

**A SURVEY OF THE IMPACT OF OPERATIONAL LOSSES ON
PROFITABILITY OF COMMERCIAL BANKS IN KENYA**

ONGERA JOSHUA BOSIRE

D61/P/7631/02

SUPERVISOR:

MRS. A. KITHINJI

**UNIVERSITY OF NAIROBI
JAMES KABETE LIBRARY**

**A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE
OF MASTER OF BUSINESS ADMINISTRATION SCHOOL OF BUSINESS
UNIVERSITY OF NAIROBI.**

SEPTEMBER 2006

University of NAIROBI Library

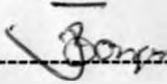


0492950 1

DECLARATION

This management research project is my original work and has not been presented for the award of a degree in any other university.

Signed-----



-----Date

3/10/06

ONGERA JOSHUA BOSIRE

D61/P/7631/02

This management research project has been submitted for examination with my approval as university supervisor.

Signed-----



-----Date

23/10/06

ANGELA KITHINJI (MRS)

**Department of finance and accounting, school of business,
University of Nairobi**

DEDICATION

This study is dedicated to my parents, brothers, sisters, nephews and

nieces without whose efforts and sacrifice I could not have progressed

this far. May their sacrifice and dreams of their hard work bear ripe

fruits.

AMEN.

ACKNOWLEDGEMENTS

I appreciate and wish to extend my gratitude to all those who in one- way or another enabled me to complete this study. More especially:

- My supervisor Mrs. Kithinji; I thank her for her firm; decisive, timely and invaluable advice and positive criticisms that were challenging and enabled me focus on the objective of the study.
- My fellow colleagues at work Mr.Nzioki, Mr. Yussuf and Kenya Commercial Bank library staff for sacrificing their valuable time to give me support throughout my study.
- My friends for sacrificing their valuable time encouraging and supporting me throughout my study.
- Last but not least to my parents, brothers, sisters, nephews and nieces without whose efforts and sacrifice I could not have progressed this far.
- May God bless you.

TABLE OF CONTENTS

	PAGE
Declaration-----	i
Dedication-----	ii
Acknowledgements-----	iii
Table of Contents-----	iv
List of Abbreviations-----	vii
Abstract-----	viii
CHAPTER ONE: INTRODUCTION-----	1
1.1 Background-----	1
1.2 Statement of the Problem -----	5
1.3 Objectives of the Study-----	6
1.4 Hypothesis-----	6
1.5 Importance of the Study-----	6
CHAPTER TWO: LITERATURE REVIEW-----	9
2.1 Risk Management-----	9
2.2 Operational Risk Management-----	10
2.3 Framework of Operational Risk Management-----	12
2.4 Operational Losses-----	24
2.5 Profitability-----	34
2.6 Related Studies-----	36
CHAPTER THREE: RESEARCH METHODOLOGY-----	38
3.1 Research Design-----	38

3.2 Population of Study-----	38
3.3 Data Collection -----	38
3.4 Data analysis-----	38

CHAPTER FOUR: DATA ANALYSIS-----40

4.1.1 Industry Average-----	40
4.1.2 African Banking Corporation -----	41
4.1.3 Bank of Baroda-----	42
4.1.4 Barclays Bank of Kenya Ltd -----	43
4.1.5 Commercial Bank of Africa-----	44
4.1.6 CFC Bank Limited-----	45
4.1.7 Charterhouse Bank Limited-----	46
4.1.8 Chase Bank Limited -----	47
4.1.9 City Finance Bank -----	48
4.1.10 Consolidated Bank of Kenya-----	49
4.1.11 Co-operative Bank of Kenya -----	50
4.1.12 Credit Bank Limited -----	51
4.1.13 Development Bank of Kenya-----	52
4.1.14 Diamond Trust Bank Kenya -----	53
4.1.15 Equatorial Commercial Bank -----	54
4.1.16 Equity Bank Limited -----	55
4.1.17 Fina Bank Limited -----	56
4.1.18 First American Bank Limited -----	57
4.1.19 Giro Commercial Bank-----	58
4.1.20 Guardian Bank -----	59
4.1.21 Habib Bank Limited-----	60
4.1.22 Habib AG Zurich -----	61
4.1.23 Investment & Mortgages Bank-----	62
4.1.24 Imperial Bank Limited -----	63
2.1.25 Kenya Commercial Bank Ltd -----	64

4.1.26 Middle East Bank of Kenya -----	65
4.1.27 National Bank of Kenya Ltd-----	66
4.1.28 Paramount-Universal Bank -----	67
4.1.29 Standard Chartered Bank Ltd-----	68
4.1.30 Stanbic Bank Kenya Limited -----	69
4.1.31 Transnational Bank Limited -----	70

**CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS,
RECOMMENDATIONS, LIMITATIONS OF THE STUDY AND
SUGGETIONS FOR FURTHER RESEARCH -----71**

5.1 Summary of Findings, Conclusions and Interpretations-----	71
5.2 Limitations of the Study -----	72
5.3 Recommendations-----	73
5.4 Suggestions for Further Study-----	73

REFERENCES-----75

APPENDICES-----77

A1.1 List of Commercial Banks-----	77
A1.2 Table of Research Data-----	79
A1.3 Table of Ratios-----	82
A1.4 Significance Tests-----	86

LIST OF ABBREVIATIONS

PAT/EBIT- Profit after tax (PAT) to Earnings before Interest and Tax (EBIT)

OP/EBIT- Operational losses to Earnings before Interest and Tax (EBIT)

OP/T OP EX- Operational losses to Total Operating Expenses

ABSTRACT

Profitability is cited as a major predictor or determinant of business failure. Ratios used to measure profitability have shown to be suitable predictors of subsequent insolvency of firms. This study addresses the impact of operational losses on profitability.

Data from 30 commercial banks was obtained and analyzed using SPSS package. This study shows that there was an upward trend in year 2002, downward trend in 2003, upward trend in 2004 and a downward trend in year 2005 of operational losses ratio for the industry. This study shows a zigzag movement. The relationship between profitability and level of operational losses was found to be direct and negative for the industry.

The findings reveal that the trend of operational loss level kept on varying from year to year without a clear defined direction for most of the commercial banks. Most of the commercial banks had an upward trend in years 2001, 2002 and 2003 followed by a downward trend in years 2004 and 2005. The relationship between profitability and level of operational losses was found to be direct and negative for most of the commercial banks. Some commercial banks show a positive relationship such that increase in operational losses will lead to increase in profitability. The relationship was found to be significant. The category most affected is the big banks mostly government owned commercial banks. The large foreign owned banks indicated lower significance levels as compared to large locally owned commercial banks. The small commercial banks foreign owned indicated a lower significance level as compared to small locally owned commercial banks.

The result of this study is consistent with findings of other researchers on the effect of operational losses on profitability. This study shows that the impact of operational losses on profitability of commercial banks is significant as opposed to general believe that the impact of operational losses on profitability of commercial banks is not significant.

CHAPTER ONE: INTRODUCTION

1.1 Background

1.1.1 Operational Losses Management

Banks like any other institutions play an important role in the economy. The auxiliary services they offer to other institutions, corporate bodies and sectors of the economy, among others are numerous (Gruening and Bratanovic, 1999). Banks are sensitive institutions in the economic environment, thus need for concern from all stakeholders in the economy on their stability. They do act as intermediaries of funds between surplus user units and deficit user units. For them to be able to play this role, their liquidity position should be closely monitored. All banks are thus encouraged to have a risk-management department whose sole responsibility is to report their liquidity position regularly (Gruening and Bratanovic, 1999).

A service organization can encounter actual or speculative failure. The former might be the failure of a new service to deliver appropriate quality, speed, flexibility or expected cost, and revenue performance. Whereas, speculative failure can be seen as the inability to deploy operational or other resources where they can earn returns an idea similar to the accountant's concept of an "opportunity cost". Operational loss may generate a range of negative consequences for an organization, for example, customer defection, damaged corporate image, litigation and increased insurance costs (Brown et al, 2000; Dorner, 1997; Winter and Steger, 1998). The operations management and service management literature often discusses loss control but failing to point out the impact of operational loss on profitability (Schelesinger and Heskett, 1991; Chase and Stewart, 1994).

Operational loss includes items classified by banks as loan loss provision, depreciation, amortization, and other operating expenses in the published financial statements (Basel Committee 2000; Saunders 2000).

Good operational loss management is a decisive competitive advantage as it helps to maintain stability and continuity and supports revenue and earnings growth in commercial banks (Doering 2003). Risk management is an obligation to stakeholders thus diligent and intelligent risk taking is an "attitude" towards stakeholders. Thus despite all the progress in the quantification of operational losses, operational loss management will remain a blend of art and science. Operational loss management is a daily struggle against uncertainty and a daily learning process. Operational loss is part of corporate life particularly in financial institutions. Operational loss is highly multifaceted, complex and often interlinked making it necessary to manage, rather than fear. While not avoidable, operational loss is manageable – as a matter of fact most banks live reasonably well by incurring operational losses, especially "intelligent operational losses", (Jorion, 2001).

Deregulation and globalisation of financial services, together with the growing sophistication of financial technology, are making the activities of banks and thus their risk profiles more complex. The Basel Committee on Banking and Supervision (2003) suggests that risks other than credit, interest and market risks can be substantial. According to Basel Committee (2003), the greater use of highly automated technology has the potential to transform risks from manual processing errors to system failure risks as greater reliance is placed on globally integrated systems. The growth of e-commerce brings with it potential risks such as internal and external frauds and systems security issues that are not fully understood. The emergence of banks acting as large-volume service providers creates the need for continual maintenance of high-grade internal controls and backup systems. According to the Credit-Suisse Group (2001), banks may engage in risk mitigation techniques to optimize exposure to market and credit risk but which may in turn produce other forms of risk like operational risks which the group categorized as organizational risks, process risks, technology risks, human risks and external risks.

Commercial banks mainly engage on operating activities to generate revenue. These activities in turn are the cause of operational losses if not properly managed. Operational losses have been defined, as the risk of loss resulting from inadequate or failed internal

processes, people, and systems or from external events (Basel Committee 2000). The Committee identified the following operational losses, which are likely to result into substantial losses: internal frauds, which include intentional misreporting of positions, employee theft, and insider trading on employee's own interest; external frauds through robbery, forgery, cheque kitting, and damage from computer hacking; employment practices and work place safety relating to compensation claims, violation of employee health and safety rules, organized labour activities, discrimination claims and general liability; clients, products and business practices such as misuse of confidential customer information, money laundering and sale of unauthorized products; damage to physical assets through terrorism, vandalism, earthquakes, fires and floods; losses arising from business disruptions and systems failures such as hardware and software failures, telecommunication problems and utility outages; execution delivery and process management, such as data entry errors, collateral management failures, incomplete legal documentation, unapproved access given to client accounts and vendor disputes.

According to Dermont (2002) operational loss is not really one loss but many. It is a sweep up term covering everything that does not fall neatly under either credit loss or market loss. One operational loss event can lead to another. Some financial events can directly cause operational loss. The literature on operational loss and its management in the service sector is overwhelmingly concerned with the suppression of negative consequences of failure (Lewis, 2003). It does so by taking into consideration three aspects of loss management, failure prevention, failure management and management via recovery methods and insurance (Hollman and Forest, 1991). Some authors have developed normative models of how decisions on long-term developmental issues can accommodate learning from implementation of failure prevention and crises management methods (Preeble, 1997). However there is little empirical research in the area of the impact of operational loss on profitability.

1.1.2 The Kenya Banking Sector

Commercial banking took root in Kenya at the turn of the 20th century with the partitioning of Africa by the European imperial powers. The first bank to establish operations was National Bank of India, which started a branch in Mombasa in 1896. By 1972, there were a total of 12 commercial banks operating in the Kenyan market. The banking system currently has 44 commercial banks, 2 non-banking financial institutions, 2 mortgage finance companies and 3 building societies.

Weaknesses in the banking system became apparent in the late 1980s and were manifest in the relatively controlled and fragmented financial system, differences in regulations governing banking and non-bank financial intermediaries, lack of autonomy and weak supervisory capacities to carry out its surveillance role and enforce banking regulations by the Central Bank, inappropriate government policies which contributed to an accumulation of non-performing loans, loss of control of money supply by the Central Bank and non-compliance by financial institutions to regulatory requirements of the 1989 Banking Act among others.

In the earlier 1990s the government embarked on reforms designed to promote a more efficient and market-oriented financial system, improve the mobilization, allocation and utilization of financial resources, increase the efficiency of the process of financial intermediation, and develop more flexible instruments of monetary policy. The reform program focused on policy, legal and institutional framework.

According to Basu and Rolfes (1995) deregulation dramatically change the operating environment for banks. Since liberalization, the industry has undergone tremendous changes. Competition resulted from micro-finance houses and Cooperative Societies, which opened front-office operations providing services very much similar to those of the commercial banks and NBFIs converting to commercial banks (Koros, 2000). Because of poor economic performance and dwindling good lending opportunities, banks have been forced to diversify to non-balance sheet based income streams. Attracting this source of

income requires banks to take deliberate strategic initiatives towards improvement of the product/service range and delivery channels (Market Intelligence, 2002).

1.2 Statement of the Problem

Given the important role that banks play in any economy, it is crucial to understand the factors that influence their viability and survival. Instances of bank failure thus raise important concerns to both local and foreign investors in any country. According to Waciira (1999), the apparent variability of profitability of companies with time has real implications for the business community, especially the banking sector. The recent failures in banking industry have raised great concern and have forced banks to put more emphasis on financial loss measures but this has not sorted out the problem of bank failures.

Operating activities being the major dealings of commercial banks are one of the sources of financial losses, which the banks incur. The dynamism of these activities creates loopholes, which results to increased loan loss provision, depreciation, amortization, and other operating expenses as published in the financial statements. Failure to effectively manage operating activities results to operational losses emanating from both the internal and external environment. Operating losses do impact on profits because it is charged to the profit and loss account and they are merely cost additive. Proper control of the operating loss directly translates to increased profits. Operational loss only appears when it crystallizes in the form of an outflow and its potential is hidden thus need to discover its impact on profits.

Yussuf (2005), conducted a study on management of operational risk of Commercial Banks in Kenya and highlighted the need for a critical study on the impact of operational losses on profitability of banks. Mugo (2003) conducted a study on relationship between interest rate spread and profitability of commercial banks and suggested a research to be conducted to find out whether commercial banks in Kenya have managed to diversify away risk through other sources of profitability other than interest rate spread.

This study addresses the omissions of the earlier researchers by examining and analyzing the level of operational losses as well as the impact of operational losses on profitability of commercial banks in Kenya.

1.3 Objectives of the Study

- To analyze the level and trend of operational losses of commercial banks in Kenya.
- To establish the impact of operational losses on profitability of commercial banks in Kenya.

1.4 Hypothesis

HO: Null hypothesis – The impact of operational losses on profitability of commercial banks is not significant.

H1: The impact of operational losses on profitability of commercial banks is significant.

1.5 Importance of the Study

The findings of the study will be beneficial to the following parties.

- **Creditors**

To assess the creditworthiness of commercial banks based on both financial losses and operational losses reports without ignoring the later as it equally affects profitability.

- **Investors**

The study will make the investors recognize that the overall level of operational losses equally affects their return on investment and hence not ignore the operational losses element when making investment decisions.

- **Commercial Banks Managers**

The study will enable the commercial banks managers appreciate the need to monitor and control operational losses as it equally affects the profitability of the commercial banks.

- **Commercial Bank Employees**

The staff involved in the day-to-day operating activities will draw inference to the study in appreciating the need for controlling operational losses as it affects profitability and their future benefits in the bank.

- **Government**

The government being the regulator charged with monitoring and ensuring stability in the banking industry the report will assist them to know that the banks are equally affected by the level of operational losses and thus set measures based on both financial and operational losses.

- **Credit Rating Agencies**

This study will enable the Credit Rating Agencies to appreciate and include both financial and operational losses indicators whenever assessing the creditworthiness of the commercial banks.

- **Management Consultants**

With this study the management consultants can advise on the best investment decisions based on not only the financial losses position but equally considering the inherent operational losses as it also impacts on the profitability of commercial banks.

- **Academicians**

The academicians will find the study useful as it will highlight areas for further research and also it will contribute to new knowledge. Also the study will give an insight of how the operational losses affect various stakeholders in the banking sector. The academicians being charged with dissemination of knowledge to various stakeholders will hence find this study useful when doing so.

CHAPTER TWO: LITERATURE REVIEW

2.1 Risk Management

The key principles in risk management are: firstly, a clear structure has to be established, allocation of responsibility and accountability and discipline are basic preconditions for risk management. Processes have to be prioritized and disciplined, responsibilities should be clearly communicated and accountability assigned thereto. Secondly, there should be rigorous measures in case of non-compliance or breaches, all should know the rules of the game and have courage for unpleasant measures with a "culture of consequences". Thirdly, completeness, integrity and relevance of data, systems and information should form a basis of operational risk management. No diagnosis should be attempted without information. What is measured, observed and recognized should get attention. Data characteristics are ideally; complete, objective, consistent, transparent, standardized, comparable across the institution, interpretable, auditable, replicable, embedded in aggregated processes, and above all they are relevant and credible as to facts and perceptions (Yussuf, 2005).

Credibly quantified and relevant risks represent an opportunity. Thoughtful self-challenge, especially rigorous audit reports, can provide a formidable basis to avoid or limit operational risks. Risk management is part art, part science because facts, perceptions and expectations are all important. Risk management is often the art of drawing sufficient conclusions from insufficient premises. Complex organizations, restructurings and projects can add risks, but notably complexity is the enemy of speed and responsiveness. The more complex a risk type is, the more specialized, and concentrated and controlled its management must be (Doering; 2003).

According to Gardener, Mills and Cooperman (2000), and Ross, Westerfield and Jaffe (1990), there exist different types of risks that different organizations can face. The risks highlighted here in are interest rate risk, exchange rate risk, technology risk, market risk, liquidity risk, credit or default risk and operational risk. Interest rate risk defined as the

potential variation in the returns from an investment or that variation in return caused by unexpected changes in interest rates. Exchange rate risk is the natural consequence of international operations in a world where foreign currency values moves up and down. This involves offshore transactions. Technology risk occurs when technological investments do not produce the anticipated cost savings in economies of scale. Market risk defined as risk incurred in the trading of assets and liabilities due to changes in interest rates, exchange rates and other asset prices. It arises when firms actively trade assets and liabilities rather than holding them for a longer-term investment. Liquidity risk is the risk that a firm may not have enough liquid cash to offset its maturing obligations. Credit or default risk is the risk that the promised cash flows may not be paid in full, this means that financial institutions are more exposed to this risk than other firms. Operational risk relates to individual firms overall business strategies, organization, functioning of internal systems compliance with internal policies and procedures and measures against mismanagement and fraud (Gardener, Mills and Cooperman 2000, and Ross, Westerfield and Jaffe 1990).

2.2 Operational Risk Management

Sustained, attractive returns increasingly depend on excellent risk management, including operational risks management. Operational risks of a bank is not new, it is as old as banks themselves. If properly managed operational risk can add value and represent a valid business case in two dimensions; control, which is achieved through independent risk assessment, compliance, business continuity planning, supervisory requirements, limits, progress reporting, escalation, and corrections. Control basically covers avoiding accidents, catching non-compliance and illegal actions, complying with rules and regulations, complying with usual management needs and shareholder value creation achieved through efficiency, correct risk evaluation and pricing, duplicate control avoidance, rational economic capital allocation, reduction of regulatory capital, product enhancements, competitive strategic advantage and improved reputation. Shareholder value creation adds a further stage, which treats operational risks more like a real business. Operational risks management also gets close to quality management,

efficiency management and the concept of opportunity cost (British Bankers Association, 1999).

Doering (2003) states that for any operational risks management project to succeed, senior management must not only support the process but must be seen to participate in the implementation, there must be credibility in the whole process, small realistic steps should be taken at a time, all at once is impossible, the aim should be to build a better organisation afterwards. According to Meridian Research Inc (2000), implementing operational risks management implies the progression through the following four stages. The first stage is the identification stage, which involves data collection and the prioritisation of risks. In this stage there is significant business unit involvement and a limited technology usage coupled with a significant use of manpower. The second stage involves metrics and tracking and includes finding quantifiable means to track risks and the creation of reporting mechanism. In this stage, business unit involvement is significant. Investment is made in automated data gathering and workflow technologies and use of manpower is significant. The third stage involves measurement and includes the development and continuous refinement of modeling approach and the creation of operational risks data. The Majority of effort is borne by operational risks group within the business. Here there is significant technology development effort and a limited use of manpower. The fourth stage involves integrated management, which includes integrating operational risks exposure data into management process. There is significant senior management involvement in this stage. Management of operational risks exposures such as insurance is employed. Investment in processes is significant and limited technology or manpower is required.

Meridien Research (2000) approximates the lead-time for Stage 1 to Stage 4 with a minimum of 2 - 3 years, depending on the complexity and the size of an organisation. The research indicates that most of the top 500 financial institutions worldwide are still in stage 1 and 2. A handful has attained stages 3 and 4; internal acceptance and credibility of the tools and figures produced are not without doubts, however.

2.3 Framework of Operational Risks Management

According to the British Bankers Association (1999), a common framework for Operational risks management for banks, which has emerged recently includes integrated processes, tools and mitigation strategies. The components of this framework include; risk policies, risk management process, risk mitigation, operations management, the company's culture and strategy. These operational risk management aspects can be highlighted as corporate governance, audit driven operational management, management structure for operational risks, top-down versus bottom-up operational risks management, strategy, structure and simplicity, segregation of duties, operational risk control process, personal attention by senior management, stakeholders, symbol and sustainability, compensation systems, modern IT systems which lead to new processes, safety and speed, staff and skills, style and shared values.

2.3.1 Corporate Governance

The Bank of International Settlements' (1999) report, the Cadbury report (2000) and the Turnbull report (2000) all call on the various boards' responsibility to identify the relevant risks and to have an "embedded" risk management system, not just a "separate exercise" or "to take risk into consideration". This is essential for proper operational risks management. The Basle Committee (1999) identifies the following as essential practices; the board of directors should establish strategic objectives and a set of corporate values; there should be clear line of responsibility and accountability, the board of directors should possess proper qualifications, there should be appropriate oversight by management, internal and external auditors should act as independent checks, compensation should be consistent with bank's ethical values, objectives, strategy and control environment and there should be transparency as to corporate governance. The recent supervisory and auditing requirements make it very clear that senior management today has an ever-increasing responsibility to deal with risks, including operational risks, in a diligent and continuous fashion.

It is not so crucial whether the whole Board of directors, the Audit or Chairman's Committee, an Executive Board Risk Committee, the Chief Executive Officer or the Chief Risk Officer have such a responsibility. Important is that it is done with skill, diligence, care and promptly, with clear allocation of responsibility, independence with built-in checks, deadlines, controls and proper reporting. The role of an Audit or Risk Committee of the Board has become much more visible, including the information for the Supervisory Board. Regulators take a more vivid interest in such or similar committees and Board functions related to risks, including operational risks. The intensity and frequency of risk management discussions depend on the organisation's specific situation. Each organisation has to strike the balance between what is to be managed tightly and what more loosely (Bank of International Settlements', 1999).

2.3.2 Audit Driven Operational Risks Management

It is self-evident that auditing and controlling activities do not only involve reporting to those who are audited. Internal audit reports go to the Chairman or Audit Committee of the Supervisory Board; thus ensuring independence. Internal and external audits play a very relevant role, especially in the operational risks arena. It is true that many conventional audits are more control-oriented or concentrating on symptoms. However, forward looking and a diligent audit report is an excellent base for operational improvements and reduction or elimination of operational risks. As important as the audit reports themselves are the corresponding follow-ups and corrective actions by those concerned. The Business Units should have their own audit tracking system. At Group level, the Chief Executive, Chief Finance Officer and Chief Risks Officer should review audit reports. Unsatisfactory major reports are subject to additional follow-up requests by senior management (British Bankers Association, 1999).

2.3.3 Management Structure for Operational Risks

A survey by the British Bankers Association (1999) has identified 3 generic organisational models for operational risks management, which include a head office operational risks function, a dedicated but decentralised support and internal audit, and playing a lead role in operational risks management. As important as the concrete structure is the visibility, acceptance and firmness of risk management, as it is not a profit center. Risk management must add value by, fostering risk awareness in various situations and cycles of a firm or market, setting standards, ensuring smooth running of the firm's risk processes and methods, disclosing and escalating relevant risks to senior management, offering constructive risk mitigation and pricing advice, assessing, quantifying risks and benchmarking with peers, where feasible

2.3.4 Top-down versus Bottom-up Operational Risks Management

According to the Credit Suisse Group (2001), there is no commonly accepted benchmark or model as to the methodology of managing operational risks. As to be expected in the art of management, there are arguments for both top-down and bottom-up approaches in operational risks management. The operational risks management process includes identification, assessment, measurement, evaluation, priority setting, reporting, control and mitigation. What is most important seems to be the clear ownership of an activity, the ability to generate reliable, meaningful and relevant information and a well functioning early warning system.

2.3.5 Strategy, Structure and Simplicity

There are very few really original banking strategies. Implementation is the issue. However, any bank without a dedicated, simple and continuously checked strategy is lost from the start: "Strategy is always simple, but it is not for that reason easy". The strategy should secure no undue risk taking, for example the strategy should emphasis the setting of ambitious but realistic targets. The structure very much depends on the strategy. Only

a logical structure can lead to the successful implementation of the strategy, especially for operational risks management and its related issues like Total Quality Management, efficiency and effectiveness. A structure for the 21st century has to take into account the need for continued innovation, creativity and with flexibility. The structures should be simple and clearly define the responsibilities and accountabilities at each reporting level.

2.3.6 Segregation of Duties

Internal and external cases indicate that many of the significant operational risks losses in history were related to the lack of segregation of duties relating to front versus support functions. This fact holds true not only for lower level functions, but also for Executive Board levels.

2.3.7 Operational Risks Control Process

In its September 1998 framework on internal control the Bank of International Settlements (BIS) identifies three main objectives and roles of the internal control framework namely efficiency and effectiveness of activities (performance objectives), reliability, completeness and timeliness of financial and management information (information objectives) and compliance with applicable laws and regulations (compliance objectives). Internal control consists of the; management oversight and the control culture; risk recognition and assessment; control activities and segregation of duties; information and communication and monitoring activities and correcting deficiencies. The control and compliance process of a firm represents one of the most decisive operational risks management tasks, especially in today's environment. An appropriate control and compliance culture is part of the risk culture, which needs close and continued attention by senior management (Bank of International Settlements, 1998).

Regulators' standards are continuously being raised. Supervisors increasingly discipline breaches of responsibilities thus there is need to optimize activities so that they can be controlled. Clear structures and procedures should be established so as to be able to

allocate responsibilities to suitable individuals. Operational risks functions and responsibilities need be integrated in job descriptions. Relevant procedures should be constructed for the concrete activity, including structure, activity, workflow, "owner" of specific activity, does "owner" know what he or she owns. The procedures should be documented and the relevant documents maintained. Procedures should ideally have the following characteristics; they should have a single document as to rules and requirements, structured along the activity flow, comprehensive and clear so someone else can pick it up; check staff turnover, monitorable and instructing: what is to be done if this happens, teachable so it can be used as a training aid, implementable- use simple check lists and auditable.

Management and staff need to be trained. Special attention for control procedures should be paid to new business activities and product as these have many uncertainties, internet activity, e-business especially in relation to frauds and security, outsourcing of non core business functions, security and safety. Access to infrastructure and internal data should be restricted to reduce frauds and leakage of information. Client privacy, including data on clients, should be protected to maintain customer confidentiality. Insider trading should be clearly spelt out to avoid conflicts of interest, money laundering, and suitability of clients, branch and / or subsidiary offices, especially far away from the Head Office. Overly profitable areas, internal communication and information flow and change management should be under close surveillance (Bank of International Settlements, 1998).

Compliance plays an increasingly core role for operational risks control. Proper positioning of compliance for a specialized activity, for example, private banking has very different requirements compared to investment banking. There should be enough and suitable compliance staff. Procedures and reporting lines should be adequate and clear. Access to senior management should be easy and staff should understand compliance function. Compliance monitoring should be done regularly and elevation procedures should be in place. Investigation on breaches should be conducted immediately. Follow-up on rectification should be prompt. Supervisory board and senior

management have an increasing responsibility for controls and compliance from back office to boardroom (Bank of International Settlement Framework, 1998).

2.3.8 Personal Attention by Senior Management

With all the requirements as to strategy, system and systems presented up to now, one element often overlooked is the personal senior management attention to support functions and to details in regard to operational risks aspects. Senior management should visit and discuss with support and control functions frequently. They should also visit the "machine room" and show a vivid interest in some – overall unimportant detail, but important for a department or issue. Time should be allotted at management meetings for support functions. The support staff should get "pats on the shoulders" for any extraordinary achievement. The compensation difference between front producers and excellent or even crucial support people who are so relevant for mitigating operational risks and fostering reputation should not be substantial (Credit Suisse Group, 2001).

