Measuring operational risk in the ALCO process

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To my Father,

Jacobus Cornelius Smit

It's choice - not chance - that determines your destiny

- Jean Nidetch

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ABSTRACT

In the last decade, the financial service industry has become increasingly aware of the dangers posed by operational risk. Profound changes in the economic and financial environment have made it necessary for banks in general to adapt their long term strategies as well as their approaches to the management of their assets and liabilities. Regardless of this heightened awareness, banks continue to fail at effective management of these risks. The Asset and Liability Management Committee (ALCO) is responsible for managing a bank's assets and liabilities to balance its many risk exposures and thereby help it achieve its operating objectives e.g. maximising Net Interest Income (NII). Thus the ALCO process is the crux of the strategic management process performed within a bank. The ALCO process is driven by people, processes and technology which, in essence, is a broad definition of operational risk. Failure in any one of these areas will lead to failure of the ALCO, ALCO processes and, therefore, the strategic Asset and Liability Management (ALM). The focus of this study is, therefore, how to measure and manage operational risk in a bank's ALCO process. A case study was conducted, with the aid of ALCO experts in a specialised niche bank in South Africa, to identify operational risks within this bank's ALCO process. The various risk indicators of operational risk were classified into 5 broad categories. Each category was weighted according to its representative risk indicator and converted into percentages for the interpretation of the overall results. Category 2 (authority levels) has the highest negative impact, while the remaining 4 categories (employee, model, system and other indicators) have a medium negative impact, on the efficiency of the ALCO process.

Key words: Operational risk, strategic risk management, ALCO, ALM, operational risk indicators.

UITTREKSEL

Oor die laaste dekade het die industrie vir finansiële dienste al hoe meer bewus geraak van die gevare wat operasionele risiko inhou. Insiggewende veranderinge in die ekonomiese, sowel as die finansiële omgewing, het veroorsaak dat banke hul, in die algemeen, langtermyn strategieë insluitend hul benaderings ten opsigte van die bestuur van bates en laste, moes aanpas. Ten spyte van hierdie bewuswording faal banke nog steeds om hierdie risiko's effektief te bestuur. Die Bate en Laste Komitee (BELKOM) is verantwoordelik vir die bestuur van `n bank se bates en laste om sodoende die verskeie risiko blootstellings teen te werk en hierdeur by te dra tot die bereiking van die bedryfsdoelwit, naamlik die maksimering van sy Netto Rente Inkomste (NRI). Dus, is die BELKOM proses die kern van strategiese bestuur soos uitgevoer in `n bank. Die BELKOM proses word gedryf deur mense, prosesse en tegnologie wat eintlik `n breë definisie is vir operasionele risiko. Mislukking, in enige een van die areas, sal lei tot die mislukking van die BELKOM proses, en met gevolg, die strategiese Bate en Laste Bestuur. Die fokus van die studie, is dus, hoe om operasionele risiko in `n bank se BELKOM proses te meet en te bestuur. `n Gevallestudie is uitgevoer, met behulp van BELKOM spesialiste van `n gespesialiseerde nisbank in Suid Afrika, om operasionele risiko's in die bank se BELKOM proses te identifiseer. Die verskeie risiko indikatore is gegroepeer in vyf breë kategorieë. Elke kategorie is geweeg volgens sy verteenwoordigende risiko indikator en omgeskakel na 'n persentasie vorm vir makliker interpretasie van die algehele resultate. Kategorie 2 (outoriteitsvlakke) het die hoogste negatiewe impak getoon in die ondersoek en die oorblywende vier kategorieë (werknemer, model, sisteem en ander indikatore) het `n medium negatiewe impak op die effektiwiteit van die BELKOM proses van die bank getoon.

Sleutel woorde: Operasionele risiko, strategiese risikobestuur, BELKOM, operasionele risiko indikatore.

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Chapter 1

Introduction and Problem Statement

1.1 Background

Only in the 1990's did operational risk, within banking, start to attract significant attention. The infrequent occurrence of large losses was the main cause why operational risk was not recognised as a serious problem until fairly recently (Hoffman, 2002: 1). Several versions of the definition of operational risk are found in literature but the definitive version, as stated by Bessis (2002: 20) is used within this study. Operational risk can be seen as external or internal losses due to a series of events, which includes: malfunctioning information and reporting systems, internal risk-monitoring rules and procedures which are designed to take timely corrective actions, or the compliance with internal risk policy rules (Bessis, 2002: 20). Thus, operational risk can be seen as small yet frequent, as well as mostly predictable, events that take place within a bank. Examples are system glitches, reconciliation breaks, and errors in processes that are accompanied by a one in five-year large system failure and loss, defalcation, or customer dispute (Hoffman, 2002: 1).

Dedicated operational risk management in banks originated due to the recent trends in business complexity, increased operational losses and the need to manage the risk associated with these. Operational risk management aims to understand, identify and measure these operational risks on a more intelligent level. Concurrent with this, banks should also be able to successfully integrate approaches that put a stable platform in place to manage operational risk effectively, given its complexity and its impact on banks today.

According to Marshall (2001: 35), much of the impetus for operational risk management has come from the regulators as well as industry wide groups. The Group of Thirty (G-30), which is one of the most important industry groups, in 1993, issued a highly influential report that outlined twenty recommendations for good practices for derivative dealers and end users (Medova and Kyriacou, 2002: 249). Although the focus of the report was mainly

on derivates, its conclusions have set the tone for securities dealing and processing as a whole. It made a strong case for the precise definition of risk management policies, the authorisation of trading, acceptable control mechanisms, product valuation and risk management approaches and the importance of adequate disclosure and interactive management.

When undertaking the revision of the 1988 Basel Capital Accord, the Basel Committee on Banking Supervision opted to include explicit capital requirements for operational risk (Cruz, 2002: 270) due to the increased awareness of the importance of operations and the risk that it exposes business to. The explicit capital charge was proposed, by the Basel Committee, to guard a bank against operational risk in conjunction with the capital charges for market and credit risk (Bessis, 2001: 42). This proposal of the Basel Committee was included in Basel II and includes a model for calculating the economic capital against extreme risks, which is the contribution to the quantification of operational risk (BIS, 2005a: 127).

During the 1980s the financial markets were subject to phenomenal growth and fundamental changes which led to the instigation of a best practice that combined Asset and Liability Management (ALM) into one process and, soon after, the instigation of an Asset and Liability Committee (ALCO) as the strategic process, decision making, and execution entity (Whitley, 1992: XV). ALM started out as a simple liquidity gap model that analysed risk in terms of cash inflows and outflows as well as the gaps or mismatches in these cash flows. With time, the cash flow gap models gave way to duration gap models, which looked at the attributes of cash flows rather than the cash flows themselves. Advances over the years in the ALM area lead to it that the ALCO, as we know it today, is no longer limited to managing just interest rate risk but also focuses on an integrated strategic risk management approach (Decillion, 1999), where the latter includes risk adjusted profitability measurements, as well as capital allocation, for internal profitability analysis (Decillion, 1999).

With escalating risk new ways were found to take and avoid risk, and the ALCO's were called into existence to manage this new environment (Whitley, 1992: XV). According to

Ong (1998: 8), the ALCO can be defined as a group of risk managers, from various areas of the enterprise, who assist the treasurer in the risk management process. Mare (1995: 5) refers to the ALCO as the most strategic meeting within financial institutions. In general, Asset and Liability Management gauges the sensitivity of a bank's balance sheet and earnings, in terms of liquidity, capital ratios and asset quality in comparison to the unexpected changes in interest rates and market conditions. Thus, the ALCO derives its role from managing the balance sheet of a bank on a tactical level in order to ensure that profitability is maximised against accepted risk limits. The ALCO can be seen as a crucial element in a bank's strategic planning, management and control. Therefore, the success of a bank in an ever changing financial environment depends on a fully functional, optimal and effective ALCO.

The first step toward creating an effective ALCO is to define the committee's goals (Mihaltian, 1993: 1). The ALCO should be integrated within the management structure and strategic planning process so that it is not seen as a law onto itself. This is because the ALCO is not a substitute for the chain of command, but rather a consultative solution to, sometimes, conflicting interests (Cade, 1997: 74). Members of the ALCO usually include a bank's chief executive officer (CEO), the treasurer, the chief dealer, the finance director, the chief lending officer, the heads of planning and marketing and perhaps an economic advisor.

As the ALCO process comprises of people and processes, a main threat to its effectiveness is operational risk. Studies on why banks fails (e.g. Mare 1995) identified the failing of the ALCO and ALCO process as one of the main causes of bank failure. The failure of the ALCO and ALCO processes are due to operational risks which appear at different levels: people, processes, technical risk and technology. In addressing operational risk in the ALCO process, a common classification of events should be set up that serves as a framework for data gathering processes on operational risk, lost event frequencies, and costs. This is easier said than done with practical difficulties lying in the very basics of agreeing on a common classification of events and on the data gathering process, (Bessis, 2002: 21).

1.2 Problem Statement

The ALCO process is the crux of the strategic management process performed within a bank. The ALCO process is driven by people, processes, and technology, which in essence form a broad definition of operational risk. Failure in any one of these areas will lead to the failure of the ALCO, ALCO processes and the resulting strategic ALM. Not addressing operational risk within the ALCO process can result in inadequate strategic planning and monitoring of the bank and its risks. With this said, Basel II requires banks to hold capital for operational risk management with the suggestions differing between the various business units (see Table 3.2). One unit not included within the Basel II standardised industry business lines is that of strategic ALM. Given the severe consequences of operational risk on the ALCO process, the question is, should strategic ALM be included as a ninth standardised business unit by Basel or just be applied within a South African contexts? The focus of this study is, therefore, how to measure and manage operational risk within the bank's ALCO process.

1.3 Motivation for this study

Banks make money by taking risks. Some of these risks are relatively easy to assess and are specific to particular assets. For example, the likelihood of a certain type of loan defaulting can be determined fairly easily based on the bank's experience with similar loans. Other types of risk, however, are more elusive and complex and do not depend solely on the attributes of any single asset or liability. Rather, they can only be assessed by considering a bank's balance sheet as a whole. Liquidity and market risk fall into this category. The ALCO is responsible for the strategic management of a bank's assets and liabilities to balance its many risk exposures and thereby help it achieve its operating objectives, i.e. maximising net interest income (NII). The ALCO's challenge is to assess the probability that various events will occur and to position the bank to handle the most likely scenarios with minimum deterioration in performance of the bank. In short the "job" of an ALCO is to:

- Assess the probability of various strategic scenarios e.g., liquidity and interest rate shocks.
- Position the bank to be able to handle the most likely of these scenarios at a minimum cost within accepted risk limits, while still achieving the targeted profitability.
- Determine the optimum combination of the bank's assets and liabilities (ALM) to meet the bank's risk and profitability objectives.

This is easier said than done. This study's literature review reveals that ALCO failures occur where individuals, who are in a position to influence margin behaviour, fail to anticipate, and adequately prepare and execute the asset and liability plan. This normally reflects the fact that the ALCO lacks clearly stated goals, uses inappropriate tools, and excludes valuable members of the organisation from the ALCO process (Mihaltian, 1993: 1). Operational risk is traditionally defined as the risk a bank faces due to losses resulting from inadequate or failed internal processes, people, and systems, or from external events (BIS, 2005a: 142), and therein lies a summary of the reasons why an ALCO will fail. With the ALCO process being the heart of the strategic management of a bank, it is essential that this process functions properly. The effective and efficient functioning of this process requires a bank to take into consideration the existing operational risk within the ALCO process, and address and manage this risk efficiently.

1.4 Aim of the Study

The aim of the study is to measure the extent of operational risk in the ALCO process, with the aim to evaluate the significance thereof in the South African banking environment. To shed light on whether South African regulators should include an evaluation of ALCO in operational risk measurement and capital charge.

1.5 Objectives of the study

To reach the above mentioned aims, this study set the following specific objectives:

- *Firstly*, to determine the importance of the Asset and Liability Management (ALM) process as well as the Asset and Liability Committee (ALCO) within strategic risk management.
- *Secondly*, to provide an overview of operational risk management regulations as described by the Basel Committee and Basel II.
- *Thirdly*, to determine what key operational risk indicators (KRIs) are as well as how to identify and control these KRIs.
- *Fourthly*, to identify key risk indicators in the ALCO process and demonstrate their practical viability, using a case study on a South African specialised niche bank.

1.6 Methodology

This study will incorporate a literature study and a case study to identify key risk indicators of operational risk in the Asset and Liability Management Committee process. The facts and information obtained for this study were extracted from various sources of literature regarding the subject. The literature review focuses on Basel II, Asset and Liability Management as well as the Asset and Liability Committee, operational risk management and key risk indicators (KRI's). The sources include articles, books, media reports and the World Wide Web. To determine and evaluate some key risk indicators of operational risk in depth interviews were conducted with current experts and relevant parties in the banking sector of South Africa and a case study of the ALCO in a specialised niche bank was done (see Chapter 5).

1.7 Limitations of the study

The sources used in Chapter 2 are mostly from the 1980's to 2000. The reason is primarily that the financial crises occurring during this period paved the way for the forming of Asset and Liability Management as it is known today. During the Savings and Loan Crisis in the United States of America, in the early 1980's, financial institutions started to focus on managing their assets and liabilities as a combined process bringing forth the birth of ALM as an integrated strategic management process. Therefore, scientific articles and books

focussing on ALM and the ALCO process date from the 1980's and 1990's. A further limitation is that of the co-operation of more banks for wide-spread participation.

1.8 Study outline

Chapter 2 is divided into three main sections. Section 2.2 and Section 2.3 will discuss strategic risk management as well as strategic management in a bank, respectively, placing emphasis on the strategic management process, implementation, and evaluation thereof. Section 2.4 discusses the composition of the ALCO include the ALCO's primary functions and responsibilities. Section 2.5 discusses in-depth the ALCO process in terms of the pre-ALCO meeting, the ALCO meeting and the post ALCO meeting within a bank.

Chapter 3 provides an overview of Basel II as the authoritative document on banking regulation for internationally active banking institutions. This chapter will also determine the implications of an explicit capital requirement of operational risk and this necessitates an understanding of capital adequacy. Furthermore, the three pillars within operational risk management, as outlined in Basel II, will be explained, as well as the concept of adequate capital. Attention will be given to the various approaches used to calculate the capital requirements for operational risk.

Chapter 4 briefly evaluates the differences between key performance indicators and key risk indicators of operational risk management by providing the various categories in which these indicators can be grouped. Chapter 4 further shows how these indicators can be identified, reported to management, and controlled to evaluate operational risk in a bank.

Chapter 5 determines and evaluates the most effective key risk indicators in the ALCO process based on a case study conducted in a specialised niche bank. Operational risk is firm specific and must be adapted according to the organisation/bank in question. The case study only identifies the most critical operational risks within the ALCO process and does not formulate a winning recipe in prohibiting the failure of the ALCO in any bank. It is

only a set of guidelines to identify measure and manage operational risk in the ALCO process of a bank.

Chapter 6 concludes the study and makes recommendations regarding operational risk management in South African banks' ALCO processes.

Chapter 2

Strategic Management in Banking

2.1 Introduction

In discussing risk management in banking it is important to note that it is not about avoiding the risks within a bank's operating environment but rather about optimally managing the risks at hand (Maitz and Smith, 2001: 15). The various risks must be identified and highlighted, measured accordingly, and managed effectively, along with understanding the interrelationship that exists between these risks (Maitz and Smith, 2001:15). In the past the Chief Executive Officer (CEO) of a bank was entrusted with the responsibility of strategically managing a bank's assets and liabilities. Currently, the Board of Directors (BoD) is required to formulate the bank's strategic plan. They must ensure that they are fully informed regarding the details of the bank's strategic management process, the execution of which is delegated to the CEO and senior management (Esterhuysen, 2003: 79). A key element in the execution of the strategic plan is Asset and Liability Management (ALM).

The risks associated with a bank's operations are complex and many, and their management/mitigation is another key element in the execution of the bank's strategic plan. A bank's strategic decision making process and the execution of the strategic plan are seated in the Asset and Liability Committee (ALCO) and its supporting secretariat. The ALCO reports through the CEO to the BoD. Cade (1997: 74) calls the ALCO the top level forum that formulates and ensures the execution of the ALM policy and reviews its implementation. Nevertheless, all in all, it boils down to the fact that the ALCO is the committee which has to decide on how to execute the strategic plan as formulated by the Board of Directors (BoD) and senior management. This implies that the role of the ALCO is to manage the balance sheet of a bank in such a way that the Net Interest Income (NII) is optimised while the various banking risks are kept within the approved limits as set by the BoD. The ALCO process can be seen as the strategic management and risk management process in a bank, which forms the basis for determining and evaluating strategies, within

given bank specific risks and the desired future direction of the bank. The aim of this chapter is to establish the importance of ALM and the ALCO within strategic risk management in a bank. In this chapter, only the general strategic management, ALM, and the ALCO theory will be discussed. This is to form an understanding of the ALCO process, which forms the foundation for the case study on operational risk in the ALCO and ALCO process that follows in Chapter 5.

In Section 2.2 the strategic management process in a bank, in general, but more specifically the three primary components of the strategic management process, will be discussed. Although there will be some reference to the ALCO and Asset and Liability Management (ALM) in Section 2.2, a detailed discussion on ALM and the ALCO follows in Sections 2.3 and 2.4 respectively. As explained in Chapter 1, the sources used in Chapter 2 are mostly from the 1980's to 2000; the main reason being that the financial crises, that occurred during this period, paved the way for the formation of ALM as it is known today. During the Savings and Loan Crisis, in the United States of America in the early 1980's, financial institutions started to focus on managing their assets and liabilities as a combined process bringing forth the integrated strategic management process that resulted in the birth of ALM. Therefore, scientific articles and books focussing on ALM and the ALCO process date from the 1980's and 1990's.

2.2 Strategic management in a bank

2.2.1 Introduction

Strategic management can be defined as a set of decisions and actions resulting from strategies that are designed to achieve the objectives of a bank (Palmer *et al.*, 1992: 107). According to Preble (1997: 770) the strategic management process includes three primary components: (i) Strategy formulation, which is nothing other than strategic planning (see 2.3.1), (ii) implementation of strategies (see 2.3.2) and, (iii) the evaluation or control of strategies (see 2.3.3). These components are discussed in more detail further in this section. Strategic risk management plays an important role in the management of a bank. Risk management is strategic and is a part of the strategic planning and execution in a bank

as discussed in Section 2.2.2. Strategic management guides the bank in executing the bank's vision (see 2.3.1.2); mission (see 2.3.1.3) and its objectives (see 2.3.1.4). With ALM being a bank specific component of strategic risk management, it is necessary to emphasise the importance of strategic risk management. This will ensure optimal development, evaluation, and amendment of a bank's strategy given the future direction of, as well as the risks that prevail within, banks. The aim is to ensure that an efficient strategic risk management process is in place for a bank to meet its set objectives.

2.2.2 The need for risk management

The number and variety of corporate and banking risks have increased greatly due to the globalisation of markets. Risks have also multiplied due to the continuous advances in technology that increases the speed and the volume of operations and transactions (Young, 2006: 29). Examples of increased external risks include rampant inflation and trade union or political activist interventions that can be ruinous and disruptive etc. In order to stay ahead of competitors and safely negotiate a way through this unstable business environment and economy, all these exposures need to be identified and addressed accordingly. This will ensure that decision makers are able to form an optimal strategic plan according to the bank's risk appetite to ascertain that the NII will be maximised and that all risks which a bank face, are kept within the limits as set out by the BoD.

There is no way to totally avoid risks in a bank; risks are apparent every- and anywhere and do negatively affect the performance of a bank if not dealt with. With the BoD left with no other alternative but to accept the reality of risk and its negative impact on the functioning of the bank, the BoD has to consider four main risk mitigation strategies namely, (Young, 2006: 32):

- *Risk avoidance*: This is the identification of activities subject to high-risk exposure and the subsequent action aimed at avoiding the risk.
- *Risk acceptance*: This is the acceptance of mild risks associated with daily activities within an organisation that can not be avoided without hampering the operations.

- *Risk transfer*: This is exposure to risk which is identified and then transferred to a third party willing to accept that risk.
- *Risk reduction*: This is where various risks are identified and actions taken to effectively reduce its potential to negatively impact on the operation.

These four mitigation strategies entail action plans by the ALCO to manage the risks within the limits set by the BoD. Common risk avoidance actions may include underwriting standards, hedges or asset-liability matches, diversification, reinsurance or syndication, and due diligence investigation (Oldfield and Santomero, 1997: 5). The goal is to rid the bank of risks not essential to the financial services provided by the bank. In terms of risk reduction, some risks can be eliminated, or at least considerably reduced, through the transfer of the risk. Risk reduction or transfer actions may include individual market participants buying or selling financial claims to diversify risk in their portfolios (Gardner *et al.*, 2001: 117). When a bank has no relative advantage in managing the risks it is faced with, there is no reason for the bank to absorb and/or manage such risks and therefore it would rather transfer those (Gardner *et al.*, 2001: 117). In other words, there is no value-added at the firm level with the acceptance of these risks. It is important to note that reducing risk in a bank may lead to a reduction in profitability. Therefore, the level of effort and amount of resources focused on reducing these risks can be communicated to shareholders and expenditure thereon justified.

Although the above points refer only to the choices about how to manage risk exposures, there is no indication of the specific steps within the risk management process that need to be taken. Usually, it is up to the management of an organisation to determine and to implement risk management processes as part of strategic management, which will suite the specific needs of the organisation. A focussed risk management team is therefore of the utmost importance to all financial companies, especially financial intermediaries. The responsibility for the day-to-day activities of risk management rests with the executive team of a bank. The different types of risks in a bank do not exist in isolation but are interrelated. Thus, it is of utmost importance that the BoD and senior management formulate a strategic plan to accommodate all the various risk categories that can be found in a bank, ultimately increasing the shareholder wealth. The next section will discuss this strategic management process in a bank in more detail.

2.3 The strategic management process

The strategic management process is the process through which the BoD and senior management formulate the bank's mission, establish goals and objectives, assess strengths and weaknesses of the bank's current operating and financial condition, and design future strategies (Kroon, 2000: 38). The strategic management of risk is not one of peripheral concern but central to the management of a bank (Cade, 1997: 218). The following section discusses the components of a strategic management process in detail to understand the process and the importance thereof in a bank.

2.3.1 Strategic planning

In the formulation of a strategy (strategic planning) attention must be given to the future direction of a bank. This usually requires a SWOT analysis that comprises of an audit of external opportunities and threats and an audit of the bank's most important internal strengths and weaknesses. Included in this phase are the development of a mission and/or vision statement for a bank and the specification of long-term objectives (Beets, 2001: 95). Strategy formulation is thus helpful in the classification of management's way of thinking and it helps in making critical choices needed to achieve success in a bank (Chorafas, 1999: 26). The various components of strategic planning are discussed next. Reference is made to strategic planning on the BoD level as well as the ALCO level.

2.3.1.1 Opportunities, threats, strengths and weaknesses

The BoD and senior management must conduct a SWOT analysis to determine a bank's strengths, weaknesses, opportunities and threats. This analysis is done by focussing on factors that affect the banks' current, as well as future, business (Collinson and Scotts, 2006: 2). Too often, a SWOT analysis is based on unrealistic and unfounded assumptions. To maximise the effectiveness of the SWOT analyses, the BoD and senior management must obtain as much information as possible about their market to justify conclusions with relevant data (Collinson and Scotts, 2006: 4). Strengths, weaknesses, opportunities and threats can be defined as (Frigo *et al.*, 2000: 8):

- *Strengths*: These are areas in which a bank excels and in which the bank has an inherent advantage over its competitors. This may be due to customers recognising the name, strong capital and asset quality, large customer base or strong and positive regulatory performance.
- *Weaknesses*: These are areas that need substantial improvement or restructuring to maintain viability and competitiveness. This may be due to an aging customer base, lack of knowledge of the customer profile, a lack of marketing resources or a lack of technological resources.
- *Opportunities*: These are areas that need to be explored and expanded upon to maintain viability and competitiveness. Management should draw up a list of internal as well as external opportunities that may lead to a competitive advantage over competitors. This may include the cross selling opportunities to existing customers or an increased market presence in the form of erecting additional ATMs.
- *Threats*: Management should again draw up a list, in this case one reflecting external and internal threats to the bank. This may include non-bank competition, inefficiencies within banking operations, high turnover of staff members, lack of appeal, to a younger customer base, or the inability of staff to adapt to the changing banking environment.

The SWOT analysis must be conducted on a regular basis seeing that the banking environment is forever changing. With the BoD and senior management concluding their analysis on factors influencing the banks' business they must incorporate these findings in their strategic view point as expressed in the vision and mission statements.

2.3.1.2 Vision

A vision can be described as a picture of where the bank wants to be in the future and is important in directing the management of change to achieve this vision (Chorafas, 1999: 27). Without a vision, a bank is condemned to simply repeat the current patterns of actions without improving. A vision provides all members in the bank with identity, purpose and direction (Chorafas, 1999: 29). This implies that a vision should challenge, inspire and improve people at all levels.

2.3.1.3 Mission

Koch (1995: 153, 155) stated that a mission statement answers the question "What is the bank?" and should include the following:

- Describe the business in which the bank is, as well as the business in which the bank does not want to be.
- Describe what differentiates the bank from the competition.
- Describe the key values of a bank that all employees must adhere to.
- Reflect the values in the bank's corporate culture as realistically expressed by senior management.
- Provide guidelines that allow for flexibility in response to internal and external change.
- Demonstrate an understanding of market opportunities and how the bank will respond to these.

A bank must ensure that it understands its mission but also the mission of its competitors (Channon, 1986: 12). In the understanding of its competitors' mission, a bank is able to establish successful defensive strategies where necessary. According to Channon (1986: 13) the mission of a bank can be determined by the following factors:

- *Corporate history*: The history of the bank has a significant impact on behaviour, as past successes influence the choice of future direction whilst past failures tend to lead to areas of avoidance.
- *Corporate culture*: Every bank has its own unique internal culture made up of the way things are normally done, the type of people employed, and the set of organisational norms and practices which govern, both formal and informal, behaviour.
- *Hierarchical management structure*: The hierarchical management structure of the bank can significantly improve behaviour. This can apply to both the formal and the informal behavioural and reporting structures.
- *Key decision-makers*: The style, aspirations and values of key decision-makers have a significant impact on the basic purpose of the bank. Almost no major shift in

strategy or organisation can occur without a prior change of leadership.

With the vision and mission determined, management should set objectives for the bank to comply with, and attain, its vision and mission. With the objectives formulated the successful execution of a bank's strategic plan mainly rests with the ALCO that has to ensure that the set objectives are met.

2.3.1.4 Objectives

Objectives for a bank are set by the BoD as well as senior management. Senior management should take into account the potential effects of the external environment, any self-imposed constraint, as is identified by the overall mission statement (as mentioned above), the internal resources of the bank, and the requirements of the shareholders (Channon, 1986: 13). Objectives allow a bank to allocate funds, labour, computer time and other resources in an objective manner. It also allows the communication of organisational intent by describing each employee's job in terms of the overall bank objectives.

Only when management has come to understand the internal as well as the external environments that the bank is exposed to, can objectives be established (Koch, 1995: 153). In evaluating the objectives of the bank and its operating units, it is important to check that they are internally consistent, and that the achievement of one does not exclude the achievement of another. Objectives within the various operating units must also be consistent with those of the bank as a whole.

2.3.1.5 Strategy

Formulating a strategy not only helps the managers of a bank to determine what risks to take but also what risks to avoid. A sound planning methodology should characterise every strategy, for strategy is not an objective in itself, but rather a master plan towards accomplishing set objectives (Chorafas, 1999: 27). According to Chorafas (1999: 28, 34) strategy integrates the following aspects:

- *Marketing and sales within the chosen market(s)*: The marketing strategy is concerned with ways to identify the bank's market and the development of a plan to reach this market in the most effective way.
- *Human resources, i.e. the clients, employees and shareholders*: The human resource strategy is the most fundamental because a bank's most important asset is not cash, but its employees, its customer base and its customers' confidence. An important issue concerning strategic planning in connection with human resources is the bank's own personnel, including its management. This involves the selection and hiring of staff, the establishment of individual responsibilities, indicators and objectives, the able handling of management inventory, lifelong learning, and promotion and salary.
- *Product development, product appeal and life cycle(s)*: The bank's product strategy must look at the range of various services offered to the market by the bank, the way they are priced, whether or not they will respond to market requirements, and how well they are being supported through communications, computers and software within the bank. This can improve their competitive advantage in the market in acquiring more clients.
- *Technological competence, moving ahead of competition*: Technology is an enabling tool, which makes it possible for a bank to reach the goals of the different strategies more effectively. All the components of strategic planning thus involve information technology, including; sustaining an absolute and relative level of technological advancement and addressing technology and investments, return on each investment, solutions by competition, modelling and experimentation, available functional performance and technology transfer requirements.
- *Financial resources and financial staying power*: Financial strategy addresses the planning of liquid resources and those easily converted into cash without financial loss, in spite of uncertainties and turbulence. It also aims to protect and grow the economic resources available to the bank.

If a master plan is based on the composition, planning and execution of these five major components, the bank will be in a position to address current challenges such as pricing

strategy, marketing and branding, delivery channels, market segmentation, product line choices, scale operations, operations in the back office etc. (Beets, 2001: 99).

It is necessary that the strategy lists priorities and gives a sense of direction, while the detailed road map that will be used to get there is established through proper planning (Beets, 2001: 99). To be able to plan correctly, a bank will need to know how its market will change in the near future, and to alter its business strategy pre-emptively (Chorafas, 1999: 112). Planning should thus be much more than just a corporate activity directed at marketing, and plans must be formulated on every level of the bank (Chorafas, 1999: 79). After deciding upon a strategic plan this plan has to be implemented in the bank. The following section will discuss the manner in which the strategic plan can be implemented.

2.3.2 Implementation of strategies

Strategic implementation involves the modification of the organisational structures as well as the processes to make sure that the planned results will be obtained (Beets, 2001: 100). This include processes to establish goals and policies, the allocation of resources to obtain objectives and to adjust motivation and reward systems to encourage better strategic thrust in the management structure (Preble, 1997: 770). It is important to keep in mind that in this section only the broad principles of strategic management will be outlined. The ALCO (see 2.5) is discussed in detail later in this chapter. The ALCO is responsible for the execution of the bank's strategic plan but can also be isolated as a strategic process itself.

