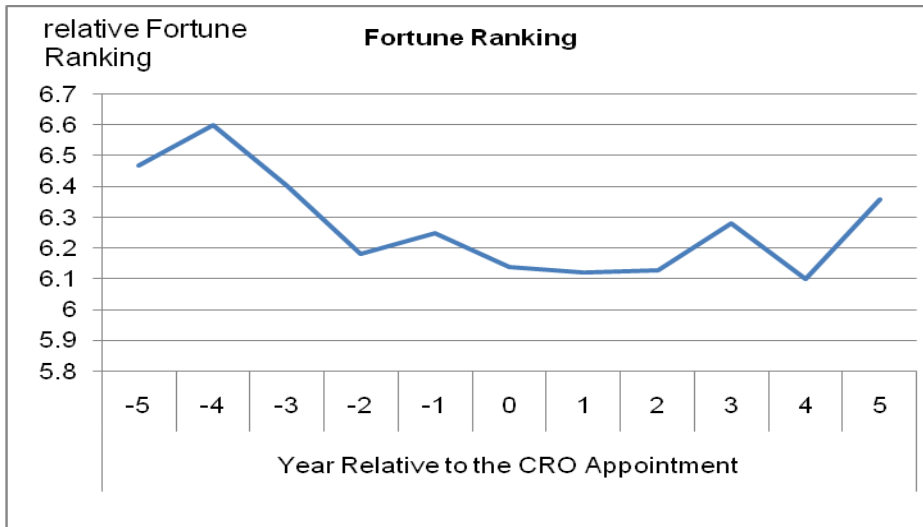
This trend confirms results of table 3, showing a steady increase in cash flow volatility. After ERM adoption, the volatility decreases in the long-run.

Figure 4.8: Standard Deviation of cash Flows one year step differences



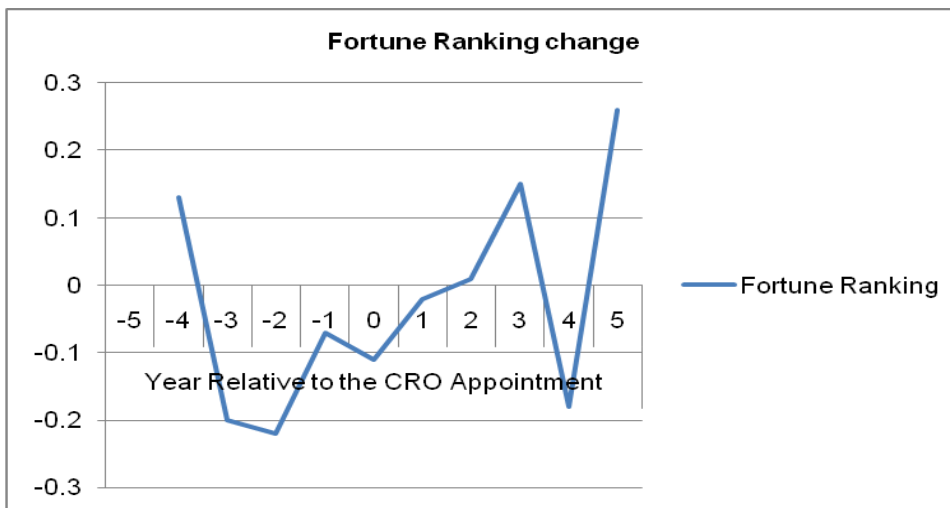
The above plot of one-year step differences ($Year_t - Year_{t-1}$), shows a sharp reduction value on the Standard Difference of Cash Flows on the sampled financial institutions depicting same behaviour expected among commercial banks on ERM adoption in the long run.

Figure 4.9: Fortune Ranking



There's decline in the Fortune "Most Admired Firms" ranking in years prior to ERM adoption. After adoption, the reduction reduces significantly, and with signs of reversal as the years progress. ERM adoption may be related to a bank responding to a period of declining reputation.

Figure 4.10: Fortune ranking one year step differences



The sharp positive forward difference on Fortune Ranking is a promising indication of the positive impact of ERM adoption, as a reliable and dependable approach towards arresting problems of Low Fortune Ranking, which is then expected to raise the confidence of investors and shareholders on the commercial bank.

CHAPTER FIVE

FINDINGS AND CONCLUSIONS

5.1 Introduction

Considering the data, graphical trends and deductions from the same, it can be clearly concluded that the proxies suggested for the analyses directly contribute to changes in the reputation of a commercial bank, with respect to CRO appointments. These appointments point towards adoption of the ERM strategy/program with a common aim of improving on the scores of the proxies considered for the sampled financial institutions. From the analysis, it's clear that reputation of such institutions improve in the long-run on adoption of an ERM program.

5.2 Recommendations

Each initial CRO appointment should be made with a target of major improvement on the relevant proxies, hence sustainable improvement in the future reputation of a commercial bank. Until such a well-articulated program is implemented, most banks will still be highly vulnerable to reputational risk which may lead to great losses in revenue, customer base and assurance of future existence in the financial market.

Worldwide markets may differ in nature; regulatory thresholds, competition patterns and cost of running business in a particular geographical area. Each banking institution ought to come up with a comprehensive structure and policy on how to employ the suggested ERM program, to regain, maintain, or improve on its reputation.

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