2.3.9 Stakeholders, Symbol and Sustainability

Influences and interdependencies between an organisation versus its stakeholders are manifold, often informal and hardly quantifiable. Stakeholders and other described factors influence the "symbol". The expression "symbol" stands for identity, reputation and brand. The new environment is fast, mobile, innovative, anywhere-anytime connected, which leads to a world, which is highly global, complex, IT-driven, interdependent, time-pressured and competitive. Every one of these characterisations entails challenges for operational risks management (Thiessen, 2000).

Creating value for financial institution customers is the greatest challenge. Customer "ownership" is probably still the key strategic barrier for competitors. Operational risks management is close to quality and operations management. Operational skills of an institution are crucial for nurturing customer loyalty, reliance, quality, access, speed, transparency, customer orientation and "risk-free" activities. Risk-free means "reliable"

for many clients. The client expects privacy for his/her personal financial transactions. The client or end-user is the final arbiter on a new service or process – not the enthusiastic internal project team. Early inclusion of potential clients, pilots and field tests can reduce the operational risks involved. The better and "risk-free" the ongoing service, the better also the internal and external credibility of the transformation project itself (Thiessen, 2000).

Banks also have to protect themselves from the customer. Good operational risks management calls for proper disclosure and suitability checks on counter parties. A company's social, ethical, environmental and working practices can make or break the reputation, a brand and affect the share price. Banks are more and more challenged in regard to their environmental consciousness for their own infrastructure. Certification of the latter is a proof of the seriousness in operational risks management. Environmentally conscious lending and investing with commensurate internal processes have operational risks content as well (Thiessen, 2000).

According to Thiessen (2000), effective corporate communication is the lifeblood of any financial institution, which is so heavily dependent on confidence and trust. Good communication can reinforce reputation, but good communication needs good facts, at least in the medium term. Good reputation is the result of what a company says about itself, what it does including in operational risks areas and what others say about it. Good reputation is the greatest intangible asset of a financial institution. An ineffective communication organisation combined with a concrete risk or major operational risks issue can lead to disaster.

The most relevant singular factor for establishing an excellent reputation long-term is earnings stability combined with growth. This is the "compensation" for the consistency driving value. Operational skills combined with a successful operational risks management are an instrumental base for sustained earnings and the management of reputation and brand. Ideally, each employee takes some responsibility for risk management as well as for corporate reputation (Thiessen, 2000).

2.3.10 Compensation-System

Banks are regularly being criticized for the "Anglo-Saxon influenced" - bonus systems according to "plain volume performance". Pure short-term orientation can be damaging for the shareholder, other stakeholders, the organization and even the individual concerned. The assessment of a line manager has to include control and reputation performance.

According to Deoring (2001), a good compensation scheme should take into account: serious negative control and compliance performance, negative audit issues especially repeated weaknesses as part of the yearly bonus fixing, in case of doubt in regard to the clean-up of previous or real operational risks performance issues, have a suspension of the bonus-entitlement until full compliance has been achieved, ensure that a meaningful portion of a bonus is in shares and/or options effective after a few years and/or with a knock-in performance. The higher the management level, the higher the longer-term component of compensation. That is the time when certain risks, including operational risks appear and when good management shows. Senior management should only get their bonuses in shares to ensure long-term commitment. Some support functions, such as reducing operational risks, increasing the operational quality and fostering the reputation are as core as the contribution of "producers". The more diverse management and staff on a global scale, the more relevant the above suggestions become (Deoring, 2001).

2.3.11 Modern IT-systems lead to New Processes

The pressure from everywhere to invest continuously and dramatically including in the interest of risk reduction, in modern processes is immense. Integrated IT networks are central, especially for a global institution. Internet enables much higher and more sophisticated levels of co-ordination, globality, efficiency and flexibility. However, they open the door for chaos and risks if they are not consistent, structured, harmonised and stable over time. The new technologies lead to unique opportunities to modify and/or overhaul business processes as to workflow, service delivery and risk reduction. It is

important to rethink or even reinvent processes. The new IT in conjunction with process re-architecture has many advantages related to the reduction of operational risks, such as higher automation, quick storage and retrieval, instant communication, monitoring against given standards, support for quick decision making, actual work steps in processes and support of process work functions (Kessler, 2000).

Kessler (2000) recommends the following as some basic rules in regard to operational risks to consider. Many even technically perfect IT-solutions fail, because the users are ill prepared and resist. Communication and training is the key issue, existing process should be reassessed on a regular basis; especially recurring mistakes need re-examination of manager, supervisor, system or systems. It is preferable to have as little manual intervention as possible as great sources of mistakes are manual interventions, minimal reconciliation and more ideal is straight through processing. It is preferable to have one source of data throughout especially market data. Data should have a single assigned owner. Business line processes need to be separated from IT. No overreaching access of line function for data and IT-systems should occur. Processes and systems should be standardised across regions and product lines and island solutions should be avoided. Future-oriented and fully compatible architecture for operational demands of business should be adopted (Kessler, 2000).

Not maximum performance, but the handling of bottlenecks mostly determines the quality and risk limitation potential. Quality is parallel to reducing operational risks. Quality should not be a differentiating factor but a precondition for a decent survival. No core systems should exist without backup; the cost / benefit of a backup should however be conducted. Systems by their nature are interdependent and complex, with potential conflicts between the interested parties, co-operation, consensus and compromise are management functions. New systems and processes should eliminate many risk sources, but they most probably add new ones any solution breed new problems, which should be appropriately tackled. Security protection, firewalls and business continuity plans are key to operational risks reduction (Kessler, 2000).

2.3.12 Safety and Speed

Safety and speed compliment one another. According to Randell (2000), one of the most distinguishing elements of competitiveness of a bank is its safety and security. However, this can imply slowness, which in turn hampers competitiveness. Today, the fast beats the slow, more often than the big and the small one. The challenges are great because they involve; managing heterogeneous systems, rapid IT changes, cost, e-commerce, Internet, restructurings and new products of all sorts. A bank's reputation, its most valuable asset is an issue of confidence and trust for which aspects of safety and security play such a crucial role. Only confidence at large builds reputation, so hard to get, so easy to lose. Confidence and credibility of a bank besides capital strength, size and position rely largely on its safety and security. Safety and security features foster accident free quality as. prevention is often cheaper in the long run than damage control (Randell, 2000). Safety and security come ahead of speed. Safety is a precondition, not a differentiation factor for a bank. A bank's appetite for safety risks has to be smaller than the one of a non-bank. Banks need safety in their speed. Trust by customers builds confidence. The damage caused by serious security and safety failures of an Internet activity most probably has a negative effect on other activities of the same organization (Randell, 2000).

Rachlin (1998) stresses that proactive business continuity planning, as a business imperative is as much prevention as a cure. Logical system threat is perceived as more important than physical threat. Traditional disaster recovery should be combined with fault-tolerant computing to mitigate unexpected surprises. Speed of crisis response is mostly more important than perfectionism. Any transformation project for example restructuring, new systems, new process and new products entail additional special and complex safety and security issues. Strong senior management support and involvement, thinking before acting, good planning, convincing business case, good discipline and controlling are key success factors for projects. High systems availability and user friendliness are a crucial and perceived indicators for safety and security. Mission-critical systems should be available throughout and downtime should be minimised with review

of hardware, software, systems compatibility, processes and staff training done regularly. Proven systems are normally more secure and reliable.

More security breaches, especially IT related stem from inside the organisation than from outside through ignorance, carelessness, complexity, deliberately. Security starts with identifying and planning own weak areas and the real assets to be protected. Protection of intellectual property, client list, computer codes and so on, is as important as protection of money. Preventive controls (biometrics password etc.) should be encouraged. Documented detection and remedy controls should be put in place. There should be clear disclosure to employees that any and all communication they engage in on company time and equipment is subject to potential surveillance (Rachlin, 1998). According to Kessler (2000), safety management is besides having the right infrastructure, technology, service level agreements, processes and recoverability, primarily a matter of operational risks management by applying disciplines, such as rigorous password security and changes; cumulative barriers to overcome for access, rigorous control mechanisms for new business activities, involving sign-offs by all concerned parties (including operations, tax, risk management), continuously updated anti-virus software, immediate virus notification, regular checks and controls of logical security backup, rigorous discipline as to breaches.

Jameson (2002) suggests that piracy on privacy and denial of service scare away clients; anywhere, transactions and data must be safe, secure, private, verifiable, auditable and defensible. E-commerce especially allows transaction information to be tracked, collected, compiled and used but not misused. Protection of privacy and safety can be fostered by, regular checks on new processes, new technology, terrestrial links (with two or more access points, satellite as stand-by), Home Banking Computer Interface Standard (HBCI) encryption plus chip card with digital signature, Public Key Infrastructure (PKI) increasingly enables users of Internet to securely and privately exchange data through the use of a public and a private cryptography key pair that is obtained and shared through a trusted authority. PKI's allow the use of digital certificates, which can identify individuals

or organizations to authorize secured and private transactions across the Internet (Jameson, 2002).

The legal ramifications of the virtual online world are influx and need careful examination. The EU for example, has started various initiatives with directives on electronic signatures, e-commerce, distance marketing of the banking industry, distance selling and data protection. The legal aspects are potentially relevant in the context of comprehensive general liability insurance. Watch for domain name infringement, sale of keywords, copyright infringements and patent infringements, invasion of privacy, defamation, unfair competition, contractual risks, jurisdictional risk, employment practice liability, health and safety of staff, and local legal specifics.

2.3.13 Staff and Skills

The value of a bank increasingly lies in its intangibles; data, knowledge, skills, people, network, reputation and brand. These are bundled together in the organisation and can also reflect in operational risks. Worldwide, a battle for talent is going on. Human capital has become more important than financial capital. For financial institutions, employee selection, retention and development are at least on the same level as customer loyalty or shareholder support. As a matter of fact, the last two stakeholders' aspects very much depend on proper management and staff (Rachlin, 1998).

2.3.14 Style and Shared Values

Style and shared values are core issues for the risk management of a financial organisation, including for operational risks management. Rachlin (1998) recommends the following guidelines to address operational risks at the root as they touch the individual's attitudes, actions and reactions. Culture is core for the identity of people. Traditionally, culture has been linked to common language, values, customs and beliefs on a local, national and perhaps regional level. Corporate culture an expression often used and misused is the formal and informal, written and unwritten and often invisible

totality of common norms, values, thinking and acting which determines the behaviors of management and staff. Each organisation has its very specific corporate culture. It is a qualitative expression of the organisation, internally and externally; such an expression can be difficult to describe. Risk culture, besides people, is the most crucial factor for a successful risk management generally and in operational risks management in particular. The control culture acts above all at the very place where risks are taken (Rachlin, 1998).

2.4 Operational Losses

The banking business revolves around operational activities. The highest percentage of these activities is a source of operational loss. Operational loss will primarily be driven by: new products, product sophistication, new distribution channels, new markets, new technology; complexity of operational activities, E-Commerce, processing speed, business volume, new legislation, role of non-government organizations, globalisation, shareholder and other stakeholder pressure, regulatory pressure, mergers and acquisitions, re-organisations, cultural diversity of staff and clients, faster ageing of know-how, insurance companies and capital markets (Basel Committee 2003). The operational losses mainly comprise of frauds/forgeries, system failures and the human element in operating activities (Basel committee, 2003).

2.4.1 Types of Operational Losses

The commercial banks are faced with a wide exposure to various types of operational losses. Each institution has its own, individual and unique operational setting. Thus, to be able to manage operational losses might require tailoring its definition and its sub-categories to the firm's specific setting. Operational losses include items classified by banks as loan loss provision, depreciation, amortization, and other operating expenses in the published financial statements. Operational losses will also be viewed in line with prescribed central bank of Kenya prudential ratios. This research adopts the profit before tax as published by the institutions as the guiding index in comparing operational losses of different institutions.

2.4.2 Operational Loss Indicators

All departments in a bank watch certain figures or trends related to their work. Sales people would monitor performance; settlement staff monitors mistakes resulting from inaccuracies in their operation. They all choose certain indicators, which can be sensibly tracked over time. According to the Credit Suisse Group (2000), the market has set out three different names for such indicators, which are relevant for operational risks management. These indicators are as follows; key performance indicators are normally used for monitoring operational efficiency; red flags are triggered if the indicators move outside the established range. Examples include; failed trades, staff turnover, volume, and systems downtime. Key control indicators demonstrate the effectiveness of controls. Examples include: number of audit exceptions and number of outstanding confirmations. Key risk indicators are primarily a selection of key performance indicator and key control indicator. This selection is made by risk managers from a pool of business data/indicators considered useful for the purpose of risk tracking. A key risk indicator gives insight on the extent of stress of an activity. Examples include; a number of failed trades, severity of errors and omissions, cancel and corrects, change management events, contract staff versus permanent staff, IT security breaches, breaches in service level agreements, unfilled vacancies, absence levels and customer satisfaction surveys. Typically, a business unit or department uses 10-15 different key risk indicators. Key risk indicators must be used as a time series to monitor and foresee trends. If skillfully used, such trend analyses can serve as an early warning system and provide directional input for senior management involvement.

2.4.3 Measures of Operational Loss

According to Young (1979), models and quantifications are only as good as the data they are built on. Data availability is a precondition. Activities only turn into data, if they are recorded in a form, which can be retrieved at a later stage. While recording many of their actions, banks cannot record everything in permanence. In operational loss particularly, most banks have highlighted only bits and pieces of the big operational loss picture in the

past. The question for operational loss data is what do we have already? What do we still need and by which means to get it? In particular, it is important to establish clarity on the frequency in which operational risks data is available or should be available. Do we have and do we need daily, monthly, quarterly, annual data? What level of detail at which operational loss data is or should be available (Young, 1979).

Many operational loss areas just cannot be measured but require judgment. Accordingly, two types of data, qualitative data and quantitative data must be distinguished. The quantitative and qualitative data require different treatment, interpretation and analysis. In this context it is extremely important that the information to be captured in the data is clearly defined, in terms of content, feature and unit. This is a precondition for standardization and tracking possible failures of reporting and formats (Young, 1979).

Operational loss data of an entity is unique to availability, characteristics, causality, subjectivity, transactions and portfolio types. The questions that need to be examined are: have external loss and pooled data known in the market been carefully interpreted? Are the operational loss figures pure operational losses or are they combined with an element of market, credit or other risks? Are they insurance claims or estimated losses? Are the figures gross or net figures? Do they include the cost to fix the damage? What are the specific losses compared with revenues, turnover, earnings and equity of the respective commercial bank?

Relevance has to be ensured as times change, new environments and new products are put in place. Constant surveys and checks of the type of data being used must be performed to avoid unrealistic indicators. New data content needs have to be assessed and old and less confirmed data must be weeded out. Data access issues have to be settled. Sources on operational loss data can be created through data sharing agreements or consortiums. According to Jorion (1997), many commercial banks shy away from such an approach, understandably so given specific circumstances such as confidentiality aspects, media, and impact on overall perception.

Quantification is a powerful tool for enhancing transparency, as long as it is credible. In the financial industry managers and regulators have an increasing interest in quantifying operational loss. The collection of relevant data presents a major stumbling block. Unlike market and credit risk, operational loss is internal to the firm. Since firms are understandably not eager to reveal their failings, public data on losses caused by operational loss are nowhere as rich as other forms of risk (Jorion, 1997).

This section investigates the three major questions to be answered when proceeding to quantification: what object, why, and how is it to be quantified? This will help us to identify the operational risks quantification possibilities and limitations, the areas of operational loss where a measurement could be performed and the most appropriate methods for this measurement in order to thrive for the relevance of operational loss vis à vis the total losses, acceptable costs of gathering operational risks information and the credibility of the operational loss quantification outcome.

The quantification and measurement of operational loss generally involve looking at four aspects of a phenomenon within an organization: size, severity or intensity, its frequency and its context dependency (Jewell, 2000). The size describes the observed extent of a move. The frequency describes the number of times a move of a given size occurs within say a given time period or a given organizational unit. Both require the ability to observe the phenomenon. These aspects are at the core of the quantification of market and credit risk. For operational losses, fewer elements are effectively observable. The context dependency describes whether the move size is different in different situations or not. This tells whether every operational loss event is unique in it self or shows regularities in occurrence as drivers do not alter. Context dependency, in contrast to market and credit risk is generally high for operational losses as its major drivers, people and organization are unique and change permanently. Also, the higher the context dependency, the less the past will be a good indicator for the future. In the area of operational loss as for market risks, this aspect is very important as several operational loss elements are highly interrelated (Jewell, 2000).

Quantification of operational losses depends on the purpose and one has to be clear about these before data collection for it to serve any use. Here we have to make sure that the quantification of operational risks whether via modeling or another method is focused on and compatible with the business needs of the firm. In other words, we have to ensure that quantification output is geared for management needs and quantification makes the most efficient use of existing resources and is relevant and credible. Once the questions are solved of what and for which purpose operational losses are to be quantified, the most suitable quantification or modeling method can be chosen. There are a number of choices including a qualitative assessment, a process mapping and a quantitative modeling (Jewell, 2000).

Hoffman (1998) argued that, the trend is not to use particular models and techniques on a stand-alone basis but increasingly in combination with each other to do justice to the complexity of operational losses. This trend of combining various quantification approaches allows firms to tailor make quantification approaches to their own specific operational losses environment. The commercial banks can use a variety of models in operational loss quantification depending on their need (Hoffman, 1998). The Factor-derived or Indicator Based Models which apply causal factors to build a prediction of the level of loss exposure can be used. For example, they would use a combination of error rates, frauds rates, failed reconciliation's, employee training expenditure, staff turnover, indicators of the IT system complexity, indicators for the quality of governance and so on to project a level of operational losses. They tend to produce a figure for the relative future value of the causal factors on operational losses, but not necessarily of the operational losses amount. They are also considered to be only partially representative of operational losses root causes (Hoffman, 1998).

According to BIS (1999), an indicator-based quantification is a possible method for the quantification of operational losses and the corresponding regulatory capital allocation. The level of operational losses is identified by a multiple of a simple observable indicator or a combination thereof. Suggested indicators include: gross revenues, fee income, operating costs, managed assets or total assets adjusted for off-balance sheet exposures

(BIS, 1999). The BIS method is a factor or causal theory model simplified to its extreme. It assumes a linear link between the level of operational losses and business activity, thereby offering the advantage of being easily implementable. The most important drawback of the BIS causal theory model is that an operational loss quantification based on exclusively measurable indicators is bound to produce incorrect and misleading approximations of operational losses. This is because the high context dependency of most operational loss elements makes qualitative, non-measurable operational losses aspects critical in determining its level (BIS, 1999). The BIS method also bears the danger of creating perverse incentives. For example, lowering control related costs would save capital, but also raises the operational losses. Lowering fee income would save capital, but also crowd-out the regulated fee-income banking activities in favor of unregulated financial actors and thereby increase the loss within the financial markets (BIS, 1999).

The drawback of relying exclusively on measurable indicators in factor / causal methods can be overcome by integrating qualitative aspects of operational losses. These methods could be particularly useful in top-down frameworks to gain insights in both, low and high frequency events. The Loss-Scenario or Qualitative Assessment Model, which produces a subjective loss estimate for a given time horizon and confidence level, based on the experience and expertise of key managers can be used. Weaker assessment forms could just require ranking of the operational losses level for each elements of a loss map or checklist. Qualitative assessment models have been put forward, as they are particularly well suited for tackling both the frequency in observability of operational losses and its high context dependency. A purely qualitative assessment can also be turned into a quantification method. This could involve four core elements namely a check-list for a periodic and systematic qualitative assessment of each element of operational losses, a grading scale-based assessment considering criteria such as severity, probability and time horizon of occurrence, grading dependent management escalation procedures, action triggers, or compensation rules and reports in and a transformation of the grading into an operational losses level expressed in say Kenya shillings. Such methods have the advantage of enhancing transparency of the change of operational

losses. They also allow a proactive management of the level of operational losses. However, as they rely on the subjective judgment of experts, they are only appropriate for a crude quantification of the operational losses economic capital level and operational losses capital allocation (Hoffman, 1998).

Capital Allocation, where few banks have used modeling techniques to derive or aimed at deriving an operational loss economic capital or establishing an operational loss capital allocation mechanism. A top-down approach is followed for the attribution of operational loss capital to business lines. It involves two steps, which include the loss measurement and the capital attribution. In the loss measurement process, an actuarial model and Monte Carlo simulation is applied to the loss database combined with a loss scenario modeling. A loss potential is generated for each operational loss class and for the overall firm. The capital attribution process builds on a factor-based modeling using a broad array of loss factors. These loss factors are detailed at the individual business line and profit center level, for example the training expenses of a given business line or the settlement error rate. The factor-based model produces operational loss weights for each business line. Based on these weights, the overall firm operational loss capital is then allocated or distributed to the individual business lines (Hoffman, 1998).

To perform both these steps, the firm relies on its well-populated operational loss database covering the whole range of the loss distribution, including the long-tail losses. The database consists of two sections: internal losses and losses from other firms. The loss events are classified in the database within one of the firm's operational loss classes. These classes have been kept to a minimum given that operational loss events are relatively sparse - and defined based on causation sources such as resource and asset. This has led to the creation of five classes which include: relationships, people, physical assets, technology resources, and external issues. These classes are more geared to loss management purposes than control oriented (Hoffman, 1998).

For simplicity of measure this study adopts operational losses as published by commercial banks. Operational losses will include items classified by banks as loan loss

provision, depreciation, amortization, and other operating expenses. Operational losses will also be viewed in line with prescribed Central Bank of Kenya prudential ratios. This study will adopt the earnings before interest and tax as published by the institutions as the guiding index in comparing operational losses of different institutions. Ratio analysis has been used to measure the effect of operational losses. According to Cooperman, Mills and Gardner (2000), Cornett, Ors and Tehranian (2002), Rose (1994) and Dziobek and Parzabasioglu (1998), the following ratios are used:

$$\text{Operational losses to Total operating expenses} = \frac{\text{Operational losses}}{\text{Total operating expenses}}$$

$$\text{Operational losses to Earnings before Interest and Tax (EBIT)} = \frac{\text{Operational losses}}{\text{Earnings before Interest and Tax}}$$

$$\text{Operational losses to Net Assets or Capital Employed} = \frac{\text{Operational losses}}{\text{Net Assets or Capital Employed}}$$

$$\text{Operational losses to Net Worth} = \frac{\text{Operational losses}}{\text{Net Worth}}$$

2.4.4 Operational Loss Management

Control basically covers avoiding accidents, catching non-compliance and illegal actions, complying with rules and regulations, complying with usual management needs and shareholder value creation achieved through efficiency, correct loss evaluation and pricing, wastage avoidance, rational economic capital allocation, reduction of regulatory capital, product enhancements, competitive strategic advantage and improved reputation. Shareholder value creation adds a further stage, which treats operational loss more like a

real business. The British Bankers Association (1999) relates, operational loss management close to quality management, efficiency management and the concept of opportunity cost management.

In order for operational loss management to succeed, senior management must not only support the process but must be seen to participate in the implementation. there must be credibility in the whole process, small realistic steps should be taken at a time, all at once is impossible, the aim should be to build a better organization afterwards (Doering, 2003). The Credit Suisse Group (2001), suggest that one can differentiate between "six levels of defense" for operational losses taking into consideration of the diversity of operational loss in the banking industry as follows:

Level 1: Business front line with the prime responsibility for taking and managing risks.

Level 2: Support functions like product control, strategic risk management, and compliance management with focus on specific operational loss areas and concentrations.

Level 3: Senior management and supervisory board with focus on the overall loss profile.

Level 4: Internal and external audit with focus on deficiencies as to policy, structure, rules and regulations.

Level 5: Regulators - supervisors with prime role of an external referee.

Level 6: Shareholders and other stakeholders as ultimate daily overall judges.

According to Doering (2003), an analytical and conscious approach to solve management issues in regard to operational loss can be structured along what he calls the 12 S's for every organization, namely – Strategy, Structure, Simplicity, System(s), Safety, Speed, Skills, Shared values, Stakeholders, Symbol, Sustainability and Synchronisation.

2.4.5 Tools for Managing Operational Loss

Management of operations has always used given tools to identify, assess, control and manage operational loss in its day-to-day specific area of activity (British Bankers Association 1999). No one tool on its own is sufficient as each has its limitations. Synchronisation of the tools combined with previously discussed, more high-level approaches of general management including audits and compliance measures is the issue. Such an approach leads to integrated loss management. The tool commonly used is Control and Risk Self-Assessment technique. Control and Risk Self-Assessment (CRSA) is a work team-based technique to help managers identify and measure operational loss through estimates based on the consensus opinion of a group of knowledgeable managers and staff. The ultimate objective of this process is to foster the identification, assessment and mitigation of operational loss. This is where a formally documented process in which management and work teams review the effectiveness of the business controls to contain operational loss and to meet defined objectives is used (British Bankers Association, 1999).

A facilitator is designated to assist the work team whose members should be people who are key to the achievement of the specific business objective or are influencing the operation that has been selected for review. In many cases, a cross-functional work team helps to develop the broadest possible coverage for the achievement of the business objective. Management must clarify the relationship between the organisation's primary corporate objectives and the specific business line objectives for each participating unit. These objectives can include diverse areas, as well as diverse practical applications for every department and every employee function (British Bankers Association, 1999).

Workshops are conducted with employees from participating departments using a framework consisting of control categories, to review the controls in place to achieve each business objective under analysis. The framework's categories may include: purpose, commitment, planning, capability, direct controls, measurement, employee well being and morale, process oversight and culture. The objectives are analyzed in terms of,

threats, which are events that could prevent the achievement of an objective, controls, which are activities that provide additional assurance that objectives are met and agreed residual loss, the real or possible events or situations where a business/quality objective is not being met or may not be met given the controls in place. The information on threats, controls and operational loss is captured for each business objective. The information is then documented, summarized and reported to senior management. Due to the dynamic nature of a firm's operational loss profile, findings should be periodically updated (British Bankers Association, 1999).

2.5 Profitability

Profit/losses is the end result of the commercial banks after deducting operating expenses and operational losses from their income. Profitability is the performance of commercial banks income-generating activities (Komen, 2002; Mirghani, 2003). Profit/loss position is very crucial to any firm because it determines its growth rate and its survival. Every firm embarks on cost management strategies aimed at increasing profits. This cost management strategies omits the element of operational losses.

2.5.1 Determinants of Profitability of Commercial Banks

According to Saunders (2000), the level of operating costs, non-operating costs and macro-economic variables, determines profitability of the commercial banks. Operating costs and macro-economic variables are areas where commercial banks have laid more emphasis (Yussuf, 2005). The efficiency of the commercial banks contributes a lot to increased income generation and collection. Kwan and Eisenbeis ,(1992) argues that increased efficiency results to increased returns as the operating loss element is reduced. According to Kwan and Eisenbeis ,(1992), the income variables of a commercial bank include Interest income, investment income (dividends, rent) and other miscellaneous incomes whereas the operating costs of a commercial bank include interest expense, staff salaries, loan loss provisions, operating lease rentals, bad and doubtful debts charges, directors emoluments and other operating expenses. He further argues that through

increased efficiency the commercial banks can save on the loan loss provisions, operating lease rentals, bad and doubtful debts charges, and other operating expenses thus increased incomes. Kwan and Eisenbeis (1992), emphasizes that loan loss provisions, operating lease rentals, bad and doubtful debts charges, and other operating expenses are a waste to any firm as this is a direct deduction from earned income without any additive value to the firm.

2.5.2 Measures of Profitability

Profitability is mainly measured using ratios. Ratio analysis provides clues to investigate profitability issues in detail. However, caution needs to be applied while interpreting ratios as they are calculated from the accounting numbers, which suffer from accounting policy changes, arbitrary allocation procedures and inflation. Researchers however continue to consider ratios as valid measures of profitability. According to Cooperman, Mills and Gardner (2000), Pandey (1999), Cornett, Ors and Tehranian (2002), Rose (1994) and Dziobek and Parzabasioglu (1998), the following are profitability ratios commonly used:

$$\text{Profit after tax (PAT) to Earnings before Interest and Tax (EBIT)} = \frac{\text{Profit after Tax}}{\text{Earnings before Interest and Tax}}$$

$$\text{Return on Investment (ROI) before Tax} = \frac{\text{Earnings before Interest and Tax}}{\text{Net Assets or Capital Employed}}$$

$$\text{Return on Investment (ROI) after Tax} = \frac{\text{EBIT (1-Tax Rate)}}{\text{Net Assets or Capital Employed}}$$

$$\text{Return on Equity (ROE)} = \frac{\text{Profit after Tax}}{\text{Net Worth}}$$

UNIVERSITY OF NAIROBI
JAMES KABETE LIBRARY

2.5.3 Effects of Operational Losses on Profitability

The operational losses when they crystallize are reduced from profits generated by the commercial banks in the current year or claimed from insurance companies if the risk was insured. In most cases insurance companies do not compensate the commercial banks because of contributory negligence. Where these losses are huge they do reduce the commercial banks profits substantially. Also the operational loss triggers other costs. According to Saunders (2000), operational losses triggers other costs like cost on lost bank image, increased compensation costs, investigation costs, litigation costs, cost on loss of customer confidence, increased insurance premiums due to increased operational risks, reduced interest incomes due to fraudulent borrowers, higher employment and training costs due to high turnovers and firing of those implicated on fraudulent activities, and depletion of capital due to fraudulent allowance allocations or practices to cover operational losses without affecting current profits. Kwan and Eisen concluded that costs should not be looked at in isolation as one cost can trigger other costs.