The following conditions are necessary for the successful implementation of a bank's strategic plan (Beets, 2001: 101, 104):

2.3.2.1 A recognised need

For the acceptance of strategic planning within a bank there must be a clear and explicit, recognised need that increased attention should be paid to the forward direction of the bank. Need recognition usually comes about through the appearance of the following factors (Channon, 1985: 49):

- *Unsatisfactory financial performance:* When financial performance has deteriorated in relative terms in comparison with major competitors, top management will come under increasing pressure from shareholders to re-establish their relative market position;
- *Successful competitive pressure:* The superior performance of key competitors often prompts a management reaction in the form of the introduction of strategic plans to counter the competitors' strategy;
- *Sudden and unplanned serious loss:* When sudden and unplanned losses occur, there is always a major inquest in any bank. The result of such an inquest usually means changes in control systems in an attempt to prevent any recurrence of the problem; reorganisation to penalise those responsible for the area of loss; and reappraisal of the planning system to reduce business uncertainty; and
- *Strategic shocks:* A strategic shock may be present when a major unexpected event occurs for which top management has no prepared response, for example, an acquisition bid or tender offer. If management has not adequately planned, the shock of such an event forces rapid and rigorous reappraisal of plans and the planning system.

2.3.2.2 Leadership commitment

Without the clear commitment of the CEO, strategic planning is unlikely to be successful. The ALCO (see 2.5) should be acting as the arm of the senior executive management in the construction and implementation of the bank's strategic plans.

2.3.2.3 External environment

The execution of the strategic plan as formulated by the BoD and senior management is the responsibility of the ALCO. Factors that impede the execution of this plan are not only internal factors within the bank but also factors that the bank has no control over. These factors are those that emanate from outside the bank. It is important that these factors are identified and taken into account when the ALCO formulate various strategies to achieve the BoD's objectives within the BoD approved limits.

2.3.2.4 Suitable reorganisation

A carefully developed strategy will normally subdivide the bank's business into a portfolio of opportunities with alternative strategies. This has an impact on the way the bank is organised and a structure will be adapted to fit the needs of strategy rather than the strategy being insufficiently fitted onto the existing structure of the bank.

2.3.2.5 Development of an information base

A prerequisite for the successful introduction and execution of the strategic plan is the collection and the organising of suitable data for a strategic analysis. Information required would include data to allow, for example, correct market sector identification. The data will also be used in the monitoring of the achieving of the objectives.

2.3.2.6 Suitable control system design

The development of an appropriate management information and control system allows the bank to make better decisions on, for example, segmentation, pricing strategies etc., (Beets, 2001: 103). Without such information, the bank may provide uneconomic services to customer groups that may be unattractive, through an inappropriate and over-expensive delivery system, for most of the time. In addition to financial controls, banks also need strategic controls, that is, the ALCO process, to monitor the progress of the strategic plan and to implement appropriate contingency action at specific predetermined trigger points. The precise choice of what controls to concentrate on will vary for individual banks, depending upon their primary strategy.

2.3.2.7 Reward and sanction system balance

By ensuring that the bank's reward and sanction system reinforces the planning process, the successful implementation of the strategic plan is enhanced (Beets, 2001: 103). It is important that this reward and sanction system is consistent with bank strategy, with behaviour positive to the plan being rewarded, and negative behaviour being sanctioned.

2.3.2.8 Good communication

It is essential for successful strategic planning to communicate the BoD and senior management's aspirations for the bank in general, but also for the individual business units and to all the staff members of the bank. A bank that does not adequately internally communicate its intentions can have inconsistency in the strategic objectives of the individual bank units and the bank as a whole (Beets, 2001: 104). Communication also aids in creating cohesion, helps overcome the inertia that exists in many banks and acts as a positive motivating force on all levels in a bank.

2.3.2.9 Time

It is important that sufficient time be given to permit the development of good quality plans, which are credible and acceptable as most banks' initial plans can sometimes be of poor quality. It can take a few revisions of the plans before a planning system settles down and starts to produce meaningful results (Beets, 2001: 104). The above section described the implementation of the strategies, but it is just as important to evaluate the strategies.

2.3.3 Evaluation of strategies

Evaluation of a strategy(-ies) is primarily concerned with traditional control processes which involves the review and feedback of performance to determine if plans, strategies and objectives are being achieved (Preble, 1997: 770, 772). The resulting information will be used to solve problems or to take corrective actions.

2.3.4 Conclusion

In this section, the three components of strategic management namely (i) Strategy formulation, (ii) implementation of strategies and, (iii) the evaluation or control of strategies were discussed in detail. Strategic management can be seen as the process by which decisions and actions are taken to achieve the bank's objectives, taking into account the future direction of the bank. To ensure that the bank achieve its objectives, it is

important not just to evaluate the existing strategies in the bank, but to make the necessary amendments to these strategies or develop new strategies if it is necessary. The ALCO is responsible for the execution of the BoD's strategic plan and also assists in the development, evaluation and amendment of strategies. The next section will place emphasis on the importance of the ALCO and the management of the asset and liabilities in a bank as a key element in the execution of the strategic plan.

2.4 The Asset and Liability Committee

2.4.1 Introduction

In any bank managing the asset and liabilities is the central part of the execution of the strategic plan as formulated by the BoD. In many publications it was found that Asset and Liability Management (ALM) and the Asset and Liability Committee (ALCO) are used as synonyms. In this study, however, ALM is by definition the process of deliberately structuring/posturing the combination of the bank's assets and liabilities in anticipation of likely future events (Jarrow and van Deventer, 1999: 8). In other words it can be seen as the strategic planning, implementation and control processes that affect the volume, mix, maturity, rate sensitivity, quality and liquidity of the bank's assets and liabilities (Thornhill, 1993: 10). The responsibility of the day-to-day activities for risk management rests with the executive team of a bank, as already mentioned in the above sections. The different types of risk in a bank do not exist in isolation but rather have an effect on one another. Thus, it is of utmost importance that the BoD and senior management formulate a strategic plan to accommodate all the various risk categories that can be found in a bank, ultimately increasing the shareholder wealth.

Given a bank's vision, mission and objectives, as set by the BoD and senior management, in this study, the ALCO's responsibility is to ensure adherence to the risk limits set by the BoD in the execution of the strategic plan. This implies that the ALCO is responsible for organising the ALM process and related strategic risk management processes in the bank. The ALCO reports to the BoD due to the delegated tasks received from the BoD that is ultimately responsible for the successful execution of the strategic plan through strategic

ALM and risk management. This discussion re-emphasises the importance of the ALCO in the bank and the serious consequences to its operations if operational risks render the ALCO process ineffective.

The ALCO can not execute the strategic plan without the necessary information and impact reports of various scenarios of likely future events. It is the responsibility of the ALCO secretariat, a supporting unit to the ALCO, to conduct the necessary simulations and present the effects of various possible changes in market conditions that relate to the balance sheet, and its impact on the position of the bank's asset and liability mix, at the pre-ALCO meeting (see 2.5). These different scenarios, generated by the ALCO secretariat, are constrained by the strategic plan formulated by the BoD and senior management. The scenarios also include possible future strategies like the introduction of new savings product or the opening of a new branch, or more complicated scenarios, for example, possible merger or acquisitions. With the ALCO being a bank specific component of strategic risk management, emphasis must be placed on the importance of strategic risk management to ensure optimal development, evaluation, and amendment of a bank's strategy given the future direction, as well as the risk that prevails within banks. The aim is to ensure that an efficient strategic risk management process is in place in a bank to meet its set objectives and maximise the NII and manage risks within the limits as stipulated in the BoD's strategic plan for the bank.

The science of Asset and Liability Management (ALM) has evolved fast since the 1980's, but the degree to which banks make use of Asset and Liability Management varies considerably (Bitner and Goddard, 1992: 7). The first step in developing an asset and liability strategy is to form a committee. The foundation of ALM is therefore the ALCO that is responsible for the ALM process (Mare, 1995: 3). In the following section the ALCO will be discussed as well as the various components responsible for formulating strategies to manage the asset and liabilities of a bank.

2.4.2 Composition of the Asset and Liability Committee

Firstly, it is important to state who and what the ALCO is and who the members of the ALCO are. The ALCO is the committee in charge of executing the strategic plan of the BoD and senior management. The ALCO must report to the BoD on the implementation of this plan stating whether it is within the BoD limits or not. The members of the ALCO are made up by the Chief Executive Officer (CEO), who chairs the ALCO, and the heads of the departments involved in the ALCO, namely:

- ALCO secretariat;
- Treasurer;
- Senior lending officer;
- Senior liability manager;
- Chief financial officer (CFO);
- Senior investment manager;
- Senior risk manager;
- Other functions e.g. economists, marketing, human resource manager, who can be permanent members or attend only by invitation when deemed necessary by the CEO.

The first four members listed above, as well as the CEO, are generally involved in the pre-ALCO meeting. It is the responsibility of the BoD and the CEO to select an ALCO which is represented by senior staff. The ALCO must be large enough to include the major areas of the bank that will be the most heavily involved in ALM, but not so large that it becomes difficult to function effectively (Bitner and Goddard, 1995: 22). Ideally the ALCO should consist of at least four members, but not exceed eight members (Styger, 1998: 4). There are several goals that the ALCO is trying to achieve. First and foremost are strategic ALM and strategic risk management, as well as the following (Mare, 1995: 6):

- Keep the level of interest rate risk within the stated goals;
- Enhance the bank's Net Income (NI);
- Provide adequate liquidity to the bank.

These goals are achieved through strategic ALM. The ALCO can, thus, be seen as a decision-making unit which is responsible for balance sheet planning from a risk/return perspective, including the strategic management of interest rate and liquidity risks. The decisions made by the ALCO are based on the results of various scenarios simulated by the ALCO secretariat regarding interest rates, liquidity, credit risk, capital risk etc. The ALCO secretariat is a department/unit that is responsible for:

- Data collection;
- Research;
- Contracting of research required for simulations;
- Scenario and strategy simulations;
- Providing administrative support to the ALCO e.g. organise meetings, keep minutes, and prepare and compile the ALCO meeting documentation pack.

It is important not to confuse this unit with the divisions responsible for ALM, the ALCO, nor is it the responsibility of the ALCO secretariat to oversee the functioning of treasury. The ALCO secretariat is responsible for the collection of data/information relating to the ALCO process and analysing, monitoring and reporting the risk profiles to the ALCO. The operating staff should also prepare forecasts (simulations) showing the effects of various possible changes in market conditions as related to the balance sheet, communicate the decisions and action plans to the relevant managers that will ensure that the ALCO functions properly. The secretariat is also responsible for arranging the ALCO meetings and taking minutes at these meetings.

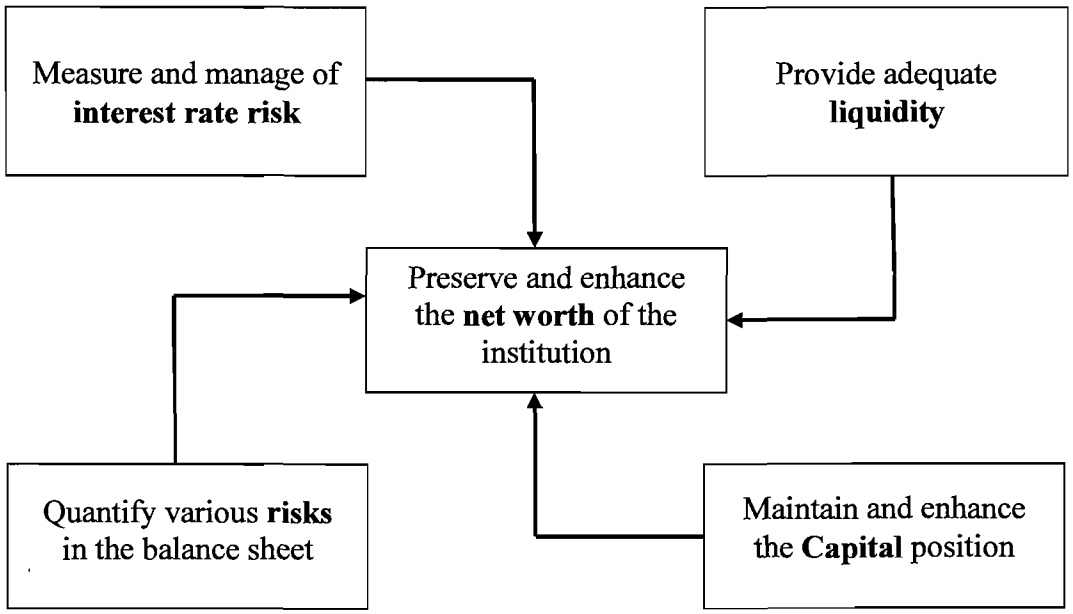
Thus, it becomes more and more clear that the ALM of a bank can only be effective if the ALCO is effective. It is important that the members who are involved in the ALCO are personnel with a thorough knowledge of the bank and the structure of the ALM within a bank. As mentioned in the beginning of this section, the ALCO is in charge of ALM. The ALCO process guides the ALCO to determine optimal ALM strategies within the parameters of the BoD's strategic plan. In this section of Chapter 2, the people and systems within the ALCO are discussed, whereas Section 2.5 will evaluate the ALCO by discussing the 10 Step process of the ALCO in a bank in more detail.

In a bank the ALCO process is formulated by the ALCO. The following section will continue the evaluation of ALM and the role that it plays in strategic risk management in a bank, by describing the primary functions of the ALCO in more detail before discussing the ALCO process in Section 2.5.

2.4.3 Primary functions of the ALCO

A frequently asked question is: What are the functions of the ALCO in a bank? The ALCO is not simply about risk management, it is also about enhancing the net worth of a bank through opportunistic positioning of the balance sheet. To obtain insight into what a bank is trying to achieve with ALM, it is important to evaluate the primary functions of the ALCO (Ong, 1998: 3). The ALCO plays an important role in balancing risks and profitability by continuously reviewing the risk and return trade-off. It follows from the primary functions of the ALCO that managing interest rate risk is one of the ALCO's important tasks. Other risks that require the specific attention of the ALCO is liquidity risk, capital risk or solvency risk and credit risk. Figure 2.1 is an illustration of the primary functions of the ALCO in a bank.

Figure 2.1 Primary functions of the ALCO



Source: Adapted from Ong (1998: 4)

The ultimate goal is to quantify risk in the bank and streamline the ALCO process with the intent to enhance a bank's net worth. In the following sections each function will be described in more detail as well as the execution of the functions.

2.4.3.1 Interest rate risk management

As mentioned, one of the ALCO's responsibilities is to form views regarding the future interest rates that a bank faces. Firstly, interest rate risk can be defined as the risk a bank faces due to unfavourable changes in the interest rates (Bessis, 2002: 17). In a bank, Net Interest Income (NII) can be considered a proxy for earnings. Many of a bank's balance sheet items generate income and costs which are linked to interest rates. It is known that interest rates are volatile, implying that the earnings of a bank can follow a similar pattern. Most of the balance sheet items of a bank generating revenues or costs are indexed to interest rates. In other words, a funding mismatch is created, for example, when a bank funds long term fixed rate assets with short term liabilities. Banks refer to the differences in timing of interest repricing between the assets and liabilities they hold as the gap position.

If a bank has more liabilities repricing in any given period than it has assets repricing in the same period, its gap position is referred to as negative or liability sensitive (Smuts, 2003: 98); *vice versa* will be asset sensitive. The matching of interest rate sensitive assets and liabilities to market rates are complex (Bessis, 2002: 8). However, the monitoring of interest rate risk is fundamental to Asset and Liability Management. As stated by Smuts (2003: 123) the three interest rate management positions can be categorised as strategic, tactical and trading and each of these positions requires a different level of management from the ALCO. With regards to strategic positions, it arises tactically from a bank's lending and reflects the practice of banks to lend long and borrow short; where tactical positioning arises from a bank's investment and funding activities in the money, capital and derivative markets. Trading positions are taken in anticipation of very short term rate movements.

With this said the manner in which a bank structures its asset and liabilities will determine its interest rate risk position. There are various measures available to measure and manage interest rate risk within the balance sheet of a bank. Over time banks have progressed from a single gap analysis to more sophisticated techniques. The ideal is to have an interest rate measurement system that will take into account the specific characteristics of each interest sensitive position and capture, in detail, the full range of potential movements. In order to achieve this, the ALCO needs to employ a variety of methodologies to analyse the interest rate risk. This includes gap analysis, duration analysis, and cumulative gaps. For the sake of inclusivity each will be discussed very briefly.

2.4.3.1.1 Gap analysis

Gap analysis is the simplest and most common method of measuring exposure to interest rate movements. It involves drawing up a table which separates all the various types of assets and liabilities into time bands, according to the first instance when the interest rate they bear will change (Koch and MacDonald, 2000: 305). There are several basic steps to determine this gap (Koch and MacDonald, 2000: 305):

- *Firstly*, management should develop an interest rate forecast.
- *Secondly,* management should then select a series of sequential time intervals for determining when assets and liabilities are rate sensitive.
- *Thirdly*, assets and liabilities must be grouped into these time intervals, or "buckets". This should be done according to the first repricing schedule. The principle portion of the asset/liability that can be repriced is classified as rate sensitive. Off balance sheet positions should also be taken into account. These include items such as interest rate swaps, futures etc. The bank's gap equals the amount of rate sensitive assets (RSAs) minus rate sensitive liabilities (RSLs) for each of the time intervals.

$$GAP = RSAs - RSL \qquad \textbf{(2.1)}$$

There is a periodic gap and a cumulative gap for each of the time buckets. The periodic gap compares RSAs and RSLs across a single time bucket, whereas,

cumulative gap compares RSAs and RSLs over all time buckets, from the present through the last in each successive time bucket.

- *Fourthly*, management must forecast NII given the interest rate environment and assumed repricing characteristics of the underlying instruments.

The above four steps constitute what is known as a static gap analysis. It provides a view of a bank's interest rate risk profile at a single point in time. Though the ALCO has the option of structuring the balance sheet in such a way that it produces a zero gap (the bank's NII is insensitive to general changes in the interest rates in either direction), it is not the preferred strategy. This risk adverse strategy focuses on the stabilisation of NII and may result in lower interest rate risk, but usually also results in lower levels of the bank's Net Interest Margins (NIM). The ALCO would rather attempt to ensure that the repricing structure of the bank's balance sheet generates maximum benefits from expected interest rate movements (Smuts, 2003: 126).

2.4.3.1.2 Duration gap

Duration gap is a more sophisticated approach as it takes into account both interest flows and the time value of money (Koch and MacDonald, 2000: 310). It recognises that interest rate risk arises when the timing of cash inflows differs from the timing of cash outflows. According to Koch and MacDonald (2000: 255), the traditional gap analysis compares approximate asset and liability cash flows, where duration gap analysis compares the sensitivity of the market value of all assets to the market value of all liabilities when interest rates change. The duration gap improves on the static gap analysis by quantifying the impact of changes in interest rates on the net worth of the bank. Simply put, duration gap analysis estimates the average amount of time required before the discounted value, or the present value of all cash flows, can be recovered by an asset holder, be it a bank or a bank depositor. A basic equation is (Koch and MacDonald, 2000: 311):

$$D = \frac{\sum (PV \times t)}{TPV} \qquad \textbf{(2.2)}$$

Where:

D = duration
PV = present value of cash flow
t = period
TPV = total present (market) value of cash flow

What is appealing is that it gives the ALCO a quantifiable estimate of the amount of risk that is faced, as well as an indication of how to eliminate the risk. For example, if the duration of a portfolio is known, that portfolio can be immunised against changes in interest rates by taking the opposite position in a security with the same duration or by using another appropriate derivative. Also, duration gap analysis has a close relationship to the sensitivity of the present value of a portfolio to interest rate changes. Thus, the effect of say, a 1 percent fall in the interest rate on a portfolio whose duration is 4 years, will result in its present value increasing by 4 percent.

The drawback of duration gap analysis is that it is only valid for measuring sensitivity to relatively small changes in the interest rate. For larger changes, convexity is a problem i.e. the change in the value of a banking product is not linear to a change in the interest rate. A second drawback is, adding together the duration of the different instruments in order to estimate the duration of a portfolio, implicitly rests on the unrealistic assumption that there are parallel rates on all the instruments (Tlali, 2002:41). Despite this, perhaps the biggest drawback of duration gap analysis is that logistically, preparation for duration gap analysis is not simple. It requires a large volume of data input and sometimes a burdensome mathematical procedure (Tlali, 2002: 42).

2.4.3.1.3 Cumulative gap

The cumulative gap model attempts to correct many of the deficiencies inherent in the gap analysis model by measuring the actual gap for several sequential time periods (known as maturity buckets) during the gapping horizon (Tlali, 2002: 36). In this model the sum of the periodic gaps is equal to the cumulative gap measured by the duration gap model. Within the framework of the cumulative gap model, the income spread can be hedged by

setting each periodic gap equal to zero. In the event of interest rates increasing, the periodic gap should be greater than zero. By maintaining the same positioning with respect to interest, rate within each periodic gap, the likelihood that the bank's financial objective will be met is increased. In addition, as assets and liabilities mature, the size of the gap can be dynamically changed to ensure consistency with the long term evolution of Net Income (NI).

2.4.3.1.4 Simulation analysis

Simulation is the most comprehensive and flexible technique for the analysis of interest rate exposure. It builds on the insights of gap and duration gap analysis, but surpasses both in its multidimensional capabilities (Cade, 1997: 159). Simulation implies modelling the characteristics of the entire bank's asset and liability products; the model can then be manipulated to show what might happen to certain target variables given certain assumptions about a change in the environment.

Variables included in the model are, for example, events such as parallel and non-parallel shifts in the yield curve, the relative volumes of asset classes, different maturities, the exercise of options and embedded options, and different liability structures and regulatory climates. Simulations are highly dependent on assumptions and require significant time before inputs lead to meaningful results (Van Greuning and Brajovic Bratanovic, 1999: 184). Clearly, simulation has the biggest information requirement in comparison with the other analytical techniques. Operational decisions about the level of detail and range of scenarios will be influenced by what is required by the bank's senior management. The ALCO secretariat is responsible for the collection of all the data and conducting the simulations. The pre-ALCO should ensure that the ALCO meetings focus on a restricted selection of simulation reports, tailored to the specific needs of the bank (Tlali, 2002: 43).

The drawback of this model is the many assumptions, as well as the minimum competence level of the staff, required to make it operational. This is especially true for banks operating in developing financial markets, with high interest rate and price volatility,

intense competition, and uncertainty. The availability of technical competent staff, to verify, interpret and report the model's results to management, may be a problem.

2.4.3.2 Liquidity management

Liquidity risk is another important task of the ALCO and results from the size and maturity mismatches of assets and liabilities (Bessis, 2002: 136). Every financial institution requires a certain amount of liquidity to meet its short-term liabilities. The ALCO needs to understand the interrelationship between cash flow, liquidity management, and interest rate management, as well as the impact that repricing and credit risk (see 2.4.2.5) have on liquidity and cash flow (Smuts, 2003: 130). Liquidity risk links with capital risk (see 2.4.2.4) in that both imply an inability to meet financial obligations; Liquidity is temporary, but insolvency permanent. Apart from meeting all cash needs at a reasonable cost, liquidity is necessary to provide funds for growth. Essentially, liquidity is the minimum amount that must be available to a financial institution to continue to function. Adequate liquidity is necessary to meet growth objectives and can be divided into three components (Smuts, 2003: 131):

- Short term requirements due to day to day changes in deposits and loan balances;
- Seasonal liquidity;
- Structural liquidity.

The ALCO's task is to regularly compare actual cash flow with the projected cash flow. If the actual changes in loans and deposits differ from projections, the ALCO must determine whether this is a once off occurrence, a shift in seasonal trends, or a structural change occurring in the bank's balance sheet.

In terms of the asset management approach, the ALCO, assisted by the Treasurer, looks at the maturity structure of the bank's deposits and borrowings and estimates loan and other asset growth. This is with the objective to cover cash outflows with cash inflows from maturing assets. In order to address unexpected liquidity needs, a stock of high quality assets is maintained (Van Greuning and Brajovic Bratanovic, 1999: 160). This liquidity

buffer should be carefully managed by the ALCO so that profitability is not compromised. The liability needs can be met on the liability side by increasing short term borrowings, by increasing the maturity of liabilities, and ultimately by increasing capital.

Adequate liquidity is influenced by public opinion of the bank's management and financial strength. If a bank's position is perceived to be deteriorating, excessive liquidity demands will arise; Depositors will withdraw deposits, or not renew them when they mature. The capacity of a bank to raise money in the money market at reasonable cost will also decline. In addition, borrowers may respond to the bank's potential failure by accessing their credit lines to ensure that they have funds they may need for the future. Thus, negative perceptions adversely affect the liquidity position of a bank. This highlights the importance of the ability to measure and monitor liquidity risk (Koch and MacDonald, 2000: 258).

To ensure adequate liquidity and to monitor liquidity risk the ALCO needs detailed reports such as the cash flow analysis, sources of liquidity and the projection of deviation from its history, combined with its business plan. Apart from knowing the bank's financial condition, the ALCO must also be aware of a possible liquidity crunch in the credit markets and also take action to prevent excessive liquidity accumulation. Thus, liquidity risk might become a major risk for the banking portfolio, but this does not fall within the scope of this study.

2.4.3.3 Capital or Solvency risk management

Credit risk is the risk of ultimate financial failure of the bank through chronic inability to meet its financial obligations (Cade, 1997: 16). Banks ultimately fail because they cannot independently generate sufficient cash to meet deposit withdrawals, and they operate with insufficient capital to absorb losses should they be forced to liquidate assets (Koch, 1995: 108). In other words, capital risk is the risk of being unable to cover losses, generated by all types of risk, with the available capital (Bessis, 2002: 20). It is crucial therefore to decide what level of capital will be adequate to cover the following overall risks of a bank as explained by Koch (1995:108):

- Credit risk leads to significant loan charge-offs;
- High interest rate risk occurs because of mismatched maturities and durations between assets and liabilities;
- High operating risk is associated with out of control costs.

All these risks add up and result in creditors and shareholders' demanding a premium on bank debt and bidding share prices lower; This leads to liquidity problems by increasing the cost of borrowing (Koch, 1995:109). The consequence is that of negative perceptions, which may lead to a run on the bank. Thus, a bank operating with high risk should have greater capital than banks with low risk. It is required that banks operate with at least a minimum amount of capital. The intent is to limit taking risks and bank capital reduces the risk in the following three ways (Koch, 1995: 4):

- *Provides a cushion to absorb losses*: The greater the bank's equity capital, the greater the amount of assets that can go into default before a bank is insolvent.
- *Provides access to financial markets*: This helps to prevent liquidity problems caused by deposit flows. Banks with high quality assets and a large capital base can easily issue new stock or borrow at relatively low prices.
- *Constrains growth*: By constraining growth, risk taking is limited in terms of new investments. Every bank's minimum requirement is tied to the quantity and risk profile of its assets. Assets are categorised in one of four classes with different risk weights ranging from zero to 100 percent. Selected off-balance sheet commitments are similarly categorised.

An increase in the minimum capital required to operate a bank would lead to all but the strongest banks being desperate for more capital. To ensure capital adequacy and confidence in the banking system, minimum capital requirements for individual banks must be imposed. There are two types of capital, economic[3] and regulatory[4], that play a significant role in safeguarding banks against all the risks they face. Regulatory capital for

[3] Economic capital is the amount of capital a bank itself deems necessary to operate normally, given its risk profile and it state of controls.
[4] Regulatory capital is the amount of capital a regulator requires a bank to hold to safeguard it given the risks in its operating environment.

a bank will be calculated from the proposals of the Basel Committee as stipulated by Basel II (see Chapter 3).

2.4.3.4 Credit risk management

The traditional view of credit risk is one of loss due to the failure of a counterparty to perform as contracted (Bessis, 2002:13). It is the loss that will occur when a loan defaults, or a trading counterparty fails to settle, or the decline in the credit standing of a counterparty (Gleason, 2000:29). If the credit standing deteriorates, the probability of default will therefore increase. Credit risk lies in the potential variation in net income resulting from non-payment or delayed payment (Koch, 1995:107).

Credit risk is the primary risk encountered by a bank (Bitner and Goddard, 1992: 78) and includes the following (Hussain, 2000: 77):

- *Direct credit risk*: Counterparty default on on-balance sheet products such as loans or issued debt.
- *Credit equivalent exposure*: Counterparty default on immature off-balance sheet products such as swaps and options.
- *Settlement risk*: Counterparty default on transactions in the process of being settled and where the value has been delivered to the counterparty but the return not yet received.

Credit risk which occurs within the banking portfolio is critical since a small number of important customers can generate large losses. There are various default events (Bessis, 2002:13):

- Delay in payment obligations;
- Restructuring of debt obligations due to a major deterioration of the credit standing of borrowers;
- Bankruptcies;
- Simple delinquencies or payment delays.

Traditionally credit risk was measured by ratios such as loans to assets, non-performing loans to loans, loan losses to loans and reserves for losses to loans (Hempel and Simonson, 1999: 93). However, these measures are rather deficient because they lag in time behind the returns gained from taking higher credit risk. Nowadays, credit risk is measured by means of loan concentration in geographic or industry areas, rapid loan growth, high yields on categories of loans, and the ratio of loan loss reserves to non-performing loans. Although, none of these measures is a perfect predictor, weakness in one and particularly more than one, may be a sign of future credit problems.

The techniques used for managing credit losses include selecting credit with an appropriate credit philosophy and culture, the use of credit analysis or internal credit scoring, and portfolio risk assessment (Hempel and Simonson, 1999: 93). Credit risk covers the decision-making process, before the credit decision is made, the follow-up of credit commitments, plus all monitoring and reporting processes must be done. Therefore, the size of commitment is not sufficient to measure risk; rather both quality and quantity of risk are important determinants of credit risk, where quality refers to the likelihood of default.

2.4.3.5 Quantification of risks in the balance sheet

The effective quantification of risk is one of the biggest concerns for risk managers. The fifth function of the ALCO is to quantify risk in the balance sheet. It is another indication why the ALCO is important in a bank. The delicate act required in the preservation and enhancement of its net worth, presupposes a bank's ability to measure, thoroughly, all the manifestations of risk, on and off-balance sheet. There are five basic risks that need to be measured and managed in the balance sheet; these include credit, market, operational, interest and liquidity risk. As transparency in the financial markets increases, two phenomena regarding the quantification of risk become important (Jarrow and Van Deventer, 1999: 132):

- Market-to-market valuation of assets and liabilities are readily available because markets became more liquid and better established.
- Objective statistical measures of risk are rapidly supplanting traditional asset and liability measures.

These two developments mentioned above allow for a significant portion of embedded risk in a financial institution's balance sheet to be adequately quantified, and therefore, facilitate prudent risk management. Institutions that primarily serve as financial intermediaries can take on larger amounts of risky assets and yet be able to transform them into relatively safer ones by means of diversification (Jarrow and Van Deventer, 1999: 17).

These two developments in the market did not arrive unnoticed within regulatory circles. Consequently, regulatory rules are based on the increasing ability to use market-to-market valuations and statistical quantification of risks (BIS, 2004: 223). These actions also partly stem from Basel II that allows the use of internal models for risk measurement and capital attribution.

2.4.3.6 Actively leveraging the balance sheet

There has to be a profitable side to risk management and this is the fifth function of the ALCO. Asset and Liability Management is "an insurance policy" that allows financial institutions to assume intermediation risk (Jarrow and Van Deventer, 1999: 137). A bank actively and judiciously shifts positions (either through trading activities or by asset classification) within the balance sheet and off balance sheet, capitalising on its (Jarrow and Van Deventer, 1999: 141):

- Superior internal expertise in market and credit risk analysis and risk management systems for measuring and control;
- Excellent delivering system and access to low cost funding;
- Outstanding management of regulatory and economic capital;
- Proper use of risk-adjusted return methodology;

- Cutting edge quantification, of the embedded optionally in the balance sheet, to hedge against prepayment risk;
- Prudent use of derivatives to hedge against portfolio risks.

A bank does this with the aim of deriving a significant advantage, vis-à-vis its competitors in leveraging its own balance sheet, thereby enhancing the value and at the same time assuming only a reasonable level of risk.

2.4.3.7 Preservation and enhancement of the Net worth

Perhaps the single most important function of the ALCO process is to preserve and enhance the net worth of an institution through the optimal mix of assets and liabilities (Ong, 1998: 3). The functions discussed above do not limit the scope of Asset and Liability Management (ALM) to take on risks, within the limits set by the BoD that can result in an increase in the economic value of the balance sheet. Asset and Liability Management should focus on the net worth of the bank under uncertainty, while satisfying certain constraints set by the BoD and senior management of a bank (Sargent, 1995: 103).

The uncertainty may take the form of interest rate movements, volatility in portfolio earnings, and/or general economic conditions, while the constraints can be driven primarily by regulatory requirements, corporate appetite, and expected levels of performance and returns (Ong, 1998: 3). The ability to balance the uncertainty with the constraints, while maintaining the net economic value of the institution, is the primary concern of the ALCO. In fact, after all is said and done, ALM as performed by the ALCO indeed serves as the single most important risk management channel of the institution, encompassing both reactive and proactive stances against market movements and projections of market conditions.

In the framework of risk and return a link between the two can be found. Normally, the actions taken to increase the expected returns of a bank go hand in hand with an increase in the risk structure of a bank. The ALCO's intent is to understand the various risks and the associated returns from taking these risks. While trying to balance risk and return in the

bank by making trade-offs between risk and returns, the purpose of the ALCO is to maximise these returns by minimising the risk. For a bank to be able to achieve the latter requires a broader set of policies and methods. In other words, the ALCO process must be a multidimensional set of activities.

2.4.3.8 Execution

The execution of the primary functions of the ALCO takes the form of several steps in a bank. It can be considered from two points of view; one being functions that should be performed and the other a strategic process (see 2.5).

In terms of function, it mainly refers to the bank's departments that are involved with the ALCO. The first action performed by the departments or business unit of the bank in the execution of the primary functions of the ALCO is *control*. This implies the reporting of historical financial performance, establishing of the current balance sheet and income statements, where these statements are used for the analyses of risks. The second action is *finance*. The financial departments are responsible for establishing the current year's financial objectives of the bank. This is guided by the strategic plan and the budget which resulted from the strategic plan. The objectives are set in terms of balance sheet volumes, revenues and expenses, based on set a of assumptions about interest rates, market trends, the economy and the business cycle etc. The third action is information/data collection and assessment, as well as the simulation process. It is the *ALCO secretariat*, who is responsible for the forecasting of a bank's balance sheet, cash flows and income statement with the concomitant risk profile, given changes in a bank's strategic assumptions. It is responsible for gauging the sensitivity of the bank's earnings and balance sheet strengths to unexpected changes the exogenous variables e.g. in the interest rates. The last action is the management of the cash flow and liquidity by the *treasury*. The activities of the treasury department can be divided into local and foreign activities. The funding, investment and interest rate risk management are some of the important local market activities. With regard to foreign market activities, here foreign exchange risk plays an important role. Section 2.5 will discuss the execution of the ALCO's activities as a strategic process.

2.5 The ALCO process

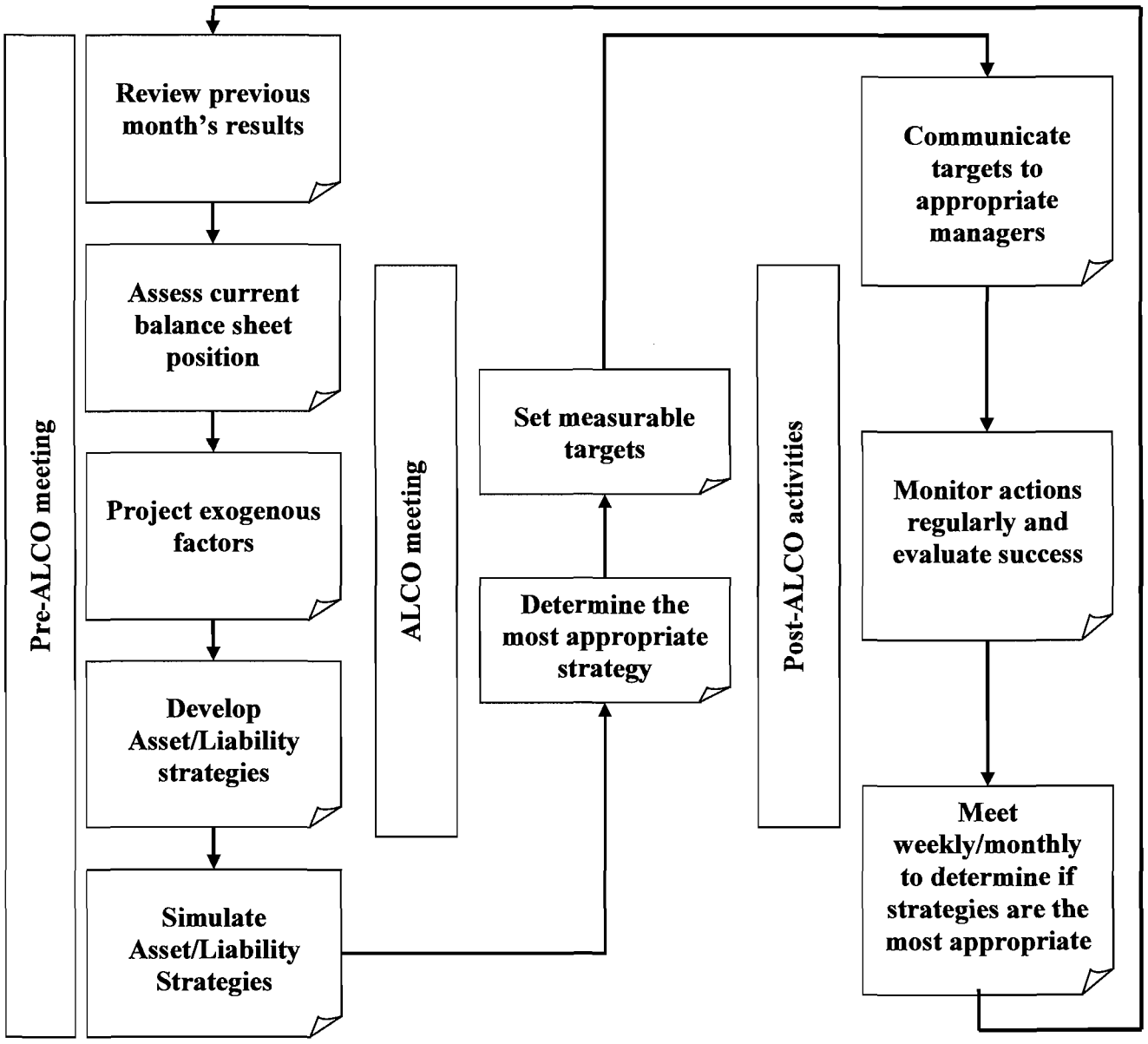
2.5.1 Introduction

As mentioned, the ALCO is in charge of strategic ALM of a bank. The ALCO process, especially the pre-ALCO, follows a specific sequence of identifying as well as quantifying risks, forecasting interest rates and exchange rates, projecting income and testing strategies to arrive at a strategy that is considered most appropriate for the bank[3]. This strategy will determine how a bank's assets and liabilities are mixed to achieve the objectives of the BoD. This process is referred to as the ALCO process (Mare, 1995: 1). The ALCO process is focussed on strategic management (see 2.3).

A bank has no control or influence over the external environment's impact on their business, for example competitors, financiers, the economy etc. Strategies need to be formulated to mitigate the severe impact these factors may have on a bank and also to benefit from opportunities that may exist. Various strategies may include new products, growth in assets/liabilities and even opening or closing of branches. The main focus of an ALCO meeting is to ensure that there is conformity between making these decisions and the execution thereof. The above-mentioned is the result of the ALCO process in a bank. The ten-step ALCO process is depicted in Figure 2.2 and the discussion of the ALCO process will be based on Mare (1995).

[3] Appendix A serves as an example of an ALCO agenda, in general.

Figure 2.2 The ALCO Process



Source: Adapted from Mare (1995: 3)

2.5.2 The pre-ALCO meeting

The pre-ALCO meeting is an imperative part of the ALCO process. In practice the "pre-ALCO meeting" consists of a number of meetings because it is a preliminary decision making process. The previous month's results and the current balance sheet position form the starting point of the pre-ALCO meeting, followed by projecting exogenous factors,

developing an asset and liability strategy, simulating possible asset and liability strategies and evaluating the result. During the pre-ALCO meeting(s) exogenous factors are projected along with the development of asset and liability strategies and simulations thereof. The results of the simulations are evaluated and further simulations are conducted if necessary. The essence of the evaluation of the results and the decision, which scenario to use, must be completed before the actual ALCO meeting. Not resolving all of the various issues in advance will lead to an ineffective ALCO meeting, due to attention being drawn away from the goal at hand, namely the strategic intent of the ALCO, i.e. risk mitigation strategies and deciding on the best ALM strategy regarding associated risks etc.

It is the responsibility of the ALCO secretariat to facilitate the pre-ALCO meeting, as already mentioned, but the pre-ALCO process also requires inputs from the CEO, treasurer, senior asset manager, senior liability manager and other functions like the economist etc. These individuals represent a high level strategic "brainstorming" that considers all of the various combinations/strategies that need to be simulated and investigated. After investigating the possible impact of the various simulations the best strategies, along with their possible outcomes, must be presented at the ALCO meeting for approval and planning of the execution thereof. The different steps that form part of the pre-ALCO meetings will be discussed in more detail the following:

2.5.2.1 Review the previous month's results

It happens all too frequently that targets are set but their achievement is not properly monitored. This is why reflecting upon the previous period's results forms part of the pre-ALCO and ALCO meetings and the variance report forms the basis of this evaluation. The ALCO policy document should specify the limits of variance that can be tolerated and procedures to identify the causes of unacceptable variance. It is the task of the ALCO secretariat to assess why there are deviations from the budget and other goals set by the ALCO and run the necessary simulations to reflect these problems for resolution at the ALCO meeting (Mare, 1995: 2).

2.5.2.2 Assessing the current Balance Sheet position

It is essential to understand the current balance sheet structure before embarking on strategies such as decisions about the bank, which market you, would like to operate in, how to change the customer profile, etc. The ALCO has to know what the current maturity profiles and attributes of the products are, as well as whether and how they will react to changes in markets conditions. The report by the pre-ALCO to the ALCO on the first two steps of the ALCO process (see 2.5.2.1 and 2.5.2.2) will be concise and focus only on facts necessary for decision making.

It is important that the ALCO policy specify different benchmarks that can/should be used to evaluate the situation at present. Benchmarks that can be specified are: in terms of *finance,* the Return on Assets (ROA) and the Return on Equity (ROE) etc.; *strategic* benchmarks may include GAP, credit risk, liquidity etc.; *performance measures* like Return on Capital (ROC) and Risk Adjusted Return on Capital (RAROC); and in terms of *tactical* benchmarks, Value at Risk (VaR) models can be used.

2.5.2.3 Project exogenous factors

This is part, if not the main part, of the pre-ALCO meeting. These factors are those that emanate from outside the institution and over which the institution has very little or no control (Tlali, 2002: 17). Interest and exchange rates cannot be forecast with certainty and management cannot afford to bet the institution on a single rate review. The most important decision in interest rate risk management is determining which rate scenario's are to be used in the simulations. This decision establishes the boundaries of rate movements within which the management will position the institution (Tlali, 2002: 17). It is crucial that these decisions are made before the formal ALCO meeting; If not and this debate is continued at the ALCO meeting, the ALCO gets sidetracked from the main purpose at hand that is, to formulate a strategy for the optimal management of the bank's asset and liabilities.

The pre-ALCO usually consists of the CEO, head ALCO officer, the ALCO secretariat, the treasurer, the asset manager and the liability manager. However, personnel from other departments in the bank may be invited to this meeting for expert inputs regarding their field of expertise. This may include e.g. experts on interest and exchange rates as well as on the economy.

2.5.2.4 Develop an asset and liability strategy

In response to exogenous factors, and taking into account the strategic direction and objectives that were set for the bank, a variety of strategies should be developed by the ALCO secretariat. The pre-ALCO will select the strategies to be used in the simulations. Strategies can vary in nature from forecasting loans growth for a specific industry, to what tenure should be selected for funding decisions. It should not be limited to only include funding or hedging strategies. At this stage, it is important to define "what if" scenarios by the pre-ALCO for simulation and careful evaluation, the results of which will be presented to the ALCO (Tlali, 2002: 17).

2.5.2.5 Simulating an asset and liability strategy

The expected or "what if" changes in the external factors and strategies need to be simulated into the future. It is of essence that guidelines are set regarding the timeframes for the simulation of the different scenarios (Mare, 1995: 3). The timeframe used may vary from situation to situation depending on the purpose of the simulation. This forms part of the strategy formulation. With the pre-ALCO analysing the various simulations it can be decided to make necessary amendments to the strategies or to simulate different strategies. The latter can be done repeatedly until the best outcome has been achieved. These strategies that contribute to the strategic intent of the bank are then presented at the ALCO meeting to select the perceived best strategy for the current situation. This strategy must be evaluated in terms of its risk profile and if it contributes to the BoD's strategic plan and objectives for the bank. The different actions and tasks of the ALCO meeting are discussed in the following section.

2.5.3 The ALCO meeting

2.5.3.1 Determine the most appropriate strategy

The ultimate purpose of the ALCO meeting, as mentioned in the previous sections, is to decide upon an appropriate strategy for the bank given its various perceptions of what the future may hold. This appropriate strategy will not be the same for different institutions and will vary according to each institution's perception of how they see the future within the strategic plan of the BoD. An institution's risk appetite will also play a role in the determination of an appropriate strategy. Risks cannot be managed if they cannot be measured (Mare, 1995: 3). The ALCO secretariat provides the management reports and very specifically, risk reports. Proposed changes made to interest rates, margins, flow of funds, and strategies as well as applying the different capital revaluation methods should be traced throughout the balance sheet, income statements, cash flow reports and all the risk reports.

The necessary information should be given to the ALCO members before the meeting. When determining the appropriate strategy for a bank it is evaluated against the bank's vision (see 2.3.1.2) and mission (2.3.1.3). The decisions taken at this point, will lead to direct or indirect ALM activities. Some decisions will be executed by the treasurer as a wholesale activity and some by the branches of the bank in the form of retail activities.

2.5.3.2 Setting measurable targets

The ALCO policy document should provide clear guidance for the translation of the ALCO decisions into quantifiable actions. This list should provide the basis of the communications process and channels from the ALCO to the responsible persons. These targets will be based on the ALCO meeting's decisions but will conform to and embrace the goals and objectives of the BoD's central strategic plan for the bank.

2.5.4 Post ALCO meeting activities

2.5.4.1 Communicating appropriate targets to managers

The decisions that are taken by the ALCO should be clearly and effectively communicated to the different line functions. There is no sense in having a sophisticated ALM model in place and to hold ALCO meetings on a regular basis if the decisions do not reach their destinations (Mare, 1995: 3). The ALCO policy document should stipulate which personnel are responsible, and should be held responsible, for implementing the different tasks at hand. This stipulation should be the base of communication from the ALCO meeting to the responsible person. The above-mentioned steps can be seen as the implementation of the strategic plan.

2.5.4.2 Monitoring and evaluating success

Actions should be monitored regularly to ensure that there is compliance with the strategies decided on and the targets that were set. Guidelines on how the variance analysis should be specified, as well as the benchmarks used to evaluate the success, should be in the ALCO policy document. Depending on the market conditions, it may be decided to hold a separate monitoring and evaluating meeting from the ALCO meeting. It can also form part of the pre-ALCO meeting.

2.5.4.3 Determine if the current strategy is appropriate

Living in a world of uncertainty and constant change, and because the exogenous factors cannot be pre-determined, the conditions and assumptions on which decisions are based may very well change. The strategies, which are being followed, must be re-evaluated on a regular basis to determine whether they are still appropriate and to make sure that they serve the organisation and its stakeholders in the way they are supposed to (Mare, 1995: 4). For management to make these decisions, good quality, up to date, real time data and information should be gathered and disseminated by the ALCO secretariat. Along with the ALCO policy document it is necessary to have a personnel policy document as well. This

document is to name all the personnel designators responsible for the ALCO secretariat, pre-ALCO, the ALCO, risk management process and monitoring thereof, including the input that will lead to successful functioning of the ALCO process in a bank.

2.5.5 Conclusion

The ALCO process in a bank can normally be seen as a top-down process. In other words the analysis is undertaken at a total bank level, and final decisions are communicated to lower levels in the bank. The ALCO process can, thus, be summarised into five overall steps. The first step being *policy and guidelines* which implies the setting up of operating limits or boundaries for the risk and return trade-offs, the establishments of risk tolerance of a bank, as well as explaining ALM risk limits and policies to the BoD and seeing to it that the necessary corrections are made if necessary. These recommendations must be from the ALCO to the BoD. The second main step is *analysis*, meaning that bank's current position in every risk dimension and its forecast for all future time periods must be determined. The next main step is that *decisions* need to be made in a bank and this is the responsibility of the ALCO. For example, if the bank is outside of its limits, or is forecast to migrate outside of its limits, then a decision needs to be taken in terms of how to correct the situation at hand. The fourth main step is the *execution*, of strategies decided by the ALCO by the different departments of the business unit of the bank. The fifth and last main step is the *evaluation* of the success and progress of the selected strategies.

Next, the ALCO policy document will be briefly discussed. The document connects the components of strategic ALM and risk management process together. The document must not stand on its own but must make part of the strategic management process as a whole. The document is used as a 'benchmark' in that it is a guideline for the ALCO process where the ALCO process on the other hand should form the base of the policy document.

2.6 ALCO policy document

An important component of an acceptable ALCO process is an appropriate policy document, which will provide boundaries for decision-making (Farm Credit

Administration, 1991: 2). According to Aiken and Peat Banking and Finance Group (1994: 2), the formulation of an ALCO policy is necessary because:

- It provides the parameters within which the ALCO process operates;
- Is essential to ensure that the ALCO process remains focused and effective;
- It provides senior management with a means of communicating the decisions taken with respect to the positioning of the bank in terms of its desired risk profile; and
- It provides a means for past ALCO's to communicate the benefits of experience gained to new members of the committee.

Most ALCO policies begin with a statement describing the general objectives of the ALCO process within the bank. Following the opening statement, the general goals are listed. The purpose of these general goals is to provide a broad focus as the framework for the more specific objectives to be defined later in the policy. A section describing the structure of the ALCO secretariat, pre-ALCO and the ALCO and their respective responsibilities is then presented. This section describes the composition of the ALCO, mandates a regular meeting schedule, requires the maintenance of minutes for each meeting and designates the ALCO as being responsible for the bank's asset and liability process, as described above (Bitner and Goddard, 1992: 58).

2.7 Conclusion

In this chapter, the general theory of strategic management was explained. It was shown that the ALCO process can be seen as the strategic planning and implementation process in a bank, consisting of the development and evaluation of proposed strategies, and the execution. The main aim of this chapter was to demonstrate the crucially important roles that the ALCO and ALCO process play in the success of a bank. It emphasises the fact that operational risks and operational inefficiencies in the ALCO process can have a very negative impact on the bank and should therefore be identified and managed. This will be the focus of chapter 5.

Chapter 3 will provide an overview of Basel II as the authoritative document on banking regulation for internationally active banking institutions. Basel II is seen as a best practice

document for banks. It deals extensively with operational risk and, therefore, the next chapter will summarise and discuss Basel II's exposition of operational risk to form the foundation of the practical investigation in Chapter 5's case study on operational risk in the ALCO.

Chapter 3

The Basel Approach to Operational Risk Management

3.1 Introduction

Risk management and the control of risks in banks have emerged as critically important management concerns over the last few decades. The Basel Committee on Banking Supervision (Basel Committee) has made a substantial contribution to the risk management process within the banking sector. Before the formal outset of the Basel Committee's guidance, regulatory requirements were basic and there was little focus on capital adequacy.

An important development in the Basel Committee's approach to risk management was to extend the focus of risk management to include operational risk (BIS, 2001e: 3). Operational risk management is one of the last pieces of the puzzle for banks wishing to both protect themselves and to optimise their risk taking behaviour. Industry comments, (BIS, 2001e: 3) on the, then proposed, treatment of operational risk in The International Convergence of Capital Measurement and Capital Standards (Basel II), gave an indication of the challenges that are faced when managing operational risk and when determining adequate capital to cover operational risk in a bank.

The Basel Committee has done extensive work on determining ways to measure operational risk based on an array of criteria. The Basel Committee has defined three approaches that can be used to measure operational risk which include the Basic Approach, the Standardised Approach, and the Advanced Measurement Approach (BIS, 2005a: 2).

Complying with Basel II and making provision for operational risk in a bank will lead to a lower capital charge, which needs to be held for operational risk. Being Basel II compliant will have an effect on the way the market assesses a bank. The importance of external valuations in generating capital requirements will increase (Saurina, 2008: 30). Banks that

have a poor rating are more than likely to face premium pricing. This is due to the fact that lenders will have to set aside additional capital to cover the risks these banks present. On a macro-economic level, these changes (separating operational risk from other financial risks and aligning risk with regulatory capital requirements) may drive greater stability in the financial markets with improved disclosure resulting in enhanced trust in the markets (Saurina, 2008: 31). Thus, improved market perception regarding a certain bank should imply that the bank could obtain funding liabilities at favourable rates, thereby reducing its risk.

With the ALCO being the heart of strategic management implementation in a bank, it is important for the ALCO not just to focus on unexpected changes in interest rates and other market conditions but also to take into account the impact of operational risk within the ALCO to ensure the effectiveness of the ALCO process. With the ALCO process running smoothly a bank will be able to perform sound strategic risk management, applying various strategies to maximise shareholder wealth.

This chapter will discuss the Basel Committee, as well as Basel II, in more detail and explore the various approaches for measuring the capital required to absorb operational losses. The intention being that the identification and management of operational risk within the ALCO process can be based upon the supervisory standards, as stipulated by the Basel Committee, which form a set of best practice guidelines and recommendations. Chapter 3 is divided into four sections where the first section discusses the background of the Basel Committee, the second section summarises Basel II, the third section looks at the definition of operational risk and the various measurement approaches of operational risk, proposed by the Basel Committee, and the final section provides a summary of the operational risk management process as set out by the Basel Committee.

The aim of this chapter is to explain Basel II's approaches to the measurement and management of operational risk. This will serve as the "best practice" foundation of the operational risk measurement and management methods developed in Chapter 4 and applied in Chapter 5.

3.2 The Basel Committee

3.2.1 Introduction

Sound supervisory standards have been formulated and promoted by the Basel Committee over the last few decades for the internationally active banks worldwide. The Basel Committee's history starts in 1974 with the most influential document, the Basel Capital Accord, published in 1988 (BIS, 2001f: 1). The Basel Committee does not have any formal supervisory authority. It only formulates the broad supervisory standards and guidelines in the expectation that individual countries' supervisory authorities will implement them though detailed arrangements best suited to their own national systems (BIS, 2001f: 2).

A brief background will be given regarding the history of the Basel Committee as well as the amendments made to the Basel Capital Accord.

3.2.2 Background to the Basel Committee

In 1974, the governors of the central banks of the Group of Ten countries formed the Basel Committee. Instability, such as the fall of the Bretton Woods System, characterised the world markets in the early 1970's. The current Basel Committee consists of senior supervisory representatives from Belgium, Canada, France, Germany, Italy, Japan, Luxemburg, Netherlands, Spain, Sweden, Switzerland, United Kingdom and the United States (BIS, 2007: 1). Each country is represented by their central bank as well as the authority with formal responsibilities for the supervision of banking businesses, where this is not the central bank (BIS, 2001f: 3). The Basel Committee usually meets at the Bank of International Settlements (BIS) in Basel, where the Basel Committee's permanent Secretariat is located. It consists of about thirty technical working groups and task forces that meet regularly.

The Basel Committee provides a platform for the regular cooperation, between the various member countries, on banking supervision. Primarily, different modalities are discussed

for international alliance in aiming to close gaps in the supervisory net (BIS, 2007: 1). The Basel Committee's broader objective is to improve supervisory understanding and the quality of banking supervision worldwide. The Basel Committee attempts to achieve this in three ways namely (BIS, 2007: 2):

- The exchange of information regarding national supervisory arrangements;
- Improved effectiveness of techniques used for supervising international banking business;
- The setting of minimum supervisory standards in areas where they are considered desirable.

It is important to understand that the Basel Committee does not have any formal supreme supervisory authority. The conclusions, therefore, derived by the Basel Committee does not have, and were never intended to have, legal force. Instead, the Basel Committee is aiming to formulate broad supervisory standards and guidelines and recommendations regarding best practices in bank risk management globally. By doing this the Basel Committee tries to encourage member countries to converge towards common approaches and common standards without detailed harmonisation of supervisory techniques. Therefore, the main focus of the Basel Committee is on capital adequacy for banks to ensure bank solvency and safety (Styger, 1998).

Although the Basel Capital Accord is intended to apply only to international active banks supervised by the Group of Ten countries, it has been adopted by more than hundred countries, as compliance gives banks a "seal of approval" in terms of capital adequacy. The latter makes it easier for them to compete internationally. The Basel Capital Accord has not only been applied to banks that are internationally active, but also to all banks to eliminate inequalities between international active banks and their competitors in their domestic markets (Esterhuysen, 2006: 128).

The next section highlights some of the most significant publications by the Basel Committee to provide additional background to the above-mentioned.

3.2.3 The Basel Capital Accord and its Amendments

The Basel Committee has published three seminal documents that had a lasting and revolutionary impact on the banking environment (Styger, 1998):

- The first was initially published in 1975, and after several revisions it was republished in 1983 as *Principles for the Supervision of Banks' Foreign Establishments.*
- The second influential document, *Capital Accord – International Convergence of Capital Measurements and Capital Standards*, was the prescription of minimum capital requirements, published in July 1988, with the aim of being converted into national regulations as soon as possible.
- In 1995 the Basel Committee started to address market risk culminating in the third influential document, *Amendments to the Capital Accord to Incorporate Market Risk*, published in January 1998.

The Capital Accord of 1998 strove to ensure sufficient levels of capital in the international banking system and also to create a more level playing field in competitive terms between banks internationally. The Capital Accord required banks to hold capital equal in value to at least eight percent of a basket of assets, weighted according to their risk (BIS, 2001a: 9). Assets are classified into four categories: 0 percent, 20 percent, 50 percent and 100 percent according to the perceived risk of the debtor category (BIS, 2001a: 10). Off-balance sheet items are converted into a credit equivalent amount through a scale of conversion factors, and then weighted according to the counterpart's risk weighting (Barbour *et al.,* 1991: 291).

The 1988 Capital Accord also did not recognise credit risk mitigation techniques and the simple bucket system has given banks the incentive to move high quality assets of their balance sheets, thereby, reducing the average quality of the banks' asset portfolio (Saayman, 2002: 126). Due to this, a more risk-sensitive framework for adequate capital measurements were proposed by the Basel Committee (BIS, 2001a: 12). The following section takes an intensive look at Basel II; it is within this Accord that the Basel Committee stipulated their credit, market, and operational risk capital requirements.

3.2.4 Basel II

Although the 1988 Capital Accord of the Basel Committee encouraged the framework to be adopted by a wide group of countries, it was criticised for its lack of differentiation. This is illustrated by the fixed capital charge of eight percent on credit regardless of the quality of the borrower (Esterhuysen, 2006: 129). This will actually motivate banks to engage in high-risk transactions that are associated with higher returns, as the capital that is required for a low-risk transaction is the same. The lack of differentiation is further exploited by the reduction of capital requirements through instruments such as securitisation and credit derivatives for example. The latter will reduce the required capital without a reduction in actual risk exposure of a bank and is referred to as regulatory capital arbitrage (Esterhuysen, 2006: 129).

Basel II is more extensive and more complex than the 1988 Capital Accord due to the intention of the Basel Committee to develop a risk-sensitive framework that contains a wider range of new options to measure operational as well as credit risk. Basel II includes a more comprehensive approach to addressing risks and it is more sensitive to the various degrees of risk involved in a bank's positions and its activities (BIS, 2005a: 6). Basel II also recognises that the best way to measure, manage, and mitigate risk differs within every bank whereas the 1988 Basel Capital Accord only provided one option for measuring capital adequacy (BIS, 2001i: 3).