Operational losses affects the level of income generation of a commercial bank as it impacts negatively on the ability of the income generating variables to efficiently perform. The direct impact is realized when the actual operational loss cost is charged to the profit and loss account (Kwan and Eisenbeis, 1992).

2.6 Related Local Studies

The issue of the impact of operational losses on profitability of commercial banks has only recently been given prominence in the world banking industry.

According to Mucheke (2001), among the key causes of bank failures are bad lending practices, incompetence on the part of bank risk managers and unsound operational practices.

Obiero (2002), did a study on the banking sector regulatory framework; its adequacy in reducing bank failures and found that of the 39 banks which failed during the period 1984 and 2002, 37.8 % collapsed mainly due to poor quality of lending. Though most banks pride in clear and sound lending policies, the reality is that they have been quite reckless in their lending activities.

Yussuf (2005), conducted a survey on operational risks management practices by commercial banks and found that operational risk departments exist only in the big banks. He noted that the most common categories of operational risks in Kenyan Commercial banks are human risks, which arise from failure of employees and conflict of interest or from other internal fraudulent behaviors; external risks, which arise from fraud or litigation by parties external to the firm and weaknesses in processes.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The study is a survey, which seeks to identify the level of operational losses and their impact on profitability of commercial banks in Kenya.

3.2 Population of Study

The population of study was the 44 commercial banks in Kenya. All the commercial banks were studied, thus no sampling was necessary.

3.3 Data Collection

The secondary data on profitability was obtained from annual accounts stocked in the Nairobi Stock Exchange library and Central Bank of Kenya library. Data on operational losses was obtained from Annual Published Accounts in the Daily Nations and Central Bank of Kenya library. Operational losses, total operating costs and profitability data for the period 2001 to 2005 was used. This study adopted the earnings before interest and tax as published by the institutions as the guiding index in comparing operational losses and profitability of commercial banks.

3.4 Data Analysis

Data was analyzed using statistical package for social sciences (SPSS) and content analysis used in summarizing the findings. Descriptive statistics, case analysis, comparative analysis and regression analysis were used in determining the impact of operational losses on profitability. The ratios were plotted in graphs to determine the trend, while the impact was established by estimating a regression equation. The equation giving the relationship between operational losses and profitability is in the form of $y = a + bx$.

Where $y = \text{Profitability ratio} = \frac{\text{Profit after tax}}{\text{Earnings before interest \& tax}}$

$x = \text{Operational loss ratio} = \frac{\text{Operational losses}}{\text{Total Operating expenses}}$
 $= \frac{\text{Operational losses}}{\text{Earnings before interest \& tax}}$

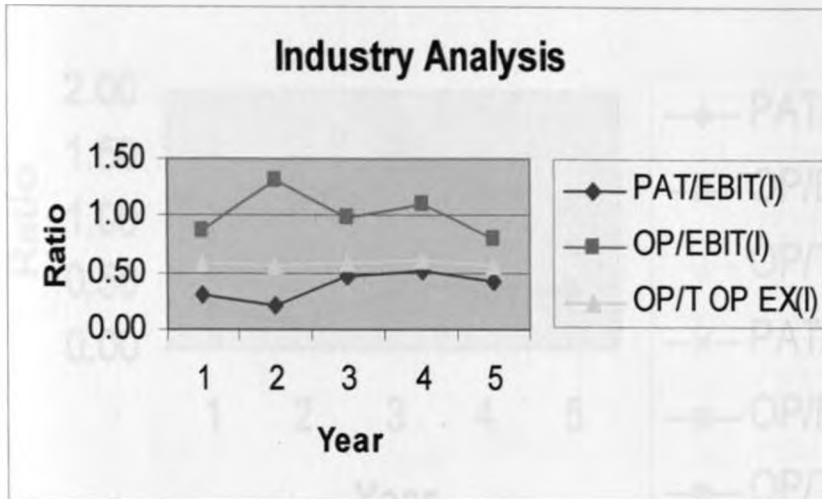
$a = y\text{-axis intercept}$

$b = \text{Coefficient}$

Tests of significance will be done to determine whether the effect of operational losses on profitability is significant. An inter-industry comparison will be done to establish the trend in the market. Also industry average will be computed to determine the benchmark. The industry average is taken as a simple average of the variables of the banks under this study.

CHAPTER FOUR: DATA ANALYSIS

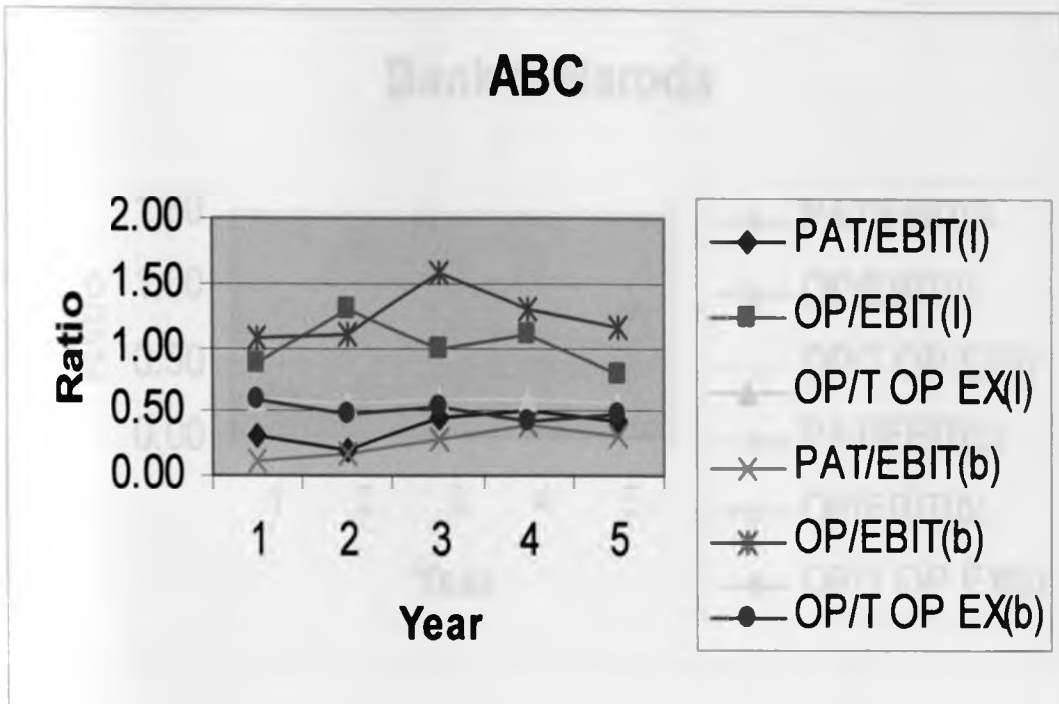
4.1.1 Industry Analysis



Source: Research Data

The industry's operational losses earnings risk level under the period of study ranged from 0.79 to 1.31. In 2001 and 2002 there was upward trend followed by a downward trend in year 2003, upward trend in year 2004 and downward trend in 2005. The industry's profitability level in the period of this study ranged from 0.20 to 0.52. In 2001 and 2002 there was a downward trend, upward trend in 2003, 2004 and a downward trend in 2005. The industry's operational losses level to total operating expenses ranged from 0.56 to 0.60. In general the profitability and operational loss ratios were moving in opposite direction. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The industry average equation used is $Y=a+b \cdot X$. The variables are period of study, profitability ratios and operational loss ratios i.e. $a=y$ -axis intercept, b = Coefficient and x =operational loss ratio. The industry $Y=0.661-0.275x$ shows that any change in (x) variable will cause a negative change in Y.

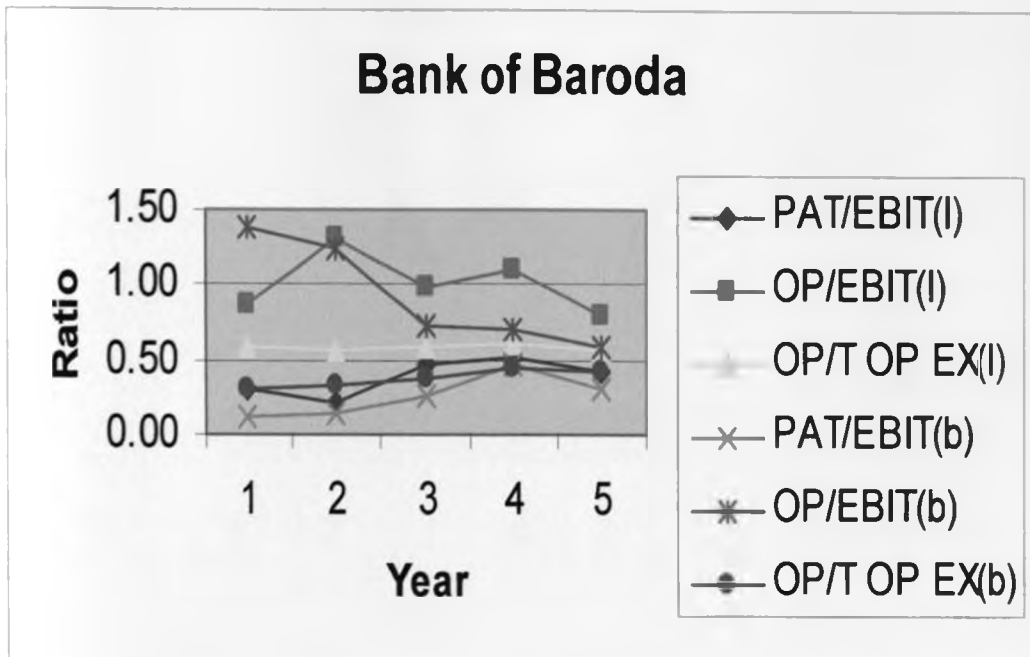
4.1.2 African Banking Corporation



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 1.07 to 1.58 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's profitability level in the same period ranged from 0.12 to 0.40 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's operational losses level to total operating expenses ranged from 0.43 to 0.60 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but for other areas under study it was doing below average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.092 + 0.279x$

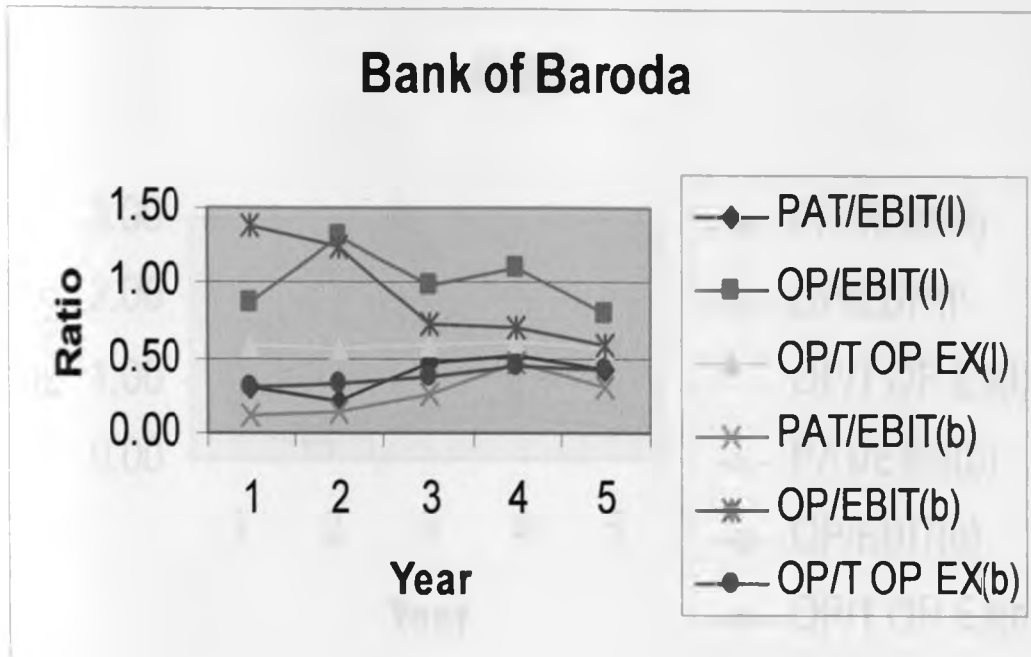
4.1.3 Bank of Baroda



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 1.07 to 1.58 whereas the industry average ranged from 0.58 to 1.38. This shows that the bank's operational losses level was lower in years 2002, 2003, 2004 and 2005 but high in 2001 compared to industry average. The bank's profitability level in the same period ranged from 0.13 to 0.47 whereas the industry average ranged from 0.20 to 0.52. In 2001 and 2002 shows a steady trend, 2003 and 2004 upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.31 to 0.44 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but for other areas under study it was doing below average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.548 - 0.314x$.

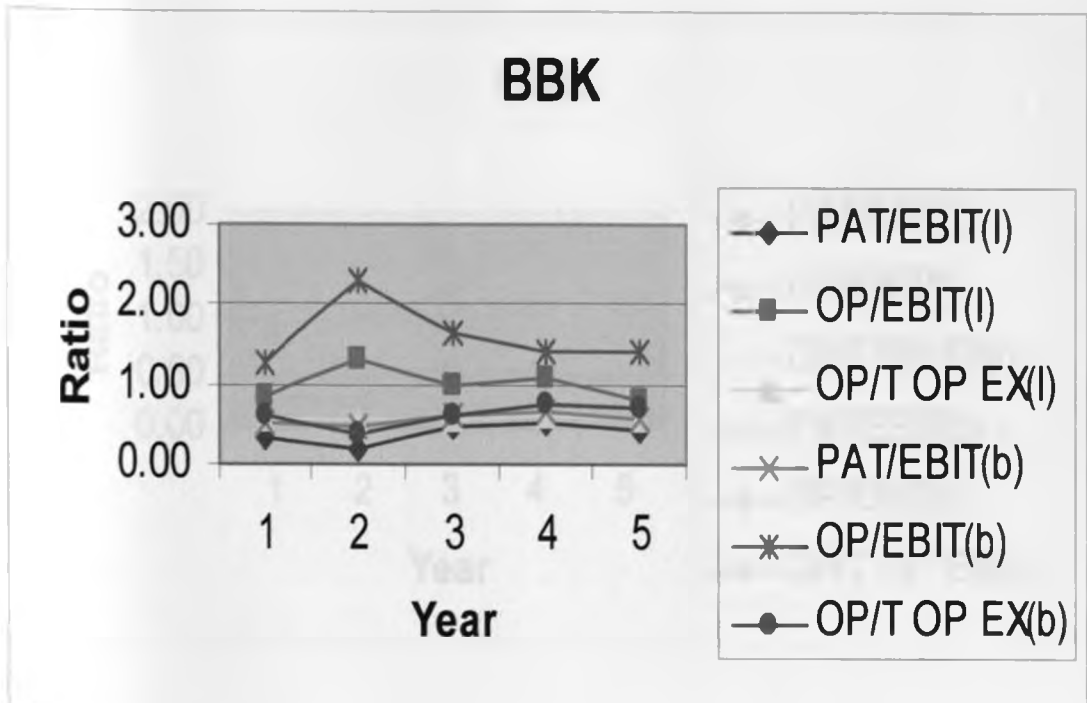
4.1.3 Bank of Baroda



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 1.07 to 1.58 whereas the industry average ranged from 0.58 to 1.38. This shows that the bank's operational losses level was lower in years 2002, 2003, 2004 and 2005 but high in 2001 compared to industry average. The bank's profitability level in the same period ranged from 0.13 to 0.47 whereas the industry average ranged from 0.20 to 0.52. In 2001 and 2002 shows a steady trend, 2003 and 2004 upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.31 to 0.44 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but for other areas under study it was doing below average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.548 - 0.314x$.

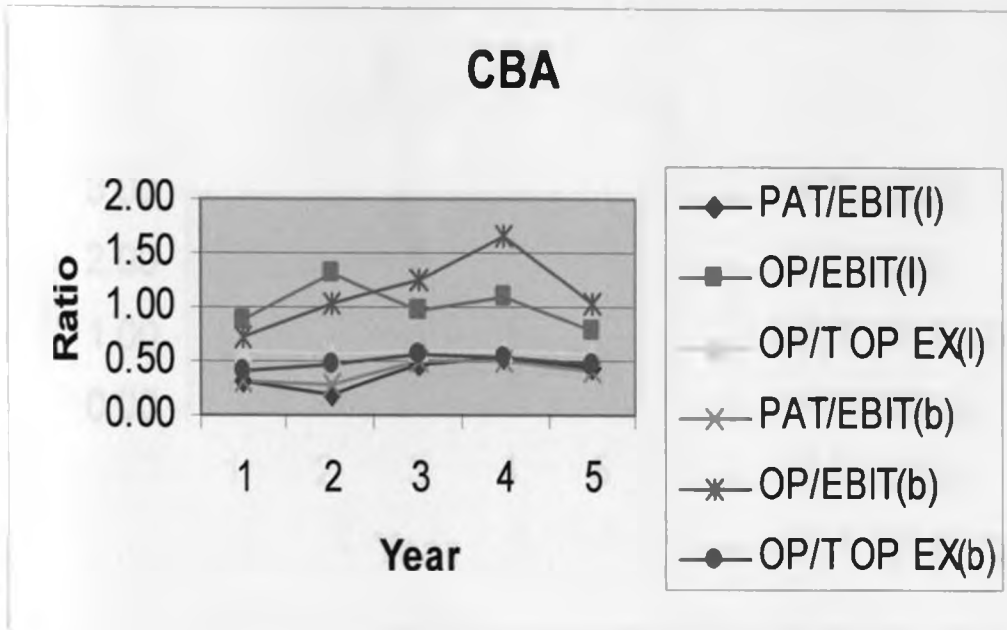
4.1.4 Barclays Bank of Kenya



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 1.26 to 2.27 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average especially in year 2002. In 2001 and 2002 there is upward trend followed by a downward trend in years 2003, 2004 and 2005. The bank's profitability level under same period ranged from 0.45 to 0.63 whereas the industry average ranged from 0.20 to 0.52. In 2001 and 2002 there is downward trend followed by an upward trend in years 2003 and 2004 and downward trend in 2005. The bank's operational losses level to total operating expenses ranged from 0.36 to 0.74 whereas the industry level ranged from 0.56 to 0.60. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.753 - 0.122x$.

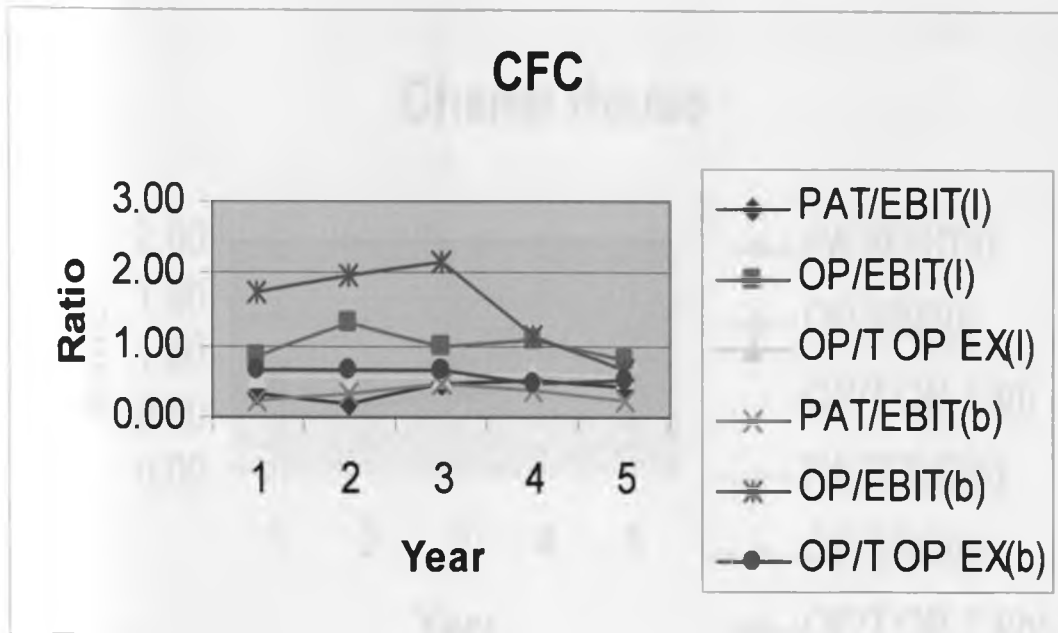
4.1.5 Commercial Bank of Africa



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.71 to 1.65 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.29 to 0.51 whereas the industry average ranged from 0.20 to 0.52. In 2001 and 2002 there is downward trend followed by an upward trend in years 2003 and steady in 2004 with a downward trend in 2005. The bank's operational losses level to total operating expenses ranged from 0.40 to 0.56 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but for other areas under study it was doing below average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.141 + 0.234x$.

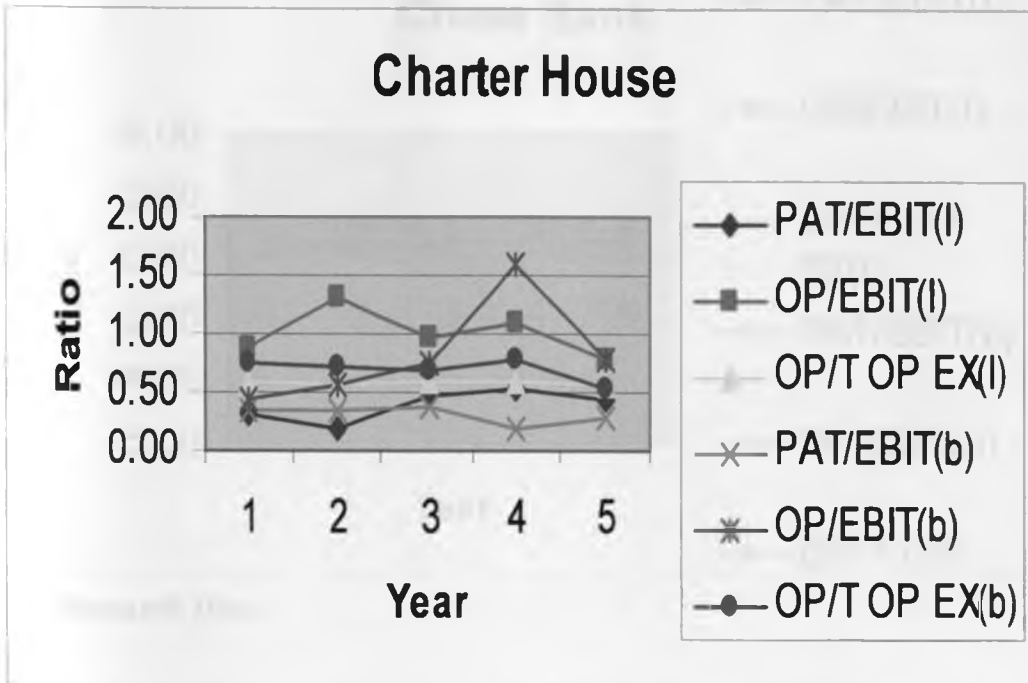
4.1.6 Credit Finance Corporation



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.67 to 2.17 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's profitability level in the same period ranged from 0.23 to 0.49 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's operational losses level to total operating expenses ranged from 0.47 to 0.67 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing above industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.172+0.104x$.

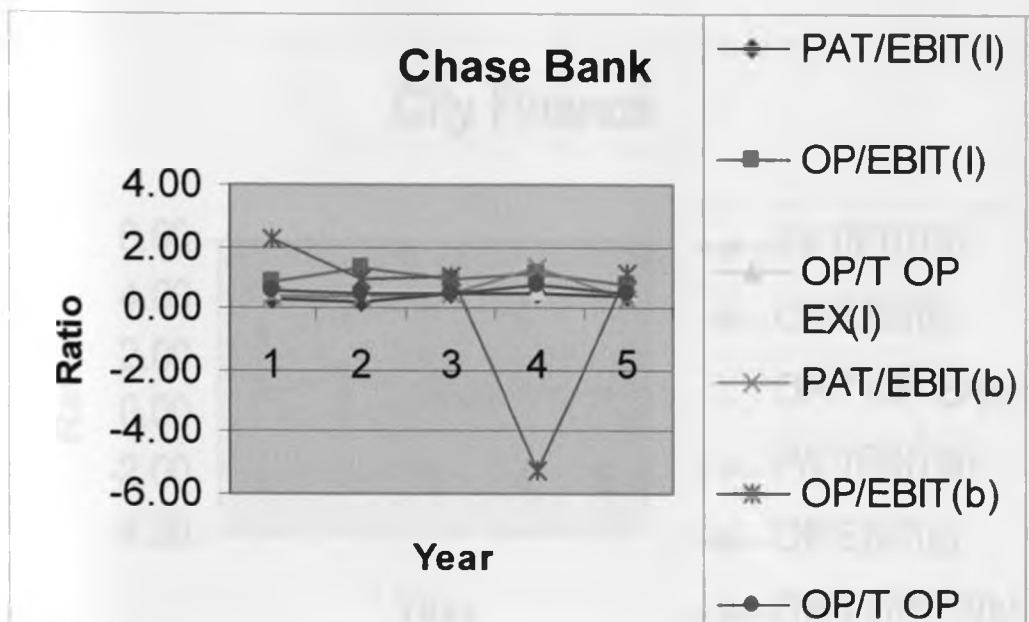
4.1.7 Charter House Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.43 to 1.58 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level in years 2001, 2002 and 2003 were low and in 2004 and 2005 high compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's profitability level in the same period ranged from 0.19 to 0.38 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in year 2004 and upward trend in 2005. The bank's operational losses level to total operating expenses ranged from 0.53 to 0.77 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing above industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.427-0.146x$.

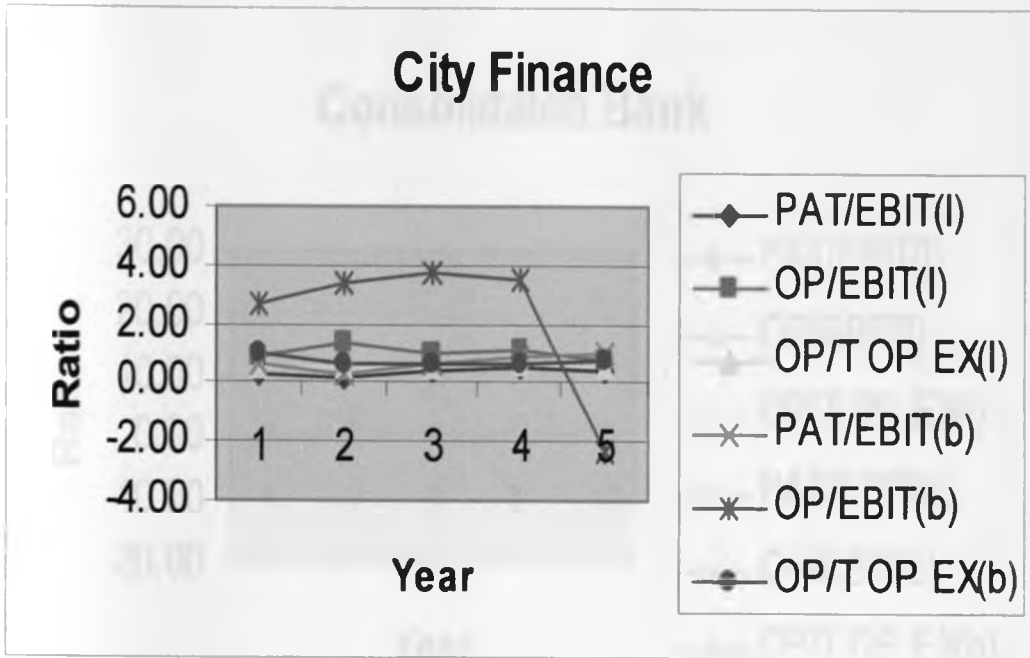
4.1.8 Chase Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from -5.28 to 2.28 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was high in 2001, low in 2002, high in 2003, low in 2004 and high in 2005 compared to industry average. The trend kept interchanging a sign of high-risk exposure. The bank trend in 2001 and 2002 showed a downward trend followed by an upward trend in year 2003, an extreme downward trend in 2004 followed by an upward trend in 2005. The bank's profitability level in the same period ranged from 0.30 to 0.44 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002 and 2003 the bank was doing above average a good sign but in years 2004 and 2005 below average. The bank's operational losses level to total operating expenses ranged from 0.50 to 0.75 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well except in year 2004. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.579-0.137x$.