The primary changes in the Basel II framework, compared to the 1988 Capital Accord, are in the approach towards credit risk and the inclusion of explicit capital requirements for operational risk in a bank (BIS, 2005a: 18). Along with setting a range of risk-sensitive options for addressing both types of risk is elaborated upon (BIS, 2005a: 18). While Basel II provides capital reductions for various forms of transactions that reduce risk, Basel II also imposes minimum operational standards to recognise poor management of operational risks (including legal risks). Furthermore, Basel II has three pillars within the capital framework requiring implementation (Bessis, 2002: 41)[1]:

[1] See Section 3.2.7 for a discussion of the three pillars

- *Pillar 1*: Minimum capital requirements, which seek to refine the standardised rules, set forth in 1988.
- *Pillar 2*: Supervisory review of an institution's internal assessment process and capital adequacy.
- *Pillar 3*: An effective use of disclosure to strengthen market discipline as a complement to supervisory efforts.

These 3 pillars are further discussed in Section 3.2.7. It is important to note that Basel II cannot be considered as fully implemented if one of the three pillars, mentioned above, is not in place (Bessis, 2002: 42). Minimum implementation of one or two of the pillars will not deliver an adequate level of soundness.

3.2.5 The objectives of Basel II

The Basel Committee outlined its objectives in a comprehensive approach to capital adequacy in 1999 (Esterhuysen, 2006: 129). The Basel Committee continues to refine the new framework and is aiming to achieve the following objectives (BIS, 2001g: 6):

- Safety and soundness should be promoted in the financial system and should at least maintain the current overall level of capital in the system.
- The equality of competitiveness should be enhanced continuously.
- For addressing risks, the Accord should constitute a more comprehensive approach.
- The Accord should contain approaches to capital adequacy that is appropriately sensitive to the degree of risk involved in a bank's positions and activities.
- Focus must be placed on banks that are internationally active, although its underlying principles should be suitable for application to banks of varying levels of complexity and sophistication.

Comparing the 1988 Capital Accord with the Basel II, the following innovations can be seen:

- *Firstly*, the aim of the new capital framework is to go further than simply bringing a number of innovative financial instruments within the scope of Basel II (BIS, 2001a: 6). The aim is to bring the calculation of capital requirements methodology more closely in line with the advances in the technology of risk management that have occurred since 1988 (De Beer, 2002: 217). It is also stated by De Beer (2002: 217) that Basel II is more forward looking by making capital standards less distorting *ex ante*. The overall objective is thus, to limit the incentives that capital standards create for banks to arbitrage its requirements by more closely aligning regulatory capital charges with the concept of loss risks (Karacadag and Taylor, 2000: 14).

- *Secondly*, Basel II moved capital regulation in a more process-orientated direction (De Beer, 2002: 217). The 1998 Capital Accord laid down a series of simple rules to develop a common metric for setting capital requirements. Basel II, however, envisages an approach where supervisors will become less involved in determining the precise rules of calculating capital adequacy (BIS, 2001a: 6). Supervisors will concentrate on ensuring that a bank's internal risk management procedures are adequate. This can be seen as a relative shift away from the mechanistic, prescribed approach to setting bank capital (rules-driven) towards a more process-orientated form of regulation.

To move away from a rules-driven to a process-orientated form of regulation is a matter of degree and not an all or nothing approach. The new capital framework will retain its regulatory and rule base capital regulation as well the incorporating economic elements and process-orientated approaches (De Beer, 2002: 217). With this shift, the emphasis from this rules- to process-orientated involves foregoing the verifiability and comparability of capital ratios across banks and banking systems to an extent which will involve greater reliance on internal risk measurement and control systems. The consequences is thus that it will become more difficult to interpret it in isolation and the terms "under-capitalised" and "well-capitalised" will be difficult to designate without an in-depth analysis.

This need of a more in-depth analysis of banks, under the Basel II, raises additional issues. This is in respect to the Third pillar (see 3.2.7.3). The internal processes to allocate capital are inherently less transparent than the current capital ratios. Unless essential elements of internal

risk management and mechanisms for the allocation of capital are disclosed, the market participants may not have the required information to be able to evaluate the capital adequacy (De Beer, 2002: 219). The market's ability to exert discipline will be undermined as well as the effectiveness of the Third pillar (see 3.2.7.3). If sufficient information were available, the market participants would be able to devote more resources to analyse banks (Saayman, 2002: 167).

The above concludes the evaluation of the objectives of Basel II. It is of great importance to understand these objectives of the new framework to be able to understand what it is the Basel Committee is trying to achieve with their new framework. The following section of Chapter 3 will discuss the overall level of capital of Basel II. This is one of the most debated aspects of Basel II.

3.2.6 Overall capital

Regarding the overall level of regulatory capital resulting from Basel II, it is the believe of the Basel Committee that it is important to be as clear as possible about its intentions with the Basel II framework (Bessis, 2002: 40). Basel II intends to maintain the overall level of regulatory capital in the banking system while providing more sensitive approaches to risk than the approaches of the 1988 Capital Accord (Esterhuysen, 2003: 25). Consistent with the objectives of Basel II, the Basel Committee envisages the following (Esterhuysen, 2003: 26):

- Under the standardised approach (see 3.3.3) the Basel Committee maintains the eight percent minimum capital requirement and states that they "desire neither to produce a net increase or a net decrease on average in minimum regulatory capital".
- With respect to the Internal Ratings-Based Approach (IRB), the ultimate goals of the Basel Committee are to ensure that the overall level of regulatory capital generated is sufficient to address the underlying credit risk and is such that it provides capital incentives relative to the standardised approach.

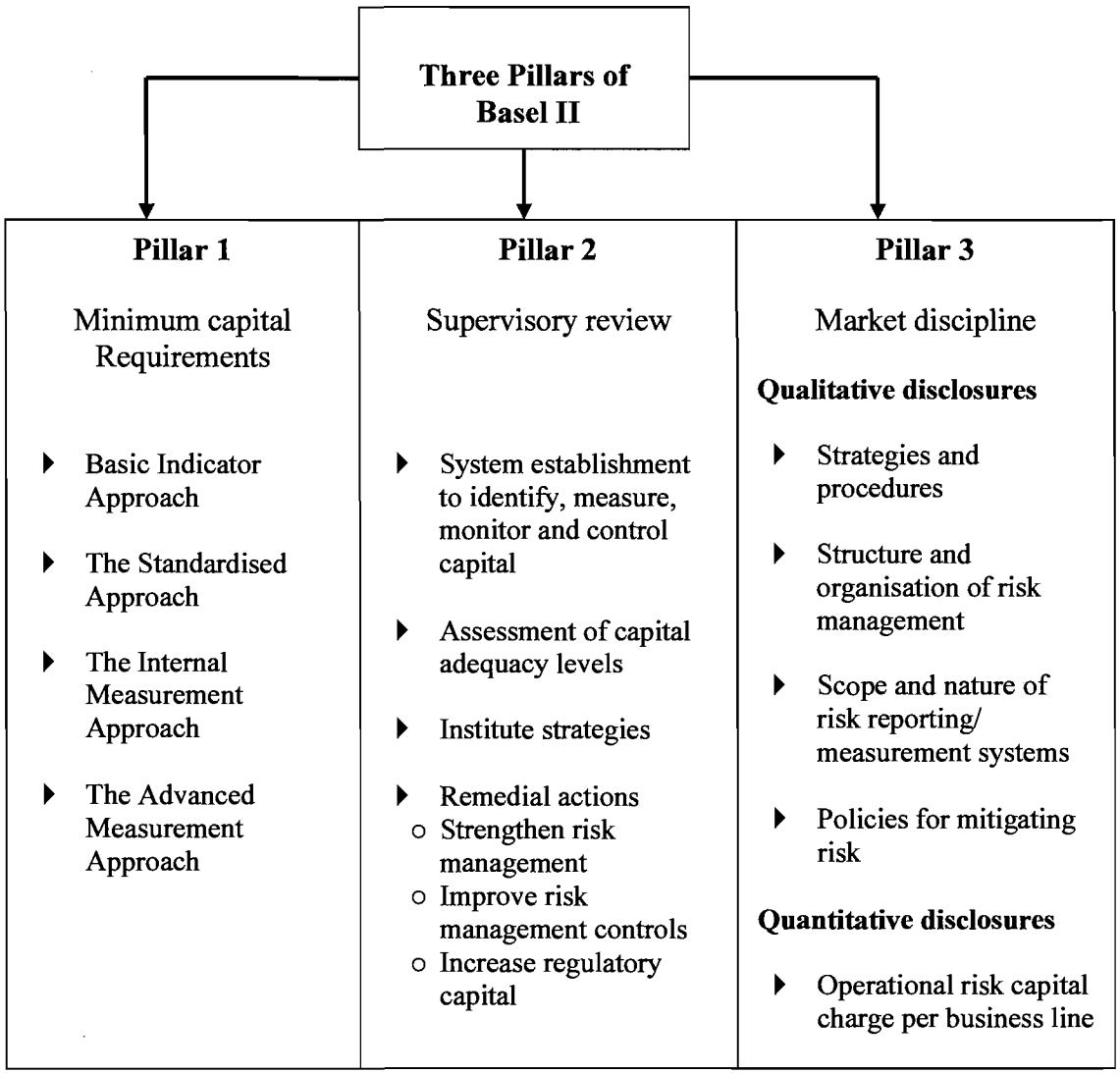
- Consequently, for foundation IRB institutions, the Basel Committee is aiming for a small (2-3 percent) average decline in minimum capital requirements compared to current capital requirements and the propose standardised approach.
- For institutions on the advanced IRB approach a further fall of similar average magnitude is being targeted.

The Basel Committee recognised the difficulty in assessing the average impact of its above-mentioned proposals across a diverse range of internationally active banks (BIS, 2001a: 16). In addition to the 1988 Capital Accord, Basel II consists of three pillars: minimum regulatory capital, supervisors review, and market discipline. The following section will then continue the evaluation of Basel II in terms of the three pillars.

3.2.7 The three pillars of Basel II

It is important to note, before this section continues, that the three pillars of Basel II are not a key issue of this study but will be briefly discussed here to ensure a proper evaluation of Basel II. As mentioned, Basel II is a set of consultative documents which describe recommended rules for the improvement of credit risk measures, extends the scope of capital requirements to operational risk, provides various enhancements to the 1988 Capital Accord, and details the 'supervision' and 'market discipline' pillars (Bessis, 2002: 41). Basel II is very extensive, which provides a menu of options, extended coverage, and more elaborate measures, in addition to descriptions of work in progress, with unsettled issues streamlined in the final package. Basel II comprises of three pillars, previously mentioned in the earlier sections of this chapter (see 3.2.5) and includes the following as illustrated in Figure 3.1:

Figure: 3.1 The three pillars of Basel II



Source: (Esterhuysen, 2006: 133)

The Basel Committee emphasises the mutually reinforcing role of the three pillars, and confirmed that together, the three pillars contribute to a higher level of safety and soundness in the financial system (Bessis, 2002: 41). Previous implementations of the regulations for credit and market risks, confirmed by value at risk (VaR)[2] models for both risks, revealed that the banking book generates more risks than the trading book and thus necessitates a more in-depth

[2] It is the maximum loss not exceeded with a given probability defined as the confidence level, over a given period of time. It is commonly used to measure the market risk however; VaR is a very general concept that has broad applications. VaR is widely applied in finance for quantitative risk management for many types of risks (Bessis, 2002: 12).

look at the above-mentioned pillars (Esterhuysen, 2003: 27). The following section therefore aims to evaluate the above-mentioned pillars as part of the evaluation of Basel II.

3.2.7.1 Pillar 1: Minimum capital requirement

The minimum capital requirements of the Basel Committee are based on the fundamental elements of the 1988 Capital Accord: a common definition of regulatory capital that remains unchanged, and minimum ratios of capital to risk-weighted assets (BIS, 2000: 2). It is the measurement of risk that is embodied in the risk-weighted assets that Basel II addresses. Under Basel II, the denominator of the minimum total capital ratio consists of the following three parts (Bessis, 2002: 42):

- The sum of risk-weighted assets for credit risk, plus
- 12.5 times the capital charge for market risk, plus
- 12.5 times the capital charge for operational risk.

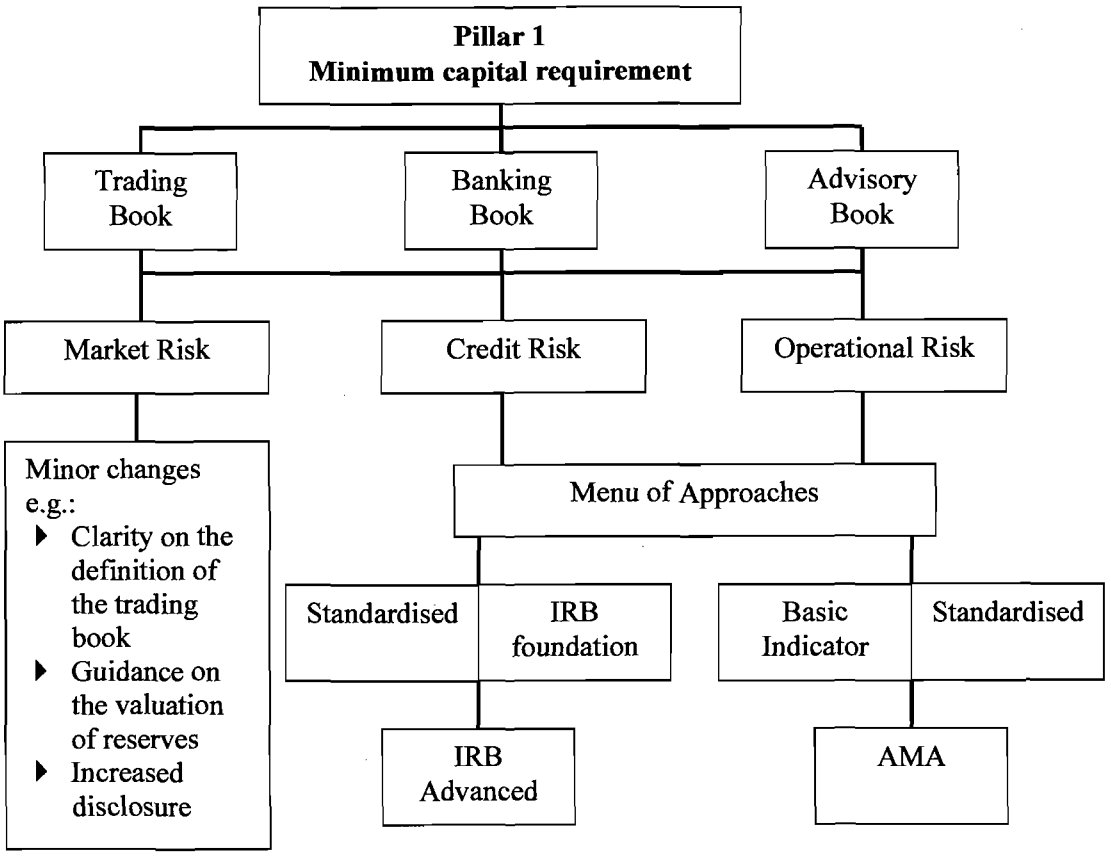
Minimum total capital = Σ (risk weighted assets for credit risk) + 12.5*(capital charge for market risk) + 12.5*(capital charge for operational risk)

Assuming a bank has risk weighted-assets to the value of R970, a market risk capital charge of R20, plus an operational risk charge of R10, the denominator of the total capital ratio can be calculated as follows:

Minimum total capital = 970 + 12.5*(20+10) = R1345

Multiplying by 12.5, a bank creates a numerical link between the calculations of the capital required for credit risk, where the capital is based on risk-weighted assets, and the capital requirement for operational risk and market risk (Koch and McDonald, 2000: 376). Figure 3.2 illustrates Pillar 1 of Basel II.

Figure 3.2: Basel II – Pillar 1



Source: (Esterhuysen, 2006: 136)

The regulatory capital requirements for market, credit and operational risk are covered by Pillar 1. The Basel Committee give a range of options for addressing both credit and operational risks in order to improve risk-sensitivity. The primary changes to the minimum capital requirements set out in the 1988 Capital Accord are: firstly, the approaches to credit risk and secondly, the inclusion of explicit capital requirements for operational risk (Bessis, 2002: 42) and thirdly, the decision of the Basel Committee to treat interest rate risk under Pillar 2 (Banking Council, 2001: 14).

The Basel Committee decided to broaden the focus on Pillar 1 and to include operational risk[3]. In line with its approach to credit and market risk, the Basel Committee (BIS, 2003a: 126) offers several approaches to the minimum capital requirements for operational risk.

[3] Pillar 1 is one of the main focuses of the study and will be discussed in-depth in Section 3.3.

3.2.7.2 Pillar 2: Supervisory review

The Basel Committee consider the supervisory review as an important component of the minimum capital requirement (Pillar 1), and market discipline (Pillar 3). The second Pillar, of Basel II, is intended to ensure that each bank has sound internal processes in place to assess the adequacy of its capital based on a thorough evaluation of its risks (Barclays, 2001: 5). The responsibility for the evaluation, on how well financial institutions are addressing their capital adequacy needs relative to their risk, will fall upon the supervisors. In doing so, supervisors will draw on, amongst other considerations, their knowledge of best practices across institutions.

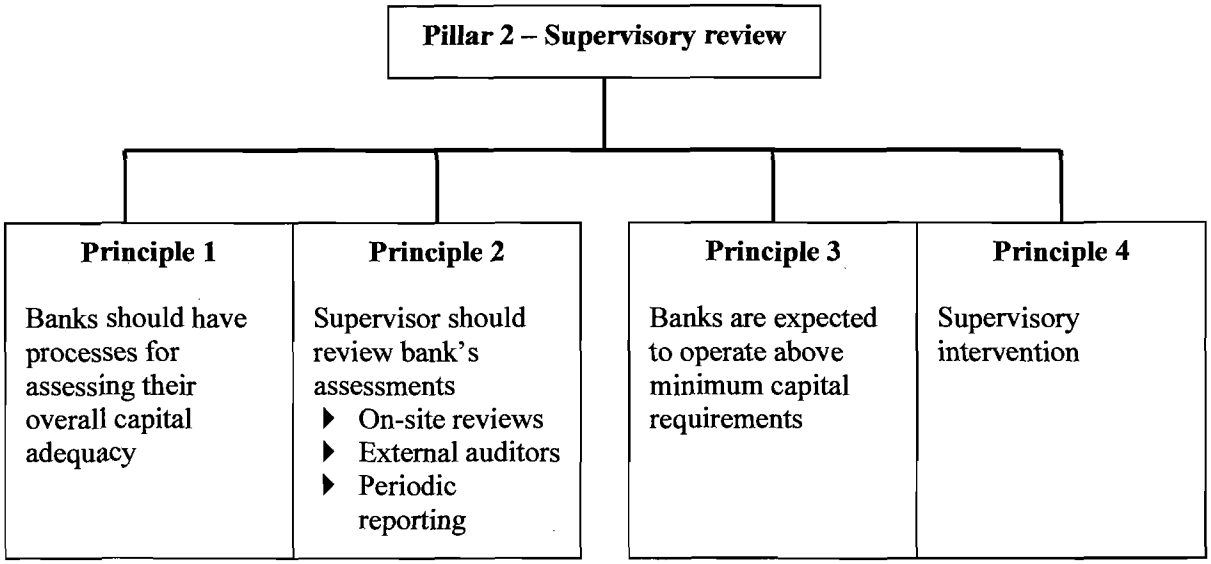
The Basel Committee sees four areas where supervisory review is a necessary complement to Pillar 1 and the disclosure requirement of Pillar 3 (Kaufman and Scott, 2003: 12):

- To deal with the risk that is only partially addressed in Pillar 1, where the review of individual institutions reveals issues that are not adequately covered by the general requirement;
- To capture risks that have been left out of Pillar 1 (e.g. interest rate risk in the banking book and strategic and reputation risks facing the bank);
- To assess factors external to the institution (e.g. effects of the business cycle);
- To ensure compliance with the various operational and disclosure standards, associated with the use of advanced approaches for credit and operational risk, or the use of particular credit risk mitigation techniques.

In addition to the above, supervisors will have already reviewed and evaluated the bank's capital adequacy through on-site examinations, off-site surveillance, and reviewed the work of external and internal auditors (Karacadag and Taylor, 2000: 28). Supervisors will review the internal capital adequacy assessments of a bank and discuss the internal capital targets set by each bank, under the new approach (Hoffman, 2002: 4). Thus the goal, of supervisors' reviewing the banks' capital position, is to ensure the position is consistent with the overall risk profile and strategy (Hoffman, 2002: 4). Furthermore, supervisory review is assigned the task of ensuring that banks are operating above the minimum regulatory capital ratios to enable

early supervisory intervention if the capital does not provide a sufficient buffer against risk (Karacadag and Taylor, 2000: 28).

Figure 3.3: Basel II – Pillar 2



Source: (Esterhuysen, 2006: 138)

This proposal by the Basel Committee is not intended to replace the judgment and expertise of a bank's management, or to shift the responsibility of maintaining capital adequacy to supervisors (Karacadag and Taylor, 2000: 30). Capital should not be regarded as a substitute for addressing fundamentally inadequate control or risk management processes in a bank (Bessis, 2002: 48). The Basel Committee also formulated four basic principles that should guide supervisors' policies (BIS, 2001g: 31), which are also illustrated in Figure 3.3:

- *Principle 1*: Banks should have a process for assessing their overall capital in relation to their risk profile and strategy for maintaining their capital levels.
- *Principle 2*: The internal capital adequacy assessment strategies should be reviewed, as well as their ability to monitor and ensure compliance with regulatory capital ratios should be reviewed. Appropriate action should be taken by supervisors if they are not satisfied with the results of the evaluation process.

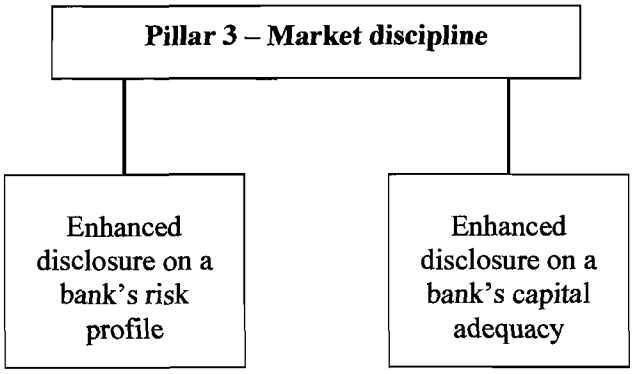
- *Principle 3*: Banks must operate above the minimum regulatory capital ratios and supervisors should have the ability to enforce this.
- *Principle 4*: Supervisors should intervene at an early stage to prevent capital from falling below the required minimum to underwrite the risk characteristics of a particular bank and should implement rapid remedial actions if capital is not maintained or restored.

There is concern with the implementation process pertaining to Pillar 2 as the detailed requirements can be perceived as an indication that the supervisory review will be intrusive (Hoffman, 2002: 13). Furthermore, Principle 3 suggests that regulators will require banks to hold capital above the regulatory minimum even where there is no well-defined weakness or lack of management and control.

3.2.7.3 Pillar 3: Market Discipline

Market discipline, which is illustrated in Figure 3.4, is the third major pillar of the Basel Committee's approach to capital adequacy. Supervisors not only face a technically more challenging task but, in the exercise of discretion and judgment over subjective and qualitative matters, they are likely to be exposed to political pressure from banks and other interested parties (Hoffman, 2002: 13). Market discipline could act to counter such forces and provide supervisors with incentives to conduct their responsibilities thoroughly and fairly (BIS, 2001a: 40).

Figure 3.4: Basel II – Pillar 3



Source: (Esterhuysen, 2006: 140)

Empirical studies indicate that neither the market, nor supervisors, possesses clearly superior processes for quality assessments (BIS, 2005a: 147). This is recognised by the Basel II proposals, with market discipline and supervisory review only forming part of an integrated three-pillar approach. The supervisor's advantage, over outside investors, is that they can require access to all data, including confidential information that the bank would prefer not to make public. At the same time, supervisors are more constrained by law, regulations, and data availability, to keep their formal analytical methods constraint for relatively long periods of time (Bliss and Flannery, 2001: 8).

The strength of quality market assessments is that investors can access and investigate any information that seems relevant, and they can freely change their analytical methods when circumstances seem to warrant it (Bliss and Flannery, 2001: 8). In addition, the Basel Committee expects supervisors to implement a supervisory response, aimed at remedying a situation, where a bank does not comply with the disclosure recommendations under Pillar 3 (BIS, 2001c: 2). The strength of this response should depend on the nature, implications, and duration of non-compliance (BIS, 2001b: 2).

As previously mentioned, the success of Basel II depends on the implementation of all three pillars, as well as proper coordination amongst them. Basel II cannot be considered fully implemented if all three pillars are not fully implemented. With this said, the focus of this study is not credit risk as addressed by Basel II. The focus falls on operational risk

and the management of operational risk within the ALCO process of a bank. Thus, the following section will address operational risk more specifically, starting with the definition (see 3.3), while Section 3.4 will discuss Basel II's approaches to the identification and measurement of operational risk. Section 3.5 explains Basel II's proposals for operational risk management in a financial institution. Basel II's proposals for the measurement and management of operational risk will serve as the "best practice" foundation of the discussion of the three topics in Chapter 4 and their application in Chapter 5.

3.3 Operational risk

3.3.1 *Introduction*

Basel II defines operational risk as the risk a bank faces due to the loss which results from inadequate or failed internal processes, people, and systems, or from external events. The Basel II definition of operational risk includes legal risk, but excludes strategic, as well as reputation, risk for capital charge purposes (BIS, 2005a: 142). It is important to note that it is a broad definition and that the approach towards operational risk is business specific, implying that operational risk is unique as regards the size and nature, as well as the complexity, of the specific institution's activities. Nevertheless, Basel II demands clearly documented strategies and oversight by the BoD and senior management along with a strong operational risk culture and internal control culture (e.g., clear lines of responsibility and segregation of duties), effective internal escalation and reporting, and contingency planning (BIS, 2005a: 15). The Basel II operational risk definition implies that there are four sources of potential loss (BIS, 2005a: 139):

- *Inadequate or failed internal processes*: Banks operate an indeterminate number of processes to deliver their products to their customer's base. Process risk can occur at any stage within the value chain. For example, marketing material can be mailed to the wrong customers, new account documentation can turn out not to be robust, transactions can be processed incorrectly, etc.

- *People*: Operational risk losses can result from worker compensation claims, violation of employee health and safety rules, organised labour activities, and discrimination claims. People risks can further include inadequate training and management, human error, lack of segregation of duties, over reliance on key individuals, lack of integrity or honesty, etc.
- *Systems*: The growing dependence of banks on complicated and intricate IT systems is a key source of operational risk. Data corruption problems, whether accidental or deliberate, are regular sources of embarrassing and costly operational mistakes.
- *External events*: This source of operational risk has at least two evident dimensions to it: Firstly the extent to which a chosen business strategy pursued by a bank may expose it to adverse external events and secondly, independent external events that impact on it, emanating from the business environment in which it operates.

With the defining of operational risk, it is important for a bank to also define how the bank views operational risk management, operational risk loss, and operational event loss and blend these various definitions into managing an operational risk within the bank's operating environment. Young (2002: 193) stated that operational risk due to event loss should be reviewed as part of the bank's operational risk management strategy. The Basel Committee has identified the following seven main categories, as illustrated by Table 3.1, of operational risk due to event loss that may add up to substantial losses.

Table 3.1 The Basel event category

Event type	Definition	Category
Internal Fraud	Losses due to acts, intended to defraud, misappropriate property, or circumvent regulations, the law, or company policy, excluding diversity/discrimination events, which involve at least one internal party.	1. Unauthorised activity 2. Theft and fraud
External Fraud	Losses due to acts, intended to defraud, misappropriate property, or circumvent the law, by a third party.	1. Theft and fraud 2. System security
Employment practices and workplace safety	Losses arising from inconsistencies in employment, health or safety laws or agreements, from payment or personal injury claims, or from diversity/discrimination.	1. Employee relations 2. Environmental safety 3. Diversity/ Discrimination
Clients, products and business practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients	1. Suitable, disclosure, fiduciary 2. Improper business or market practices 3. Product flaws 4. Advisory activities
Damage to physical assets	Losses arising from loss or damage to physical assets from natural disasters or other events.	1. Disasters and other events
Business disruption and system failures	Losses arising from disruption of business due to system failures.	1. System
Execution, delivery and process management	Losses from failed transaction processing or process management, from relations with trade counterparts.	1. Transaction capture 2. Monitoring and reporting 3. Customer intake documentation 4. Trade counterparts

Source: (BIS, 2004: 33)

The following section will discuss the different methods/approaches available to banks for the assessment of their overall capital charge as stipulated by Basel II. It is important to note, that the following measurements are for bank specific operational risk. If management do decide to treat the ALCO as a separate business unit, the bank can calculate and provide for an the ALCO operational risk capital charge according to the principles discussed below. This will, however, only be done in exceptional cases. The approaches will normally be used to identify operational risk in the ALCO process to reduce and/or manage those risks to ensure an effective and optimal ALCO process.

3.3.2 Basel's approaches to the identification and measurement of operational risk

3.3.2.1 Introduction

Basel II intends to maintain the overall level of regulatory capital in the banking system by providing risk measurement approaches which are more sensitive to risk than the approaches of the 1988 Capital Accord. Four approaches, in order of increasing sophistication, are proposed in fulfilment of the Basel II objective to move away from a one-size-fits all, towards a more independently tailored, approach to capital adequacy (BIS, 2005a: 1).

These approaches include the following (BIS, 2005a: 144):

- The Basic Indicator Approach (BIA);
- The Standardised Approach (SA);
- Internal Measurement Approach (IMA);
- The Advanced Measurement Approach (AMA).

The Basic Indicator Approach (BIA) is the least complex of the four, where the Advanced Measurement Approach (AMA) is the most complex. However, a bank will not be allowed to choose to revert to a simpler approach without the necessary supervisory approval once it has operated on a more advanced approach (BIS, 2003a: 120). In addition, if a supervisor determines that a bank is using a more advanced approach, yet no longer meets the qualifying

criteria of that specific approach, it may require the bank to revert to a simpler approach for some or all of its operations, until it meets the conditions specified by the supervisor for returning to a more advanced approach (BIS, 2003a: 120). The following sections will evaluate the above-mentioned approaches in more detail.