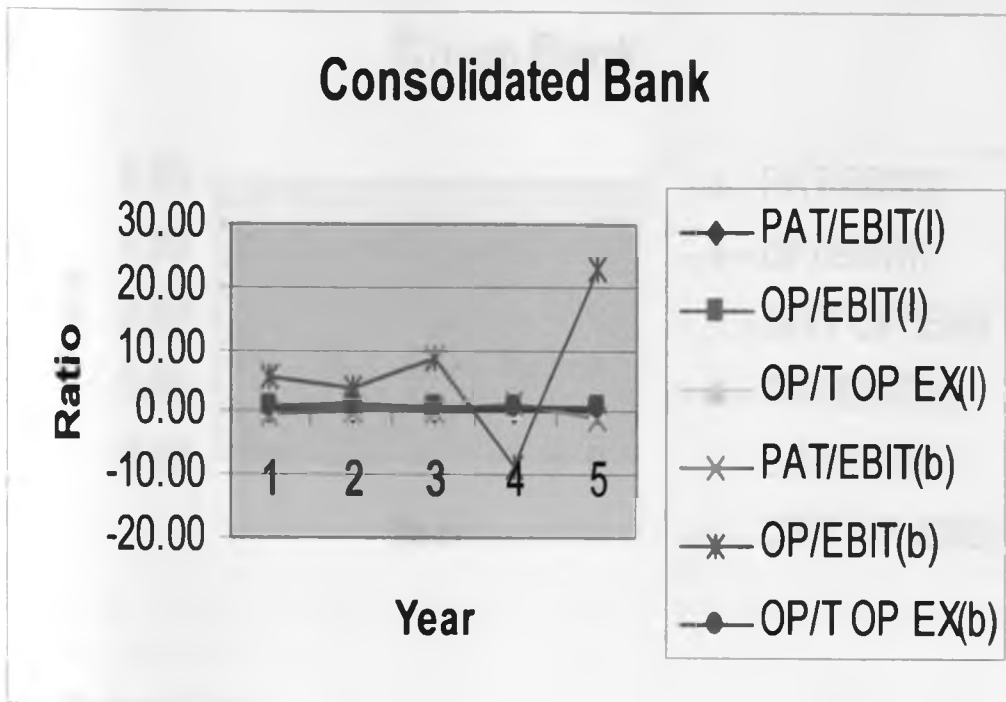
4.1.9 City Finance Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from -2.31 to 3.75 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was too high in years 2001, 2002, 2003 and 2004 but also too low in year 2005 compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's profitability level in the same period ranged from 0.33 to 0.106 whereas the industry average ranged from 0.20 to 0.52. In 2001 and 2002 there is a downward trend followed by an upward trend in years 2003, 2004 and 2005. The bank's operational losses level to total operating expenses ranged from 0.59 to 0.95 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing below average a bad sign. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.871-0.074x$.

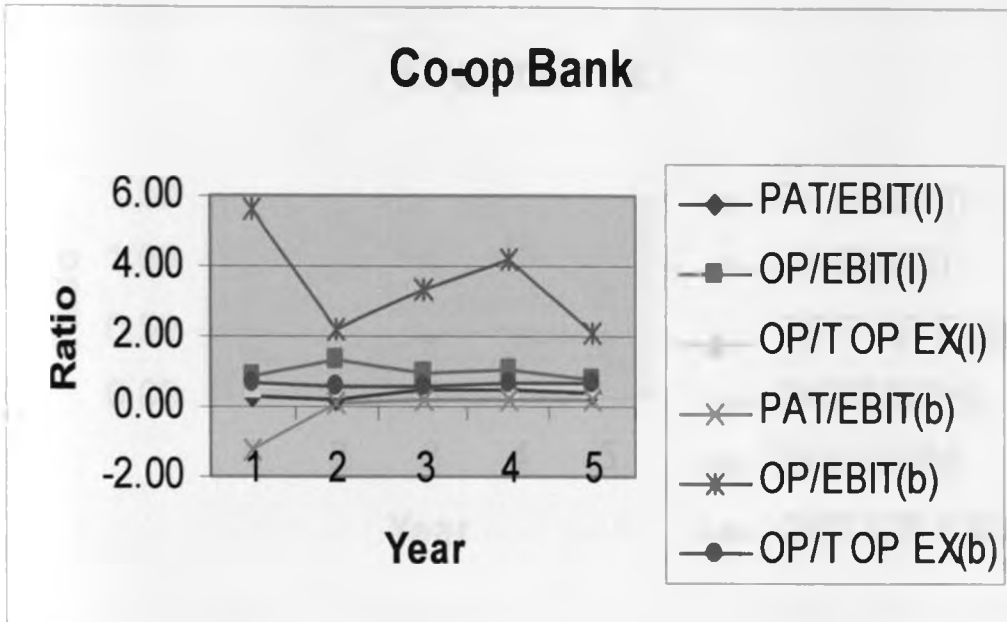
4.1.10 Consolidated Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from -8.48 to 22.99 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. In 2002 downward trend followed by upward trend in years 2003, 2004 and 2005. The bank's profitability level in the same period ranged from -0.67 to 1.43 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.54 to 0.76 whereas the industry level ranged from 0.56 to 0.60. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.683-0.065x$.

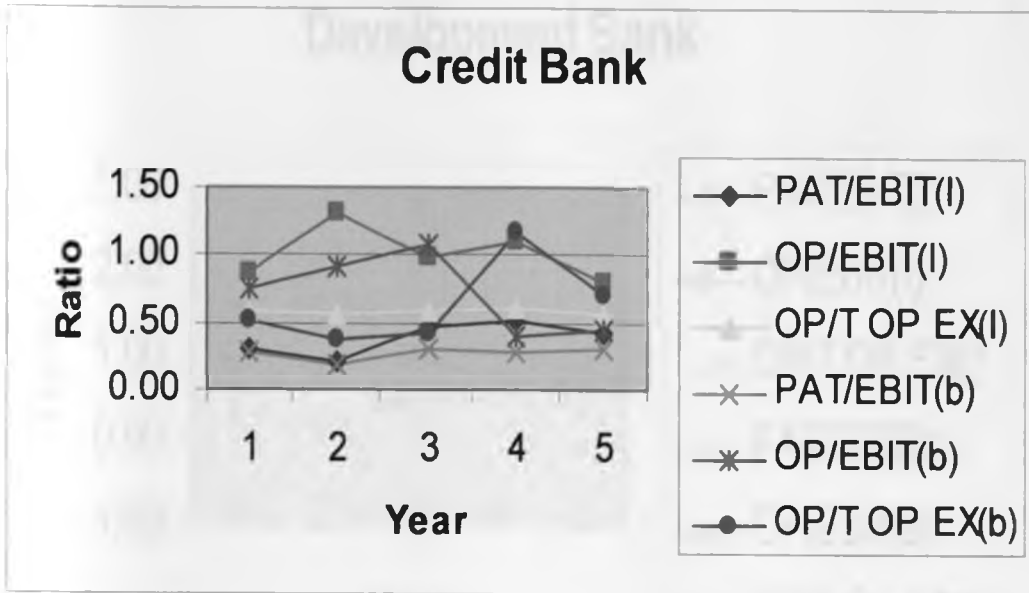
4.1.11 Co-operative Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 2.07 to 5.60 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was too high compared to industry average. In 2002 shows an upward trend followed by a downward trend in years 2003 and 2004 with a downward trend in 2005. The bank's profitability level in the same period ranged from -1.27 to 0.22 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.43 to 0.60 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but for other areas under study it was doing below average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=1.115-0.353x$.

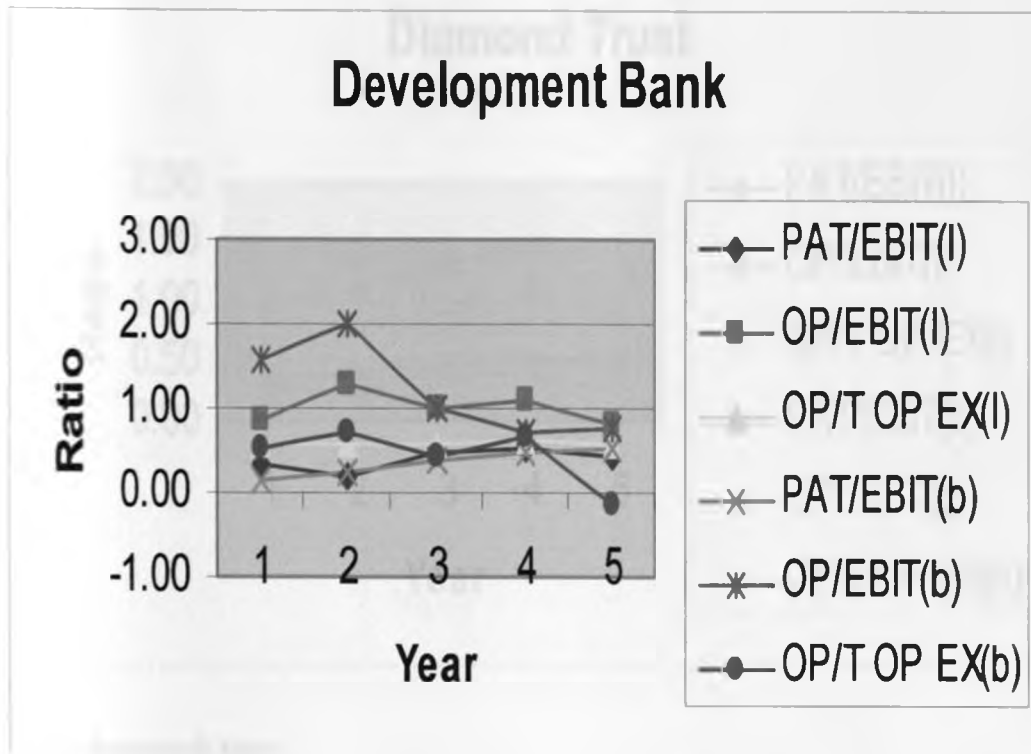
4.1.12 Credit Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.41 to 1.07 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high in 2003 but lower in years 2001, 2002, 2004 and 2005 compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in year 2004 with upward trend 2005. The bank's profitability level in the same period ranged from 0.19 to 0.31 whereas the industry average ranged from 0.20 to 0.52. In 2002 there is downward trend followed by an upward trend in year 2003, downward trend in 2004 and upward trend 2005. The bank's operational losses level to total operating expenses ranged from 0.36 to 1.17 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well except in years 2004 and 2005. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.320-0.063x$.

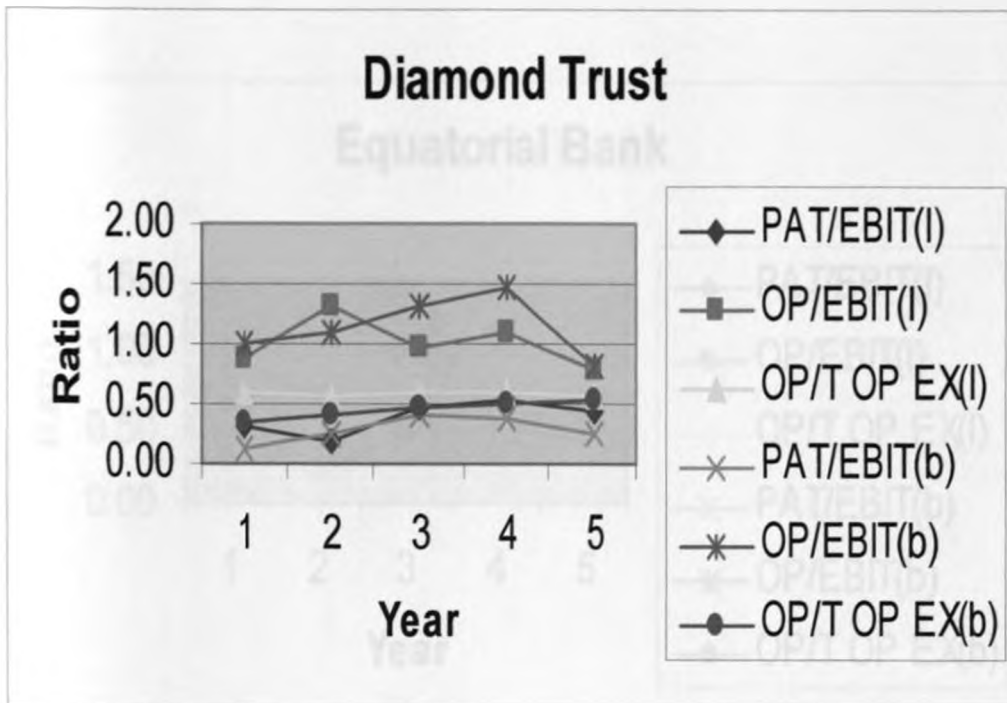
4.1.13 Development Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.71 to 2.01 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high in years 2001, 2002 and 2003 but low in 2004 and 2005 compared to industry average. In 2001 and 2002 there is upward trend followed by a downward trend in years 2003, 2004 and 2005. The bank's profitability level in the same period ranged from 0.16 to 0.52 whereas the industry average ranged from 0.20 to 0.52. The study shows an upward trend in all the years a good sign of improvement. The bank's operational losses level to total operating expenses ranged from -0.16 to 0.73 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.666-0.257x$.

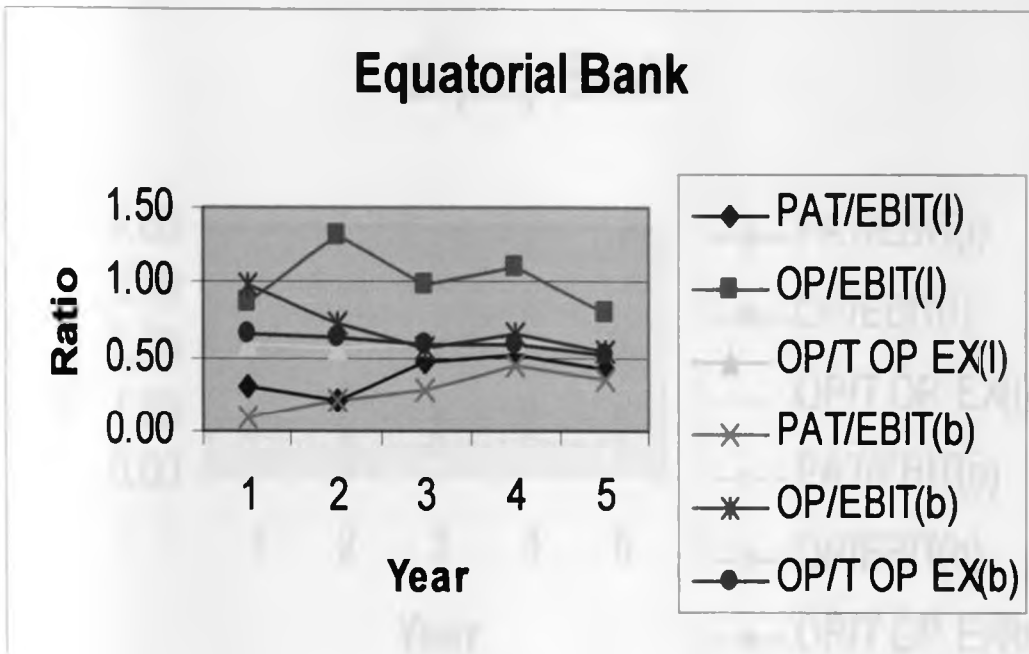
4.1.14 Diamond Trust



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.08 to 1.48 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.13 to 0.41 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's operational losses level to total operating expenses ranged from 0.34 to 0.49 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well above average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.052 + 0.295x$.

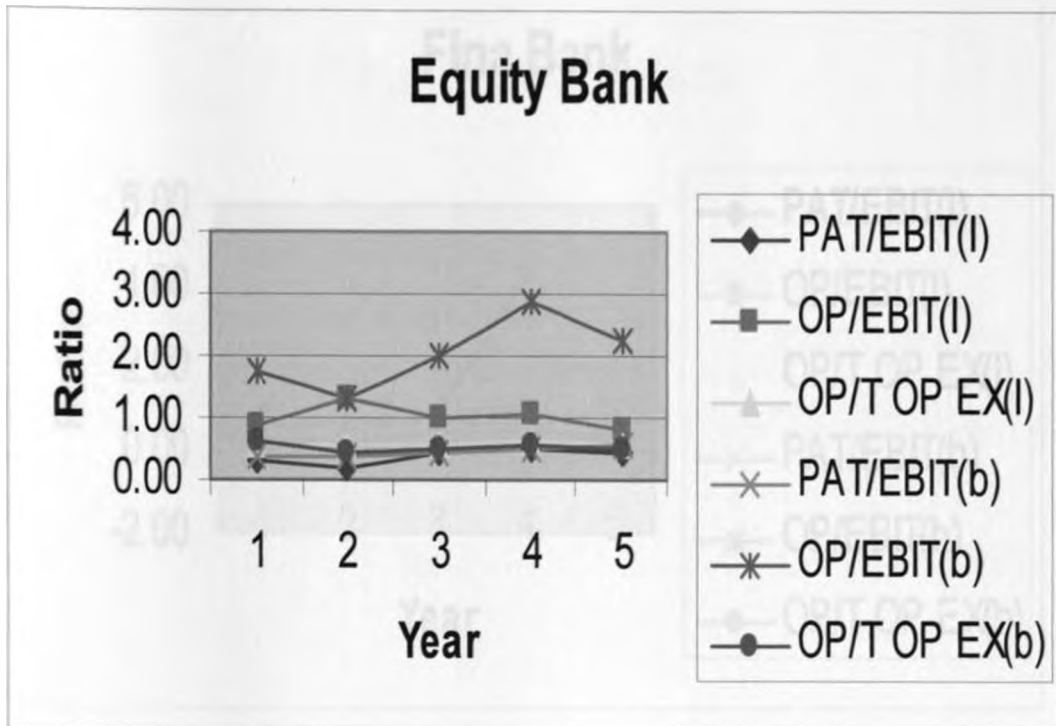
4.1.15 Equatorial Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.53 to 0.98 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level were well below industry average. In 2001, 2002 and 2003 there is downward trend followed by an upward trend in year 2004 with a downward trend in 2005 a good sign for the bank. The bank's profitability level in the same period ranged from 0.10 to 0.45 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.51 to 0.66 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank showed an improvement in years 2003, 2004 and 2005. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.640-0.525x$.

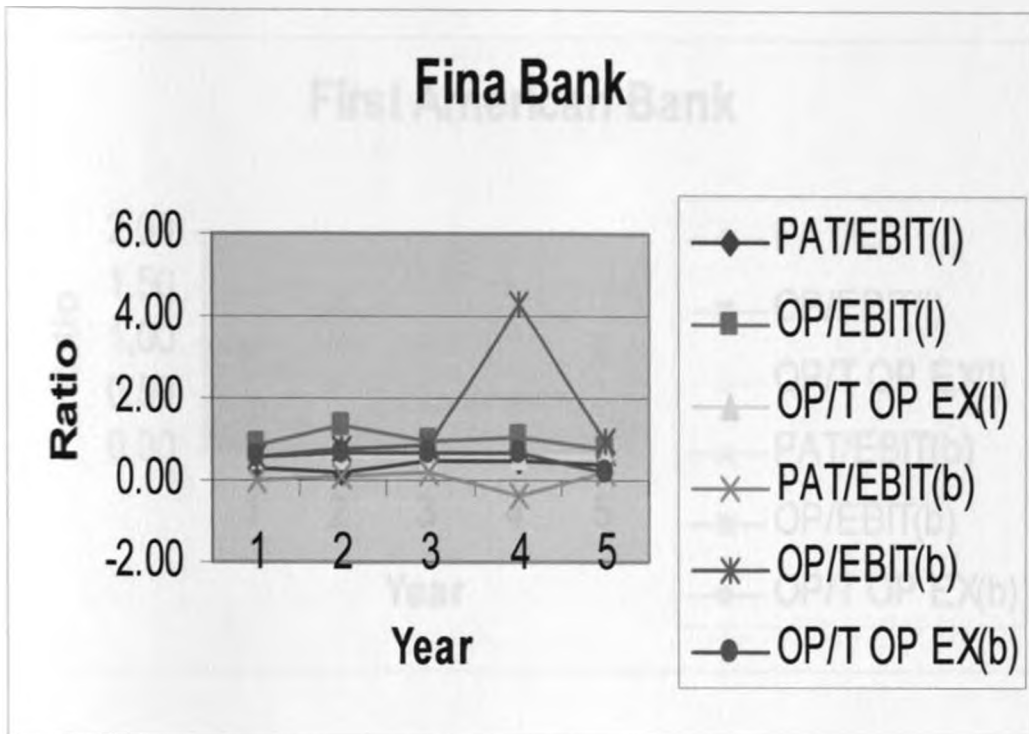
4.1.16 Equity Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 1.33 to 2.90 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level were above the industry average. In 2002, 2003 and 2004 there was an upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.36 to 0.59 whereas the industry average ranged from 0.20 to 0.52. The study shows an improvement in terms of profitability above industry average. The bank's operational losses level to total operating expenses ranged from 0.45 to 0.60 whereas the industry level ranged from 0.56 to 0.60. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.265+0.093x$.

4.1.17 Fina Bank

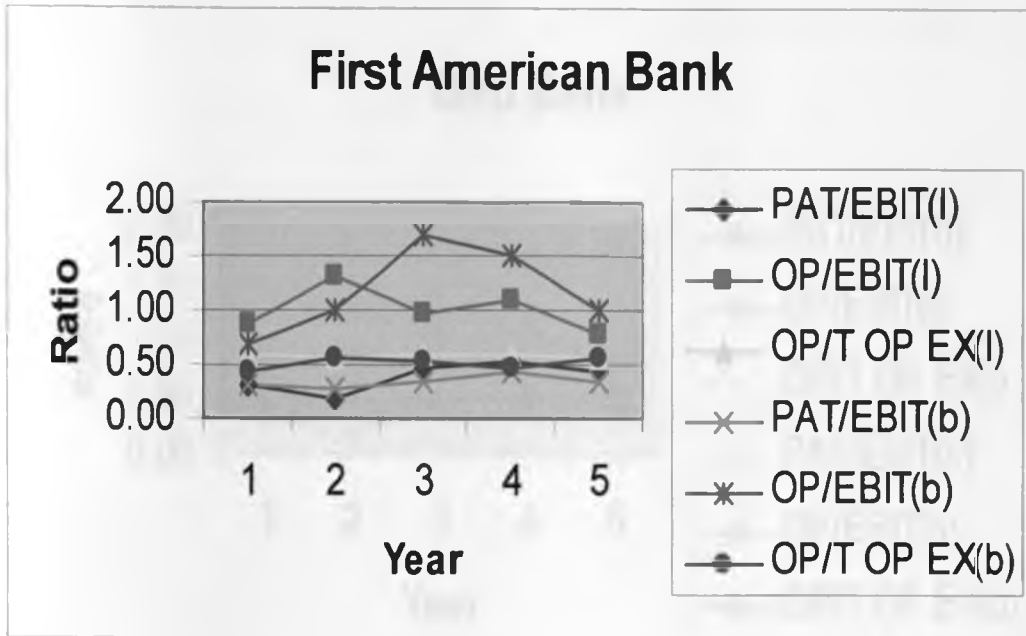


Source: Research Data

Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.61 to 4.24 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was low in years 2001, 2002 and 2003 but high in 2004 and 2005 compared to industry average. In 2001, 2002, 2003 and 2004 there was upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from -0.35 to 0.21 whereas the industry average ranged from 0.20 to 0.52. The study shows a poor performance of the bank compared to industry average. The bank's operational losses level to total operating expenses ranged from 0.16 to 0.71 whereas the industry level ranged from 0.56 to 0.60. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.231-0.133x$.

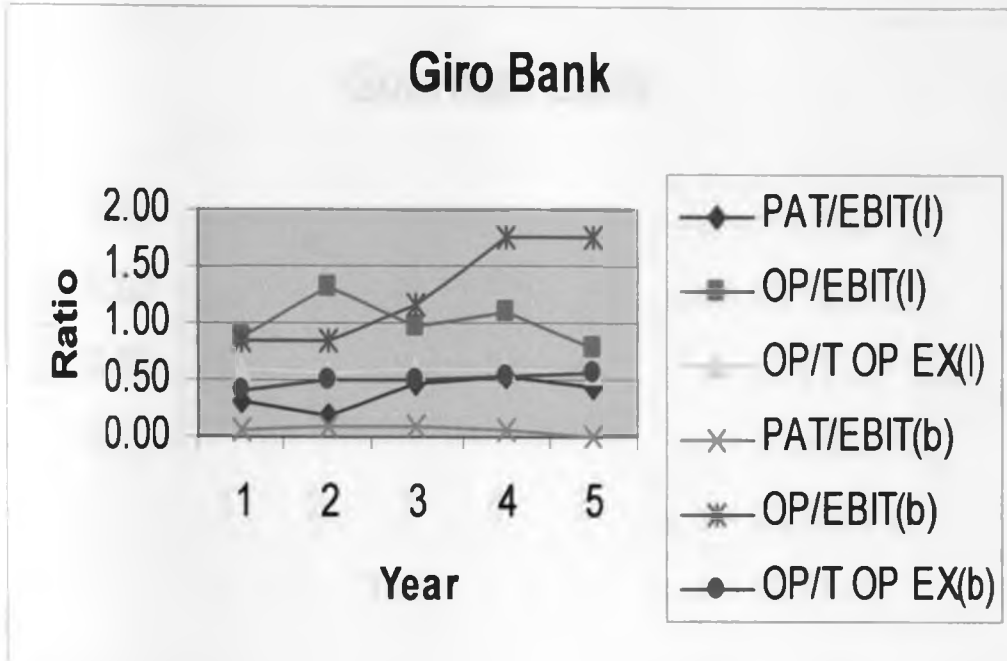
4.1.18 First American Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.67 to 1.68 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was low in year 2001 and 2002, high in 2003, 2004 and 2005 compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's profitability level in the same period ranged from 0.29 to 0.44 whereas the industry average ranged from 0.20 to 0.52. In 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.43 to 0.57 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but for other areas under study it was doing below average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.228+0.097x$.

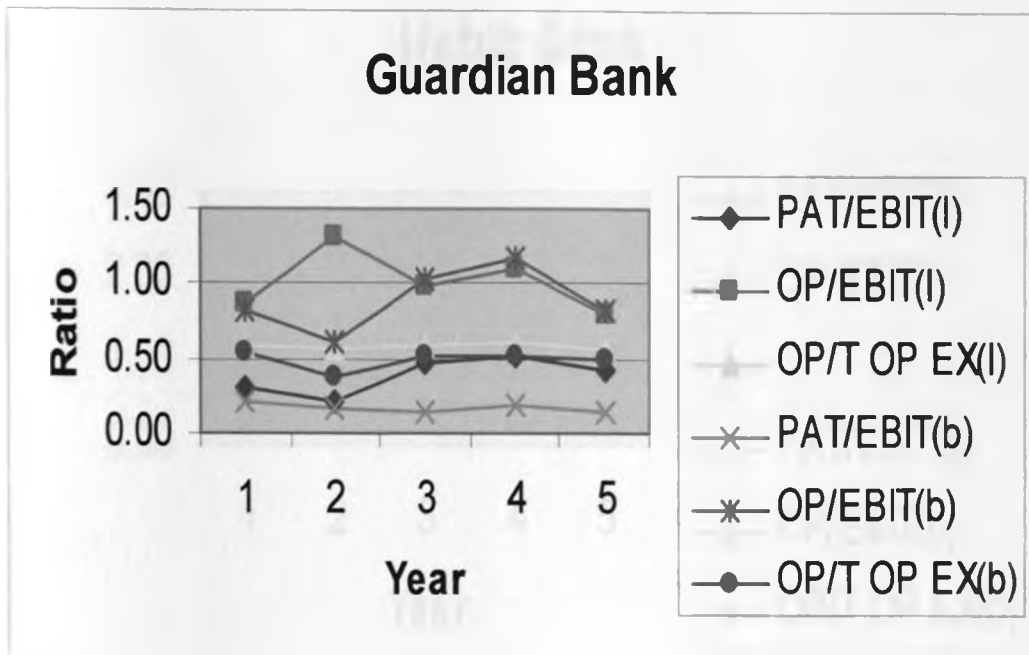
4.1.19 Giro Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.85 to 1.74 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. In 2002, 2003 and 2004 there is upward trend followed by a steady position in year 2005. The bank's profitability level in the same period ranged from 0.00 to 0.10 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in years 2004 and 2005. The bank's operational losses level to total operating expenses ranged from 0.42 to 0.55 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well but with an upward trend as compared to industry declining trend, which is a bad sign. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.123-0.047x$.

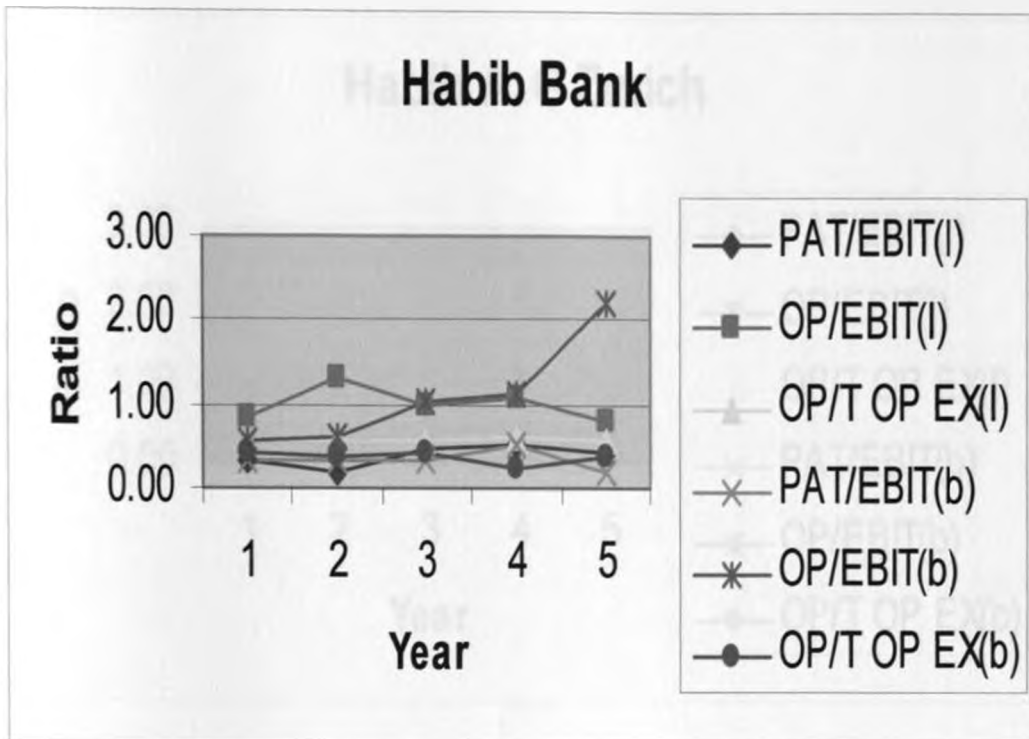
4.1.20 Guardian Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.61 to 1.18 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses levels are within the range compared to industry average. In 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.15 to 0.22 whereas the industry average ranged from 0.20 to 0.52. The study shows that the profitability of the bank was below the industry average a bad sign. The bank's operational losses level to total operating expenses ranged from 0.38 to 0.55 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.183-0.009x$.

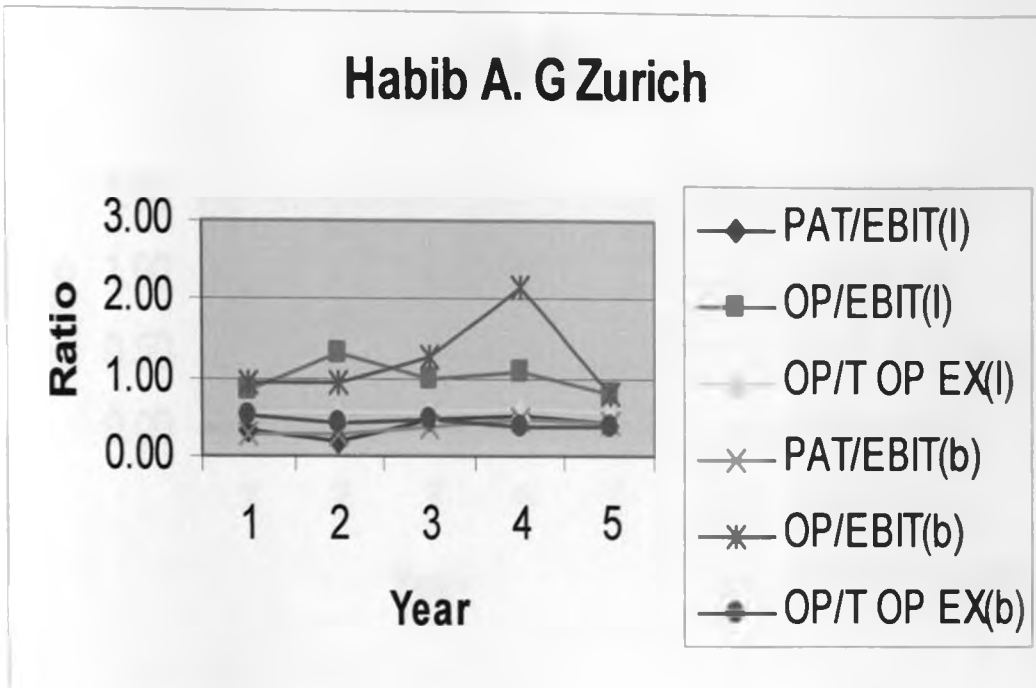
4.1.21 Habib Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.56 to 2.19 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. The study shows an upward trend for all the years under study. The bank's profitability level in the same period ranged from 0.19 to 0.52 whereas the industry average ranged from 0.20 to 0.52. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.26 to 0.41 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well as compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.437-0.086x$.

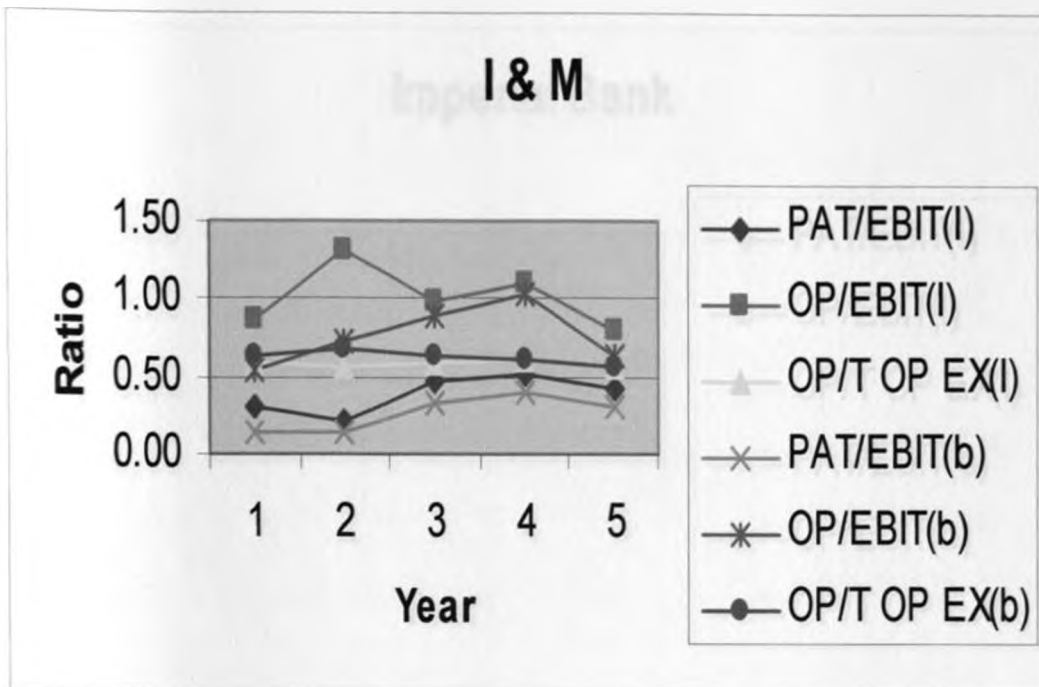
4.1.22 Habib A. G Zurich



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.81 to 2.16 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was high except year 2002 compared to industry average. In 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.26 to 0.47 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was below industry average a bad sign for the bank. The bank's operational losses level to total operating expenses ranged from 0.39 to 0.51 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well as compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.228+0.108x$.

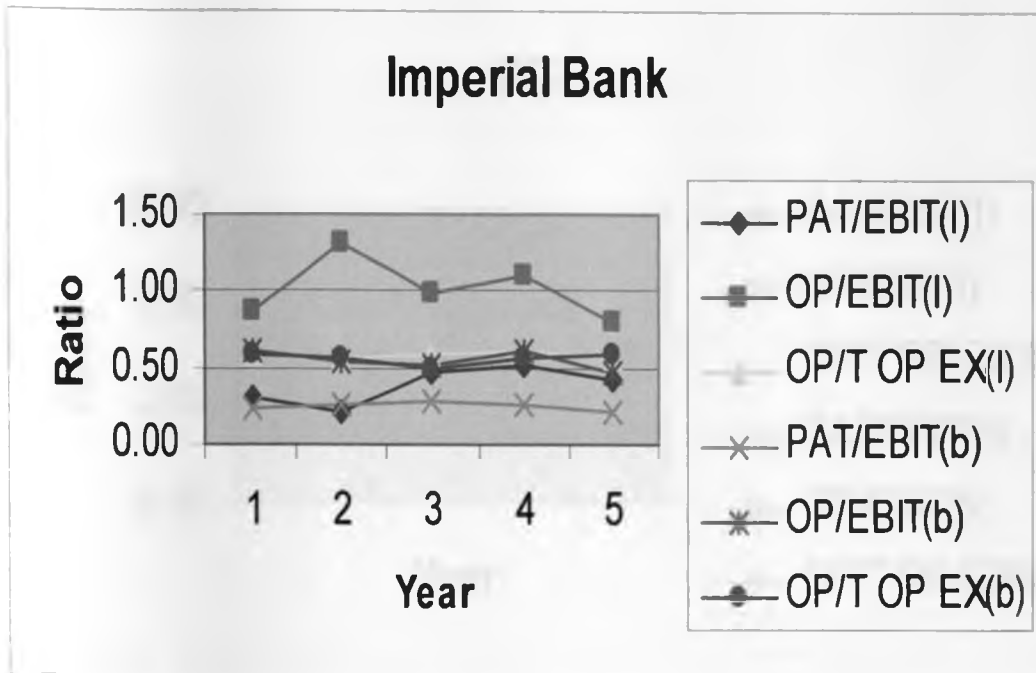
4.1.23 I & M



Source: Research Data

The banks operational losses earnings risk level under the period of study ranged from 0.54 to 1.03 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was lower compared to industry average. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.13 to 0.40 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was below industry average a bad sign for the bank. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's operational losses level to total operating expenses ranged from 0.56 to 0.68 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y = -0.117 + 0.493x$.

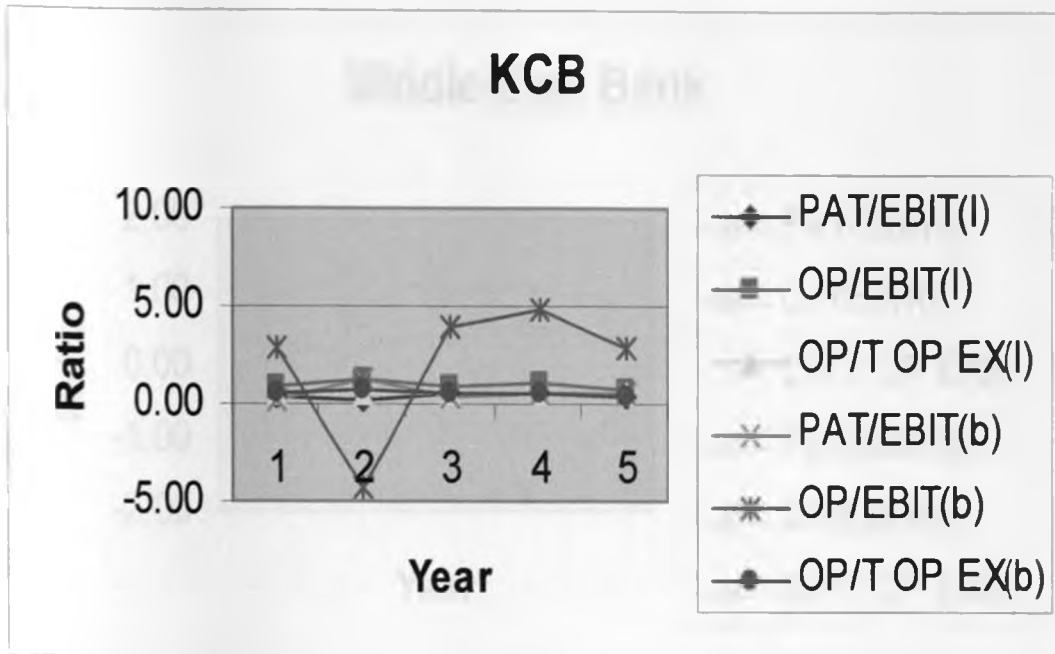
4.1.24 Imperial Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.46 to 0.61 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was lower compared to industry average. In 2001, 2002 and 2003 there was downward trend with an upward trend in years 2004 and downward trend in 2005. The bank's profitability level in the same period ranged from 0.20 to 0.28 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was below industry average a bad sign for the bank. In 2001, 2002 and 2003 there was upward trend followed by a downward trend in years 2004 and 2005. The bank's operational losses level to total operating expenses ranged from 0.50 to 0.60 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing bad as compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.151+0.172x$.

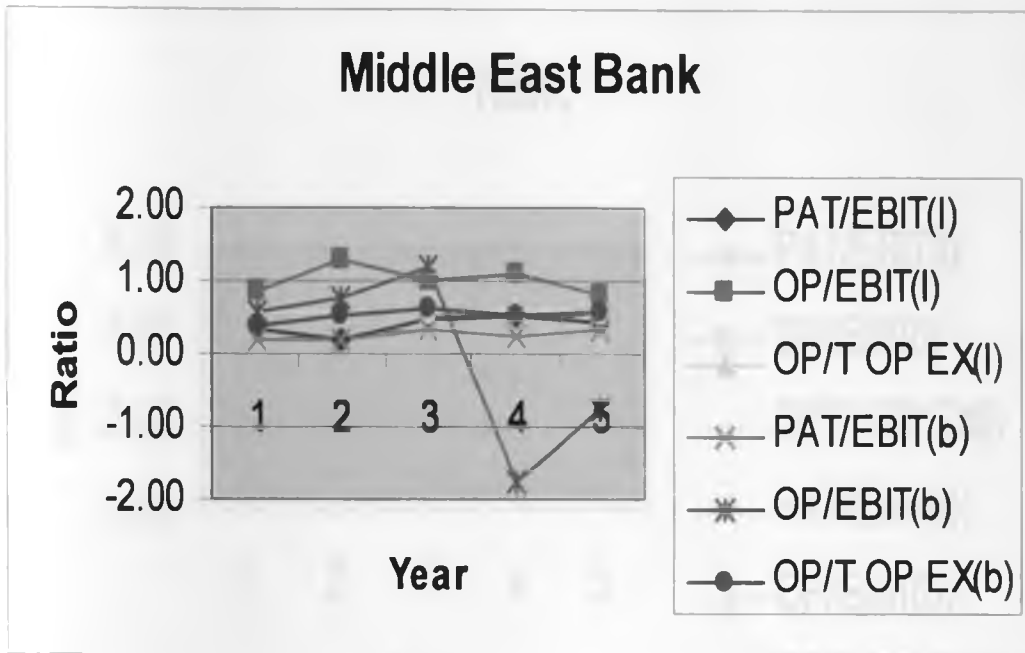
4.1.25 Kenya Commercial Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from -4.35 to 4.77 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was too high compared to industry average but with slight improvement in year 2005. In 2001, 2002 and 2004 there was an upward trend followed by a downward trend in years 2003 and 2005. The bank's profitability level in the same period ranged from 0.13 to 0.56 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was above industry average except 2001 and 2003 a good sign for the bank. The bank's operational losses level to total operating expenses ranged from 0.44 to 0.68 whereas the industry level ranged from 0.44 to 0.68. There was an improvement in terms of operating expenses compared to industry average in years 2003, 2004 and 2005. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.755-0.099x$.

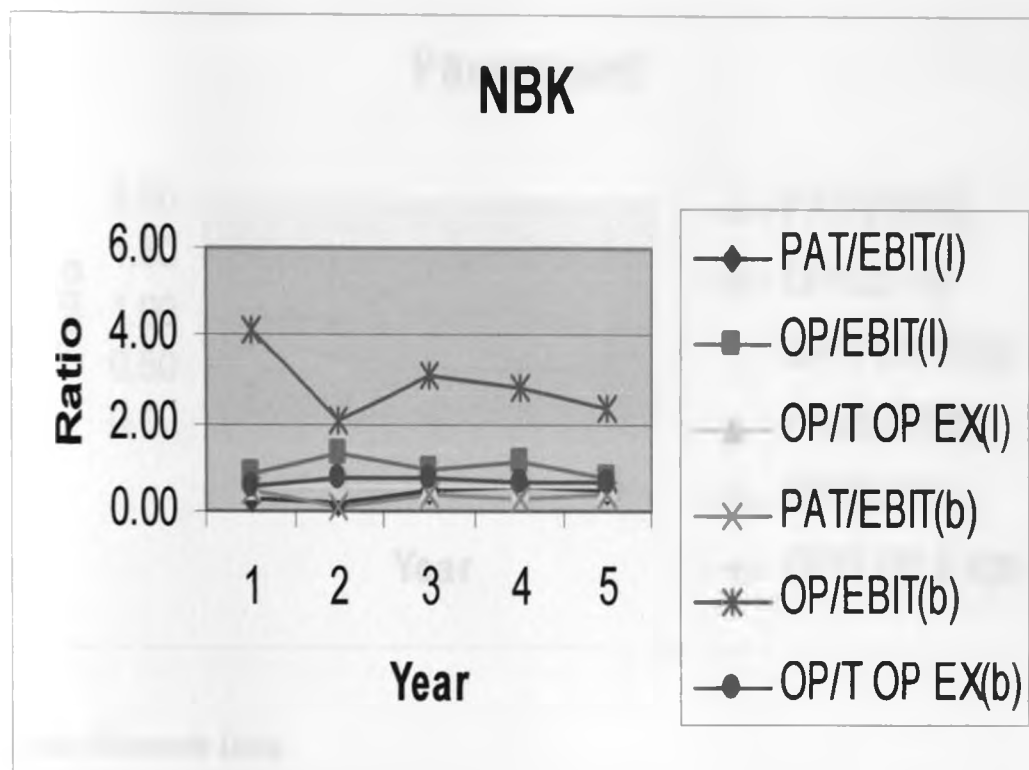
4.1.26 Middle East Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from -0.78 to 1.76 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was high in years 2003 and 2004 but low in 2001, 2002 and 2005 compared to industry average. In 2001, 2002, 2003 and 2004 there is upward trend followed by a downward trend in year 2005. The bank's profitability level in the same period ranged from 0.20 to 0.33 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was below industry average a bad sign for the bank. The bank's operational losses level to total operating expenses ranged from 0.40 to 0.64 whereas the industry level ranged from 0.56 to 0.60. The trend was not bad when compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.259-0.007x$.

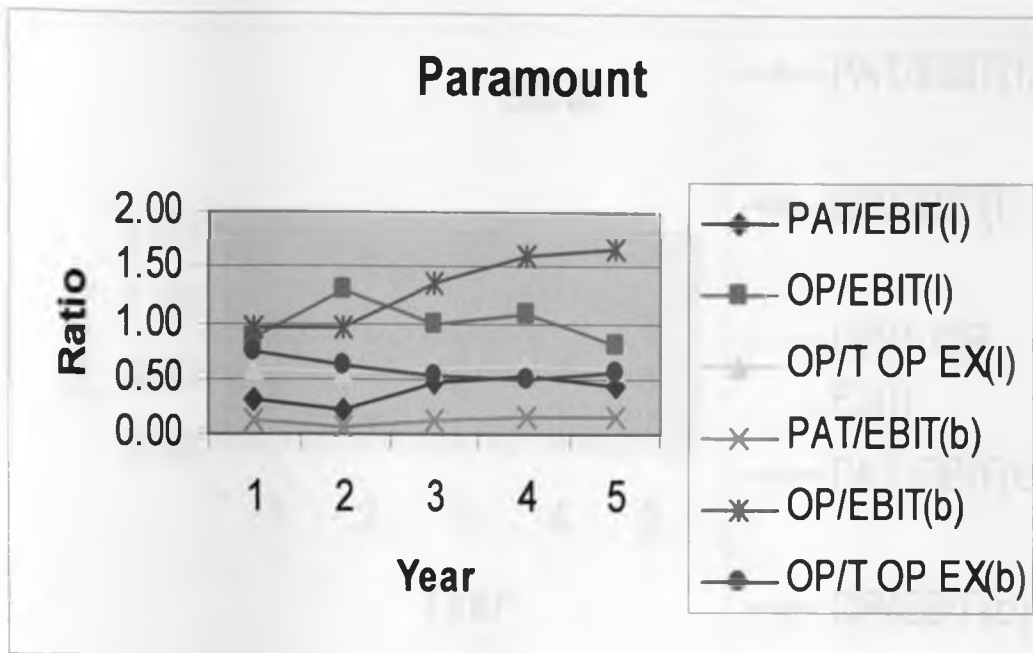
4.1.27 National Bank of Kenya



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 2.06 to 4.12 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was too high compared to industry average. In 2003 there was upward trend with a downward trend in years 2002, 2004 and 2005. The bank's profitability level in the same period ranged from 0.13 to 0.45 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was below industry average a bad sign for the bank. The bank's operational losses level to total operating expenses ranged from 0.60 to 0.73 whereas the industry level ranged from 0.56 to 0.60. The operating expenses of the bank were higher compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.009+0.111x$.

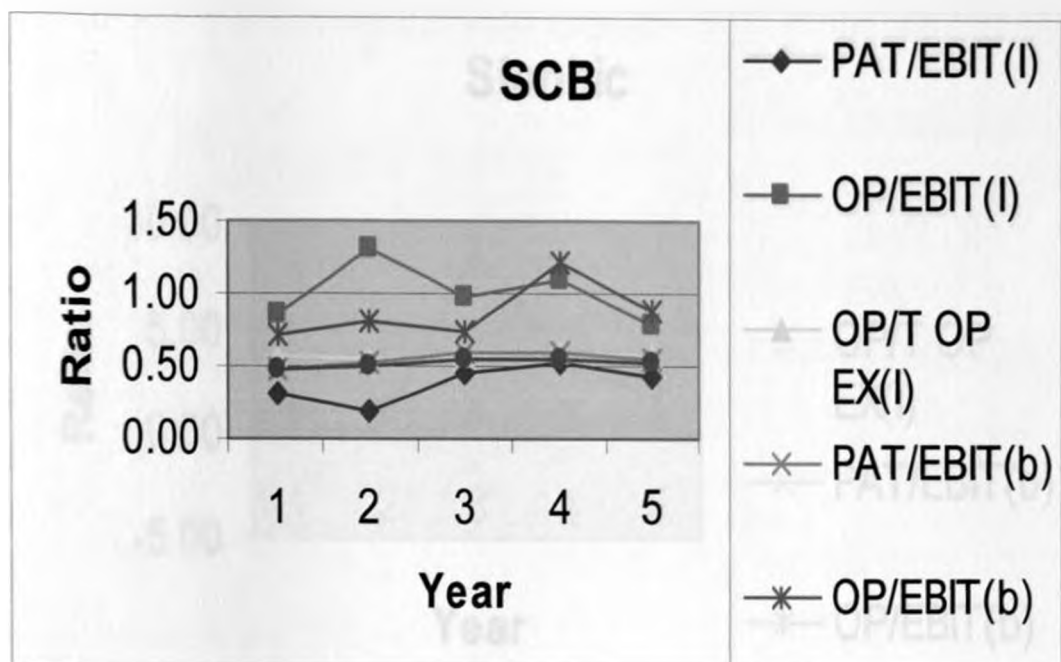
4.1.28 Paramount Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.94 to 1.65 whereas the industry average ranged from 0.79 to 1.31. This shows that the bank's operational losses level was high compared to industry average. The study shows an upward trend for the years under study. The bank's profitability level in the same period ranged from 0.07 to 0.15 whereas the industry average ranged from 0.20 to 0.52. The bank's profitability level was below industry average a bad sign for the bank. There was a slight improvement in years 2002, 2003 and 2004 but below average. The bank's operational losses level to total operating expenses ranged from 0.49 to 0.75 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank badly in year 2001 and 2002 but improved in years 2003, 2004 and 2005 compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.023+0.075x$.

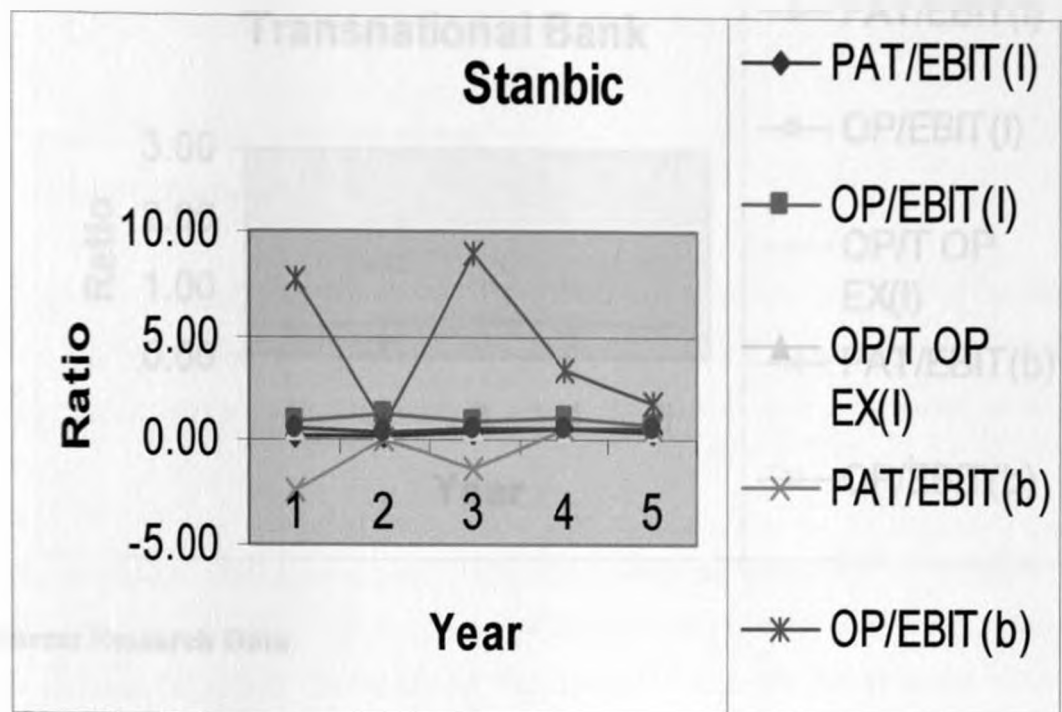
4.1.29 Standard Charted Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.71 to 1.22 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was low compared to industry average. In 2001 and 2002 there was upward trend followed by a downward trend in years 2003 with upward trend in 2004 followed by a downward movement in 2005. The bank's profitability level in the same period ranged from 0.49 to 0.61 whereas the industry average ranged from 0.20 to 0.52. The profitability was good compared to industry. The bank's operational losses level to total operating expenses ranged from 0.47 to 0.54 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well above industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.427+0.141x$.