3.3.2.2 The Basic Indicator Approach (BIA)

This is the most basic approach as it links the capital charge to a single indicator, i.e. gross income. This indicator serves as a proxy for overall operational risk exposure. Each bank holds capital to cover operational risk equal to a fixed percentage of the indicator (BIS, 2001h: 6).

Banks using the Basic Indicator Approach must hold capital, to cover operational risk, equal to a fixed percentage (denoted alpha) of the average of the previous three years' positive annual gross income. The figures for any year in which annual gross income is negative or zero, should be excluded from both the numerator and denominator when calculating the average. The charge may be expressed as follows (BIS, 2005a: 144):

$$K_{BIA} = \frac{\left[\sum (GI1..n \times \alpha)\right]}{n} \qquad \textbf{(3.1)}$$

Where:

K_{BIA} = the capital charge under the Basic Indicator Approach;
GI = annual gross income, where positive, over the previous three years;
n = number of the previous three years for which gross income is positive;
α = 15 percent, which is set by the Basel Committee, being the industry wide level of required capital.

To qualify for the BIA approach, a bank should be relatively small with little exposure to operational risk (assume limited losses due to fraud and IT related incidents, with limited staff involvements and operations in a single country). Should this profile suit bank Z and

should bank Z's gross incomes over the last three years be R30 million, R35 million and R36 million respectively, its capital charge for operational risk using equation 3.1 will be:

$$K_{BIA} = \frac{(R30million + R35million + R36million)}{3 \times 15\%}$$

$$K_{BIA} = \text{R5 050 000}$$

Bank Z must therefore hold capital of R5,05 million towards operational risk for the current year, which implies the bank will be able to absorb an operational loss up to the value of R5,05 million.

The Basic Indicator Approach set out in Basel II has no specific criteria for the use of this approach in contrast to all the other Basel II measurement approaches that have specific criteria. The BIA may be used by any bank, regardless of its complexity or sophistication (BIS, 2005a: 113). Nevertheless, banks using this approach are encouraged to comply with the Basel Committee's guidance on *Sound Practices for the Management and Supervision of Operational Risk*, February 2003 (BIS, 2005a: 145).

This section concludes the discussion on the first and most basic operational risk measurement approach. The next section takes the discussion further by investigating the Standardised Approach.

3.3.2.3 The Standardised Approach (SA)

The Standardised Approach (SA) represents a further refinement along the evolutionary range of approaches for operational risk capital (Wyatt, 2002: 72). The SA differs from the BIA in that a bank's activities are divided into standardised industry business lines, each with its own indicator for operational risk and own fixed percentage of capital requirement (BIS: 2003a: 121). The SA is better able to reflect the different risk profiles across banks as indicated by their broader business activities. According to Basel II, business lines normally consist of the following (BIS, 2005a: 146), but individual operations might differ:

- Corporate finance;
- Trading and sale;
- Retail banking;
- Commercial banking;
- Payment and settlement;
- Asset management.

The capital charge for each business line is calculated by multiplying the three year average gross income, from each individual business line, by a factor beta. Beta serves as a proxy for industry wide relationships between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line (BIS, 2003a: 122). However, the determination of the beta factor for each business lines is problematic. It should be calculated according to loss experience and the calculation should be done using a clear and objective methodology (BIS, 2001b: 7).

The available databases of operational losses tend to be biased, e.g. larger losses and publicly available data tend to carry more weight. Data collection of internal losses is still in the developing phase for most banks. This necessitates subjective analysis of the risks and the possible losses (BIS, 2003a: 123).

The Basel Committee has estimated preliminary beta factors based on data from a sample of internationally active banks (BIS, 2005a: 145). The levels of these factors vary widely, reflecting the different weightings of the business lines, the choice of different indicators, and the size of the sample (BIS, 2005a: 145). Mathematically, the beta factor of each business line is the product of 20 percent of current minimum capital requirement (MRC) from the bank sample and the business line weighting, divided by the summation of the financial indicators for the business line (BIS, 2005a: 146):

$$K_{TSA} = \frac{\left\{\sum years_{1-3} \max\left[\sum\left(GI_{1-8} \times \beta_{1-8}\right), 0\right]\right\}}{3} \qquad \textbf{(3.2)}$$

Where:

K_{TSA} = the capital charge under the Standardised Approach;

GI_{1-8} = the average level of gross income, over the past three years, for each of the eight business lines;

β_{1-8} = a fixed percentage, set by the Basel Committee, relating the level of required capital to the level of the gross income for each of the eight business lines. The values of the betas are detailed in Table 3.2.

Table 3.2 Beta factors for business lines

Business line	**Beta factor**
Corporate finance (β_1)	18%
Trading and sales (β_2)	18%
Retail banking (β_3)	12%
Commercial banking (β_4)	15%
Payment and settlement (β_5)	18%
Agency services (β_6)	15%
Asset management (β_7)	12%
Retail brokerage (β_8)	12%

Source: (BIS, 2005a: 147)

The results, of the Basel Committee's initial assessment, suggest that there are a very wide distribution of operational capital charges for individual banks above and below the assumed industry average of 20 percent of current minimum regulatory capital (BIS, 2003a: 124). The preliminary findings indicate that some banks would be required to hold more than twice the assumed industry average, while other banks face a charge well below the average (Wyatt, 2002: 72).

3.3.2.3.1 Qualifying criteria for the Standard Approach

Meeting the Basel Committee's *Sound Practices for the Management and Supervision of Operational Risk,* banks have to meet certain criteria, which are listed in the section below, to be eligible for the SA.

3.3.2.3.2 Effective risk management and control

Banks have to meet certain qualitative criteria including (BIS, 2006: 148):

- There must be an independent risk control and audit function.
- Risk reporting systems must be used effectively.
- The BoD and senior management must be actively involved.
- The risk management system must be documented.

For internationally active banks to use the Standardised Approach, they must meet the following criteria (BIS, 2006: 149):

- The bank must have an operational risk management system with clear responsibilities assigned to an operational risk management function.
- The bank must track relevant operational risk data including material losses by business lines as part of its internal operational risk assessment system.
- Operational risk exposures, including material operational losses, must be regularly reported to the BoD and senior management.
- The bank's operational risk management system must be well documented.
- The bank's operational risk management processes and assessment system must be subjected to validation and regular independent review.
- External auditors and/or supervisors must subject the bank's operational risk assessment system (including the internal validation processes) to regular review.

Banks also have to establish an independent operational risk management function and processes which cover the design, implementation and review of its operational risk

measurement methodology (Esterhuysen, 2006: 148). Responsibilities include the establishment for the measurement of operational risk and control over the construction of the operational risk methodology and key inputs (Esterhuysen, 2006: 149). Banks' internal audit groups must also conduct regular reviews of the operational risk management process and measurement methodology in order to qualify for the SA (BIS, 2003b: 13). Esterhuysen (2003: 38) states that a bank must have proper risk reporting systems in place, to be able to generate the data that is used in the calculation of a capital charge, and must also have the ability to construct management reports, based on the results attained, to qualify for the Standardised Approach. It is important for a bank to track relevant operational risk data across the institution for each business line (see Table 3.1).

The Basel Committee states (BIS2001: 15) that a bank should develop specific, documented criteria for mapping current business lines and activities into the standardised framework. In addition, the Basel Committee states that a bank should regularly review the framework and implement appropriate adjustments to cater for new or changing business activities (BIS, 2001d: 15).

The Basel Committee suggests that, in some cases, banks may also be allowed to use the Alternative Standardised Approach (ASA), given they can satisfy their respective supervisor's requirements (BIS, 2005a: 142). The following section takes a closer look at the ASA.

3.3.2.3.3 The Alternative Standardised Approach (ASA)

At national level, supervisory discretion may be applied to allow a bank to make use of the ASA, provided the bank can convince the supervisor in question that this alternative approach provides an improved risk evaluation basis, by example, avoiding double counting of risks (BIS, 2005a: 146). When a bank is allowed to make use of the ASA it will not be allowed to revert back to the use of the SA without the necessary permission of its supervisor (as with all the various approaches, banks are not permitted to move between approaches) (BIS, 2005a: 144).

The operational risk capital charge under the ASA is the same as in the case of SA with the difference being two business lines – retail banking and commercial banking (BIS, 2005a: 146). These business lines, advances and loans (multiplied by a fixed factor M) replace gross income as the exposure indicator. The betas for retail banking and commercial banking remain unchanged from those used under the SA (Esterhuysen, 2006: 153). The ASA operational risk capital charge for retail banking can be expressed as (BIS, 2005a: 146):

$$K_{RB} = \beta_{RB} \times M \times LA_{RB} \qquad \textbf{(3.3)}$$

Where:

K_{RB} = the capital charge for the retail banking business line;

β_{RB} = the beta for the retail business line;

LA_{RB} = the total outstanding retail loans and advances (non-risk weighted and gross provisions), averaged over the past three years;

M = 0.0035.

For the purpose of the ASA, total loans and advances, in the retail business line, consist of the total drawn amounts in the following credit portfolios (BIS, 2005a: 145):

- Retail;
- Small and medium enterprises (SME) treated as retail;
- Purchased retail receivables.

For commercial banking, total loans and advances consist of the drawn amount in the following (BIS, 2005a: 145):

- Corporate;
- Sovereign;
- Bank;
- Specialised lending;

- Small and medium enterprises (SME) treated as commercial;
- Purchased corporate receivables.

Banks may aggregate retail banking and commercial banking under ASA, if they wish, using a beta of 15 percent (BIS, 2005a: 146). Similarly, those banks that are unable to disaggregate their gross income into the other six business lines, can aggregate the total gross income for the six business lines using a beta of 18 percent (BIS, 2005a: 146).

This section concludes the discussion on the SA as well as the ASA. The following section will evaluate the operational risk capital charge measurement by discussing the Internal Measurement Approach (IMA).

3.3.2.4 The Internal Measurement Approach (IMA)

Banks meeting certain strict supervisory standards are allowed to use internal loss data to calculate the required capital. Young (2006: 33) stated that there are a few banks worldwide that have a history of more than three years and some have already started to calibrate the capital charge under this approach. The other banks, lagging behind, collected the necessary data to be able to implement this approach (Young, 2006: 33). Under this approach the capital charge, for operational risk of a bank, is determined according to the following steps (BIS, 2001b: 9):

- The bank's activities will be divided into business lines as with the standardised approach. Operational loss types will be identified, where possible for each business line.
- The supervisor will specify an exposure indicator (EI), for each business line/loss type combination, which is a proxy for the amount of risk exposure due to each business line's operations.
- Next, a parameter representing the probability of the loss event (PE), as well as a parameter representing the loss given for that event (LGE), must be determined. The product of EI, PE and LGE equals the expected loss (EL) for each business line/loss type combination.

- The supervisor supplies a fixed percentage (the gamma factor) for each business line/loss type combination, which translates the expected loss (EL) into a capital charge. The overall capital charge for the bank is the sum of all the resulting products.
- To facilitate the process of supervisory validation; banks will have to supply their supervisors with the individual components of the expected loss calculation and not just the product, EL.

There is also a gamma factor (γ), which represents a constant that is used to transform expected loss (EL) into a risk or a capital charge (BIS, 2001b: 9). This is defined as the maximum amount of loss, per holding period, within a certain confidence interval (BIS, 2001b: 9). The scale of gamma will be determined and fixed by supervisors for each business line/loss type and its determination is further based on an industry wide loss distribution (BIS, 2001e: 10). However, the risk profile of each bank is not necessarily equivalent to the industry wide loss distribution. The IMA will require banks to have a sound internal loss reporting practice, as well as an operational loss data base, extending back a number of years (in most cases five years) for significant business lines (De Beer, 2002: 237). The internal loss data needs to be supplemented by relevant external loss data. Sources of external data need to be reviewed regularly to ensure the accuracy and the applicability thereof. Knowledgeable staff, a sound measurement methodology, and an appropriate systems infrastructure are indispensable to meet these, and all other requirements (Esterhuysen, 2006: 150).

The accuracy of loss data will also need to be established through "use tests" (BIS, 2001e: 10). Banks that do not fully integrate an internal measurement methodology into daily activities and business decisions should not qualify for this approach (De Beer, 2002: 237). De Beer (2002: 238) also affirmed that banks would have to validate whether the operational environment is accurately reflected in the collected data and estimations and should integrate experience and judgment into the analysis. The conditions, under which judgments or 'over-rides' may be used, should be specified, clearly documented and be subject to independent review. Supervisors should also examine the data collection, measurement, and validation process, and assess the appropriateness of the operational risk control environment of the bank.

This concludes the discussion on the IMA for operational risk. The next section will proceed with the discussion of operational risk measurement methodologies by evaluating the fourth and most complex measurement approach, the Advanced Measurement Approach (AMA).

3.3.2.5 The Advanced Measurement Approach (AMA)

The Advanced Measurement Approach is the fourth and most complex of the four approaches and is regarded as more advanced than the Internal Measurement Approach. The regulatory capital under this approach will equal the measure generated by the bank's internal operational risk measure system using the quantitative as well as the qualitative criteria for AMA discussed below. Banks, which adopted the AMA, were required to calculate their capital requirement using this approach, as well as the existing Basel Capital Accord, for a year prior to implementation of Basel II at the beginning of 2008 (BIS, 2006: 124). The capital charge of the AMA is the lowest of the four approaches, but is the most challenging to implement due to its complexity.

When a bank adopts the AMA the bank may, with the approval of its host supervisors and the support of its local supervisors, make use of an allocation mechanism for the purpose of determining the regulatory capital requirement for internationally active banking subsidiaries. Where the latter are not deemed to be significant relative to the overall banking group but are themselves subjected to this framework (BIS, 2005b: 143).

It was also stated by the Basel Committee that supervisor approval would be conditional on a bank demonstrating to the satisfaction of the relevant supervisors that the allocation mechanism for these subsidiaries is appropriate and can be supported empirically (BIS, 2005b :144). The Basel Committee also mentioned further that the BoD and senior management of each subsidiary are responsible for conducting their own assessment of the subsidiary's operational risk and controls ensuring that the subsidiary is adequately capitalised in respect of those risks (BIS, 2005b: 143). The incorporation of a well-reasoned estimate of diversification benefits, subjected to supervisory approval, may be factored at a group-wide level or at the banking subsidiary level (BIS, 2005b: 145).

The appropriateness of the allocation methodology will be reviewed with consideration given to the degree/stage of development of risk-sensitive allocation techniques and the extent to which it reflects the level of operational risk in the legal entities and across the banking group (BIS, 2001a: 12). It is expected by supervisors that the AMA banking groups will continue their efforts to develop increasingly risk sensitive operational risk allocation techniques, notwithstanding initial approval of techniques based on gross income or other proxies for operational risk (BIS, 2110a; 13).

Banks adopting the AMA are required to calculate their capital using the above approach as well as the capital floor based on application of the 1988 Capital Accord (BIS, 2001a: 140). This capital is derived by applying an adjustment factor to the following amount:

- 8 percent of the risk weighted assets;
- Plus Tier 1[4] and Tier 2[5] deductions;
- Less the amount of general provisions that may be recognised in Tier 1 capital (BIS, 2005b: 13).

Table 3.3: Adjustment factors

	From year-end 2005	**From year-end 2006**	**From year-end 2007**	**From year-end 2008**
Foundation IRB approach	Parallel calculation.	95 %	90 %	80 %
Advanced approaches for credit and/ or operational risk	Parallel calculation or impact studies.	Parallel calculations.	90 %	80 %

Source: (BIS, 2005a: 13)

[4] Tier 1 capital includes common stock and surplus, undivided profits (retained earnings), qualifying non cumulative perpetual preferred stock, minority interest in the equity accounts of consolidated subsidiaries, and selectable identifiable intangible assets less goodwill and other intangible assets (Esterhuysen, 2006: 159).

[5] Tier 2 capital includes the allowance for loan and lease losses, subordinated debt capital instruments, mandatory convertible debt, intermediate term preferred stock, cumulative perpetual preferred stock with unpaid dividends, and equity notes and other long term capital instruments that combine both debt and equity features ((Esterhuysen, 2006: 159).

The adjustment factor for banks using the Internal Ratings Based Approach (IRB) for credit risk for the year beginning year-end 2006 is 95 percent, where the adjustment factor for banks using either the foundation and/or advanced IRB approaches for credit risk, and/or the AMA approach for the year beginning year-end 2007 is 90 percent, and for the year beginning year-end 2008 is 80 percent (BIS, 2005a: 13). Table 3.3 illustrates the application of these adjustment factors.

3.3.2.5.1 Qualifying criteria for the Advanced Measurement Approach

In order for banks to use the AMA, they have to meet certain qualifying criteria, explained in the following section.

3.3.2.5.1.1 General criteria

In order for banks to use the AMA, the supervisor should be satisfied that at least two of the following criteria are met (BIS, 2005b: 150):

- The BoD and the senior management of the bank are actively involved in the supervision of the operational risk management framework.
- The existence of a risk management system that is conceptually sound and is implemented with integrity.
- The availability of sufficient resources in the main business lines as well as in the control and audit areas.

A bank's AMA is subject to a period of initial monitoring by its supervisor before it can be used for regulatory purposes. This period allows the supervisor to determine whether the approach is credible and appropriate (BIS, 2005b: 150). The bank's measurement system must also be capable of supporting an allocation of economic capital for operational risk across business lines in a manner that creates incentives to improve business lines' operational risk management. Banks are also subject to qualitative and quantitative standards, both explained in the sections to follow.

3.3.2.5.1.2 Qualitative standards

A bank must meet the following qualitative standards before it is permitted to use the AMA (BIS, 2005a: 150):

- An independent operational risk management function, responsible for the design and implementation of the bank's operational risk management framework.
- An internal operational risk measurement system, closely integrated into the day-to-day risk management processes of the bank.
- Regular reporting of operational risk exposures and loss experience to business unit management, senior management, and to the BoD.
- A well documented operational risk management system.
- Regular reviews performed by internal and/or external auditors, of the operational risk management processes and measurement systems.
- Validation of the operational risk measurement system by external auditors and/or supervisory authorities and which must include the following:
  - Verification that the internal validation processes are operating adequately.
  - Transparent and accessible data flows and processes associated with the risk measurement system. In particular, it is necessary that the auditors and supervisory authorities are in a position to have easy access, whenever they judge it necessary and under appropriate procedures, to the system's specifications and parameters.

3.3.2.5.1.3 Quantitative standards

The Basel Committee (2005a: 151, 155) stated the following quantitative standards for the use of the AMA:

- *The AMA soundness standard*: It is important that a bank can demonstrate that its approach captures potentially severe "tail loss" events. Whatever approach is used, a bank must also demonstrate that its operational risk measurement meets a soundness standard comparable to that of the Internal Ratings Based Approach for credit risk (i.e. comparable to a one-year holding period and a 99.9 percent confidence interval).

- *Detailed criteria*: Supervisors should require the bank to calculate its regulatory capital requirements as the sum of the expected loss (EL) and unexpected loss (UL), unless the bank can demonstrate that it is adequately capturing EL in its internal business practices. A bank's risk management system must be granular to capture the major drivers of operational risk affecting the tail of the loss estimates.
- *Internal data*: The tracking of internal loss event data is an essential prerequisite to the development and the functioning of a credible operational risk measurement system. Internal loss data is crucial for tying a bank's risk estimates to its actual loss experience.
- *External data*: A bank's operational risk measurement system must use relevant external data, especially when there is reason to believe that the bank is exposed to infrequent, yet potentially severe losses.
- *Scenario analysis*: A bank must use a scenario analysis of expert opinion in conjunction with external data to evaluate its exposure to high severity events.
- *Business environment and internal control factors*: In addition to using loss data, whether actual or scenario-based, a bank's firm-wide risk assessment methodology must capture the key business environment as well as the internal control factors that can change the bank's operational risk profile. These various factors will make a bank's risk assessments more forward-looking, reflect the quality of the bank's control and operating environments more directly, help to align the capital assessments with the risk management objectives, and provide instant recognition of both improvements and deterioration in the operational risk profiles.

The aim of the above approaches is that improvements in operational risk management would eventually reflect in a lower capital charge. It is also believed, by the Basel Committee, that with the introduction of the AMA, a bank will find it easier to calculate their capital charge for operational risk.

This section concludes the discussion on the quantitative and qualitative criteria for the use of the AMA. The following section discusses risk mitigation under AMA.

3.3.2.5.2 Risk mitigation

It is stated by the Basel Committee (BIS, 2005a: 151) that under the AMA, banks are allowed to recognise the mitigating impact of risk insurance on the measurement of operational risk when calculating regulatory minimum capital requirements. The Basel Committee further states that the recognition of insurance mitigation will be limited to 20 percent of the total risk capital charge calculated under the AMA (BIS, 2005a: 151). To qualify for the above, banks need to comply with the following (BIS, 2005b: 151):

- The insurance provider must have an A-rated minimum claims paying ability.
- The insurance policy must have an initial term of no less than one year.
- The insurance policy must have a 90 day minimum notice period for cancellation.
- The insurance policy may not have exclusions or limitations that are triggered by supervisory actions.
- The calculation of risk mitigation has to reflect the bank's insurance coverage in a manner that is transparent in its relationship to, and consistent with, the actual likelihood and impact of the loss used in the bank's overall determination of its operational risk capital.
- A third party entity must provide the insurance.
- The framework for recognising insurance must be well reasoned and documented.
- The bank must disclose a description of its use of insurance for the purpose of mitigating operational risk.

The Basel Committee also mentioned (BIS, 2005a: 152) that the bank's methodology, for recognising insurance under the AMA, must capture certain elements through discounts in the amount of insurance recognition, for example, a residual term of one year, a policy cancellation term of less than one year, as well as where there is uncertainty about payment or mismatches in coverage (BIS, 2005a: 152).

3.3.2.6 Conclusion

This section concludes the discussion on the measurement methodologies of operational risk capital as part of Basel II. All these capital measurements aim to calculate the amount of capital a bank will have to hold to absorb an operational loss event when it occurs. The next section discusses the proposed practices for operational risk management as set out by the Basel Committee in the light of the evaluation of Basel II.

3.4 Proposed practices for operational risk management

3.4.1 Introduction

It is recognised by the Basel Committee that operational risk is a substantial element of other risks within a bank and is an area where banks are devoting much needed attention and resources. Operational risk lends itself more easily to quantification, and hence effective management, than other risk elements. It is important that banks attempt to manage all significant risks and that supervisors review them as part of the supervisory review under Pillar 2 (see 3.2.7.2) of Basel II. This is to ensure safer and sound banking.

This section of Chapter 3 outlines the set of principles proposed by the Basel Committee. These principles provide a framework for the effective management and supervision of operational risk. The guidelines are intended to serve as best or sound practices within the financial industry. It is also used by internationally active banks and supervisory authorities when operational policies, procedures and practices are evaluated. The guidance mentioned in this part of Chapter 3 is intended to apply not just too internationally active banks (e.g., based on size complexity or systematic importance), but also to the smaller or less complex banks. As already mentioned, (see 3.2.7.3) under Pillar 2, supervisors are responsible for the evaluation of how well banks address their capital adequacy needs relative to their risks. In doing so, supervisors will draw on, amongst other considerations, their knowledge of best practices across institutions. In other words, banks successfully implementing Pillar 2 will ensure it has adequate capital to support all the risks in its business. Compliance to Pillar 2 encourages banks to use better techniques for monitoring and managing their risks.

This operational risk management framework provides guidance for banks to enable them to bring their supervisory practices in line with world best practice. The four key elements that form the basis of operational risk management will be discussed below.

3.4.2 Operational risk management – Four key elements

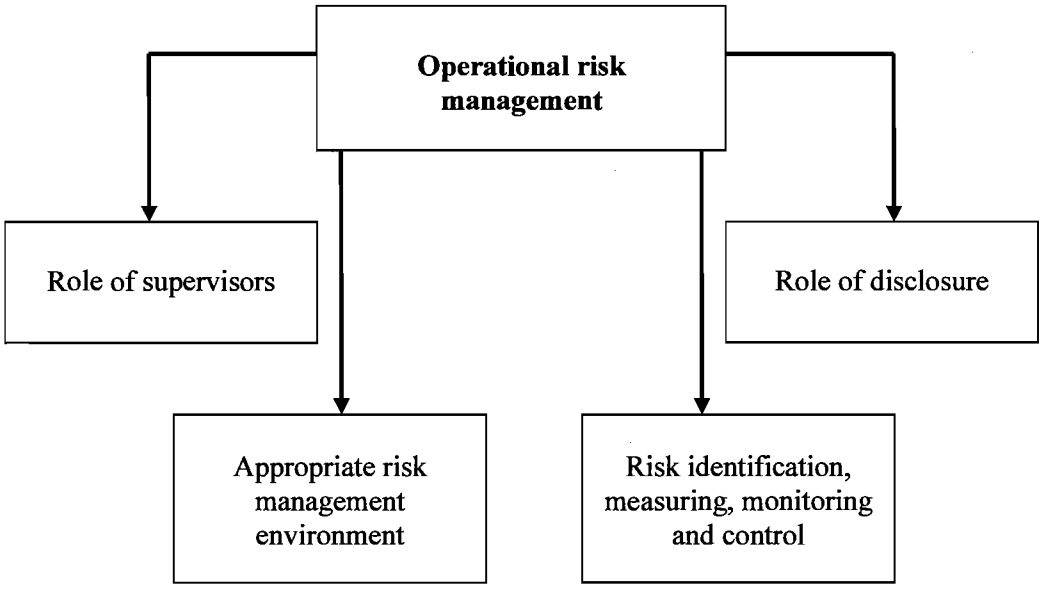
Regulators throughout the world recognise that banks have had much difficulty with quantifying operational risk as the nature of the risk is unique to each institution. The Basel Committee recognises the fact that the exact approach for operational risk management that a bank decides on will depend on a set of factors, which includes the size, sophistication, the nature, and the complexity of the bank's activities. However, despite these differences, clear strategies and oversight by the BoD and senior management, a strong internal control culture (including, among other things, clear lines of responsibility and segregation of duties), effective internal reporting, and contingency planning are all crucial elements of an effective operational risk management framework for banks of any size and scope[6] (BIS, 2003c: 5).

Taking into consideration the different nature of operational risk in different banks, the Basel Committee defines the management of operational risk to mean the identification, assessment, monitoring and control/mitigation of risks (BIS, 2003c: 5). The sound practice paper (BIS, 2003c: 1, 17) is structured around ten basic principles grouped into four key elements for managing operational risk management, which include the following (BIS, 2006: 203) (see Figure 3.5):

- The development of an appropriate risk management environment.
- The identification, measuring, monitoring and controlling of the risk.
- The role of supervisors.
- The role of disclosure.

[6] See Chapter 5 for the discussion of these elements within the ALCO of a bank.

Figure 3.5 Operational Risk – Four key elements



Source: (Compiled by the author)

Each of the ten principles are discussed in the following sections in as they apply to the four key elements in operational risk management.

3.4.2.1 The risk management environment

According to the Basel Committee, there are three basic principles that management must follow when they are developing a risk management environment. These include the following (BIS, 2003c: 5, 8):

Principle 1: The BoD should be aware of all the major aspects of the bank's operational risks as part of a distinct risk category that should be managed, approved. The bank should review its operational risk management framework. The framework has to provide a firm-wide definition of operational risk for the bank and lay down the principles of how operational risk is to be identified, assessed, monitored and controlled/mitigated within the bank.

Principle 2: The BoD should ensure that the bank's operational risk management framework is subject to an effective and comprehensive internal audit, by operationally independent, appropriately trained and competent staff. The internal audit function should not be responsible for managing operational risk.

Principle 3: Senior management must accept the responsibility of implementing the operational risk management strategy approved by the BoD. The strategy must be implemented consistently throughout the whole banking organisation, and all levels of personnel should understand their responsibilities with respect to operational risk management. The responsibility for developing the policies, processes, and procedures, for managing operational risk in all of the bank's products, activities, processes and systems, vests in senior management.

If a bank fails to address operational risk, which is present in virtually all bank activities, there is an increased likelihood that some risk may go unrecognised and therefore be uncontrolled. Management must translate the operational risk strategy established by the BoD into policies, processes and procedures that can be implemented and verified (Cade, 1997: 35). While each level of management is responsible for the appropriateness and effectiveness of policies, processes, procedures and controls within its operating sphere, senior management must clearly assign authority, responsibility and reporting relationships to encourage this responsibility. The above-mentioned responsibilities include ensuring that the necessary resources are available to manage operational risk (Cade, 1997: 35).

The key element in developing an appropriate risk management environment is to ensure that personnel know exactly what is required from them (King, 2000: 55). An appropriately developed operational risk management environment improves the effectiveness of the identification, measuring, monitoring and control of operational risk, which is the Basel Committee's second key element of operational risk management.

3.4.2.2 Identification, measurement, monitoring and control of risk

The second key element of operational risk management, identified by the Basel Committee, is the identification, measurement, monitoring and control of operational risk. This key element consists of the next four basic principles, which include the following (BIS, 2003c: 8, 12):

Principle 4: Managers have to identify the operational risk inherent in all types of products, activities, processes and systems in the bank. Managers should also ensure that before new products, activities, etc., are introduced or undertaken, the operational risk inherent in them is subject to adequate assessment procedures.

Principle 5: Banks should implement a process to regularly monitor operational risk profiles and exposure to material losses. There should be regular reporting of relevant information, to senior management and the BoD that supports the proactive management of operational risk.

Principle 6: Managers should implement a system to monitor, on an ongoing basis, operational risk exposure and loss events by major business lines.

Principle 7: Managers should have policies, procedures and processes to control or mitigate operational risk in the bank (see Chapter 4). Managers should also assess the cost and the benefits of alternative risk limitation and control strategies and should adjust their operational risk exposure using appropriate strategies.

Following on the management and monitoring of risk is the role of supervisors in operational risk management as discussed in the following section.

3.4.2.3 Role of Supervisors

The role of Supervisors is the third key element in operational risk management identified by the Basel Committee and is based on the following two principles on a single principle (BIS, 2003c: 14):

Principle 8: Banking supervisors must require all banks, regardless of size, to have an effective framework in place to identify, assess, monitor and control/mitigate material operational risks as part of an overall approach to the bank's risk management. Thus adhere to the previous key element.

Principle 9: Supervisors should, directly or indirectly, conduct regular, independent evaluations of the bank's policies, procedures and practices as related to operational risk. Supervisors should also ensure that there are appropriate mechanisms in place that apprise them of any significant developments at banks that impact on their operational risk.

Considering the two above-mentioned principles, the Basel Committee has thought to establish better supervision and control over operational risk management by including Pillar 2 (Supervisory Review) (see 3.2.7.2). Pillar 2 of Basel II is an integral and critical component and is intended to ensure that banks have adequate capital to support the risks in their business, but also to encourage banks to develop and use better techniques in managing those risks. Where supervisors determine that a bank's operational risk management is either inadequate or ineffective for the bank's specific risk profile, supervisors should require improvements along with the possibility of a provisional additional capital buffer for operational risk, consistent with Pillar 2 (Barclays, 2001: 7).

Medova and Kyriacou (2002: 276) also stated that supervisors should seek to ensure that, where banks are part of a financial group, there are procedures in place to ensure that operational risk is managed in a consistent approach across the group. In creating the assessment, cooperation and exchange of information with other supervisors may be necessary and in some extreme cases, the help of external auditors may be acquired. However, supervisors can only perform their duties if banks provide adequate information. The role of disclosure is discussed in the following section.

3.4.2.4 Role of disclosure

The role of disclosure is the fourth key element in operational risk management identified by the Basel Committee and is based on a single principle (BIS, 2003c: 14):

Principle 10: Banks should make sufficient public disclosure to allow market participants to assess their approach to operational risk management.

Pillar 3 (see 3.2.7.3) of Basel II emphasises the importance of market discipline in supporting minimum capital requirements and the supervisory review process. The Basel Committee believes that the timely and frequent public disclosure of information by banks may lead to enhanced market discipline. However, this area of operational risk disclosure is not yet well established, primarily because banks are still in the process of developing operational risk techniques (King, 2000: 167). It is the belief of the Basel Committee that only where a bank has a sound operational risk management framework that identifies, controls, measures and monitors operational risk in an effective manner, will such a disclosure framework be beneficial for assessing the markets and improving effective capital allocation and pricing (BIS, 2001f: 13).

3.4.3 Responsibilities and management structure

The Basel Committee recognises the fact that processes for the management of operational risk are evolving and the Basel Committee wants to encourage continued innovation in this area. The Basel Committee further recognises that the elements for sound operational risk management programmes are in place but that there are some banks that experience difficulties with the implementation of their management structures regarding operational risk. The aim of this section is thus to clarify the guidance set out by the Basel Committee regarding management structures and the responsibility of operational risk management.

3.4.3.1 The Basel Committee guidelines for management structures and responsibilities

The Basel Committee has listed a number of management responsibilities with regards to operational risk, which include the following (BIS, 2005a: 40):

- Establish consistent definitions for operational risk across the bank's business units.
- Develop bank level policies, procedures and practices to ensure that operational risk is appropriately identified, measured, monitored and controlled.
- Produce bank level operational risk reports to indicate the exposures and forward looking key risk and performance indicators or scorecards in the bank.
- Oversee and ensure the integrity of the operational risk assessment process within the business lines.
- Implement and maintain the bank's economic capital assessment and allocation methodologies for operational risk.
- Develop strategies for mitigating operational risk, possibly in conjunction with risk-mitigation products e.g. Operational risk insurance, outsourcing, operational risk derivatives and pooling arrangements.

The Basel Committee stresses the fact that the above-mentioned, as well as the establishment of a bank-wide perspective on operational risk as well as an effective operational risk management structure, is founded on the insights and expertise of the business line managers (BIS, 2001b: 19). The operational risk management functions have to work closely with business lines to be able to implement bank-level policies. In many cases, the operational risk management function has independent operational risk managers within each major business line whose responsibility it is to assess the risks at ground level and ensure that risk management policies are put in place. In many banks, business line managers are responsible for developing tracking measures of the major sources of operational risk, reporting on issues regarding their operational risk management functions and establishing appropriate control measures.

3.4.3.2 Structures for operational risk management

Many banks, with diversified business activities, indicated, in discussions with the Basel Committee, that operational risk forms a significant component of their overall risk profiles. At a number of banks, operational risk is considered to rank second only to credit risk in terms of risk exposure and may be greater than market risk (for example, when measured in terms of economic capital allocations) (BIS, 2001b: 12). Operational risk may, however, present the largest potential loss exposure to a bank that focuses on asset management or payments and the processing of activities. It is against this background that the BIS (2001b: 12) stated that, leading banks have, or are in the process of putting in place, clearly defined organisational structures for market and credit risk and which, in principle, reflect a decision making process that sets policy centrally (generally working closely with affected business lines) yet executes it on a decentralised basis.

Banks' management structures and responsibilities of operational risk vary, but a number of themes are emerging at leading banks. Many banks have established an independent operational risk management function that has a direct reporting line to senior management (i.e. the Chief Risk Officer) (King, 2000: 37). An emerging practice at leading banks is to rationalise the potentially overlapping responsibilities of various operational risk management committees and activities by forming a bank-wide operational risk committee or unit with a designated head of operational risk. The head of operational risk may, in turn, participate in a firm-wide risk committee that includes credit and market risk and can provide an effective forum to coordinate risk management activities and address potential gaps (BIS, 2001b: 14).

The Basel Committee highlights that guidance on management's responsibilities and structures are still in the development phase and are still not adequate for effective operational risk management. The Basel Committee also emphasised that major discussions with banks are underway to obtain information regarding the shortcomings of management in terms of their responsibilities and structures for the effective management of operational risk.

3.5 Conclusion

The aim of Chapter 3 was to provide an overview of the Basel Committee and Basel II, as the authority in banking regulation for international active banking institutions, by focusing on one risk, i.e., operational risk only. It is established that the first Basel Capital Accord was widely adopted around the world. Consequently, from a competitive viewpoint, consequently, it is to the advantage of a bank to adhere to the prescriptions of the Basel Committee. To stay relevant, the Capital Accord was due for a review. The Basel Committee has released Basel II to replace the Capital Accord with a more risk sensitive framework. Basel II intends to improve safety and soundness in the financial system by placing more emphasis on the bank's internal control and management, the supervisory review and market discipline.

For the first time operational risk is measured by Basel II and consists of three different approaches of increasing sophistication (BIA, SA and the AMA). As the complexity of these approaches increases, the capital charge requirement decreases, but the qualifying criteria increase. It is expected that operational risk on average will constitute about 15 percent of the overall capital charge under Basel II. One of the Basel Committee's goals is not to raise aggregate regulatory capital inclusive of operational risk. The choice of definition of operational risk will have a big effect on the resulting capital charge. It is clear that an explicit capital requirement for operational risk has a definite impact on the capital adequacy.

It is outlined by the Basel Committee that the four key elements in operational risk management are not the solitary elements that banks must consider when managing operational risk, but regard it as the foundation for an effective operational risk management programme or strategy. It is clear that operational risk differs from other banking risks in that it is typically not directly taken in return for an expected reward, but exists in the natural course of banking activity, and that it affects the risk management process. At the same time, failure to properly manage operational risk can result in a misstatement of a bank's risk profile and expose the bank to significant losses. The

guidance on management's responsibilities and structures are highlighted in the last section of this chapter to emphasise the effective management of operational risk in a bank.

Chapter 4 builds on Chapter 3 and focus on the 2nd key element of operational risk management, namely identification, measuring, monitoring and control. The aim of Chapter 4 is to explain what key operational risk indicators are and to indicate how these indicators can be identified and how it is used to measure operational risk. This knowledge will then be applied to the case study in Chapter 5.

Chapter 4

Operational Key Risk Indicators

4.1 Introduction

According to Esterhuysen (2006: 77), there are three different types of operational risks namely: (i) past operational risks, which have occurred and resulted in money losses to the bank, the reoccurrence of which can be prevented by evaluating and identifying the causal factors; (ii) current operational risks that may occur at any time and management has little time to identify (i.e. the ability to foresee their occurrence) or forestall these risks, and; (iii) future operational risks, which may occur in the near future, have not yet been identified, with very little information is available about these risks, and the management has some time available to identify them before they happen.

A well documented history of operational losses is useful to identify risk areas and the impact of operational losses on a bank and can assist management in forecasting future losses. This is done by, among others, analysing trends. The identification, of possible current operational risks, is very difficult if there has not yet been a similar operational loss event and thus no loss event to analyse (Esterhuysen, 2006: 94). Numerous studies have been conducted on identifying operational risk events for organisations or a bank as a whole. The problem, however, especially lies in identifying and managing operational losses within separate units/departments of organisations/banks.

Thus, regardless of whether indicators must be identified for the bank as a whole or a certain unit of the bank, management should identify indicators that are able to assist in the identification of the current operational risks. These indicators should be identified on the basis of key risks in a business. These indicators can be found everywhere. People rely on them daily to monitor, for example, investment performances, economic growth and health and even management/employee performances (Esterhuysen, 2003: 97). As mentioned in Chapter 2, the ALCO has several goals which need to be achieved. Firstly there is the need

to implement strategic ALM and secondly strategic risk management. It is stated by Mare (1995: 7) that some of the reasons why the ALCO fails are as follows:

- *Unclear purpose*: Not everyone on the ALCO knows what is really required of them and what the management wants them to achieve.
- *Wrong tools*: The members on the ALCO often use inappropriate tools for the job, e.g. they use long term analysis when a short term analysis is needed.
- *Staffing of the ALCO*: The ALCO can be wrongly staffed at times. An investment driven bank is staffed with investment personnel and vice versa.

As stated in Chapter 3 the main causes of operational risk are people, processes, systems and external events. It is evident that these causes of operational risk can be found within the ALCO process of a bank. With this said, risk managers are left to wonder about the following: Where and how does the process of operational risk tracking and measurement begin in the ALCO? How can a risk manager compile an operational risk profile and manage it? How should management link existing control functions in a bank to control for operational risk in the ALCO process? Which types of indicators are most useful to identify and measure operational risk exposure in the ALCO? In other words when is it appropriate to make use of key performance indicators (KPIs) and when will it be more appropriate to make use of key risk indicators (KRIs) for management to identify the exposure to operational risk within the ALCO? All of the above-mentioned questions should be topics of discussion in operational risk management circles, in fact, they are indicative of the various perspectives and approaches to operational risk management that can exist in the ALCO process of a bank.

Therefore it should not come as a surprise that risk managers have begun to make use of performance and risk indicators as early warning signals to track an organisation's level of exposure to operational risk. These indicators need to be amended to address operational risk in the ALCO process, which will enable management to identify and optimally manage these operational risks. Risk indicators are seen as the cornerstones of both effective measurement and management of operational risk (Esterhuysen, 2003: 98).

The aim of Chapter 4 is to determine what key operational risk indicators are and how they can be identified and implemented in the ALCO process. These methodologies will be applied to the case study in Chapter 5 to identify KRIs in the ALCO of a bank. Thus, the following sections will address KRIs of operational risk and more specifically, in-depth discussions follow in Section 4.3 on the basic concepts of KRIs, Section 4.4 on organisational considerations regarding KRIs, Section 4.5 on the identification of KRIs and Section 4.6 on the practical considerations regarding identification, data collection, standards, management, and reporting of operational risk.

Before Chapter 4 proceeds to look at and evaluate operational risk indicators in detail, it is important to distinguish between a key risk indicator (KRI) and a key performance (KPI) indicator. The following section provides a short overview of a KPI in order to distinguish it from a KRI.

4.2 Key performance indicators vs. Key risk indicators

4.2.1 Key performance indicators

Key performance indicators (KPIs) help a bank define and measure progress towards a bank's objectives. KPIs can be seen as quantifiable measurements, agreed to beforehand, that reflect critical success factors of a bank (Reh, 2008: 1) and differ from bank to bank. KPIs typically consist of any combination of reports, spreadsheets, or charts and they may include, amongst others, global or regional sales figures and trends over time, personnel statistics and trends, real-time supply chain information, or anything else that is deemed critical to an institution's success (Esterhuysen, 2003: 98). Whatever KPIs are selected, they must reflect a bank's objectives (see 2.3.1.4), they must be key to its success and they must be quantifiable.

In developing KPIs, the developer defines target performance levels, which are an essential element of the strategic planning process (see 2.3.1), after which the best way to present any variance from the target must be decided on (Lopez, 2002: 3). For example, a bar chart of sales KPIs may flag regions that are under quota in red while those that are at, or above, quota are flagged green. Management are able to see a bank's strong and weak areas

at a glance. Typical KPIs that are used in financial institutions include the following (Reh, 2008: 4):

- Statutory KPIs, such as GAAP or Legal Regulatory requirements;
- Profitability per business unit/product;
- Exception reporting;
- Employee performance, such as assets under management or profit per customer;
- Competitiveness, such as market share;
- Cost management, such as ROA (Return on Assets) on IT or new delivery channel monitoring;
- Credit management, such as time to settlement or credit exposure.

As can be seen from the above, there are a large number of KPIs that provide different measures of performance for a bank. Thus, KPIs can be identified as an indicator that shows the bank's overall performance at a specific time. Whereas a KRI, discussed in the next section, identifies a specific risk.

4.2.2 Key Risk Indicators

In the framework of operational risk management, risk indicators are one of the key tools used by management to support risk assessment and risk monitoring in a bank (Davies and Haubenstock, 2002: 40). Risk indicators can be seen as a broad category of measures that are used to monitor the activities in a bank according to its various operational risk categories (see Chapter 3, Table 3.1). In other words, KRIs are measurable metrics or indicators that track exposure or loss, or, as Davies *et al.* (2006: 3) put it, "trouble". Anything that can perform this function may be considered a risk indicator. A risk indicator becomes key when it has the ability to track a particular important exposure, or it does so especially well, or ideally both. In operational risk, risk managers are interested in KRIs that monitor operational risk.

The number of customer complaints is an example of a risk indicator (Esterhuysen, 2003: 138). As customer complaints increase, the probability that there are some underlying and

potentially systemic mistakes and errors of judgement being made is likely to rise. In other words, there is ground for thinking that, at least in some ranges; changes in the value of this indicator are most likely associated with changes in operational risk exposure or operational loss experience (Davies *et al.,* 2006: 3). The number of customer complaints is also an example of a common indicator – an indicator that would seem to be relevant at most points of risk in an organisation. Similarly, staff turnover and the number of audit points may also be considered common indicators (Esterhuysen, 2003: 138).

Most indicators are not common but, rather specific to individual businesses or processes. For example, the frequency of unmatched trades would be a predictor of losses arising from the settlement process within a retail brokerage but it is irrelevant to other businesses (Reh, 2008: 6). The frequency of unmatched trades is also an example of a performance indicator – in this case, of performance in the trade-matching activity (Reh, 2008: 4). In fact, the KRI in one business line may be a performance indicator (KPI) in another business line. The preferred terminology depends on the user's perspective and the activity in which they are engaged, but, not unsurprisingly, there is often some overlap.

The following section intends to define KRIs for operational risk by describing their basic concepts.

4.3 Basic Concepts of Key Risk Indicators

4.3.1 Introduction

The term risk indicator broadly refers to captured information that provides useful views of underlying risk profiles at various levels within an institution (Hoffman, 2002: 242). KRIs are measures which indicate the level of and changes in a bank's risk profile. This is achieved by focusing KRIs on the causes of potentially significant risk events and exposures. The key attributes of KRIs are that they (Lloyds, 2005: 3, 4):

- Highlight current risk levels by providing a measure of the status of an identified risk and the effectiveness of its control and provide information, which gives a useful ongoing view of the underlying behaviour of the risk profile;
- Highlight trends and changes in the risk level by monitoring changes in risk between formal risk and control assessments;
- Provide early warning signals through predictive risk indicators, which highlight changes in the risk environment, control effectiveness and potential risk issues, before these crystallise and result in a loss or other exposure;
- Enable actions that prevent or minimise material loss or incident by prompting timely action on early warning signals;
- Express escalation criteria for risk management by using thresholds to convert raw indicator data into meaningful risk ratings to aid effective decision-making.

It can be seen that KRIs seek to quantify all aspects (both tangible and intangible) that are required by a risk manager to enable risk-based decision making. KRIs may be *grouped* in a number of ways. Esterhuysen (2006: 97) and Taylor (2005: 16) both state that KRIs can be classified into three main *groups*, as follows:

- Risk indicator by type.
- Risk indicator by risk class.
- Firm wide vs. business-specific risk indicator.

Each of the above-mentioned will be discussed in the following sections.

4.3.2 Risk indicators by type

4.3.2.1 Introduction

There are at least five *types* of KRIs, which include (Hoffman, 2002: 242, 247):

- Inherent risk indicators;
- Individual management control risk indicators;

- Composite risk indicators;
- Operational model risk factors;
- Environmental indicators.

For issues of simplicity, this study limits the illustration of these distinctive measure types within two general classes of risk: technology-related risks and people risks (see 3.3.1), such as misdeeds, mistakes, and other related actions or inactions.

4.3.2.2 Inherent risk indicators

An inherent risk indicator is typically indicates risk related to the nature of activities, which may include relevant factors such as complexity of rules and regulations, ambiguous claim forms, lack of guidance, etc. In other words, on a basic level, the monitoring of descriptive business data is useful to provide a context, and a means of forming exposure. Thus, these inherent risk indicators provide a dimension for inherent risk exposure (Esterhuysen, 2006: 99). The data that support the measurement of these inherent risk indicators are accessible from all areas across the bank and is generally inexpensive to collect (McPail, 2003: 17). Much of this data is already tracked by various reporting functions within the bank and, in addition, some operational risk managers maintain this information, and apply it to risk financing and/or insurance purchasing decisions, or in satisfying requests from insurance underwriters (Hoffman, 2002: 243). Examples are the number of transactions, volumes of trades, value of assets in custody and value of transactions.

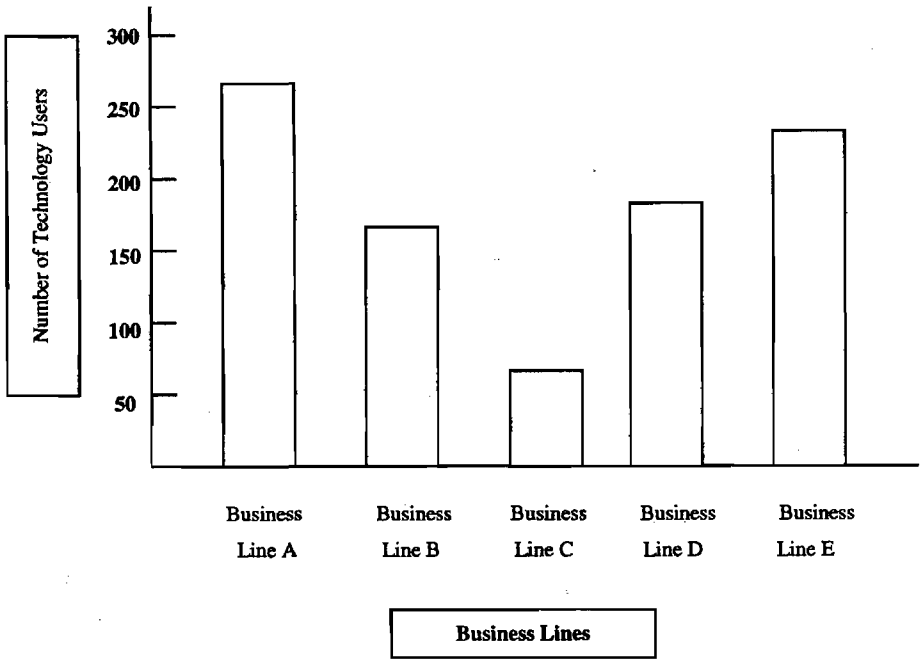
4.3.2.3 Individual Management Control Risk Indicators

The second types of risk indicator is where some banks capture certain types of variables that are believed to be appropriate indicators of risks posed by business managers, but are not simply descriptive; instead, they are representative of management's actions or inactions (Hoffman, 2002: 243). These risk indicators may also already be tracked in some form by a bank, for example, some prudent managers may already monitor such indicators systematically for some classes of risks in the form of KPIs. Existing processes in a bank may need to be modified,

however, in order to collect data that represent the entire institution, and all classes of risks (Theodore, 2002: 13).

Take the example of a business unit or institution that decides to commence streamlining its operations, by distributing more management information system (MIS) data for key areas onto the Web, for access over the Internet or its own intranet, as the case may be. Business functions, that may be affected, may include purchasing, human resources, trading and settlement, and client services. The total number of users of technology that requires training is illustrated in Figure 4.1. If the users are not properly trained they may apply the data incorrectly or not use it at all. Therefore, the number of people that requires training can be seen as an example of a firm-wide risk indicator (4.3.3).

Figure 4.1 Risk indicators: User number requiring training

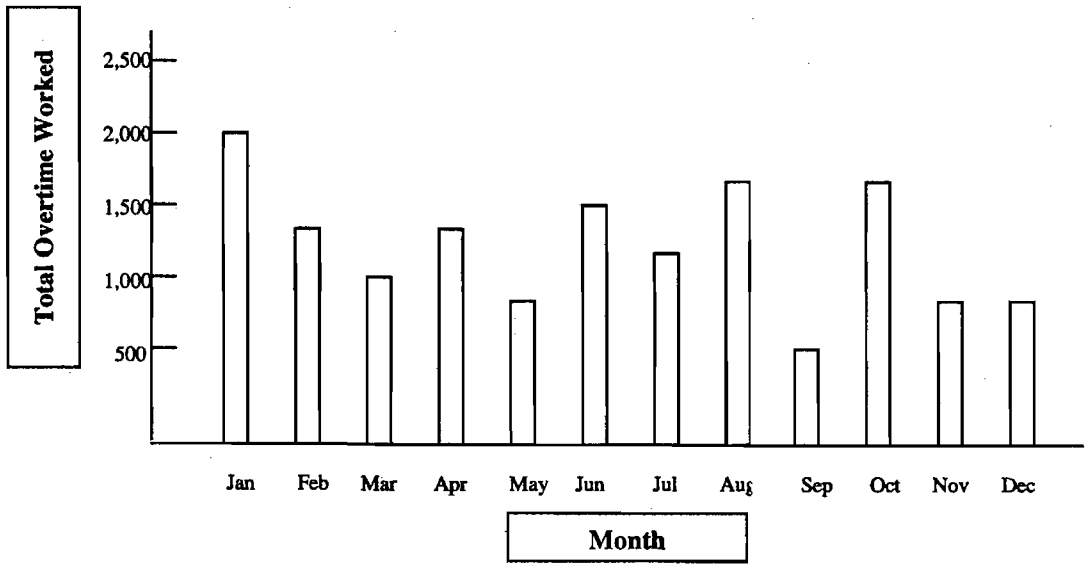


Source: (Esterhuysen, 2003: 111)

The management control risk indicator for technology may explicitly include the number of users requiring training in new technology and will be represented as actual numbers or weighted to reflect total employees in the department (Hoffman, 2002: 244). Alternatively, the employee risk indicators may include the amount spent on training and

employee review completion rates (see Figure 4.2). As an example of business-specific risk indicators (see 4.3.3), in a financial institution the introduction of new technology usually requires training to maintain productivity levels; this can be an important measure to assess risk. These risk indicators may be captured in terms of any meaningful unit, for example hours, rand, or employee numbers (Theodore, 2002: 19). Taylor (2006: 19) states that it is critical that operational risk MIS is flexible and sophisticated enough to be able to accept data in any unit(s) entered.

Figure 4.2 Business-specific indicators: Overtime worked



Source: (Esterhuysen, 2003: 112)

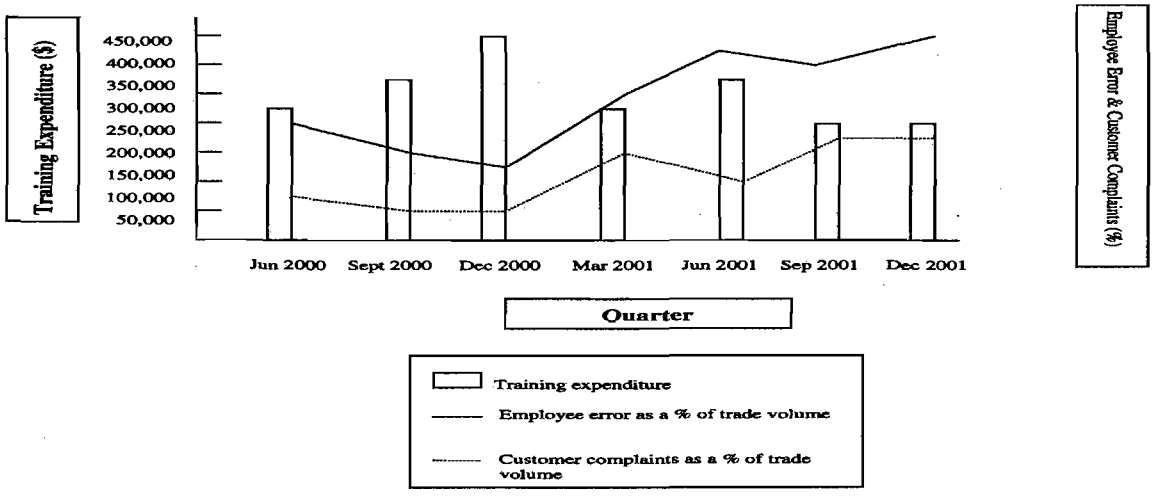
As illustrated in Figure 4.2, this is the total overtime hours worked as a business-specific (see 4.3.3) risk indicator. The analysis of business-specific indicators in isolation may prove to be only marginally beneficial (Esterhuysen, 2006: 97). The inherent benefit might only be realised when used as a variable within a group of relevant indicators (i.e., a composite). The strength of firm wide risk indicators lies within their comparability across the institution (Haubenstock *et al.*, 2004: 42). Taylor (2006: 16) further argued that users should realise that the benefit they gain in comparability and transparency across the institution might be partially offset by the generic (nonbusiness-specific) nature of these measures. In this example, inherent risk indicators (see 4.3.2.2), such as numbers of servers, number of

technology applications, or number of business continuity plans required, provide dimensions to the technology risk profile across a bank. Similarly average transactions value, transaction volume, number of employees, and overtime serve to provide dimension to people (see 3.3.1) and employee risks (see 5.2.2) (Taylor, 2006: 17).

4.3.2.4 Composite risk indicators

Esterhuysen (2006: 101) explained that this type of risk indicator is the third and a more complex type of risk indicator. Combining risk indicators provides management with an opportunity to measure multiple dimensions of risk associated with a specific class of risk, behaviour, or business activity for either the inherent risk indicators or management control indicators (Calomaris and Herring, 2002: 5). By tracking inherent risk (see 4.3.2.2) variables and individual management control risk indicators (see 4.3.2.3) together as composites, over time, can show some interesting relations. As illustrated in Figure 4.3, there appears to be a strong correlation between declining investment in employee training and the error rates of these employees, and the rate of customer complaints. In this case, it can show the user what an employee's optimal employee/training/performance levels are and whether performance is getting better or worse.

Figure 4.3 Composite risk indicators: Training dollars vs. employee error rate vs. customer complaints.



Source: (Esterhuysen, 2006: 102)

In practise this can be a good indication of the current exposure to operational risk, by combining different KRIs. Theodore (2002: 19) mentioned that taking the concept of composite risk indicators further, risk managers can combine numerous inherent and/or control indicators to create operational risk indices, such as a new application risk index or an overall technology risk index.

4.3.2.5 Operational risk model factors

Operational risk model factors are essentially a subset of the above-mentioned three types of indicators (Esterhuysen, 2003: 113). With operational risk, this category implies that risk managers would not want to use all these data measures in an operational risk measurement model (Hoffman, 2002: 246). For simplicity, risk managers will select certain risk indicators from the three types mentioned above, in order to apply the most effective ones to modelling purposes (Lopez, 2002: 17). Factor models are derived from various underlying risk indicators that characterise a risk profile (Hoffman, 2002: 247).

4.3.2.6 Environmental indicators

Environmental measures are typically more *ex ante* and often have a large qualitative component. Examples would include the number of customer complaints, changes in the experience levels of staff, employee satisfaction, training levels, and rate of change in technology. Many banks have struggled with these more subjective measures, and there is no proof that they relate *ex post* to changes in either measures or losses (Davies and Haubenstock, 2002: 41). As leading indicators, however, they should be used by management to influence the risk profile. In reality, an effective indicator framework combines *ex post* and *ex ante* measures. By specifically relating the indicators to categories of risk, the risk framework will have more credibility and be easier to defend. It will also make future causal modelling easier.

The above section then concludes the discussion on the different *types* of risk indicators. The following section will describe the second main group of KRIs, namely risk indicators by *class*.

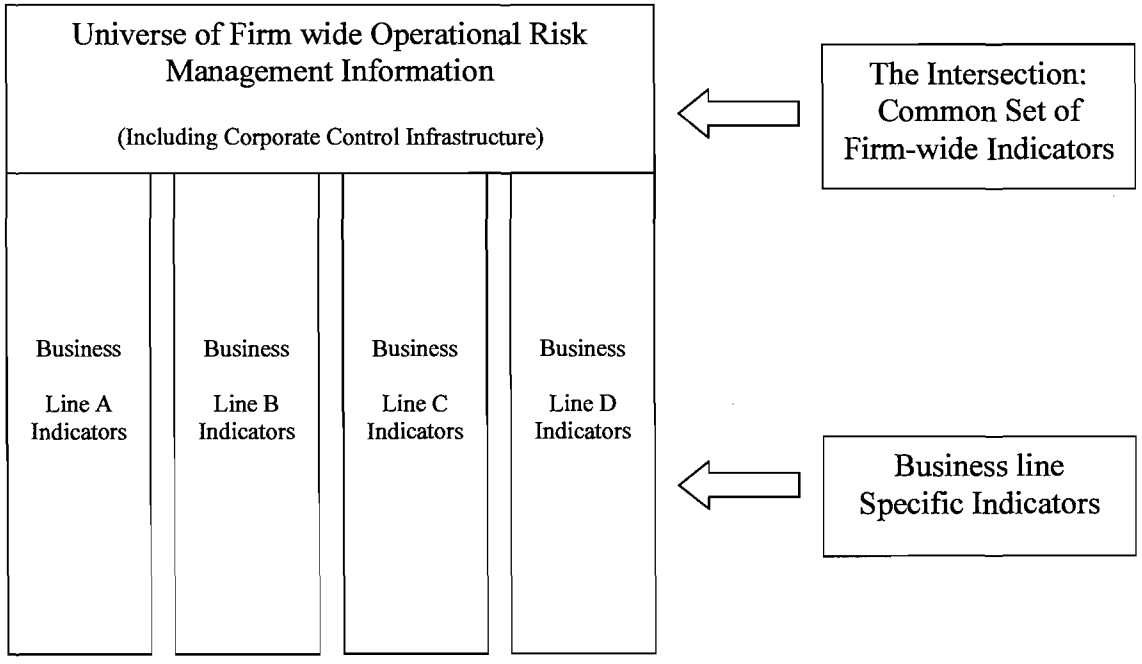
4.3.3 Risk indicators by risk class

This classification includes mapping of KRIs into risk classes (Hoffman, 2002: 241). For consistency within the study, this chapter will use people, relationships, physical assets, technology/processing and other external risk classes. Each area implies its own set of KRIs as drivers or predictors of operational risk and loss (see Table 4.3 and Chapter 5).