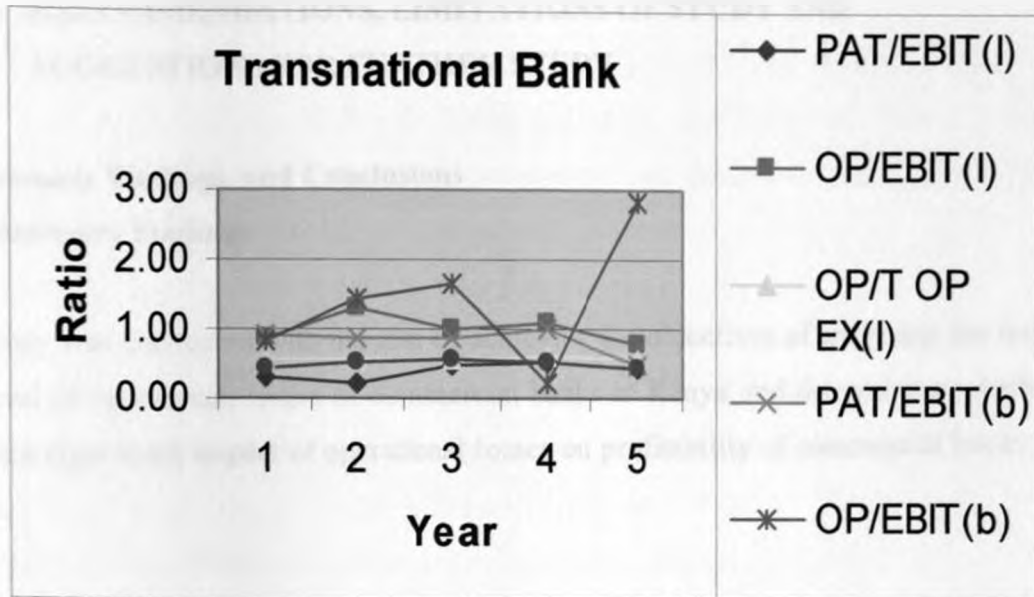
4.1.30 Stanbic Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.79 to 9.03 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level were high compared to industry average. There is no clear trend. The bank's profitability level in the same period ranged from -2.47 to 0.53 whereas the industry average ranged from 0.20 to 0.52. The bank's operational losses level to total operating expenses ranged from 0.44 to 0.66 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=0.860-0.304x$.

4.1.31 Transnational Bank



Source: Research Data

The bank's operational losses earnings risk level under the period of study ranged from 0.24 to 2.81 whereas the industry average ranged from 0.79 to 1.31. The study shows that the bank's operational losses level was high 2002, 2003 and 2005 but low in 2001 and 2004 compared to industry average. In 2001, 2002 and 2003 there is upward trend followed by a downward trend in year 2004 with upward movement in 2005. The bank's profitability level in the same period ranged from 0.46 to 0.98 whereas the industry average ranged from 0.20 to 0.52. The profitability level was stable except in 2005, which is a bad sign for the bank. The bank's operational losses level to total operating expenses ranged from 0.42 to 0.55 whereas the industry level ranged from 0.56 to 0.60. In terms of operating expenses the bank was doing well compared to industry average. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The statistical analysis shows r-squares and significant tests, which are greater than zero a clear indication of how significant the impact of operational losses is on profitability. The overall industry shows the same results of significance as the individual banks. The study shows a bank equation of $Y=1.096-0.201x$.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS, LIMITATIONS OF STUDY AND SUGGESTIONS FOR FURTHER STUDY

5.1 Summary Findings, and Conclusions

5.1.1 Summary Findings

This study was conducted with the aim of achieving the objectives of analyzing the level and trend of operational losses of commercial banks in Kenya and determining whether there is a significant impact of operational losses on profitability of commercial banks in Kenya.

To achieve the above objectives, profitability and operational losses ratio were computed. Industry average was computed by taking the simple average of variables under research for 30 commercial banks. The trend was then compared with the change in the industry average, the operational and profitability ratios over the period 2001 to 2005.

The study results reveal that the profitability of commercial banks is affected by operational losses and there exists an inverse relationship between profitability and operational losses of commercial banks of Kenya. The above findings can be explained by looking at the big banks and mostly government owned and foreign owned banks. Where lower operational losses ratio were noticed there was increased profitability.

The relationship between profitability and level of operational losses was found to be direct and positive for most commercial banks whereas some had negative relationship. The relationship was found to be significant. The category most affected is the big banks mostly government owned commercial banks. The large foreign owned banks indicated lower significance levels as compared to large locally owned commercial banks. The foreign owned small commercial banks indicated a lower significance level as compared to small locally owned commercial banks.

The statistical analysis and significance tests show a value greater than zero, which is a good sign that the operational losses have a direct relationship with the level of profitability. This study shows r-square of 0.195, t-test of 2.010 and significance level of 0.729. The overall industry shows the same results of significance as the individual banks. The equation used is $Y=a+b*X$. The variables are period of study, profitability ratios and operational loss ratios.

a=y-axis intercept

b= Coefficient

This study's statistical analysis shows an industry equation of $Y=0.661-0.275x$. This study shows that any change in (x) variable will cause a negative change in (Y). The constant variable 0.661 is the profitability ratio representing the profit that is not affected by change in operational loss ratio whereas the variable -0.275 represents coefficient factor. The industry equation gives a clear indication of the effect of operational losses on profitability in the banking industry.

5.1.2 Conclusions

The result of this study is consistent with findings of other researchers about the effect of operational losses on profitability. This study shows that the impact of operational losses on profitability of commercial banks is significant as opposed to general believe that the impact of operational losses on profitability of commercial banks is not significant.

5.2 Limitations of the Study

Granted that the data used in this study was obtained from published financial statements, one must be cautious of the limitations associated with such data. This data may, to some degree be manipulated by the management of a firm to present a "rosy" view of the firms position. This kind of manipulation is known as "window dressing". The possibility of window dressing has been controlled to some extent by use of many commercial banks.

There was a limitation due to lack of data for some commercial banks reducing the banks under study to 30 instead of 44.

The figures of operational losses may include non-operational losses for the same commercial banks, as there is no clear demarcation between operational losses and operating expenses used directly in generation of revenue. This study was undertaken within a fixed duration and the researcher did not have adequate time to explore aspects like dynamic ratios, which reflect day-to-day operations of the commercial banks.

5.3 Recommendations

Commercial banks should put more emphasis on operational losses management as it affects their profitability. For Central Bank, being the regulator should put strong mechanisms to monitor commercial banks operational risk exposure and if need be require them to submit operational risk exposure quarterly returns. There is need to include detailed operational loss variables in the financial statements to facilitate accurate judgment when assessing the profitability of commercial by its stakeholders.

5.4 Suggestions For Further Study

A study based on dynamic operational losses and profitability ratio analysis is hereby recommended. This study will establish the day-to-day impact of operational losses on profitability of commercial banks. A study on other industries on same variables could be undertaken. Another study can be done on each of the variables separately over a longer period of time with more than two ratios. A further study can be done to test how the efficiency levels affect profitability of commercial banks.

REFERENCES

- British Bankers' Association. (1999), Operational Risk. the Next Frontier.
- Davies, P., (2000), Fraud Watch, KPMB, 2nd Edition London
- Basel Committee, (1998), "Framework for the Internal Controls Systems in Banking Organizations". September BIS BASEL
- Rose P. S.(1997), "Money and Capital Markets, Financial Institutions and Instruments in a Global Marketplace" Sixth edition Irwin.
- Credit Suisse Group (2003) "Operational Risks in Financial Services" April Report
- Payle D (1997) "Bank Risk Management –Working paper No. 272", University of California
- Basel Committee, Risk Management Group (2000), "Other Risks (OR) Discussion Paper" April BIS, BASEL.
- Doering H.U (2003), "Operational Risk in Financial Services" Report, April FSA (2000).
- FSA 2000, Consultation Paper 46"Money Laundering: the FSA's New Role", London, April report.
- Basel Committee, (1996), Payment and Settlement Systems, "Settlement Risk in Foreign Exchange Transactions" BIS BASEL March.
- Dickinson. G. (2000), "Insurance Finds a Blend of Innovation and Tradition" Financial Times, June.

Kimball, R. (2000), "Failures in Risk Management" New England Economic Review, January/ February.

Kimber, M. (2000), "Finding Value in a Collection of Losses" Operational Risk Manager June.

Philippe Jorion, (1997) "Value at Risk" Second Edition McGraw-Hill.

Jameson, R (1998), "Operational Risk and Financial Institutions" Arthur Andersen, UK.

Meridien Research Inc. (2000), "Time for a New Look at Operational Risk" New York.

Morris, S. (2000), "Operational Risk Control, What FSA Expects... and You Must Do" London.

Samad-Khan et al (1998), "Measuring Operational Risk" Global Trading, Quarter 4.

Jameson, R. (1998), "On the Quantification of Operational Risk" Operational Risk and Financial Institutions, Risk Books, London A Short Polemic in.

The Daily Nation (June, 2005) "Banks Fail Test on Risk Control".

The Daily Nation (February to April 2002, 2003, 2004 and 2005) "Financial Statement Publications"

Rachlin, C. (1998), "Operational Risk in Retail Banking" in Jameson, R. Operational Risk and Financial Institutions, Risk Books, London.

Senior, A. (1999), "A Modern Approach to Operational Risk" Risk Professional, Issue 1/3 May.

Thiessen, K. (2000), "Don't Gamble with Goodwill" the Conference Board of Canada. Report.

Young, B. (2000), "Quantification of Operational Risk" Center for Operational Risk Research & Education.

Yussuf A. Idarus (2005), "Survey of Operational Risks Management Practices by Commercial Banks in Kenya" U.O.N Unpublished MBA Project.

Wachira W. (1999), " An Analysis of the Relationship Between Liquidity and Macroeconomic Indicators: An Inter Industry Comparison" U.O.N Unpublished MBA Project.

Hennie V. G. and Bratanovic. B. (1999), " Analyzing Banking Risk" World Bank Publication on.

APPEDICES

A1.1 List of Commercial Banks

- 1 African Banking Corporation
- 2 Akiba Bank Ltd
- 3 Bank of Baroda
- 4 Bank of India
- 5 Barclays Bank of Kenya Ltd
- 6 CFC Bank Limited
- 7 Charterhouse Bank Limited
- 8 Chase Bank Limited
- 9 Citibank, N.A.
- 10 City Finance Bank
- 11 Commercial Bank of Africa
- 12 Consolidated Bank of Kenya
- 13 Co-operative Bank of Kenya
- 14 Credit Bank Limited
- 15 Development Bank of Kenya
- 16 Diamond Trust Bank Kenya
- 17 Dubai Bank Limited
- 18 Equatorial Commercial Bank
- 19 Equity Bank Limited
- 20 Fidelity Commercial Bank
- 21 Fina Bank Limited
- 22 First American Bank Limited
- 23 Giro Commercial Bank
- 24 Guardian Bank
- 25 Habib AG Zurich
- 26 Habib Bank Limited
- 27 Imperial Bank Limited

	TABLE 3			
	Assets	Liabilities	Capital	Reserves
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				

TABLE OF RESEARCH DATA

yr	Operational Losses	Total		Earnings After tax	PAT/EBIT	OP/EBIT	OP/T	OP EX
		operating expenses	Earnings Before Interest & Tax					
C	2001	144.89	242.24	227.44	27.57	0.12	1.07	0.60
C	2002	95.86	202.19	184.63	30.10	0.16	1.10	0.47
C	2003	138.83	255.88	162.17	44.70	0.28	1.58	0.54
C	2004	110.09	253.86	194.18	78.12	0.40	1.31	0.43
C	2005	145.69	305.64	263.20	81.72	0.31	1.16	0.48
Bank of Baroda	2001	86.53	277.34	201.34	25.63	0.13	1.38	0.31
Bank of Baroda	2002	99.97	306.28	246.68	32.01	0.13	1.24	0.33
Bank of Baroda	2003	104.56	279.53	383.63	97.62	0.25	0.73	0.37
Bank of Baroda	2004	134.47	307.14	431.69	201.76	0.47	0.71	0.44
Bank of Baroda	2005	131.76	311.09	540.55	165.65	0.31	0.58	0.42
IK	2001	4,330.00	7,027.00	5,593.00	2,955.00	0.53	1.26	0.62
IK	2002	3,198.51	8,944.00	3,934.00	1,783.00	0.45	2.27	0.36
IK	2003	5,745.00	9,152.00	5,653.00	3,367.00	0.60	1.62	0.63
IK	2004	6,140.00	8,316.00	5,857.00	3,715.00	0.63	1.42	0.74
IK	2005	6,082.00	8,824.00	6,361.00	3,721.00	0.58	1.39	0.69
IA	2001	317.01	787.48	1,112.72	353.74	0.32	0.71	0.40
IA	2002	409.81	880.93	853.57	250.21	0.29	1.03	0.47
IA	2003	549.26	983.94	780.53	396.72	0.51	1.26	0.56
IA	2004	483.40	920.56	556.57	282.20	0.51	1.65	0.53
IA	2005	620.37	1,294.04	1,241.20	511.41	0.41	1.04	0.48
IC	2001	870.47	1,322.85	771.80	191.82	0.25	1.71	0.66
IC	2002	881.26	1,337.53	681.98	224.73	0.33	1.96	0.66
IC	2003	1,130.30	1,696.01	781.90	382.05	0.49	2.17	0.67
IC	2004	355.87	760.15	687.39	242.44	0.35	1.11	0.47
IC	2005	453.75	853.01	1,271.29	295.71	0.23	0.67	0.53
Charterhouse	2001	63.61	84.53	194.95	64.04	0.33	0.43	0.75
Charterhouse	2002	81.94	112.48	204.99	72.68	0.35	0.55	0.73
Charterhouse	2003	103.09	148.69	197.45	74.60	0.38	0.75	0.69
Charterhouse	2004	182.59	237.78	150.63	28.04	0.19	1.58	0.77
Charterhouse	2005	112.24	211.47	265.97	77.13	0.29	0.80	0.53
Chase	2001	117.31	213.62	93.80	38.75	0.41	2.28	0.55
Chase	2002	39.10	78.10	80.01	32.16	0.40	0.98	0.50
Chase	2003	47.52	92.78	91.28	40.27	0.44	1.02	0.51
Chase	2004	200.86	266.61	(50.50)	(67.12)	1.33	(5.28)	0.75
Chase	2005	77.85	156.06	142.51	42.79	0.30	1.10	0.50
City Finance	2001	61.38	64.94	24.08	14.90	0.62	2.70	0.95
City Finance	2002	40.38	57.94	17.08	5.66	0.33	3.39	0.70
City Finance	2003	35.65	54.54	14.55	9.47	0.65	3.75	0.65
City Finance	2004	26.69	45.06	12.89	11.40	0.88	3.50	0.59
City Finance	2005	83.19	102.64	(44.48)	(47.00)	1.06	(2.31)	0.81
Consolidated	2001	184.93	317.19	58.54	(13.14)	(0.22)	5.42	0.58
Consolidated	2002	428.23	561.94	144.87	77.20	0.53	3.88	0.76
Consolidated	2003	251.47	444.82	51.74	12.17	0.24	8.60	0.57
Consolidated	2004	228.47	420.88	(49.65)	(71.02)	1.43	(8.48)	0.54
Consolidated	2005	232.41	432.87	18.83	(12.66)	(0.67)	22.99	0.54
Co-op Bank	2001	1,802.79	2,858.22	510.78	(651.01)	(1.27)	5.60	0.63
Co-op Bank	2002	1,702.33	2,819.98	1,280.30	164.78	0.13	2.20	0.60
Co-op Bank	2003	1,725.72	2,963.53	883.39	154.99	0.18	3.35	0.58
Co-op Bank	2004	2,468.24	3,821.70	922.06	206.61	0.22	4.14	0.65
Co-op Bank	2005	2,945.35	4,553.23	2,204.47	439.96	0.20	2.07	0.65
Credit	2001	50.26	97.25	129.62	37.62	0.29	0.75	0.52
Credit	2002	38.40	105.31	115.20	21.95	0.19	0.91	0.36
Credit	2003	52.61	123.60	115.10	34.23	0.30	1.07	0.43
Credit	2004	54.87	47.08	114.84	32.68	0.28	0.41	1.17
Credit	2005	62.58	89.86	199.54	62.28	0.31	0.45	0.70

elopment	2001	145.01	282.62	178.00	28.79	0.16	1.59	0.51
elopment	2002	280.28	381.62	189.63	41.57	0.22	2.01	0.73
elopment	2003	78.93	182.70	186.60	69.91	0.37	0.98	0.43
elopment	2004	63.92	93.55	131.89	65.40	0.50	0.71	0.68
elopment	2005	(26.35)	166.00	220.81	115.62	0.52	0.75	(0.16)
mond Trust	2001	106.93	312.38	307.89	40.93	0.13	1.01	0.34
mond Trust	2002	133.05	338.01	309.21	75.53	0.24	1.09	0.39
mond Trust	2003	211.77	447.11	342.03	139.24	0.41	1.31	0.47
mond Trust	2004	280.29	577.58	389.71	147.34	0.38	1.48	0.49
mond Trust	2005	418.41	770.49	965.51	248.88	0.26	0.80	0.54
uatorial	2001	106.28	162.20	166.25	17.40	0.10	0.98	0.66
uatorial	2002	95.45	152.54	208.65	43.92	0.21	0.73	0.63
uatorial	2003	76.45	133.12	239.05	65.14	0.27	0.56	0.57
uatorial	2004	61.30	103.32	155.25	69.91	0.45	0.67	0.59
uatorial	2005	55.98	109.04	205.23	71.02	0.35	0.53	0.51
uity bank	2001	196.69	326.32	184.54	65.75	0.36	1.77	0.60
uity bank	2002	116.55	256.75	192.58	74.24	0.39	1.33	0.45
uity bank	2003	217.72	420.35	210.51	97.31	0.46	2.00	0.52
uity bank	2004	465.62	817.51	281.75	136.14	0.48	2.90	0.57
uity bank	2005	642.52	1,302.21	582.86	344.60	0.59	2.23	0.49
sa	2001	131.33	245.60	403.70	7.01	0.02	0.61	0.53
sa	2002	196.83	296.66	413.15	45.90	0.11	0.72	0.66
sa	2003	198.55	314.62	356.30	74.75	0.21	0.88	0.63
sa	2004	364.41	514.31	121.34	(42.22)	(0.35)	4.24	0.71
sa	2005	54.70	344.80	347.55	61.03	0.18	0.99	0.16
RST AMERICAN	2001	151.69	350.34	520.57	154.66	0.30	0.67	0.43
RST AMERICAN	2002	231.28	408.63	409.04	118.76	0.29	1.00	0.57
RST AMERICAN	2003	215.67	417.46	248.36	85.33	0.34	1.68	0.52
RST AMERICAN	2004	231.20	510.10	340.70	150.23	0.44	1.50	0.45
RST AMERICAN	2005	235.28	412.63	413.04	138.74	0.34	1.00	0.57
iro	2001	97.78	235.46	275.04	16.68	0.06	0.86	0.42
iro	2002	123.78	242.46	286.04	23.45	0.08	0.85	0.51
iro	2003	122.04	244.15	213.00	21.50	0.10	1.15	0.50
iro	2004	146.05	273.79	157.39	10.22	0.06	1.74	0.53
iro	2005	180.98	328.00	188.22	0.88	0.00	1.74	0.55
uardian	2001	103.90	189.40	231.30	51.34	0.22	0.82	0.55
uardian	2002	57.82	154.12	252.71	43.26	0.17	0.61	0.38
uardian	2003	109.91	211.96	203.64	30.53	0.15	1.04	0.52
uardian	2004	111.41	219.74	186.13	33.95	0.18	1.18	0.51
uardian	2005	103.27	214.45	264.28	39.06	0.15	0.81	0.48
abib	2001	56.32	136.28	245.00	78.08	0.32	0.56	0.41
abib	2002	53.11	143.24	232.28	76.85	0.33	0.62	0.37
abib	2003	67.75	167.10	159.89	55.97	0.35	1.05	0.41
abib	2004	35.07	136.58	121.19	63.54	0.52	1.13	0.26
abib	2005	67.10	175.85	80.15	14.87	0.19	2.19	0.38
Habib A.G Zurich	2001	99.57	195.07	210.40	61.70	0.29	0.93	0.51
Habib A.G Zurich	2002	84.57	190.07	205.40	53.27	0.26	0.93	0.44
Habib A.G Zurich	2003	82.07	181.68	140.99	52.45	0.37	1.29	0.45
Habib A.G Zurich	2004	70.08	179.87	83.21	39.03	0.47	2.16	0.39
Habib A.G Zurich	2005	74.99	189.48	233.08	95.06	0.41	0.81	0.40
ISM	2001	172.73	274.70	507.54	68.16	0.13	0.54	0.63
ISM	2002	214.36	317.53	439.58	59.77	0.14	0.72	0.68
ISM	2003	332.54	523.95	580.67	195.08	0.34	0.90	0.63
ISM	2004	400.85	651.05	634.82	254.65	0.40	1.03	0.62
ISM	2005	422.83	748.81	1,174.09	345.52	0.29	0.64	0.56
Imperial	2001	156.04	261.22	435.24	101.64	0.23	0.60	0.60
Imperial	2002	159.60	279.46	512.28	127.38	0.25	0.55	0.57
Imperial	2003	155.25	312.76	616.44	175.02	0.28	0.51	0.50
Imperial	2004	244.32	434.77	708.42	184.37	0.26	0.61	0.56

rial	2005	281.29	473.84	1,030.56	205.54	0.20	0.46	0.59
	2001	5,126.06	8,397.36	2,880.80	381.98	0.13	2.91	0.61
	2002	7,131.00	10,486.61	(2,411.10)	(3,000.64)	1.24	(4.35)	0.68
	2003	3,235.85	6,602.41	1,694.19	485.52	0.29	3.90	0.49
	2004	3,259.32	6,760.67	1,418.10	793.10	0.56	4.77	0.48
	2005	3,053.64	6,936.27	2,426.43	1,343.61	0.55	2.86	0.44
le East	2001	60.40	152.68	264.64	54.42	0.21	0.58	0.40
le East	2002	83.69	158.71	202.35	40.04	0.20	0.78	0.53
le East	2003	128.32	200.71	169.21	53.57	0.32	1.19	0.64
le East	2004	(90.76)	(167.12)	95.22	23.39	0.25	(1.76)	0.54
le East	2005	(107.87)	(186.21)	239.56	78.86	0.33	(0.78)	0.58
K	2001	1,666.31	2,761.25	670.23	298.87	0.45	4.12	0.60
K	2002	2,150.42	3,058.10	1,485.51	198.76	0.13	2.06	0.70
K	2003	2,492.86	3,434.72	1,127.23	403.90	0.36	3.05	0.73
K	2004	2,407.69	3,431.37	1,216.97	382.61	0.31	2.82	0.70
K	2005	2,460.24	3,654.59	1,571.86	598.54	0.38	2.33	0.67
ramount	2001	58.51	78.26	82.92	9.56	0.12	0.94	0.75
ramount	2002	46.51	74.26	78.92	5.90	0.07	0.94	0.63
ramount	2003	43.19	80.93	59.37	6.98	0.12	1.36	0.53
ramount	2004	41.73	84.61	52.70	8.16	0.15	1.61	0.49
ramount	2005	59.15	108.97	65.85	9.28	0.14	1.65	0.54
CB	2001	1,540.85	3,269.13	4,599.70	2,235.23	0.49	0.71	0.47
CB	2002	1,741.06	3,465.54	4,291.72	2,206.13	0.51	0.81	0.50
CB	2003	1,827.85	3,395.09	4,600.10	2,788.72	0.61	0.74	0.54
CB	2004	1,999.17	3,689.17	3,033.40	1,832.18	0.60	1.22	0.54
CB	2005	2,132.66	3,990.13	4,502.26	2,443.00	0.54	0.89	0.53
tanbic	2001	433.12	652.86	85.38	(210.78)	(2.47)	7.65	0.66
tanbic	2002	65.27	149.83	190.12	26.39	0.14	0.79	0.44
tanbic	2003	437.64	730.53	80.88	(104.35)	(1.29)	9.03	0.60
tanbic	2004	365.98	720.43	212.07	109.98	0.52	3.40	0.51
tanbic	2005	563.93	982.42	555.62	291.95	0.53	1.77	0.57
Transnational	2001	96.47	224.51	271.39	251.63	0.93	0.83	0.43
Transnational	2002	113.48	226.30	156.56	134.18	0.86	1.45	0.50
Transnational	2003	125.69	230.09	138.67	118.21	0.85	1.66	0.55
Transnational	2004	124.87	248.15	1,052.27	1,035.98	0.98	0.24	0.50
Transnational	2005	100.45	239.84	85.41	39.31	0.46	2.81	0.42

TABLE OF RATIOS

	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.12	1.07	0.60	0.36	0.11
2002	0.20	1.31	0.56	0.16	1.10	0.47	0.15	0.15
2003	0.46	0.98	0.58	0.28	1.58	0.54	0.47	0.17
2004	0.52	1.09	0.60	0.40	1.31	0.43	0.47	0.31
2005	0.43	0.79	0.57	0.31	1.16	0.48	0.54	0.27

Bank of Baroda	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.13	1.38	0.31	0.36	0.09
2002	0.20	1.31	0.56	0.13	1.24	0.33	0.15	0.10
2003	0.46	0.98	0.58	0.25	0.73	0.37	0.47	0.35
2004	0.52	1.09	0.60	0.47	0.71	0.44	0.47	0.66
2005	0.43	0.79	0.57	0.31	0.58	0.42	0.54	0.53

Bank of India	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.53	1.26	0.62	0.36	0.42
2002	0.20	1.31	0.56	0.45	2.27	0.36	0.15	0.20
2003	0.46	0.98	0.58	0.60	1.62	0.63	0.47	0.37
2004	0.52	1.09	0.60	0.63	1.42	0.74	0.47	0.45
2005	0.43	0.79	0.57	0.58	1.39	0.69	0.54	0.42

Bank of Maharashtra	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.32	0.71	0.40	0.36	0.45
2002	0.20	1.31	0.56	0.29	1.03	0.47	0.15	0.28
2003	0.46	0.98	0.58	0.51	1.26	0.56	0.47	0.40
2004	0.52	1.09	0.60	0.51	1.65	0.53	0.47	0.31
2005	0.43	0.79	0.57	0.41	1.04	0.48	0.54	0.40

Bank of Commerce	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.25	1.71	0.66	0.36	0.15
2002	0.20	1.31	0.56	0.33	1.96	0.66	0.15	0.17
2003	0.46	0.98	0.58	0.49	2.17	0.67	0.47	0.23
2004	0.52	1.09	0.60	0.35	1.11	0.47	0.47	0.32
2005	0.43	0.79	0.57	0.23	0.67	0.53	0.54	0.35

Charter House	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.33	0.43	0.75	0.36	0.76
2002	0.20	1.31	0.56	0.35	0.55	0.73	0.15	0.65
2003	0.46	0.98	0.58	0.38	0.75	0.69	0.47	0.50
2004	0.52	1.09	0.60	0.19	1.58	0.77	0.47	0.12
2005	0.43	0.79	0.57	0.29	0.80	0.53	0.54	0.36

Chase Bank	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.41	2.28	0.55	0.36	0.18
2002	0.20	1.31	0.56	0.40	0.98	0.50	0.15	0.41
2003	0.46	0.98	0.58	0.44	1.02	0.51	0.47	0.43
2004	0.52	1.09	0.60	1.33	-5.28	0.75	0.47	-0.25
2005	0.43	0.79	0.57	0.30	1.10	0.50	0.54	0.27

City Finance	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.62	2.70	0.95	0.36	0.23
2002	0.20	1.31	0.56	0.33	3.39	0.70	0.15	0.10
2003	0.46	0.98	0.58	0.65	3.75	0.65	0.47	0.17
2004	0.52	1.09	0.60	0.88	3.50	0.59	0.47	0.25
2005	0.43	0.79	0.57	1.06	-2.31	0.81	0.54	-0.46

Consolidated	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	-0.22	5.42	0.58	0.36	-0.04
2002	0.20	1.31	0.56	0.53	3.88	0.76	0.15	0.14
2003	0.46	0.98	0.58	0.24	8.60	0.57	0.47	0.03
2004	0.52	1.09	0.60	1.43	-8.48	0.54	0.47	-0.17
2005	0.43	0.79	0.57	-0.67	22.99	0.54	0.54	-0.03

Bank	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	-1.27	5.60	0.63	0.36	-0.23
2002	0.20	1.31	0.56	0.13	2.20	0.60	0.15	0.06
2003	0.46	0.98	0.58	0.18	3.35	0.58	0.47	0.05
2004	0.52	1.09	0.60	0.22	4.14	0.65	0.47	0.05
2005	0.43	0.79	0.57	0.20	2.07	0.65	0.54	0.10

	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.29	0.75	0.52	0.36	0.39
2002	0.20	1.31	0.56	0.19	0.91	0.36	0.15	0.21
2003	0.46	0.98	0.58	0.30	1.07	0.43	0.47	0.28
2004	0.52	1.09	0.60	0.28	0.41	1.17	0.47	0.69
2005	0.43	0.79	0.57	0.31	0.45	0.70	0.54	0.69

Investment	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.16	1.59	0.51	0.36	0.10
2002	0.20	1.31	0.56	0.22	2.01	0.73	0.15	0.11
2003	0.46	0.98	0.58	0.37	0.98	0.43	0.47	0.38
2004	0.52	1.09	0.60	0.50	0.71	0.68	0.47	0.70
2005	0.43	0.79	0.57	0.52	0.75	-0.16	0.54	0.70

Food Trust	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.13	1.01	0.34	0.36	0.13
2002	0.20	1.31	0.56	0.24	1.09	0.39	0.15	0.22
2003	0.46	0.98	0.58	0.41	1.31	0.47	0.47	0.31
2004	0.52	1.09	0.60	0.38	1.48	0.49	0.47	0.26
2005	0.43	0.79	0.57	0.26	0.80	0.54	0.54	0.32

Marial	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.10	0.98	0.66	0.36	0.11
2002	0.20	1.31	0.56	0.21	0.73	0.63	0.15	0.29
2003	0.46	0.98	0.58	0.27	0.56	0.57	0.47	0.49
2004	0.52	1.09	0.60	0.45	0.67	0.59	0.47	0.68
2005	0.43	0.79	0.57	0.35	0.53	0.51	0.54	0.65

City bank	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.36	1.77	0.60	0.36	0.20
2002	0.20	1.31	0.56	0.39	1.33	0.45	0.15	0.29
2003	0.46	0.98	0.58	0.46	2.00	0.52	0.47	0.23
2004	0.52	1.09	0.60	0.48	2.90	0.57	0.47	0.17
2005	0.43	0.79	0.57	0.59	2.23	0.49	0.54	0.26

First Bank	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.02	0.61	0.53	0.36	0.03
2002	0.20	1.31	0.56	0.11	0.72	0.66	0.15	0.15
2003	0.46	0.98	0.58	0.21	0.88	0.63	0.47	0.24
2004	0.52	1.09	0.60	-0.35	4.24	0.71	0.47	-0.08
2005	0.43	0.79	0.57	0.18	0.99	0.16	0.54	0.18

First American	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.30	0.67	0.43	0.36	0.44
2002	0.20	1.31	0.56	0.29	1.00	0.57	0.15	0.29
2003	0.46	0.98	0.58	0.34	1.68	0.52	0.47	0.20
2004	0.52	1.09	0.60	0.44	1.50	0.45	0.47	0.29
2005	0.43	0.79	0.57	0.34	1.00	0.57	0.54	0.34

First	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.06	0.86	0.42	0.36	0.07
2002	0.20	1.31	0.56	0.08	0.85	0.51	0.15	0.10
2003	0.46	0.98	0.58	0.10	1.15	0.50	0.47	0.09
2004	0.52	1.09	0.60	0.06	1.74	0.53	0.47	0.04
2005	0.43	0.79	0.57	0.00	1.74	0.55	0.54	0.00

	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.22	0.82	0.55	0.36	0.27
2002	0.20	1.31	0.56	0.17	0.61	0.38	0.15	0.28
2003	0.46	0.98	0.58	0.15	1.04	0.52	0.47	0.14
2004	0.52	1.09	0.60	0.18	1.18	0.51	0.47	0.15
2005	0.43	0.79	0.57	0.15	0.81	0.48	0.54	0.18

	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.32	0.56	0.41	0.36	0.57
2002	0.20	1.31	0.56	0.33	0.62	0.37	0.15	0.54
2003	0.46	0.98	0.58	0.35	1.05	0.41	0.47	0.33
2004	0.52	1.09	0.60	0.52	1.13	0.26	0.47	0.47
2005	0.43	0.79	0.57	0.19	2.19	0.38	0.54	0.08

AG Zurich	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.29	0.93	0.51	0.36	0.32
2002	0.20	1.31	0.56	0.26	0.93	0.44	0.15	0.28
2003	0.46	0.98	0.58	0.37	1.29	0.45	0.47	0.29
2004	0.52	1.09	0.60	0.47	2.16	0.39	0.47	0.22
2005	0.43	0.79	0.57	0.41	0.81	0.40	0.54	0.50

	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.13	0.54	0.63	0.36	0.25
2002	0.20	1.31	0.56	0.14	0.72	0.68	0.15	0.19
2003	0.46	0.98	0.58	0.34	0.90	0.63	0.47	0.37
2004	0.52	1.09	0.60	0.40	1.03	0.62	0.47	0.39
2005	0.43	0.79	0.57	0.29	0.64	0.56	0.54	0.46

eral	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.23	0.60	0.60	0.36	0.39
2002	0.20	1.31	0.56	0.25	0.55	0.57	0.15	0.46
2003	0.46	0.98	0.58	0.28	0.51	0.50	0.47	0.56
2004	0.52	1.09	0.60	0.26	0.61	0.56	0.47	0.42
2005	0.43	0.79	0.57	0.20	0.46	0.59	0.54	0.43

CS	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.13	2.91	0.61	0.36	0.05
2002	0.20	1.31	0.56	1.24	-4.35	0.68	0.15	-0.29
2003	0.46	0.98	0.58	0.29	3.90	0.49	0.47	0.07
2004	0.52	1.09	0.60	0.56	4.77	0.48	0.47	0.12
2005	0.43	0.79	0.57	0.55	2.86	0.44	0.54	0.19

ide East	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.21	0.58	0.40	0.36	0.36
2002	0.20	1.31	0.56	0.20	0.78	0.53	0.15	0.25
2003	0.46	0.98	0.58	0.32	1.19	0.64	0.47	0.27
2004	0.52	1.09	0.60	0.25	-1.76	0.54	0.47	-0.14
2005	0.43	0.79	0.57	0.33	-0.78	0.58	0.54	-0.42

EXK	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.45	4.12	0.60	0.36	0.11
2002	0.20	1.31	0.56	0.13	2.06	0.70	0.15	0.06
2003	0.46	0.98	0.58	0.36	3.05	0.73	0.47	0.12
2004	0.52	1.09	0.60	0.31	2.82	0.70	0.47	0.11
2005	0.43	0.79	0.57	0.38	2.33	0.67	0.54	0.16

Paramount	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.12	0.94	0.75	0.36	0.12
2002	0.20	1.31	0.56	0.07	0.94	0.63	0.15	0.08
2003	0.46	0.98	0.58	0.12	1.36	0.53	0.47	0.09
2004	0.52	1.09	0.60	0.15	1.61	0.49	0.47	0.10
2005	0.43	0.79	0.57	0.14	1.65	0.54	0.54	0.09

	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.49	0.71	0.47	0.36	0.68
2002	0.20	1.31	0.56	0.51	0.81	0.50	0.15	0.64
2003	0.46	0.98	0.58	0.61	0.74	0.54	0.47	0.82
2004	0.52	1.09	0.60	0.60	1.22	0.54	0.47	0.50
2005	0.43	0.79	0.57	0.54	0.89	0.53	0.54	0.61

DC	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	-2.47	7.65	0.66	0.36	-0.32
2002	0.20	1.31	0.56	0.14	0.79	0.44	0.15	0.18
2003	0.46	0.98	0.58	-1.29	9.03	0.60	0.47	-0.14
2004	0.52	1.09	0.60	0.52	3.40	0.51	0.47	0.15
2005	0.43	0.79	0.57	0.53	1.77	0.57	0.54	0.30

Operational	PAT/EBIT(l)	OP/EBIT(l)	OP/T OP EX(l)	PAT/EBIT(b)	OP/EBIT(b)	OP/T OP EX(b)	b=y/x(i)	b=y/x(b)
2001	0.32	0.86	0.58	0.93	0.83	0.43	0.36	1.12
2002	0.20	1.31	0.56	0.86	1.45	0.50	0.15	0.59
2003	0.46	0.98	0.58	0.85	1.66	0.55	0.47	0.51
2004	0.52	1.09	0.60	0.98	0.24	0.50	0.47	4.17
2005	0.43	0.79	0.57	0.46	2.81	0.42	0.54	0.16

SIGNIFICANCE TESTING TABLES

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.442
R Square	0.195
Adjusted R Square	-0.073
Standard Error	0.131
Observations	5,000

	df	SS	MS	F	Significance F
Regression	1,000	0.013	0.013	0.728	0.450
Residual	3,000	0.052	0.017		
Total	4,000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.061	0.320	0.10	0.923	-0.385	1.707	-0.385	1.707
X Variable 1	-0.275	0.322	-0.854	0.406	-1.288	0.749	-1.288	0.748

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.516
R Square	0.267
Adjusted R Square	0.022
Standard Error	0.112
Observations	5,000

	df	SS	MS	F	Significance F
Regression	1,000	0.014	0.014	1.081	0.375
Residual	3,000	0.038	0.013		
Total	4,000	0.052			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.002	0.336	-0.274	0.802	-1.160	0.878	-1.160	0.878
X Variable 1	0.279	0.267	1.043	0.373	-0.371	1.130	-0.371	1.130

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.697
R Square	0.752
Adjusted R Square	0.669
Standard Error	0.073
Observations	5,000

	df	SS	MS	F	Significance F
Regression	1,000	0.048	0.048	9.038	0.037
Residual	3,000	0.016	0.005		
Total	4,000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.138	0.088	1.578	0.213	-0.141	0.418	-0.141	0.418
X Variable 1	0.067	0.021	3.115	0.007	0.054	1.997	0.054	1.997

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.029
R Square	0.001
Adjusted R Square	-0.332
Standard Error	0.235
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.002	0.943
Residual	3.000	0.166	0.055		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.040	0.703	1.470	0.226	-1.189	3.277	-1.189	3.277
X Variable 1	-0.026	0.500	-0.050	0.983	-1.810	1.754	-1.810	1.754

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.031
R Square	0.001
Adjusted R Square	-0.332
Standard Error	0.242
Observations	5.010

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.003	0.961
Residual	3.000	0.176	0.059		
Total	4.000	0.176			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.292	0.847	1.584	0.266	-1.722	4.308	-1.722	4.308
X Variable 1	-0.100	1.863	-0.054	0.981	-4.028	3.829	-4.029	3.829

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.788
R Square	0.633
Adjusted R Square	0.511
Standard Error	0.099
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.050	0.050	5.184	0.107
Residual	3.000	0.029	0.010		
Total	4.000	0.080			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.548	0.135	4.052	0.027	0.118	0.979	0.118	0.979
X Variable 1	-0.314	0.138	-2.277	0.107	-0.754	0.125	-0.754	0.125

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.874
R Square	0.763
Adjusted R Square	0.684
Standard Error	0.071
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.049	0.049	9.674	0.053
Residual	3.000	0.015	0.005		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.183	0.072	2.539	0.085	-0.048	0.413	-0.048	0.413
X Variable 1	0.783	0.252	3.110	0.053	-0.018	1.585	-0.018	1.585

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.326
R Square	0.108
Adjusted R Square	-0.192
Standard Error	0.222
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.018	0.018	0.356	0.593
Residual	3.000	0.148	0.049		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.833	0.305	2.732	0.072	-0.138	1.804	-0.138	1.804
X Variable 1	0.188	0.311	0.597	0.593	-0.804	1.178	-0.804	1.178

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.922
R Square	0.850
Adjusted R Square	0.800
Standard Error	0.160
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.434	0.434	16.955	0.028
Residual	3.000	0.077	0.026		
Total	4.000	0.511			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.124	0.538	5.803	0.010	1.411	4.838	1.411	4.838
X Variable 1	-5.883	1.424	-4.118	0.028	-10.388	-1.332	-10.385	-1.332

1) PATIENT (b)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.697
R Square	0.486
Adjusted R Square	0.315
Standard Error	0.058
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.010	0.010	2.839	0.191
Residual	3.000	0.010	0.003		
Total	4.000	0.020			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.753	0.118	0.386	0.006	0.378	1.128	0.378	1.128
X Variable 1	-0.122	0.072	-1.685	0.191	-0.352	0.108	-0.352	0.108

2) PATIENT (b)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.997
R Square	0.994
Adjusted R Square	0.993
Standard Error	0.011
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.064	0.064	542.432	0.000
Residual	3.000	0.000	0.000		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.619	0.043	-14.272	0.001	-0.756	-0.481	-0.756	-0.481
X Variable 1	1.793	0.077	23.290	0.000	1.548	2.039	1.548	2.039

3) PATIENT (b)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.857
R Square	0.734
Adjusted R Square	0.646
Standard Error	0.121
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.122	0.122	8.290	0.064
Residual	3.000	0.044	0.015		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.316	0.246	1.286	0.289	-0.466	1.097	-0.466	1.097
X Variable 1	0.433	0.150	2.879	0.064	-0.046	0.912	-0.046	0.912

4) PATIENT OP EX (b)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.893
R Square	0.798
Adjusted R Square	0.730
Standard Error	0.209
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.518	0.518	11.831	0.041
Residual	3.000	0.131	0.044		
Total	4.000	0.649			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.072	0.441	6.973	0.000	1.670	4.474	1.670	4.474
X Variable 1	-2.444	0.711	-3.440	0.041	-4.706	-0.183	-4.706	-0.183

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.805
R Square	0.848
Adjusted R Square	0.530
Standard Error	0.070
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.027	0.027	5.515	0.100
Residual	3.000	0.015	0.005		
Total	4.000	0.041			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.141	0.118	1.167	0.317	-0.234	0.516	-0.234	0.516
X Variable 1	0.234	0.100	2.348	0.100	-0.083	0.551	-0.083	0.551

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.941
R Square	0.886
Adjusted R Square	0.848
Standard Error	0.049
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.057	0.057	23.367	0.017
Residual	3.000	0.007	0.002		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.094	0.101	-0.928	0.422	-0.417	0.229	-0.417	0.229
X Variable 1	1.174	0.243	4.834	0.017	0.401	1.947	0.401	1.947

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.318
R Square	0.101
Adjusted R Square	-0.198
Standard Error	0.223
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.017	0.017	0.339	0.602
Residual	3.000	0.149	0.050		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.793	0.378	2.101	0.128	-0.408	1.995	-0.408	1.995
X Variable 1	0.188	0.320	0.582	0.602	-0.831	1.203	-0.831	1.203

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.816
R Square	0.665
Adjusted R Square	0.554
Standard Error	0.233
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.324	0.324	5.963	0.082
Residual	3.000	0.163	0.054		
Total	4.000	0.487			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.183	0.857	-1.237	0.304	-4.228	1.862	-4.228	1.862
X Variable 1	4.778	1.957	2.442	0.082	-1.448	11.005	-1.448	11.005

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.330
R Square	0.107
Adjusted R Square	0.100
Standard Error	0.982
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.017	0.017	1.978	0.324
Residual	3,000	0.028	0.008		
Total	4,000	0.045			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.172	0.130	1.442	0.343	-0.208	0.553
X Variable 1	0.104	0.074	1.409	0.254	-0.131	0.338

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.320
R Square	0.102
Adjusted R Square	0.107
Standard Error	0.138
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.007	0.007	0.342	0.560
Residual	3,000	0.058	0.019		
Total	4,000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.254	0.232	1.091	0.354	-0.485	0.993
X Variable 1	0.206	0.077	0.594	0.500	-1.780	2.591

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.170
R Square	0.221
Adjusted R Square	0.038
Standard Error	0.208
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.037	0.037	0.652	0.424
Residual	3,000	0.129	0.043		
Total	4,000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.170	0.171	2.343	0.023	-0.102	1.633
X Variable 1	0.134	0.101	0.882	0.424	-0.377	0.686

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.123
R Square	0.015
Adjusted R Square	-0.313
Standard Error	0.233
Observations	5,000

ANOVA		df	SS	MS	F	Significance F	
Regression		1,000	0.003	0.003	0.046	0.843	
Residual		3,000	0.164	0.055			
Total		4,000	0.166				
		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept		0.959	0.238	4.028	0.028	0.201	1.717
X Variable 1		0.056	0.260	0.215	0.843	-0.773	0.885
						Lower 95.0%	Upper 95.0%
						0.885	1.717
						-0.773	0.885

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.164
R Square	0.027
Adjusted R Square	-0.287
Standard Error	0.510
Observations	5,000

ANOVA		df	SS	MS	F	Significance F	
Regression		1,000	0.022	0.022	0.083	0.792	
Residual		3,000	0.782	0.261			
Total		4,000	0.803				
		Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept		0.288	1.964	0.155	0.887	-5.644	6.222
X Variable 1		0.797	2.964	0.288	0.792	-7.710	9.245
						Lower 95.0%	Upper 95.0%
						9.245	6.222
						-7.710	9.245

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.859
R Square	0.755
Adjusted R Square	0.674
Standard Error	0.043
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.017	0.017	9.294	0.056	
Residual	3.000	0.006	0.002			
Total	4.000	0.023				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.427	0.044	9.751	0.002	0.288	0.567	0.288	0.567
X Variable 1	-0.146	0.048	-3.044	0.056	-0.298	0.007	-0.298	0.007

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.571
R Square	0.326
Adjusted R Square	0.102
Standard Error	0.120
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.021	0.021	1.452	0.315	
Residual	3.000	0.043	0.014			
Total	4.000	0.064				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.680	0.251	2.709	0.073	-0.119	1.479	-0.119	1.479
X Variable 1	-0.061	0.197	-1.205	0.315	-3.499	1.577	-3.499	1.577

Regression Statistics	
Multiple R	0.934
R Square	0.872
Adjusted R Square	0.830
Standard Error	1.241
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	31.619	31.619	20.516	0.000
Residual	3,000	4.624	1.541		
Total	4,000	36.243			

	Coefficients		t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
	Intercept	X Variable 1						
	14.609	3.269	4.469	0.021	4.206	23.013	4.206	23.013
	-25.927	5.724	-4.529	0.020	-44.144	-7.710	-44.144	-7.710

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.671
R Square	0.444
Adjusted R Square	0.425
Standard Error	0.716
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.678	0.678	50.162	0.006
Residual	3,000	0.041	0.014		
Total	4,000	0.719			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.579	0.052	11.148	0.002	0.414	0.745	0.414	0.745
X Variable 1	-0.137	0.019	-7.083	0.006	-0.198	-0.075	-0.198	-0.075

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.567
R Square	0.322
Adjusted R Square	0.095
Standard Error	0.120
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.021	0.021	1.422	0.319
Residual	3,000	0.043	0.014		
Total	4,000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.287	0.098	2.924	0.061	-0.025	0.599	-0.025	0.599
X Variable 1	0.169	0.142	1.193	0.319	-0.283	0.621	-0.283	0.621

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.304
R Square	0.093
Adjusted R Square	-0.210
Standard Error	0.224
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.015	0.015	0.306	0.619
Residual	3,000	0.151	0.050		
Total	4,000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.006	0.100	10.034	0.002	0.887	1.325	0.887	1.325
X Variable 1	-0.021	0.037	-0.533	0.619	-0.139	0.096	-0.139	0.096

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.862
R Square	0.465
Adjusted R Square	0.287
Standard Error	0.233
Observations	3,000

ANOVA

	df	SS	MS	F	Significance F
Regression	1,000	0.142	0.142	2.608	0.205
Residual	3,000	0.163	0.054		
Total	4,000	0.306			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.871	0.145	6.003	0.000	0.409	1.333	0.409	1.333
X Variable 1	-0.074	0.046	-1.615	0.205	-0.219	0.072	-0.219	0.072

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.785
R Square	0.616
Adjusted R Square	0.468
Standard Error	0.091
Observations	3,000

ANOVA

	df	SS	MS	F	Significance F
Regression	1,000	0.039	0.039	4.813	0.110
Residual	3,000	0.025	0.008		
Total	4,000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.130	0.123	1.067	0.368	-0.261	0.521	-0.261	0.521
X Variable 1	0.359	0.184	1.94	0.116	-0.162	0.881	-0.162	0.881

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.646
R Square	0.418
Adjusted R Square	0.224
Standard Error	0.180
Observations	5,000

ANOVA

	df	SS	MS	F	Significance F
Regression	1,000	0.069	0.069	2.152	0.239
Residual	3,000	0.097	0.032		
Total	4,000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.892	0.112	7.987	0.004	0.536	1.247	0.536	1.247
X Variable 1	0.052	0.035	1.467	0.239	-0.060	0.163	-0.060	0.163

Regression Statistics	
Multiple R	0.415
R Square	0.172
Adjusted R Square	-0.104
Standard Error	2.682
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	4.486	4.486	0.624	0.487
Residual	3.000	21.579	7.193		
Total	4.000	26.065			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.809	7.186	1.085	0.357	-15.091	30.703	-15.091	30.703
X Variable 1	-7.575	9.592	-0.790	0.487	-38.100	22.950	-38.100	22.950

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.821
R Square	0.847
Adjusted R Square	0.797
Standard Error	0.360
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	2.160	2.160	16.688	0.027
Residual	3.000	0.389	0.130		
Total	4.000	2.548			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.663	0.191	3.567	0.038	0.074	1.262	0.074	1.262
X Variable 1	-0.065	0.018	-4.082	0.027	-0.118	-0.014	-0.118	-0.014

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.241
R Square	0.058
Adjusted R Square	-0.256
Standard Error	0.142
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.004	0.004	0.184	0.697
Residual	3.000	0.060	0.020		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.375	0.068	5.547	0.012	0.160	0.589	0.160	0.589
X Variable 1	0.038	0.089	0.429	0.697	-0.245	0.321	-0.245	0.321

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.607
R Square	0.369
Adjusted R Square	0.159
Standard Error	0.187
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.081	0.081	1.754	0.277
Residual	3.000	0.105	0.035		
Total	4.000	0.186			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.078	0.098	10.835	0.002	0.760	1.393	0.760	1.393
X Variable 1	-0.011	0.008	-1.324	0.277	-0.037	0.015	-0.037	0.015

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.157
R Square	0.025
Adjusted R Square	-0.300
Standard Error	12.858
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	12.585	12.585	0.078	0.801
Residual	3.000	496.023	165.341		
Total	4.000	508.608			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	17.824	41.615	0.429	0.697	-114.266	149.944	-114.295	149.944
X Variable 1	-18.968	68.750	-0.276	0.801	-237.762	169.827	-237.762	169.827

Regression Statistics	
Multiple R	0.157
R Square	0.025
Adjusted R Square	-0.100
Standard Error	12.858
Observations	3.000

ANOVA		df	SS	MS	F	Significance F
Regression		1.000	12.585	12.585	0.076	0.801
Residual		3.000	496.023	165.341		
Total		4.000	508.608			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	11.824	41.515	0.429	0.697	-114.295	148.944	-114.295	149.944
X Variable 1	-11.888	68.750	-0.276	0.801	-237.762	199.827	-237.762	199.827

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.921
R Square	0.847
Adjusted R Square	0.787
Standard Error	0.360
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	2.160	2.160	18.666	0.027
Residual	3.000	0.389	0.130		
Total	4.000	2.549			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.683	0.191	3.567	0.038	0.074	1.292
X Variable 1	-0.965	0.016	-4.082	0.027	-0.116	-0.014

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.241
R Square	0.038
Adjusted R Square	-0.236
Standard Error	0.142
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.004	0.004	0.184	0.697
Residual	3.000	0.060	0.020		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.375	0.668	0.547	0.012	-0.160	0.589
X Variable 1	0.038	0.099	0.429	0.697	-0.245	0.321

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.607
R Square	0.369
Adjusted R Square	0.159
Standard Error	0.887
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.061	0.061	1.754	0.217
Residual	3.000	0.105	0.035		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1.078	0.099	10.835	0.002	0.760	1.393
X Variable 1	-0.011	0.008	-1.324	0.217	-0.037	0.015

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.791
R Square	0.628
Adjusted R Square	0.501
Standard Error	0.481
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	1.065	1.065	6.911	0.011
Residual	3.000	0.631	0.210		
Total	4.000	1.702			

	Coefficients	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1.115	0.244	1.900	0.152	0.144
X Variable 1	-0.353	0.157	-2.230	0.111	-0.854

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.353
R Square	0.125
Adjusted R Square	-0.167
Standard Error	0.137
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.008	0.008	0.427	0.540
Residual	3.000	0.058	0.019		
Total	4.000	0.064			

	Coefficients	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.302	0.062	0.101	0.008	0.194
X Variable 1	0.069	0.105	0.954	0.560	-0.265

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.261
R Square	0.068
Adjusted R Square	-0.242
Standard Error	0.227
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.011	0.011	0.220	0.671
Residual	3.000	0.155	0.052		
Total	4.000	0.166			

	Coefficients	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1.132	0.288	3.931	0.020	0.215
X Variable 1	-0.036	0.078	0.488	0.671	-0.263

Regression Statistics	
Multiple R	0.107
R Square	0.028
Adjusted R Square	-0.206
Standard Error	1.666
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.239	0.239	0.008	0.184
Residual	3.000	8.328	2.776		
Total	4.000	8.567			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.923	18.405	-0.105	0.923	-20.488	16.648	-40.488	36.840
X Variable 1	0.673	20.571	0.324	0.748	-38.479	102.768	-67.459	122.708

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.377
R Square	0.142
Adjusted R Square	-0.144
Standard Error	0.052
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.001	0.001	0.498	0.532
Residual	3.000	0.008	0.003		
Total	4.000	0.009			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.320	0.068	4.678	0.018	0.102	0.538	0.102	0.538
X Variable 1	-0.083	0.090	-0.704	0.532	-0.348	0.222	-0.348	0.222

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.779
R Square	0.607
Adjusted R Square	0.477
Standard Error	0.092
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.039	0.039	4.842	0.120
Residual	3.000	0.025	0.008		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.177	0.264	-0.671	0.550	-1.017	0.663	-1.017	0.663
X Variable 1	2.042	0.948	2.155	0.120	-0.974	5.059	-0.974	5.059

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.328
R Square	0.108
Adjusted R Square	-0.190
Standard Error	0.222
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.018	0.018	0.382	0.590
Residual	3.000	0.148	0.049		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.839	0.295	2.848	0.065	-0.099	1.776	-0.099	1.776
X Variable 1	0.232	0.385	0.601	0.590	-0.995	1.458	-0.995	1.458

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.836
R Square	0.700
Adjusted R Square	0.599
Standard Error	0.183
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.233	0.233	8.988	0.077
Residual	3.000	0.100	0.033		
Total	4.000	0.333			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.194	0.197	6.058	0.009	0.567	1.821	0.567	1.821
X Variable 1	-0.748	0.283	-2.643	0.077	-1.648	0.153	-1.648	0.153

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.907
R Square	0.823
Adjusted R Square	0.764
Standard Error	0.079
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.086	0.086	13.821	0.034
Residual	3.000	0.019	0.006		
Total	4.000	0.104			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.060	0.060	1.001	0.051	0.318	0.683	0.318	0.683
X Variable 1	-0.257	0.069	-3.731	0.004	-0.416	-0.038	-0.416	-0.038

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.807
R Square	0.651
Adjusted R Square	0.535
Standard Error	0.086
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.042	0.042	5.584	0.006
Residual	3.000	0.022	0.007		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.160	0.102	1.565	0.210	-0.186	0.486	-0.186	0.486
X Variable 1	0.632	0.267	2.369	0.090	-0.218	1.482	-0.218	1.482

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.541
R Square	0.293
Adjusted R Square	0.057
Standard Error	0.198
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.049	0.049	1.243	0.348
Residual	3.000	0.117	0.039		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.772	0.227	3.382	0.043	0.048	1.496	0.048	1.496
X Variable 1	0.193	0.173	1.115	0.346	-0.356	0.744	-0.356	0.744

Regression Statistics	
Multiple R	0.514
R Square	0.264
Adjusted R Square	0.019
Standard Error	0.565
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F	Upper 95%	Lower 95%	Upper 95.0%	Lower 95.0%	
Regression	1.000	0.343	0.343	1.076	0.376	2.217	-0.524	2.217	-0.524	
Residual	3.000	0.957	0.319			3.336	-1.697	3.336	-1.697	
Total	4.000	1.301								
Coefficients										
Intercept	0.846	0.431	1.965	0.144	-0.524					
X Variable 1	0.821	0.791	1.037	0.376	-1.697					

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.704
R Square	0.496
Adjusted R Square	0.328
Standard Error	0.091
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.024	0.024	2.952	0.184
Residual	3.000	0.025	0.008		
Total	4.000	0.049			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.052	0.200	-0.260	0.812	-0.688	0.584	-0.888	0.584
X Variable 1	0.295	0.172	1.718	0.184	-0.251	0.841	-0.251	0.841

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.687
R Square	0.472
Adjusted R Square	0.296
Standard Error	0.108
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.030	0.030	2.882	0.200
Residual	3.000	0.034	0.011		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.162	0.144	1.121	0.344	-0.287	0.620	-0.287	0.620
X Variable 1	0.785	0.478	1.638	0.200	-0.740	2.310	-0.740	2.310

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.479
R Square	0.229
Adjusted R Square	-0.028
Standard Error	0.207
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.038	0.038	0.893	0.414
Residual	3.000	0.128	0.043		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.585	0.454	1.288	0.288	-0.680	2.030	-0.680	2.030
X Variable 1	0.369	0.380	0.945	0.414	-0.874	1.611	-0.874	1.611

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.004
R Square	0.000
Adjusted R Square	-0.333
Standard Error	0.305
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.000	0.995
Residual	3.000	0.280	0.093		
Total	4.000	0.280			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.133	0.872	1.300	0.285	-1.841	3.907	-1.841	3.907
X Variable 1	0.013	1.924	0.007	0.995	-6.109	6.136	-6.109	6.136