4.3.4 Business-specific vs. firm wide KRIs

The third main group of KRIs is the categorisation of KRIs by the breadth of their application across the entire institution (Hoffman, 2002: 241). Business-specific KRIs are indicators that define an individual business type, for example a trading bank would at a minimum track transactions, settlements, and failed trades, whereas a retail bank would track numbers of customer accounts, complaints, teller shortages, etc. (Hoffman, 2002: 241).

Figure 4.4 Key risk indicators: Firm wide vs. business-Specific



Source: (Hoffman, 2002: 242)

Conversely, there are also firm-wide KRIs. Figure 4.4 sets the stage for the overall discussion on firm wide and business-specific risk indicators throughout this chapter. Firm wide KRIs include training dollars spent, employee error rates, and system technology as illustrated in subsequent figures (McPail, 2003: 16). Business-line specific measures will include unique variables by business line (McPail, 2003: 16).

The above section then concludes the discussion on the three main groups of KRIs. The next section will precede the evaluation of KRIs of operational risk by first evaluating the organisational considerations.

4.4 Organisational considerations

Due to inherent flexibility, risk indicators may be captured at various levels throughout the institution. For instance, at one level, risk indicators may be specifically defined and captured through different dimensions across the entire institution (Lopez, 2002: 19). Alternatively, risk indicators may be directed to cater specifically for risks associated with the very nature of certain business-line functions, productions, personnel, and other operational environmental factors (Lopez, 2002: 18). In other words, risk managers often think of risk indicators as either firm wide or business-specific in nature (see 4.3.4). That is in order to say that to establish a relative comparison from one business line to the next, risk managers will identify risk indicators that can be applied to any type of business line (Esterhuysen, 2003:135). These risk indicators are referred to as firm wide risk indicators, and as mentioned earlier, will include generic variables such as numbers of people, systems and customers (Taylor, 2006: 17). While these variables help to relate one business to the next, by making them comparable, they may become a bit too generic for the individual line manager. By soliciting management input, as stated by Hoffman (2002: 247), into the definition of risk indicators at various levels, however, and committing management to their systematic measurement, the risk manager increases the potential for buy-in to and credibility of the process. In other words, the trick is to find an overlap between firm wide and business-line risk indicators (see Figure 4.2).

The identification process of risk indicators, as described by Davies and Haubenstock (2002: 41), will benefit from the involvement and input of several management levels that will

contribute to a flexibility that allows for different perspectives. In the process of fine tuning the operational risk management programme in a bank, along with seeking measures appropriate to investment management operations, risk managers should target some front line managers for responses (Esterhuysen, 2003: 116). These managers focus more on predicted operational level risk indicators and therefore are more aware of deviations from existing performance measures.

The above concludes the evaluation of KRIs in terms of its organisational considerations. The aim of this study is not to scrutinise too closely the above-mentioned factors but rather to provide a mere glimpse of organisational considerations impacting on operational risk. Taking this into account, it is suggested that further research on the above is required. The following section of Chapter 4 will explain the process of identifying KRIs in the banking environment.

4.5 Identifying Key Risk Indicators

4.5.1 Introduction

Risk managers work at all levels within the institution/bank to identify and define variables, operational risk indicators, and composite operational risk indicators (Taylor, 2006: 16). These measures should contain an appropriate hybrid blend of firm wide and business-line indicators (Haubenstock *et al.*, 2004: 44). Identifying KRIs may be a significant step forward for many banks in that risk appetite can be clearly conveyed, risk and return optimised, and the achievement of primary goals through more effective operational risk management can be improved (Davies *et al.*, 2006: 1).

When banks establish indicators, there are a few primary objectives that must be kept in considered. It is important that indicators are risk sensitive, meaning; they must give insight into the events, which may result into losses (Lam, 2006: 7). This is easier said than done. Indicators should not only be consistent with changes in the business environment but also give insight into the risk of one business area or process impacting on another business area.

The aim of the following section is to understand basic fundamentals in identifying, specifying, and considering different methods to monitor and report KRIs.

4.5.2 Methods of risk identification

There are various methods used for the identification of risk indicators. However, it is unlikely that one particular method will be sufficient for the identification of all the risk exposures. A combination of methods might be required to effectively identify a bank's total exposure to risk. It should also be kept in mind that identification is a continuous process, in the sense that identified risks must be regularly monitored and new risks highlighted (Young, 2006: 53). The use of a systematic process for the identification of risk exposures will ensure that critical, potential risks are monitored and included in further analysis. The method used to identify risks will depend on the nature of the activities under review. Key risks indicators can be identified in a number of ways, some of these are (Young, 2006: 55):

- Workshops and interviews;
- Brainstorming sessions;
- Questionnaires;
- Risk process flow analysis, which involves mapping the processes of the business and determining the risk exposures that exist in these processes;
- Comparisons with other banks;
- Discussions with peers;
- Checklists;
- Loss history.

These methods are, however, mostly subjective, as they are usually based on the judgement and experience of participating staff (Davies *et al.*, 2006: 1). Therefore, accurate identification of the impact and likelihood of risk events occurring is difficult. Sometimes, actual loss data of external and internal events can provide management with an indication of the impact of events, which can serve as a measurement of the potential effect of events and the subsequent risk exposure of a bank (Theodore, 2002:

25). Nevertheless, this section's intent is to highlight some of the basic facts used to identify KRIs as stated by Davies *et al.* (2006: 3) and Lloyds (2005: 4). The following aspects are the most important to consider when identifying KRIs (Young, 2006: 60):

- The capture of both quantitative and qualitative data is an important aspect of identifying KRIs. Once identified, the risk manager can provide risk indicator reports and scores to appropriate management levels for action.
- Risk and performance indicators must be calculated. It is also important to keep in mind that different risk indicators are used at different levels and in different areas.
- The best risk indicator will be forward looking or predictive in order to be useful as either a modelling or management tool.
- Quantification is important but if any institution limits itself to tracking only those risk indicators that can be readily quantified, it may be missing issues that are more relevant. Relative-ranked scoring can assist in bridging this gap.
- Risk indicators should be relevant to a business. Business staff and managers should be involved in selecting the key risk indicators that are most relevant to their risk and performance.
- Model factors are different and risk indicators or factors used for modelling should be simplified. Whereas a business or profit centre might use numerous risk indicators to track its business, it can be very confusing to use all of the risk indicators in modelling. In other words, keep risk indicators relevant to the business, meaning that business staff and managers should be involved in the identifying process of KRIs.

The above mentioned aspects are the most important to consider when identifying KRIs, but are not specific requirements and should serve only as a guideline. None of these will have an impact if KRIs are not reported correctly and in a timely manner (see 4.5.4).

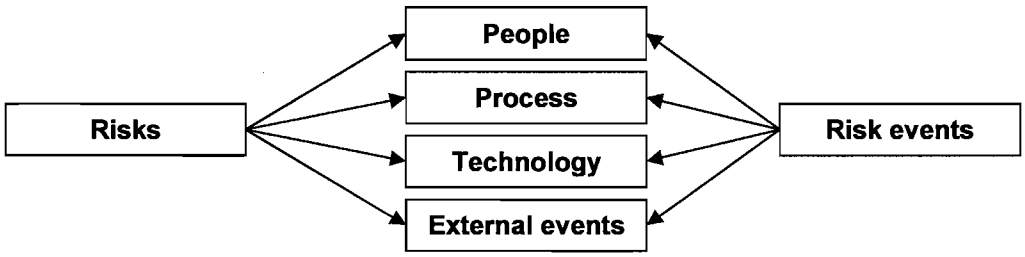
4.5.3 Procedures for risk identification

During risk identification, it is important, firstly, to determine the aim and underlying objectives of the process. The objectives of risk identification could be e.g. the raising of risk awareness, the tracking and monitoring of risks, and the assessment of the financial

impact. These objectives cannot be achieved without a risk identification process (Lam, 2006: 7). The process for identifying KRIs is as follows:

- *Step 1*: Background work. This implies that the banks' make use of its risk assessment methods to identify only the KRIs for the top ten risks – this will come from the bank's risk system, for example, pull top 5/10 risks from the risk reporting system as illustrated by Figure 4.5. It is also important to obtain all of the management reports in the bank to help with the identifying KRIs in that lists are drawn up of existing indicators from management reports that can potentially be linked to these risks.

Figure 4.5 Reporting system per risk category



Source: (Compiled by the author)

- *Step* 2: Research for more indicators that might be applicable to these risks[1].
- *Step 3*: Workshop with the bank (never go in a workshop without a proposed set of KRIs) where KRIs are defined in terms of meaning, measure, and use.
- *Step 4*: Define thresholds.
- *Step 5:* Determine data availability.
- *Step 6*: Assign data owners.

Sometimes, it is also necessary for potential risks to be identified before a new venture is embarked upon, e.g. in the event of the development of a new product, a joint venture or a

[1] Look for potential indicators on the international website KRIex.org.

merger. Thus, the risk identification processes can be either of the following (Young, 2006: 56):

- *Continuous risk identification process:* During this process, risk identification is regarded as an ongoing process in order to enable the identification of risk exposures in the business strategy. As circumstances change, it is imperative that the risks involved which could have a negative influence on the achievement of business objectives, are understood and appreciated. Accordingly, this step is an important part of a continuous operational risk management process.
- *Once-off risk identification process:* This entails the identification of operational risk during a process so that the feasibility of a proposed business decision is proactively determined. It would be performed, for example, during a due diligence process, before embarking upon joint ventures, mergers and acquisitions, or the development of new products or services.

Once the objectives of a risk identification process have been determined, the second step is the choice of the methodology. It is important that the method used is the one that will best suit the process. For example, workshops are a better option if all the role-players can attend, while questionnaires might be a better option when personal attendance poses a problem. According to a survey by Young (2002: 330), workshops, questionnaires and risk process analysis (process mapping) have proved to be popular methods for identifying operational risks. Table 4.1 is an example of business areas identified as harbouring inherent risks, and subsequent control measures that can be implemented as a result of an operational risk identification process.

Table 4.1 Example of identified inherent risks and control measures

Operational Risk	
Inherent risk	**Control measures**
Internal fraud	Segregation of duties Fraud prevention programme (whistle-blower) Direct supervision Authority levels Floor limits
System downtime	Daily back-up of records/documents Offsite back-up system (business continuity plans)

Source: (Young, 2006: 57)

Inherent risks are regarded as the major risk exposure of the business without any controls taken into account, while residual risk is the net risk after control measures have been taken into consideration. After the procedures for the identification of the risk have been decided upon, the proposed KRIs are then presented to management and thereafter thresholds[2] are defined. When defining thresholds it is important to keep the following in mind:

- Management targets;
- Previous year's averages (History);
- Risk appetite;
- Peer business area benchmarking;
- Keep to a colour-coded system for example green, amber and red.

When the risk indicators have been identified and appropriate thresholds are decided upon, it is the responsibility of the risk manager to compile a report for management, in other words, the various risk indicators in a bank need to be reported to management in an orderly fashion. The following section discusses how to achieve the latter.

[2] The point at which something begins or changes for example, green <= 10, amber 11-19, and red >=20.

4.5.4 Conclusion

Operational risk identification forms the first step of an operational risk management process. It attempts to identify the risk exposures and inherent risk of a bank according to its strategy and objectives. There are various methods for the identification of operational risk. Nevertheless, the use of more than one method, to eliminate the extent of subjectivity, might be necessary. The procedure for identifying risk involves, firstly, the choice of the identification method; secondly, the following of a structured and facilitated approach in order to identify inherent risk and current control measures; and lastly, reporting the relevant key risk indicators to management. The next section will describe more practical considerations regarding the identification, data collection, standards, management, and reporting of operational risk in a bank.

4.6 Practical considerations regarding identification, data collection, standards, management and reporting of operational risk

4.6.1 Introduction

Most of the effective operational risk management programmes will blend business line and corporate initiatives (Haubenstock *et al.*, 2004: 40). Clearly, working closely with management, from all levels within the institution, is essential for the long-term commitment and credibility of a risk measurement process. Risk indicator definitions will consider the rationale for the risk indicator, description of rating or measurement criteria, and the sources of data (Taylor, 2006: 19). When the risk indicators are defined, procedures must be implemented to ensure the systematic collection of accurate and timely data to monitor and analyse the underlying risk indicators. The risk indicators may also be weighted according to their significance, or predictive capabilities, to ensure the accuracy and relevance throughout the various levels of the bank (Haubenstock *et al.*, 2004: 43). Once measured, the set of risk indicators must, in practice, be continually formalised and refined, with inputs from the management responsible. Naturally, as the business environment is subjected to continual change, underlying risk indicators may also require enhancement to preserve integrity and their predictive capabilities (Hoffman, 2002: 249). Banks should therefore select

risk indicators based on their predictive value first, and data availability second, not the other way around (Haubenstock *et al.*, 2004: 43).

In any event, although data may be readily available within banks, for many variables and risk indicators it should be noted by management, that a full set of effective composite risk indicators (see 4.3.2.4) would generally impose even more responsibilities on data collection and reporting (Yam, 1998: 4). As Esterhuysen (2003: 114) mentions, capturing operational loss data has become a fundamental feature within the risk management framework of many institutions. The analyses of operational losses (including causative factors), in combination with the associated risk indicators, form the evaluation stage of the operational risk management process. Management should consider whether the risk measures in the bank have been validated as relevant, including whether they proved to have some direct relationship to the propensity of loss.

It is not the aim of this study to evaluate the above-mentioned in too much detail, but rather only to provide a better understanding regarding the practical considerations, in terms of the definition, data collection standards, and emphasis of risk indicators. The following section of Chapter 4 will further evaluate KRIs in the banking environment by looking at the implementation of an operational risk indicator system to form the base for identifying and monitoring operational risk in the ALCO process of a bank.

The following are the main phases and activities that form part of the operational risk indicator system (Esterhuysen, 2006: 85, 93):

- Identification;
- Data collection;
- Validation of operational risk indicators;
- Management;
- Reporting.

The above-mentioned phases will be discussed in more detail in the following sections.

4.6.2 Identification

In theory the various methods to make use of in the identification of risk are outlined as discussed in Section 4.5.2. Considering the practical side of risk identification will be briefly discussed. Risk managers, are on a daily basis, identify and define variables, operational risk indicators, as well as composite risk indicators, across all levels within a bank. The measures used by the risk managers should contain an appropriate hybrid blend of firm wide and business-line indicators (Esterhuysen, 2003: 126). The business line managers are responsible for ensuring compliance in the identification of risk indicators by means of an operational loss data collection methodology. The operational risk management function is responsible for providing guidance on the interpretation of the policy, for example, in the case of a large operational loss (Esterhuysen, 2006: 86). While the operational risk function is responsible for guidance and interpretation, soliciting management input in the identification of risk indicators, will assist in the establishment of credibility and durability of the process.

Nevertheless, the identification of risk indicators has no meaning if these indicators are not communicated to management. Risk indicators are identified, from time to time, that do not fit into the existing methodology. When a staff member captures such an event/incident, the risk management function must be notified to provide appropriate guidance. If the incident is not resolved, it must be discussed by the operational risk committee. The committee has to make a decision and ensure that it is fed into the operational risk loss database for implementation, if approved (Esterhuysen, 2006: 86).

4.6.3 Data collection

The collection of data/information is the first activity in forming an internal loss database for operational risk in a bank (Haubenstock *et al.*, 2004: 43). Staff across the bank, or in a certain department, collect information required to analyse operational losses. If required, staff interacts with one another where operational events occur (Young, 2006: 50) that affect more than one department. The operational risk committee establishes continuous procedures for systematic data collection, and the reporting and analysis thereof (Young,

2006: 50). The reporting and analysis must be tailored so as to facilitate the collection of data across the various levels of the bank.

Collected data is classified into appropriate categories, based on the seven Basel categories, according to Young (2002: 112). Table 3.1 is reproduced again here as Table 4.2 as it illustrates the different events for which data needs to be collected. Additionally, it is important that every department in the bank has access to the operational loss data collection tool. If not, it will lead to inaccurate data and the operational risk will not be reflected accurately by the operational losses reported in the relevant database (Esterhuysen, 2006: 88).

Table 4.2 The Basel event category

Event type	Definition	Category
Internal Fraud	Losses due to acts, intended to defraud, misappropriate property, or circumvent regulations, the law, or company policy, excluding diversity/discrimination events, which involve at least one internal party.	3. Unauthorised activity 4. Theft and fraud
External Fraud	Losses due to acts, intended to defraud, misappropriate property, or circumvent the law, by a third party.	3. Theft and fraud 4. System security
Employment practices and workplace safety	Losses arising from inconsistencies in employment, health or safety laws or agreements, from payment or personal injury claims, or from diversity/discrimination.	4. Employee relations 5. Environmental safety 6. Diversity/ Discrimination
Clients, products and business practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients	5. Suitable, disclosure, fiduciary 6. Improper business or market practices 7. Product flaws 8. Advisory activities
Damage to physical assets	Losses arising from loss or damage to physical assets from natural disasters or other events.	2. Disasters and other events
Business disruption and system failures	Losses arising from disruption of business due to system failures.	2. System
Execution, delivery and process management	Losses from failed transaction processing or process management, from relations with trade counterparts.	5. Transaction capture 6. Monitoring and reporting 7. Customer intake documentation 8. Trade counterparts

Source: (BIS, 2004: 33)

4.6.4 Validation of operational risk indicators

It is essential that a mechanism is put in place to ensure the periodical evaluation and updating of the operational risk indicators. This will result in longevity of the process and management will have faith in the effectiveness of the operational risk indicators. Operational risk indicators should be evaluated in the light of actual loss data, to determine their predictive capabilities and must be responsive to the changing business environment (Young, 2006: 52). Operational risk events (losses) and internal audit[3] findings play a major role in validating KRIs. KRIs must always be linked to the major audit findings as well as the risk category where most losses are recorded in a bank. If a KRIs cannot be linked to any of these, then it is not "key".

4.6.5 Management

When managing operational risk indicators it is very important that the collected data on the submitted operational loss events are analysed and verified. It is the responsibility of the data manager to analyse operational loss events and group causal events (common themes/joined events) obtained from information submitted by the various departments in the bank (Young, 2006: 52). The data manager must identify the relevancy of the operational loss event by identifying whether the event is a high impact or high frequency event. This will provide additional management information to the department managers for appropriate action (Esterhuysen, 2006: 91). In other words, the data manager provides input into the analysis of the root causes of these events, and then also assists in developing remedial actions (Esterhuysen, 2006: 91). These concepts will be further expanded upon in Section 4.7 during the discussion on how to control the identified operational risks.

4.6.6 Reporting

The reporting of risk indicators is essential to the successful management of operational risk in a bank. The reporting system comprises of internal as well as external reporting.

[3] It is an assessment activity that is conducted by auditors, within a bank, of diverse operations and controls within a bank to determine whether prescribed policies and procedures are followed, established standards are met, resources are used efficiently and economically, and the bank's objectives are being achieved.

With regards to internal reporting, monthly reports must be submitted to supervise operational loss data, where these reports are revised by the Chief Risk Officer (CRO), the Chief Financial Officer (CFO) and the BoD (Esterhuysen, 2006: 91). The reporting of the KRIs, and the way it is presented, is probably the most important aspect for KRIs to be effective in identifying and monitoring an institution's current exposure to operational risk (Young, 2002: 113). In almost all major financial institutions, risk managers, business, and more so executive management, have little or no time to read through lengthy reports. This implies that the internal reports should never be detailed reports, but should only deal with major risk events (losses) for the given day/week/month. It is also important to consider the frequency of KRI reporting (Young, 2002: 221). Some major banks have decided to report KRIs on a daily basis, while others report on a weekly basis, and it is not unusual for some to report on a monthly basis. This is very dependent on the number of risk sources and the availability of the data in a bank or the nature of the KRI (Lloyds, 2005: 5). When reporting KRIs, thresholds have to be established as mentioned, and these thresholds should be tied to the KRIs in order to alert management when there are changes in the KRIs and highlight potential problem areas. Most major institutions use the traffic light approach (see Table 4.3) to monitor KRIs by means of thresholds (Esterhuysen, 2006: 105) as explained in by the following:

- *Green*: Low risk (low significance); the KRI is not a concern for the institution at present.
- *Amber*: Medium risk (medium significance); the KRI is starting to become a concern. Management must focus on this, and must monitor it to establish any changes in the trend.
- *Red*: High risk (high significance); this KRI is now a major concern for the institution and for management - it indicates a potential increase in the operational risk exposure. It is important that management now determines whether this may cause a loss (direct or indirect) and if the necessary controls are in place.

The responsibility lies with management to determine when KRIs will be green, amber or red. This will ultimately depend on the risk appetite of the BoD and the management of a bank or on the nature of the business a bank is conducting. For example, as illustrated by

Table 4.3, in some areas it is normal to have around, five hundred overtime hours per month, but in other areas it will be unacceptable to have more than fifty overtime hours per month (Lam, 2006: 8). It is not necessary to report the KRIs when the indicator is classified as being green. If a KRI is amber it is only an indication that it should be monitored more closely in order to determine whether it will change to red or will stay amber (Esterhuysen, 2006: 105). Mostly, it is only the risk managers that keep record of indicators that are classified as amber and they will only highlight it when it goes to red, along with the necessary action plan to manage the risk at hand (Lam, 2006: 8).

Table 4.3 Reporting of KRIs[4]

Jan-07	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Green	Amber	Red
1. Client Service												
1.1 The number of customer complaints	8	10	4	23	8	17				<100	100-200	>200
1.2 Average resolution time (days)	1	1	6	2	3	2				<=1	2	>2
1.3 Number of complaints that took longer than 1 day to resolve	0	2	1	11	1	4				<=10	11-15	>15
1.4 % of cards delivered within the specified SLA timeframes	86	80	82	79	76	77				>=95	94-90	<90
1.5 Percentage of new clients contacted within 2 weeks	100	100	100	100	100	100				>=95	94-90	<90
1.6 Closed Accounts	226	275	216	266	173	160				<150	150-175	>175
2. Fraud												
2.1 Total monthly fraud (basis points)	6.3	11.6	11.9	8	11	13				<=8	8-10	>=10
2.2 Fraud per type - Lost	25,000	27,000	7,700	14,353	16,355	7,168				<25k	25k-30k	>30k
2.3 Fraud per type - Stolen	119,800	339,700	261,065	184,519	214,871	182,777				<300k	300k-400k	>400k
2.4 Fraud per type - Counterfeit	350,000	299,800	374,700	389,594	386,344	696,507				<400k	400k-500k	>500k
2.5 Fraud per type - CNP	260,800	298,800	152,200	148,292	147,936	190,846				<200k	200k-300k	>300k
3. Card Recoveries												
3.1 Net growth in 30-180 days (in millions)	59.8	65.0	59	56	78	54				<60M	60M-70M	>70M
3.2 Legal Managed book (in millions)	15.9	15.6	12	10.4	12	13.7				<16M	16M-18M	>18M
3.3 Monthly write-offs	600,000	2,300,000	2,700,000	2,870,000	0	0.0				<500K	500K-800K	>800K
4. Internal Audit												
4.1 Significant audit findings for the month	0	0	0	0	0	0				0	0	>=1
4.2 Significant audit findings older than 60 days	1	1	1	1	1	1				0	0	>=1

Source: (Compiled by the author)

[4] The KRIs as well as the statistics used in Table 4.3 are fabricated to facilitate a clear view on how KRIs are presented/reported to senior management, in general.

In terms of external reporting, the South African Reserve Bank (SARB) may, on an ad hoc basis, require a bank to provide a detailed operational risk report to ensure that the bank in question has sufficient control over its operational risk exposure. Although this report is on an ad hoc basis, in most cases annual reports are required and should be included as an annexure to its financial statements (Esterhuysen, 2006: 91).

Not only is it important for internal and external reporting, but a bank has to ensure that it is compliant with the regulations of the Basel Committee, in order to qualify for one of the three Basel Capital Allocation Approaches (see Chapter 3). Therefore, if needed, it is the responsibility of the data manager and the head of risk management in a specific area to ensure that the operational loss database and the operational loss data meet the requirements of the Basel Committee (Young, 2002: 140).

4.6.7 Conclusion

In accordance with the principles of operational risk management, as outlined by the Basel Committee (see Chapter 3), operational risk and exposure indicators should be transparent and reasonable, with any underlying assumptions clearly communicated to end users. The transparency and easy availability of operational risk indicators is essential for the long-term integrity of this aspect of a risk management framework. Operational risk indicators have become a critical component of effective operational risk management programs in banks. Successful business managers make use of key performance indicators (KPIs) (see 4.1) to estimate business efficiency and profitability upsides and feed this data into the operational risk indicators database for analysis. As can be seen throughout Chapter 4, operational risk indicators simply serve as a measurement of potential downside outcomes. When applied and presented effectively, operational risk indicators should serve to identify important vulnerabilities within the ALCO process, or as warning lights to enable the ALCO to navigating a path clear of the present dangers within its bank's environment.

Identifying and tracking operational risk indicators is only half the battle. After the identification of risk in a bank/business line, it is of utmost importance that management address these risks. In other words the appropriate control measures should be put in place

to manage the identified risks effectively. Section 4.7 deals with this issue by discussing the control of identified risk in a bank in more detail.

4.7 Controlling identified risk

4.7.1 Introduction

Having performed risk identification, a bank's management should take steps to manage and control the risks facing the bank. Risk control involves those activities designed for the purpose of eliminating or reducing those factors that may negatively influence the strategic objectives of a bank and may cause a loss to the bank (Young, 2006: 88). When preventive methods are ineffective at averting a loss, the controls should ultimately minimise the loss. Risk control can thus be seen as an activity designed to mitigate risk (Bloemendal, 2008: 4).

Effective risk control requires a well-supported strategic risk management programme (see Chapter 2) (Muehlen, 2007: 38). The programme should be governed by a clearly defined risk management strategy that is consistent with a bank's business strategies and its objectives. It is important that controls are established for the identified risks that the bank intends to manage (Muehlen, 2007: 38). This emphasises the importance of the identification as well as the evaluation of the risk before the formulation of control measures (Alexander and Sheedy, 2005: 78). This component of the risk management process in the bank can include activities such as the implementation of policies and procedures, internal controls, risk reporting (see 4.5.4), and decision-making, as well as the determination of an organisational structure to form the basis of the process (Young, 2006: 88).

However, it is important that after the controls have been formulated, management ensures that they are aligned with the bank's objectives. It is important that all management components are aligned to work together towards a positive and common risk profile.

4.7.2 Concept of risk control

Controlling risks entails any activity that is aimed at the prevention of losses, the minimisation of the consequences of losses that may arise from any risks facing a bank, and the pre-emptive or reactive handling of adverse events (Young, 2006: 88). It is essential for a bank to have the following three types of risk controls in place to ensure the mitigation of operational risk (Financial Services Authority, 1999: 21):

- *Preventative controls*: These control measures pre-emptive and are put in place in order to prevent a loss event from occurring, for example, segregation of duties in order to prevent fraud and errors by employees.
- *Detection controls*: These are control measures that ensure that a loss event is identified as soon as it occurs, in order to control the effect on the organisation and to put preventative controls in place to prevent a re-occurrence.
- *Contingency controls*: These control measures are necessary in order to ensure the sustainability of the organisation or business area once a risk event has occurred, for example, a back-up site that is available if a computer centre is flooded.

It is also important that the subset of risks that contribute to each main risk factor of operational risk be recognised in order to match the relevant mitigating controls to these risk indicators (Alexander and Sheedy, 2005: 81). Table 4.4 demonstrates how underlying risk factors can be mapped according to mitigating controls.

Table 4.4 Operational risks mapped according to mitigating controls

Primary source of operational risk	Mitigating systems and controls
Unskilled staff	Detailed job descriptions; training programmes; disciplinary and appraisal procedures; supervision
Human error	Checking procedures and supervision; segregation of duties; IT systems
High turnover of staff	Competitive compensation; performance-related pay; career planning; working environment; disciplinary and appraisal procedures
Fraud and theft	Segregation of duties; compliance culture; checking procedures and reporting lines; IT and physical security; supportive culture
Inadequate security systems	Virus control; detection systems and limited access for personnel; regular back-ups and protected records; manual copies of essential information
System infiltration	Firewalls and regularly altered access codes
Acts of God	Insurance; "disaster-proof" buildings and contingency planning; emergency procedures and training
Criminal activities	Security systems; emergency procedures and training; insurance
Outdated processes	Regular review and update of processes; monitoring procedures; training of staff

Source: Adapted from Financial Services Authority (1999: 22)

Activities to control risks are mostly aimed at the prevention of the adverse effect of a risk event or the minimisation of the negative impact of such an event on the bank, should it occur. Risk control programmes play an important role in ensuring that risk controls are in place. The main objectives of a risk control programme are as follows (Financial Services Authority, 1999: 23):

- A reduction of the potential effect of a loss;
- A reduction of the likelihood of a loss event occurring.

Therefore, a risk control programme implies a critical analysis of the risk indicators (the causes of loss) which is followed by action plans and procedures for managing and minimising the potential effects on the bank. Secondary objectives of an operational risk control programme are as follows (Financial Services Authority, 1999: 24):

- The avoidance of potential catastrophic losses.
- The generation of a broader understanding of operational risk issues at all levels of the bank.
- Enabling the bank to anticipate risks more effectively and be proactive in activating control measures.
- The provision of objective measurements of control performance.

Risk controls will never be faultless, but there are some characteristics of good controls that should be kept in mind. These are as follows (Financial Services Authority, 1999: 24):

- Controls should be logical, focused and verifiable;
- Controls need to be timely and accurate to be effective;
- Controls should be reviewed when deficiencies are identified;
- Controls should be constantly monitored and adapted to changing circumstances.