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.712
R Square	0.507
Adjusted R Square	0.343
Standard Error	0.106
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.035	0.035	3.084	0.177
Residual	3.000	0.034	0.011		
Total	4.000	0.069			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.640	0.212	3.015	0.057	-0.036	1.316	-0.036	1.316
X Variable 1	-0.525	0.299	-1.756	0.177	-1.477	0.426	-1.477	0.426

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.752
R Square	0.566
Adjusted R Square	0.421
Standard Error	0.066
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.036	0.036	3.907	0.143
Residual	3.000	0.028	0.009		
Total	4.000	0.064			

	Coefficient	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.110	0.110	0.997	0.194	-0.187	0.535	-0.187	0.535
X Variable 1	0.725	0.297	2.439	0.143	-0.442	1.892	-0.442	1.892

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.057
R Square	0.003
Adjusted R Square	-0.329
Standard Error	0.235
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.001	0.001	0.010	0.927
Residual	3.000	0.165	0.055		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.960	0.468	2.049	0.133	-0.531	2.491	-0.531	2.491
X Variable 1	0.005	0.800	0.100	0.927	-2.034	2.185	-2.034	2.185

SUMMARY OUTPUT

TEST REPORT OF EX(0)

Regression Statistics	
Multiple R	0.892
R Square	0.795
Adjusted R Square	0.727
Standard Error	0.093
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.101	0.101	11.667	0.042
Residual	3.000	0.026	0.009		
Total	4.000	0.127			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.052	0.512	-2.054	0.132	-2.683	0.578	-2.683	0.578
X Variable 1	2.945	0.862	3.416	0.042	0.201	5.688	0.201	5.688

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.445
R Square	0.198
Adjusted R Square	-0.099
Standard Error	0.802
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.269	0.269	0.743	0.452
Residual	3.000	1.096	0.362		
Total	4.000	1.355			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.531	2.087	-0.254	0.830	-4.810	3.205	-4.810	3.205
X Variable 1	0.398	0.802	0.496	0.652	-11.302	20.498	-11.302	20.498

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.914
R Square	0.835
Adjusted R Square	0.780
Standard Error	0.108
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.189	0.189	15.151	0.030
Residual	3.000	0.034	0.011		
Total	4.000	0.203			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.231	0.070	3.330	0.045	0.010	0.453	0.010	0.453
X Variable 1	-0.133	0.034	-3.892	0.030	-0.242	-0.024	-0.242	-0.024

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.390
R Square	0.152
Adjusted R Square	-0.130
Standard Error	0.135
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.010	0.010	0.540	0.518
Residual	3.000	0.054	0.018		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.392	0.061	6.425	0.008	0.198	0.586	0.198	0.586
X Variable 1	-0.219	0.299	-0.735	0.518	-1.170	0.731	-1.170	0.731

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.201
R Square	0.040
Adjusted R Square	-0.280
Standard Error	0.230
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.007	0.007	0.128	0.746
Residual	3.000	0.159	0.053		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.986	0.151	6.378	0.008	0.484	1.448	0.484	1.448
X Variable 1	0.026	0.075	0.355	0.748	-0.211	0.264	-0.211	0.264

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.369
R Square	0.137
Adjusted R Square	-0.151
Standard Error	1.657
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	1.303	1.303	0.474	0.540
Residual	3.000	8.241	2.747		
Total	4.000	9.544			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.102	2.144	0.048	0.985	-6.721	6.928	-6.721	6.928
X Variable 1	2.589	3.730	0.689	0.540	-9.303	14.441	-9.303	14.441

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.661
R Square	0.437
Adjusted R Square	0.248
Standard Error	0.652
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.006	0.006	2.329	0.224
Residual	3.000	0.008	0.003		
Total	4.000	0.015			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.228	0.078	2.925	0.061	-0.020	0.476	-0.020	0.476
X Variable 1	0.097	0.064	1.520	0.224	-0.102	0.299	-0.105	0.289

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.842
R Square	0.709
Adjusted R Square	0.612
Standard Error	0.079
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.045	0.045	7.309	0.074
Residual	3.000	0.019	0.006		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.220	0.226	-0.971	0.401	-0.840	0.500	-0.840	0.500
X Variable 1	1.769	0.654	2.703	0.074	-0.313	3.857	-0.313	3.857

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.210
R Square	0.044
Adjusted R Square	-0.274
Standard Error	0.230
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.007	0.007	0.139	0.734
Residual	3.000	0.159	0.053		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.863	0.344	2.570	0.082	-0.210	1.977	-0.210	1.977
X Variable 1	0.104	0.280	0.373	0.734	-0.787	0.996	-0.787	0.996

Regression Statistics	
Multiple R	0.031
R Square	0.001
Adjusted R Square	-0.332
Standard Error	0.474
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.001	0.001	0.003	0.960
Residual	3,000	0.673	0.224		
Total	4,000	0.674			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.067	1.917	0.557	0.517	-5.034	7.168	-5.034	7.168
X Variable 1	0.202	3.752	0.054	0.960	-11.738	12.143	-11.738	12.143

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.562
R Square	0.350
Adjusted R Square	0.133
Standard Error	0.034
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.002	0.002	1.615	0.203
Residual	3.000	0.003	0.001		
Total	4.000	0.005			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.123	0.050	2.473	0.080	-0.035	0.281	-0.035	0.281
X Variable 1	-0.047	0.037	-1.271	0.283	-0.166	0.071	-0.166	0.071

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.150
R Square	0.022
Adjusted R Square	-0.304
Standard Error	0.144
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.001	0.001	0.069	0.810
Residual	3.000	0.083	0.021		
Total	4.000	0.084			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.417	0.141	2.959	0.060	-0.032	0.866	-0.032	0.866
X Variable 1	-0.524	2.002	-0.262	0.810	-6.895	5.846	-6.895	5.846

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.351
R Square	0.123
Adjusted R Square	-0.169
Standard Error	0.220
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.020	0.020	0.421	0.563
Residual	3.000	0.146	0.049		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.207	0.326	3.707	0.034	0.171	2.242	0.171	2.242
X Variable 1	-0.159	0.245	-0.649	0.563	-0.939	0.621	-0.939	0.621

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.749
R Square	0.561
Adjusted R Square	0.415
Standard Error	0.344
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.454	0.454	3.836	0.145
Residual	3.000	0.355	0.118		
Total	4.000	0.809			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.949	1.649	-1.182	0.322	-7.187	3.299	-7.187	3.299
X Variable 1	8.404	3.270	1.958	0.145	-4.002	18.808	-4.002	18.808

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.643
R Square	0.413
Adjusted R Square	0.217
Standard Error	0.196
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.081	0.081	2.111	0.242
Residual	3.000	0.116	0.039		
Total	4.000	0.197			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.148	0.172	-0.858	0.430	-2.447	2.149	-2.447	2.149
X Variable 1	2.142	1.474	1.453	0.242	-2.549	6.853	-2.549	6.853

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.096
R Square	0.004
Adjusted R Square	-0.328
Standard Error	0.035
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.013	0.916
Residual	3.000	0.004	0.001		
Total	4.000	0.004			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.183	0.072	2.551	0.084	-0.045	0.411
X Variable 1	-0.009	0.038	-0.114	0.916	-0.258	0.240

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.305
R Square	0.093
Adjusted R Square	-0.210
Standard Error	0.139
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.006	0.006	0.307	0.618
Residual	3.000	0.056	0.019		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.608	0.408	1.491	0.233	-0.690	1.905
X Variable 1	-1.278	2.307	-0.554	0.618	-8.620	6.054

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.200
R Square	0.040
Adjusted R Square	-0.280
Standard Error	0.231
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.007	0.007	0.125	0.747
Residual	3.000	0.150	0.050		
Total	4.000	0.158			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1.188	0.415	2.862	0.091	-0.342	2.680
X Variable 1	-0.183	0.520	-0.353	0.747	-1.837	1.470

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.697
R Square	0.009
Adjusted R Square	-0.321
Standard Error	0.756
Observations	5.000

	df	SS	MS	F	Significance F
Regression	1.000	0.016	0.016	0.028	0.877
Residual	3.000	1.713	0.571		
Total	4.000	1.730			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	1.476	2.311	0.637	0.562	-4.562	8.513	-5.562	8.513
X Variable 1	-1.008	5.878	-0.168	0.877	-20.030	18.018	-20.030	18.018

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.467
R Square	0.218
Adjusted R Square	-0.042
Standard Error	0.123
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.013	0.013	0.839	0.427
Residual	3,000	0.046	0.015		
Total	4,000	0.058			

X Variable 1	Coefficients		Standard Error		t Stat		P-value		Lower 95%		Upper 95%	
Intercept	0.437	0.118	3.714	0.034	0.034	0.063	0.812	0.063	0.812	0.063	0.812	
X Variable 1	-0.096	0.094	-0.916	0.427	-0.205	0.213	-0.381	0.213				

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.156
R Square	0.127
Adjusted R Square	-0.164
Standard Error	0.107
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.008	0.008	0.436	0.536
Residual	3,000	0.056	0.019		
Total	4,000	0.064			

X Variable 1	Coefficients		Standard Error		t Stat		P-value		Lower 95%		Upper 95%	
Intercept	0.257	0.205	1.281	0.264	-0.388	0.307	-0.388	0.307				
X Variable 1	0.373	0.595	0.691	0.599	-1.484	2.171	-1.424	2.171				

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.563
R Square	0.322
Adjusted R Square	0.187
Standard Error	0.194
Observations	5,000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1,000	0.654	0.024	1.428	0.318
Residual	3,000	0.112	0.037		
Total	4,000	0.168			

X Variable 1	Coefficients		Standard Error		t Stat		P-value		Lower 95%		Upper 95%	
Intercept	1.200	0.185	6.489	0.007	0.007	0.012	1.788	0.012	1.788	0.012	1.788	
X Variable 1	-0.176	0.147	-1.195	0.318	-0.945	0.283	-0.945	0.283				

QUESTION 10

QUESTION 11

QUESTION 12

SUMMARY OUTPUT

(CP-EBI1(B))\OPRT CP EX(8)

Regression Statistics	
Multiple R	0.466
R Square	0.218
Adjusted R Square	-0.043
Standard Error	0.566
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.267	0.267	0.834	0.428
Residual	3.000	0.982	0.321		
Total	4.000	1.250			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.537	2.546	1.389	0.259	-4.567	11.641	-4.567	11.641
X Variable 1	-5.277	5.779	-0.913	0.428	-23.668	13.113	-23.668	13.113

SUMMARY OUTPUT

(P*E)BIT(0)/(P*E)BIT(0)

Regression Statistics	
Multiple R	0.107
R Square	0.489
Adjusted R Square	0.333
Standard Error	0.099
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.514	0.014	2.993	0.182
Residual	3.000	0.514	0.052		
Total	4.000	0.029			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.228	0.083	2.755	0.070	-0.035	0.491	-0.035	0.491
X Variable 1	0.109	0.063	1.730	0.182	-0.091	0.308	-0.091	0.206

SUMMARY OUTPUT

(P*E)BIT(0)/(P*E)BIT(0)

Regression Statistics	
Multiple R	0.945
R Square	0.894
Adjusted R Square	0.858
Standard Error	0.048
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.067	0.057	25.239	0.015
Residual	3.000	0.007	0.002		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.125	0.103	1.186	0.320	-0.451	0.206	-0.451	0.206
X Variable 1	1.407	0.290	5.024	0.015	0.516	2.299	0.516	2.299

SUMMARY OUTPUT

(OP*E)BIT(0)/(OP*E)BIT(0)

Regression Statistics	
Multiple R	0.267
R Square	0.071
Adjusted R Square	-0.238
Standard Error	0.227
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.012	0.012	0.230	0.064
Residual	3.000	0.154	0.051		
Total	4.000	0.196			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.845	0.270	3.281	0.046	0.027	1.744	0.027	1.744
X Variable 1	0.098	0.204	0.480	0.684	-0.553	0.748	-0.553	0.748

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.804
R Square	0.647
Adjusted R Square	0.528
Standard Error	0.083
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.038	0.038	5.500	0.101
Residual	3.000	0.020	0.007		
Total	4.000	0.058			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.117	0.165	-0.708	0.530	-0.642	0.408	-0.642	0.408
X Variable 1	0.483	0.210	2.345	0.101	-0.176	1.161	-0.176	1.161

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.945
R Square	0.892
Adjusted R Square	0.857
Standard Error	0.048
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.057	0.057	24.899	0.015
Residual	3.000	0.007	0.002		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.126	0.056	2.251	0.110	-0.052	0.304	-0.052	0.304
X Variable 1	0.992	0.199	4.990	0.015	0.359	1.625	0.359	1.625

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.408
R Square	0.165
Adjusted R Square	-0.113
Standard Error	0.215
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.027	0.027	0.594	0.497
Residual	3.000	0.139	0.046		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.683	0.429	1.591	0.210	-0.683	2.049	-0.683	2.049
X Variable 1	0.421	0.546	0.771	0.497	-1.318	2.159	-1.318	2.159

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.115
R Square	0.013
Adjusted R Square	-0.318
Standard Error	0.228
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.002	0.002	0.040	0.854
Residual	3.000	0.153	0.051		
Total	4.000	0.155			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.411	1.772	0.232	0.831	-5.227	6.049	-5.227	6.049
X Variable 1	0.569	2.836	0.201	0.854	-8.455	9.593	-8.455	9.593

PAT/EBIT(b)/OP/EBIT(b)

PAT/EBIT(b)/PAT/EBIT(b)

ICP/EBIT(b)/ICP/EBIT(b)

ICP/EBIT(b)/OP/EBIT(b)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.351
R Square	0.123
Adjusted R Square	-0.166
Standard Error	0.034
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.421	0.563
Residual	3.000	0.003	0.001		
Total	4.000	0.004			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.151	0.146	1.038	0.375	-0.312	0.615	-0.312	0.615
X Variable 1	0.172	0.266	0.649	0.563	-0.673	1.018	-0.673	1.018

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.186
R Square	0.038
Adjusted R Square	-0.282
Standard Error	0.143
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.002	0.002	0.120	0.752
Residual	3.000	0.062	0.021		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.191	0.561	0.341	0.756	-1.595	1.878	-1.595	1.878
X Variable 1	0.788	2.275	0.347	0.752	-6.451	8.028	-6.451	8.028

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.343
R Square	0.118
Adjusted R Square	-0.176
Standard Error	0.221
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.020	0.020	0.400	0.572
Residual	3.000	0.146	0.049		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.411	0.945	0.435	0.693	-2.598	3.418	-2.598	3.418
X Variable 1	1.090	1.723	0.633	0.572	-4.394	6.574	-4.394	6.574

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.165
R Square	0.027
Adjusted R Square	-0.297
Standard Error	0.073
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.084	0.791
Residual	3.000	0.016	0.005		
Total	4.000	0.016			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.386	0.507	0.785	0.490	-1.218	2.013	-1.218	2.013
X Variable 1	0.280	0.888	0.290	0.781	-2.887	3.117	-2.887	3.117

KCB

SUMMARY OUTPUT

(PAT/EBIT(b))/(OP/EBIT(b))

Regression Statistics	
Multiple R	0.847
R Square	0.718
Adjusted R Square	0.624
Standard Error	0.261
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.521	0.521	7.637	0.070
Residual	3.000	0.205	0.068		
Total	4.000	0.726			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.755	0.137	5.498	0.012	0.318	1.192	0.318	1.192
X Variable 1	-0.099	0.036	-2.764	0.070	-0.213	0.015	-0.213	0.015

SUMMARY OUTPUT

(PAT/EBIT(n))/(PAT/EBIT(b))

Regression Statistics	
Multiple R	0.544
R Square	0.298
Adjusted R Square	0.081
Standard Error	0.123
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.019	0.019	1.280	0.343
Residual	3.000	0.045	0.015		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.474	0.087	4.892	0.016	0.166	0.783	0.166	0.783
X Variable 1	-0.162	0.144	-1.122	0.343	-0.820	0.297	-0.820	0.297

SUMMARY OUTPUT

(OP/EBIT(n))/(OP/EBIT(b))

Regression Statistics	
Multiple R	0.688
R Square	0.471
Adjusted R Square	0.294
Standard Error	0.171
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.078	0.078	2.669	0.201
Residual	3.000	0.088	0.029		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.083	0.090	12.029	0.001	0.796	1.369	0.796	1.369
X Variable 1	-0.038	0.023	-1.634	0.201	-0.113	0.036	-0.113	0.036

SUMMARY OUTPUT

(OP/EBIT(b))/(OP/OP EX(b))

Regression Statistics	
Multiple R	0.798
R Square	0.633
Adjusted R Square	0.511
Standard Error	2.550
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	33.638	33.638	5.173	0.107
Residual	3.000	19.506	6.502		
Total	4.000	53.144			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	17.825	6.956	2.534	0.085	-4.512	39.761	-4.512	39.761
X Variable 1	-28.871	12.693	-2.275	0.107	-69.266	11.524	-69.266	11.524

SUMMARY OUTPUT

PAT/EBIT(b1)/OP/EBIT(b1)

Regression Statistics	
Multiple R	0.138
R Square	0.018
Adjusted R Square	-0.308
Standard Error	0.070
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.000	0.000	0.058	0.825
Residual	3.000	0.015	0.005		
Total	4.000	0.015			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.258	0.031	8.267	0.004	0.158	0.358	0.158	0.358
X Variable 1	-0.007	0.028	-0.241	0.825	-0.098	0.084	-0.098	0.084

SUMMARY OUTPUT

PAT/EBIT(b1)/PAT/EBIT(b1)

Regression Statistics	
Multiple R	0.664
R Square	0.440
Adjusted R Square	0.254
Standard Error	0.109
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.028	0.028	2.360	0.222
Residual	3.000	0.036	0.012		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.029	0.236	0.125	0.909	-0.722	0.781	-0.722	0.781
X Variable 1	1.371	0.892	1.536	0.222	-1.469	4.211	-1.469	4.211

SUMMARY OUTPUT

OP/EBIT(b1)/OP/EBIT(b1)

Regression Statistics	
Multiple R	0.142
R Square	0.020
Adjusted R Square	-0.306
Standard Error	0.233
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.003	0.003	0.062	0.819
Residual	3.000	0.163	0.054		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.005	0.104	9.653	0.002	0.674	1.337	0.674	1.337
X Variable 1	0.024	0.095	0.249	0.819	-0.278	0.325	-0.278	0.325

SUMMARY OUTPUT

OP/EBIT(b1)/OPT OP EX(b1)

Regression Statistics	
Multiple R	0.026
R Square	0.001
Adjusted R Square	-0.332
Standard Error	1.418
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.004	0.004	0.002	0.967
Residual	3.000	6.036	2.012		
Total	4.000	6.040			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.192	4.279	0.045	0.967	-13.426	13.809	-13.426	13.809
X Variable 1	-0.351	7.681	-0.045	0.967	-25.434	24.731	-25.434	24.731

NBSK

SUMMARY OUTPUT

(PAT/EBIT(b))-(OP/EBIT(b))

Regression Statistics	
Multiple R	0.750
R Square	0.563
Adjusted R Square	0.417
Standard Error	0.090
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.031	0.031	3.860	0.144
Residual	3.000	0.024	0.008		
Total	4.000	0.056			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.009	0.187	0.052	0.982	-0.522	0.539	-0.522	0.539
X Variable 1	0.111	0.056	1.965	0.144	-0.069	0.290	-0.069	0.290

SUMMARY OUTPUT

(PAT/EBIT(t))-(PAT/EBIT(b))

Regression Statistics	
Multiple R	0.508
R Square	0.258
Adjusted R Square	0.011
Standard Error	0.126
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.017	0.017	1.044	0.382
Residual	3.000	0.048	0.016		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.208	0.183	1.124	0.343	-0.377	0.790	-0.377	0.790
X Variable 1	0.548	0.534	1.022	0.382	-1.154	2.248	-1.154	2.248

SUMMARY OUTPUT

(OP/EBIT(t))-(OP/EBIT(b))

Regression Statistics	
Multiple R	0.478
R Square	0.228
Adjusted R Square	-0.332
Standard Error	0.207
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.038	0.038	0.877	0.418
Residual	3.000	0.128	0.043		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.154	0.384	3.529	0.039	0.133	2.575	0.133	2.575
X Variable 1	-0.121	0.130	-0.938	0.418	-0.534	0.291	-0.534	0.291

SUMMARY OUTPUT

(OP/EBIT(b))-(OP/OP EX(b))

Regression Statistics	
Multiple R	0.885
R Square	0.489
Adjusted R Square	0.292
Standard Error	0.872
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	1.197	1.197	2.652	0.202
Residual	3.000	1.354	0.451		
Total	4.000	2.551			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	10.738	4.838	2.220	0.113	-4.658	26.126	-4.658	26.126
X Variable 1	-11.538	7.883	-1.629	0.202	-34.078	11.007	-34.078	11.007

Paramount

(P)ATEBIT(0)(M)OPEBIT(b)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.849
R Square	0.720
Adjusted R Square	0.627
Standard Error	0.019
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.003	0.003	7.713	0.069
Residual	3.000	0.001	0.000		
Total	4.000	0.004			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.023	0.036	0.648	0.563	-0.091	0.138	-0.091	0.138
X Variable 1	0.075	0.027	2.777	0.069	-0.011	0.160	-0.011	0.160

SUMMARY OUTPUT

(P)ATEBIT(0)(M)OPEBIT(b)

Regression Statistics	
Multiple R	0.908
R Square	0.824
Adjusted R Square	0.765
Standard Error	0.061
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.683	0.683	14.041	0.033
Residual	3.000	0.011	0.004		
Total	4.000	0.694			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.070	0.124	-0.564	0.612	-0.466	0.326	-0.466	0.326
X Variable 1	3.767	1.005	3.747	0.033	0.568	6.967	0.568	6.967

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.393
R Square	0.155
Adjusted R Square	-0.127
Standard Error	0.216
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.026	0.026	0.549	0.512	
Residual	3.000	0.140	0.047			
Total	4.000	0.166				
Coefficients						
	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Upper 95.0%
Intercept	1.307	0.418	3.125	0.052	-0.024	2.637
X Variable 1	-0.232	0.313	-0.741	0.512	-1.226	-0.024
						0.763
						-1.226
						2.637
						0.763

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.850
R Square	0.723
Adjusted R Square	0.631
Standard Error	0.210
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.346	0.346	7.827	0.068	
Residual	3.000	0.133	0.044			
Total	4.000	0.479				
Coefficients						
	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Upper 95.0%
Intercept	3.014	0.819	4.867	0.017	1.043	4.985
X Variable 1	-2.809	1.040	-2.788	0.068	6.217	0.400
						-6.217
						0.400

328

(PAT/EBIT(b))/(OP/EBIT(b))

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.538
R Square	0.290
Adjusted R Square	0.053
Standard Error	0.052
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.003	0.003	1.224	0.349
Residual	3.000	0.008	0.003		
Total	4.000	0.012			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.427	0.114	3.750	0.033	0.085	0.790	0.085	0.790
X Variable 1	0.141	0.128	1.108	0.349	-0.288	0.548	-0.288	0.548

(PAT/EBIT(t))/(PAT/EBIT(b))

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.817
R Square	0.667
Adjusted R Square	0.557
Standard Error	0.084
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.043	0.043	6.022	0.081
Residual	3.000	0.021	0.007		
Total	4.000	0.064			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.678	0.484	-1.558	0.217	-2.057	0.705	-2.057	0.705
X Variable 1	1.828	0.785	2.454	0.091	-0.572	4.424	-0.572	4.424

(OP/EBIT(t))/(OP/EBIT(b))

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.200
R Square	0.040
Adjusted R Square	-0.280
Standard Error	0.231
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.007	0.007	0.125	0.747
Residual	3.000	0.156	0.053		
Total	4.000	0.168			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.831	0.503	1.654	0.197	-0.788	2.431	-0.788	2.431
X Variable 1	0.199	0.564	0.353	0.747	-1.587	1.896	-1.587	1.896

(OP/EBIT(b))/(OP/OP EX(b))

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.576
R Square	0.332
Adjusted R Square	0.109
Standard Error	0.193
Observations	5.000

ANOVA					
	df	SS	MS	F	Significance F
Regression	1.000	0.055	0.055	1.488	0.310
Residual	3.000	0.111	0.037		
Total	4.000	0.167			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.135	1.847	-0.688	0.540	-8.378	4.108	-8.378	4.108
X Variable 1	3.877	3.178	1.220	0.310	-8.237	13.991	-8.237	13.991

Stamba

SUMMARY OUTPUT

(PAT EBIT(b))\OP EBIT(b)

Regression Statistics	
Multiple R	0.835
R Square	0.698
Adjusted R Square	0.597
Standard Error	0.839
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	4.882	4.882	8.927	0.078
Residual	3.000	2.114	0.705		
Total	4.000	6.996			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.880	0.643	1.337	0.274	-1.188	2.907	-1.188	2.907
X Variable 1	-0.304	0.115	-2.632	0.078	-0.671	0.064	-0.671	0.064

SUMMARY OUTPUT

(PAT EBIT(n))\PAT EBIT(b)

Regression Statistics	
Multiple R	0.209
R Square	0.044
Adjusted R Square	-0.275
Standard Error	0.143
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.003	0.003	0.137	0.738
Residual	3.000	0.081	0.020		
Total	4.000	0.084			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.385	0.070	5.663	0.011	0.173	0.617	0.173	0.617
X Variable 1	0.020	0.054	0.370	0.738	-0.152	0.192	-0.152	0.192

SUMMARY OUTPUT

(OP EBIT(n))\OP EBIT(b)

Regression Statistics	
Multiple R	0.397
R Square	0.157
Adjusted R Square	-0.123
Standard Error	0.218
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	0.026	0.026	0.561	0.508
Residual	3.000	0.140	0.047		
Total	4.000	0.166			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.106	0.165	6.682	0.007	0.579	1.633	0.579	1.633
X Variable 1	-0.022	0.030	-0.749	0.508	-0.117	0.072	-0.117	0.072

SUMMARY OUTPUT

(OP EBIT(b))\OP/OP EX(b)

Regression Statistics	
Multiple R	0.774
R Square	0.600
Adjusted R Square	0.466
Standard Error	2.657
Observations	5.000

ANOVA

	df	SS	MS	F	Significance F
Regression	1.000	31.713	31.713	4.493	0.124
Residual	3.000	21.177	7.059		
Total	4.000	52.891			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-13.402	8.541	-1.580	0.215	-40.584	13.781	-40.584	13.781
X Variable 1	32.243	15.212	2.120	0.124	-16.168	80.654	-16.168	80.654

Transnational

SUMMARY OUTPUT

(PAT/EBIT(b))/(OP/EBIT(b))

Regression Statistics	
Multiple R	0.940
R Square	0.883
Adjusted R Square	0.844
Standard Error	0.082
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.150	0.150	22.818	0.018	
Residual	3.000	0.020	0.007			
Total	4.000	0.170				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.088	0.089	15.832	0.001	0.876	1.317	0.876	1.317
X Variable 1	-0.201	0.042	-4.756	0.018	-0.335	-0.066	-0.335	-0.066

SUMMARY OUTPUT

(PAT/EBIT(1))/(PAT/EBIT(b))

Regression Statistics	
Multiple R	0.052
R Square	0.003
Adjusted R Square	-0.330
Standard Error	0.146
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.000	0.000	0.008	0.933	
Residual	3.000	0.084	0.021			
Total	4.000	0.084				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.411	0.298	1.388	0.258	-0.831	1.353	-0.531	1.353
X Variable 1	-0.032	0.354	-0.091	0.933	-1.158	1.093	-1.158	1.093

SUMMARY OUTPUT

(OP/EBIT(1))/(OP/EBIT(b))

Regression Statistics	
Multiple R	0.407
R Square	0.166
Adjusted R Square	-0.113
Standard Error	0.215
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.027	0.027	0.595	0.487	
Residual	3.000	0.136	0.046			
Total	4.000	0.166				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.125	0.182	6.165	0.009	0.544	1.708	0.544	1.708
X Variable 1	-0.088	0.111	-0.772	0.487	-0.440	0.268	-0.440	0.268

SUMMARY OUTPUT

(OP/EBIT(b))/(OP/OP EX(b))

Regression Statistics	
Multiple R	0.317
R Square	0.101
Adjusted R Square	-0.199
Standard Error	1.058
Observations	5.000

ANOVA						
	df	SS	MS	F	Significance F	
Regression	1.000	0.378	0.378	0.335	0.603	
Residual	3.000	3.380	1.120			
Total	4.000	3.735				

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.119	4.728	0.871	0.448	-10.921	19.159	-10.921	19.159
X Variable 1	-5.675	9.799	-0.579	0.603	-36.859	25.508	-36.859	25.508