After the risks have been evaluated in terms of the impact and likelihood, it is possible to map them on a graph, which will indicate the risk mitigating decisions to be taken by management. These risk mitigation decisions will depend on the strategic approach of the bank in terms of the taking or avoiding of risks in order to achieve the bank's objectives (Alexander and Sheedy, 2005: 92).

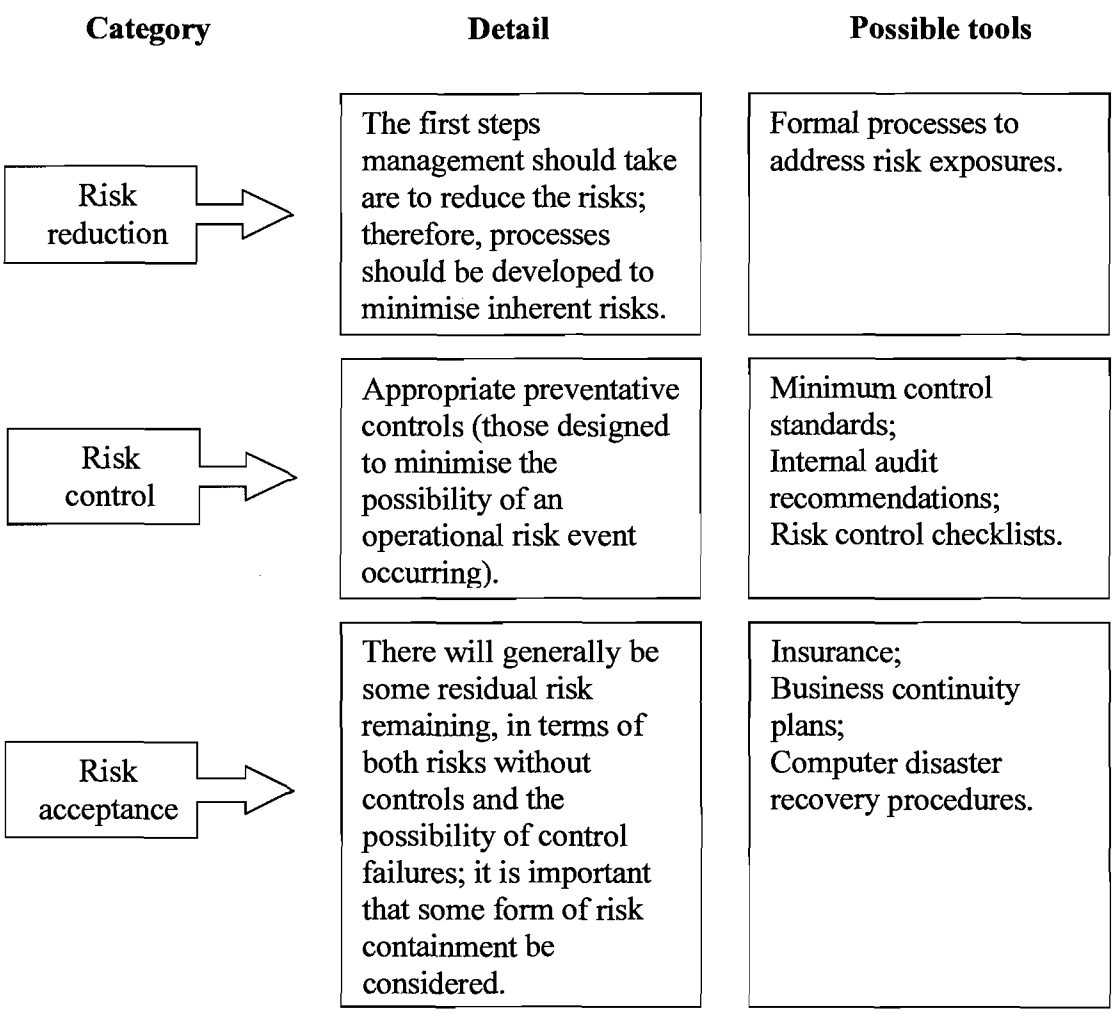
One of a bank's risk managing strategies, namely mitigation of risks, may be divided into the following three categories (as shown in Figure 4.6):

- *Risk reduction*: A first step for management is the reduction of the risk exposures of processes. Processes can be restructured or re-engineered in such a way as to eliminate or minimise the risk exposures. For example, a process for the implementation of a new product or service can be structured to include thorough risk assessments before its launch as well as the identification of potential risks and the proactive elimination of them.

- *Risk control*: Control measures are required to eliminate the risk exposure or minimise the negative effects should a loss event occur.
- *Risk acceptance*: After risk controls have been formulated to address the risk exposures, there will always be some uncontrolled residual risk remaining. This residual risk can be a result of certain risks that do not have mitigating controls, or those risk events for which the control measures have failed. Preventative internal controls should be formulated in order to reduce the risk exposure (Muehlen, 2007: 38).

In practice, risk mitigation is likely to be a combination of all three categories. The nature of this combination, however, will depend on the bank's approach to risk management, namely, whether it is a low risk-, no risk-, or high risk taking type of bank. It will also depend upon the costs of the controls and any benefits that may accrue in terms of a reduction in operational risk losses (Muehlen, 2007: 38).

Figure 4.6 Categories of risk control

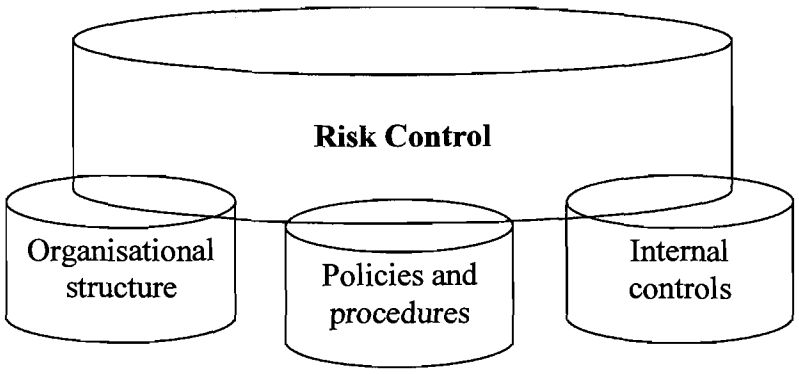


Source: Adapted from Rachlin (1998: 120)

4.7.3 Pillars of risk control

In order to ensure an effective risk control process, it is imperative that certain basic components are put into place. These components can be viewed as the pillars of risk control, and are shown in Figure 4.7.

Figure 4.7 Risk control pillars



Source: Adapted from Young (2006: 94)

The next sections discuss these components in more detail.

4.7.3.1 Organisational structure

Several organisations have central risk functions that deal with all aspects of financial risks, including credit, market, liquidity, technology, and operational risks. The key responsibilities of central risk management functions usually include the following (Alexander and Sheedy, 2005: 103):

- The establishment of risk management policies and procedures, including management reporting requirements;
- The coordination or guidance of day-to-day risk management activities;
- The identification of global risks that may influence an organisation's risk exposures;
- The research, review and approval of risk management methodologies and models in order to ensure the implementation of best practices;
- Coordination with audit and compliance functions in order to ensure that biased activities comply with laws, regulations, policies and procedures;
- The reporting of risk management results to executive management and the BoD, as well as other interested parties.

The modern approach towards risk management involves the establishment of a centralised management structure, as a controlling body, within a bank in order to ensure effective overall risk management. For a number of years, senior management has taken a closer interest in operational risk for the following reasons (Alexander and Sheedy, 2005: 104):

- Regulatory attention and senior management commitment;
- An increase in operational risk exposures;
- An increase in major loss events that have occurred internally and externally;
- A focused approach to enterprise-wide risk management.

The following pillar, which supports effective risk controls, consists of the policies and procedures for operational risk management.

4.7.3.2 Policies and procedures

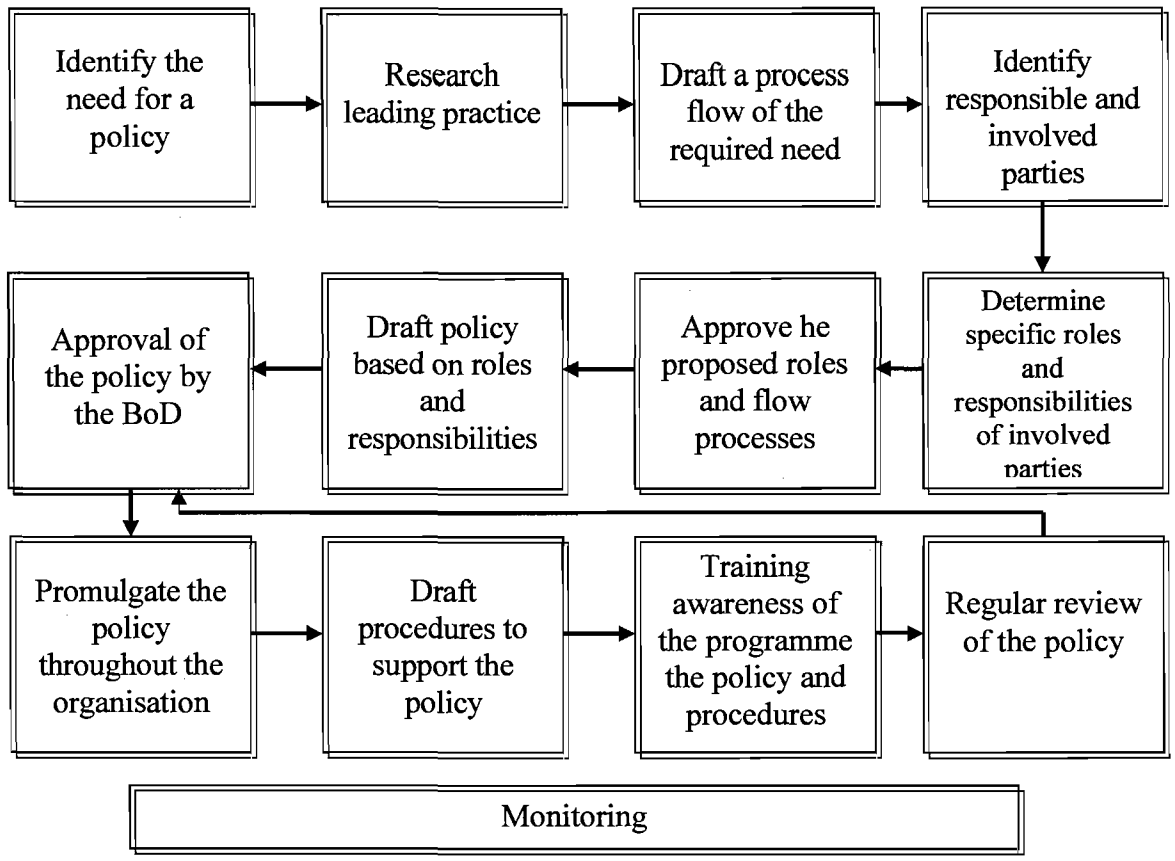
Formal policies and procedures are necessary in order to provide consistency and discipline, and can also be effective in keeping the focus on the bank's objectives. A bank's risk management policy statement should define its approach to risk management and clarify the overall roles and responsibilities of the relevant personnel (Clements, 1999: 34). It is necessary that risk policies are approved by the BoD and adopted by senior management. In order to ensure the positive contribution of policies and procedures to the bank's operations, it is important that they are regularly updated and in line with the bank's strategy, business and internal operations.

It is crucial that a risk management policy is consistent with the organisation's mission, culture and management philosophy (see Chapter 2) (Young, 2006: 93). In order to ensure that all policies are carried out daily, complete and thorough operating procedures should be documented and communicated to the appropriate staff. The procedures should contain details on specific actions to be taken for the effective management and control of risks (Clements, 1999: 35). Policies must be crisp and clear. It is imperative that a structured process is followed in the formulation of a policy. Figure 4.8 shows such a process. It is important to note that not all of the steps illustrated in Figure 4.8 will be discussed;

attention will just be given to the main steps involved in the structuring of a risk management process. Figure 4.8 demonstrates that the first step in a process for the formulation of a policy is the identification of the need for a policy. This need is reflected in the aim of the policy. The policy is a method to communicate management's views on specific business-related activities (Crouhy *et al.,* 1998: 47). The risk policy will serve as a guideline to business units on how to manage their risks, and can be used as a control measure to determine how efficient business units are in managing their risks.

The second step involves researching leading practices in order to determine the criteria of similar policies that can serve as guidelines in the drafting of a risk policy (Clements, 1999: 35). In the third step, a process flow must be developed for the specific business activities to enable the determination of the roles and responsibilities with regard to managing risks (Crouhy *et al.,* 1998: 47). These roles and responsibilities will form the basis for a risk management policy. It is important that the support of all the role-players is obtained before a draft policy is finalised.

Figure 4.8 Structured processes for the formulation of a risk management policy



Source: (Young, 2006: 96)

The next important step is the formal approval of the policy. A risk management policy usually affects the whole bank and should thus be approved by the BoD (Clements, 1999: 35). After approval, the policy must be promulgated throughout the organisation and the procedures implemented within the policy framework. Finally, the training of involved employees is necessary to enable them to perform their roles within the framework of the policy, and according to its procedures. Regular review and monitoring of the policy is necessary to ensure that it remains applicable and that it is adapted according to changes and new developments.

4.7.3.3 Internal controls

As soon as the bank's policies and procedures have been approved, internal controls should be established in order to ensure the implementation and effectiveness of these policies and procedures. The Basel Committee (1998b: 8) stated that an internal control is a process that affects everyone from the BoD to all levels of personnel. It is a continuous operating process at all levels within an organisation. The following are examples of some of the main objectives of internal controls (BIS, 1998b: 2):

- Ensuring the orderly and efficient execution of business activities;
- Adherence to management policies;
- Safeguarding the assets of the business;
- Ensuring the efficiency and effectiveness of activities;
- Producing reliable, complete and timely financial and management information;
- Compliance with applicable laws and regulations.

The Basel Committee (1998a: 2, 5) stated that a sound internal control process is critical for the ability of an organisation to meet goals and to maintain financial viability. Subsequently, it identified the following interrelated elements of internal control (BIS, 1998b: 2):

- *Management direction and the control culture*: The BoD, for example, should provide governance, guidance and direction to senior management. The BoD is also responsible for the approval and review of the overall business strategies and significant policies of the organisation, as well as the organisational structure. Top management is responsible for the promotion of integrity and high standards of ethics, and for the establishment of a culture within the organisation that emphasises and demonstrates, to all levels of personnel, the importance of internal control.
- *Risk recognition and assessment*: An effective internal control system requires the recognition and continual assessment of the risks that could adversely affect the achievement of an organisation's goals.
- *Control activities and segregation of duties*: Control activities should be an integral part of the daily activities of an organisation. This necessitates an appropriate control structure

with the performance of defined control activities on every business level. This, in turn, also necessitates a segregation of duties in order to ensure that personnel, for example, are not assigned conflicting responsibilities that could have a negative impact on business.

- *Information and communication*: An effective internal control system requires comprehensive internal financial, operational and compliance information, as well as external market information regarding events and conditions that are relevant to decision-making. An effective communication system is required to ensure that the information is available to those who need it.
- *Monitoring activities and the correction of deficiencies*: The overall effectiveness of an organisation's internal controls should be monitored continuously. The monitoring of key risks should be part of both the daily activities of an organisation, and the periodic evaluations of the business lines, as well as form part of the internal audit.

Effective internal controls will add to the effectiveness of a bank's risk management process. Most large organisations view internal controls as the major tool for the management of operational risk, and include components such as segregation of duties, clear management reporting lines and adequate operating procedures (Young, 2006: 95). Many banks expect most operational risk events to be associated with internal control weaknesses or a lack of compliance with existing internal control procedures. The Basel Committee (1998b: 6, 7) has identified five types of control breakdowns, which have recently led to substantial losses at banks and can be summarised as follows (Young, 2006: 98):

- Lack of adequate management supervision and accountability, and the failure to develop a strong culture within the bank;
- An inadequate assessment of the risk of certain banking activities;
- The failure or absence of key risk control activities, such as segregation of duties, approvals, verifications, reconciliation and reviews of operating performance;
- Inadequate communication of information between different levels of management within the bank, especially in the upward communication of problems;
- Inadequate or ineffective audit programmes and other monitoring activities.

Thus, it is clear that a bank's BoD and senior management, not just the internal audit and compliance departments, are mainly responsible for controls. As part of the fostering of the appropriate control culture within the bank, senior management should ensure that adequate control activities are an integral part of the daily functions of all relevant personal, on all levels. It involves the elimination of factors that may cause a loss and the minimisation of the effect of the loss event if it was to occur.

4.8 Conclusion

The aim of Chapter 4 was to determine what key operational risk indicators are and how to identify and control these key operational risk indicators. This knowledge will be put into practice in chapter 5 to identify KRIs for the ALCO and ALCO process. Chapter 4 placed great emphasis on key risk indicators (KRIs), where KRIs were identified as indicators of potential risk to a bank. KRIs should thus, when applied and reported effectively to the BoD and senior management, serve to identify important business vulnerabilities or provide a set of warning lights, to navigate the bank clear from the dangers presented by the operating environment of the bank.

It is important that KRIs must be confirmed as indicators of operational risk and then they can serve as part of an early warning system and can also be used in modelling. The best risk indicators will ultimately be those which are forward looking or predictive in order to be useful in either modelling or as a management tool. Whereas Section 4.1 to 4.6 have provided a theoretical discussion on the key indicators of operational risk, Chapter 5 will discuss and evaluate these key operational risk indicators in the ALCO by means of a case study in a specialised niche bank in South Africa.

Chapter 5

Key Operational risk indicators in the ALCO: A case study

5.1 Introduction

Chapter 4 explained that one of the main objectives, for operational risk managers, is to be able to identify and evaluate key indicators of operational risk in the banking environment. The identifying or constructing of metrics that serve as predictors of operational risk is a key challenge in dealing with operational risk indicators. A few years ago, most operational risk indicators were trailing in nature to other risk indicators, for example credit risk indicators. This was due to the fact that not enough attention had been given to the development of effective operational risk indicators. Nevertheless, banks have made tremendous efforts in incorporating the identification and management of operational risk with the aim to be Basel II compliant.

With much attention given to firm wide operational risk, specific business line operational risk has been left wanting. In the midst of banks being caught up in the hype of firm wide operational risk, in order to provide an overall view of the institution's operational risk exposure, they have overlooked the importance of identifying operational risk indicators for specific business lines. Rationally thinking, the different business lines make up a bank and its functioning as a business. Thus, instead of conforming to the norm of focussing on identifying only firm-wide operational risk indicators, banks should start focussing on the most important business lines which keep the bank functioning optimally.

With the implementation of such a culture in a bank the question now asked is: "With banks being Basel II complaint, why is it that financial crises are still found in markets in our day and age?" Take for example the credit crunch experienced in the American markets. All in all it boils down to institutions' assets and liabilities not being managed in accordance with one another. This may be due to the absence of a formal ALCO in a bank

or the failure of the ALCO process, if in place. It is the view of this study that the failure of the ALCO process in banks today, is caused by a lack of monitoring and managing operational risk in the ALCO of a bank. It is the aim of this chapter to demonstrate the identification/measurement, and management of operational risk in the ALCO by means of a practical case study.

To identify and evaluate the key indicators of operational risk in the ALCO process is an enormous task. It is, therefore, important to keep in mind that the operational risk indicators identified and evaluated in this chapter, are not the only indicators of operational risk in an ALCO, but can be regarded as amongst the most important.

5.2 Key operational risk indicators in the ALCO process

5.2.1 Introduction

Before this section proceeds with the identification of key operational risk indicators in the ALCO, the specialised niche bank in which the case study was conducted will be briefly discussed. A smaller bank was decided upon, the niche bank, where the ALCO and the ALCO secretariat are still one strategic unit as described in Chapter 2. In larger banks, namely the "big four" retail/commercial banks the traditional ALCO, as stated in Chapter 2, can be divided into sub-committees. The problems experienced in the large banks remain the same, however[1]. To keep the focus of the investigation within the theoretical framework of the previous chapters the case study was conducted in the niche bank.

The niche bank requested to remain anonymous. Because of this, the description of the bank is very vague. The niche bank provides financial services to specific sectors and associated industries in the South African financial market. The aim of the niche bank is to make new, suitably designed financial products available to its clientele that will facilitate them in accessing finance in their specific sectors of the South African economy. Over time the niche bank developed into a bank that is a true South African development finance

[1] See e.g. the detailed discussion in Esterhuysen (2006).

institution that serves all its clientele equally. The mission of the niche bank is amongst others:

- To develop and provide appropriate products for commercial and development clients;
- To leverage private sector investment for the industry;
- To develop partnerships with intermediaries for on-lending;
- To develop techniques for financing high-risk ventures and new business areas;
- To contribute to rural development by linking up with government structures and activities.

The case study was conducted by means of a structured interview with an ALCO expert in the niche bank. The interview followed a structured layout that was guided by the underlying theory as discussed in Chapter 2. From the interview it was clear that there are various operational risk indicators present in the ALCO process of the niche bank. The following section will describe these key risk indicators of operational risk identified in the ALCO process of the niche bank. During the investigation into the perceived sub-optimal performance of the ALCO process in the niche bank, it was decided to classify the operational risk indicators into five main groups:

- Employee indicators,
- Authority levels,
- Model indicators,
- System technology indicators,
- Other.

Along with the discussion of the above mentioned categories, the aim of this section is to provide viability to each of the identified indicators. During the investigation the various risk indicators were grouped and sub-indicators established and measured to indicate their current impact on the ALCO process of the niche bank. These sub-indicators, arrived at by conferring with the ALCO specialist, are reported by means of rating the indicators on a score between 1 and 7. The scores can be interpreted as follows:

- Where 1-2 are an indication that the indicator is considered a low priority (green), meaning the KRI does not raise concern within the ALCO process at the present.
- Where 3-4 is an indication that the indicator is considered a medium priority (amber), meaning the KRI is starting to become a concern. Management must focus on this, and must monitor it to establish any changes in the trend.
- Where 5-7 is an indication that the indicator is of a high priority (red), meaning this KRI is now a major concern within the ALCO process and for management - it indicates that this specific factor/issue has a severe negative impact on the efficiency of the ALCO process that warrants managements' immediate and intensive corrective attention.

The rest of Section 5.2 will discuss the various employee-, authority level-, model risk-, system technology-, and other indicators and summarise the results in their respective tables.

5.2.2 Employee indicators

This section will name and describe the different employee indicators of operational risk in the ALCO process of the niche bank. Although the ALCO is seen as a specific business line in the bank, employee indicators identified here can also be seen as firm wide indicators of operational risk because they are detectable in all of the business lines of a bank, but this is not the intent of this study. This study aims to identify employee indicators on two levels, namely the ALCO secretariat (see 2.5.2) and the ALCO members (see 2.5.2).

5.2.2.1 Employee turnover

Employee turnover is the rate at which employees are leaving and new employees are joining the ALCO and the ALCO secretariat. The higher the employee turnover within the ALCO process, the more time must be spent on training these new employees. The higher the number of inexperienced employees relative to the more experienced employees, the higher the exposure to operational risk in the ALCO process. In the investigation it was

found that employee turnover has a low negative impact (green) within the ALCO process in the niche bank with an overall score of 2 (see Table 5.1).

5.2.2.2 Experience levels of junior and senior staff

This indicator highlights the impact of the relative inexperience of employees involved in the ALCO process. Within the context of the bank's ALCO, the members of this process are preferably experts/specialists in the field of managing the assets and liabilities of a bank. In other words, the more inexperienced employees are, the higher the potential will be for an employee error to occur, leading to the possible failure of this specific process in a bank, thus the higher the exposure to operational risk in the ALCO process. In the investigation it was found that the experience levels of junior and senior staff has a low negative impact (green) within the ALCO process in the niche bank with an overall score of 2 (see Table 5.1) because the current staff were experienced personnel.

5.2.2.3 Technology management control

The technology management control risk indicator includes the number of employees requiring training in new and current technology in the ALCO process, for example ALM simulation software, Delphi panel software[2] etc., that will raise the skills level of the ALCO secretariat to obtain the necessary data from the various systems within the bank in order to run the various simulation models. This can be represented as actual numbers, or be weighted, to reflect the total number of employees in the process. The higher the number of employees requiring training in current and new technology, the higher the exposure to operational risk. During the investigation it was also found that the technology management control in the niche bank's ALCO process has a low negative impact (green) scoring 2 (see Table 5.1) because the current staff's competence with the ALM simulation software is satisfactory.

[2] This is a subjective and qualitative approach on the expectation of interest rates. It uses the judgement of experts to arise at a forecast.

5.2.2.4 Level of comprehension

Exposure to potential operational risk depends on the type of employee the bank wants to employ. If management chooses to employ people that will rather contribute to the image of the bank, as opposed to whether the person meets the necessary skill requirements of a specific position, it may lead to increased exposure to operational risk. This is due to the fact that some of the personnel employed are young and energetic and, therefore, may suite the bank's profile or other objectives. This does not mean that the person necessarily has the required knowledge to perform the task at hand. The result being that employees are not adequately qualified or trained for the task they are responsible for.

The ALCO members are the heads of the various departments that contribute to the management of the assets and liabilities in the bank. This does not mean that they necessarily have the know-how to analyse and understand the information that they are provided with at the ALCO meetings. This leads to a lack of interest and ultimately weak links within the ALCO. In such a case, it will run up additional costs for the bank in that the person has to be sent for appropriate training before being able to deliver what is asked of him/her. The level of comprehension within the ALCO process of the niche bank is of concern, scoring 4, indicating it has a medium negative impact (amber) on the functioning of the ALCO process in the niche bank (see Table 5.1). Management should monitor this indicator closely to prevent it from deteriorating and becoming a high negative impact risk. Basic training in ALM concepts, for some of the ALCO members can rectify this problem.

5.2.2.5 Segregation of duties

The ALCO process must be structured in such a way that it will not limit the segregation of duties of the ALCO members. Limited segregation simply means that ALCO members, as well as the ALCO secretariat, have too much on their plate. ALCO members get burnt out, tired and rushed. The risk being, that they are just going through the motions of everyday duties and responsibilities. In a worst case scenario, these members are at risk of creating justifications for less than professional performance. This may lead to that "what is important" gets put off for "what is urgent", thus reactive instead of proactive risk

management. No member should handle more than one type of function in the ALCO process. It will lead to improper decisions being made and that the BoD objectives are not met. In the investigation it was found that segregation of duties has a medium negative impact (amber) within the ALCO process in the niche bank with an overall score of 3 (see Table 5.1). The appointment of an additional staff member for the ALCO secretariat is necessary in the niche bank.

5.2.2.6 Measurement of employee indicators

The following section provides the results of the most important employee indicators of operational risk in the ALCO process of the niche bank.

Table 5.1 Scores of employee risk indicators

Employee indicator	Score
a. Employee turnover	2
b. Experience levels of junior and senior staff	2
c. Technology management control	2
d. Level of comprehension	4
e. Segregation of duties	3

Source: (Compiled by the author)

From Table 5.1, as already mentioned in the above sections, it can be seen that employee Indicator d, the level of comprehension, has the highest negative impact within ALCO process with a score of 4. This KRI is starting to become a concern and management should address this to prevent it from escalating. The level of comprehension negatively impacts on the ALCO process of the niche bank due to the lack of essential knowledge required. The latter is a result from the lack of regular evaluation of the ALCO members and that of the ALCO secretariat. It can be included in the ALCO members' contract, stipulating that the individual is subject to regular tests to evaluate his/her understanding and interpretation of certain scenarios at a given time. In other words, determine the

ongoing competence of ALCO members in terms of their duties within the ALCO process of the niche bank. The segregation of duties negatively impacts on the ALCO process in the sense that the ALCO policy document does not clearly stipulate the responsibilities of each ALCO member which will in turn ensure that each member is responsible for mainly one function in the ALCO process. Improving the segregation of duties within the niche bank entails increasing the personnel in the ALCO secretariat to accommodate the fact that the ALCO secretariat personnel currently have to le more than their responsibilities. The employee turnover, the experience levels of junior and senior staff and technology management control indicators have the lowest negative impact within the ALCO process and are at present not a concern within the ALCO process of the niche bank.

The above section then concludes the discussion on the employee indicators of operational risk in the ALCO process. The following section will discuss the authority level indicators of operational risk in the ALCO process.

5.2.3 Authority levels

Authority levels are usually related to guidelines and limits which are set by the BoD and senior management, as well as the implementation of an ALCO policy document that clearly states the rules and regulations of the ALCO and its subordinates. This includes disciplinary measures with regards to misconduct by any of the ALCO members or staff related to the ALCO process.

5.2.3.1 Roles and responsibilities of the BoD and senior management

The existing charters[3] of the niche bank fall short of their intended aim in that the specific mention of ALM responsibilities to ensure effectiveness of the ALCO process is not included in the document. The consequent result is that the BoD does not clearly communicate to the ALCO what the level of balance sheet risk acceptance is. The approval of the main changes and new proposals regarding balance sheet risk management in the niche bank's policy documents were less than satisfactory. In particular it is not

[3] A charter is a statement of rights and responsibilities, which is a formal written statement describing the rights and responsibilities of an organisation as well as the relevant managements' responsibilities.

clearly stated whose responsibility it is, at senior management level, to amend these proposals and report it to the BoD for approval. The key assumptions made by the ALCO secretariat, when simulating ALM scenarios, are not recognised and not re-evaluated within the approval of the ALM process' results. It is necessary to evaluate and adapt the assumptions on which the ALM simulations are based, due to the ever changing financial environment that a bank is faced with. In the investigation it was found that the roles and responsibilities of the BoD and senior management have a medium negative impact (amber), scoring 4, on the functioning of the ALCO process in the niche bank (see Table 5.2). Management should monitor this indicator closely so that it does not deteriorate and move into the high negative impact band.

5.2.3.2 Roles and responsibilities of the ALCO

This investigation showed that the ALCO charter/policy document does not address specific policies, limits and authorities in respect of interest rate risk and liquidity risk or any applicable regulations. The BoD and senior management do not identify quantitative parameters for which limits are set in order to define an acceptable level of risk for the bank. The main activities of the ALCO were found to be an analysis and measurement of the interest rate risk and liquidity risk of the bank only. The other important aspects, described in Chapter 2, e.g. credit risk, were not dealt with at all. It was found, while evaluating the responsibilities of the ALCO, that changes or deviations from the BoD limits are not measured or monitored by the ALCO. The relevant regulatory requirements regarding ALM i.e. interest rate risk and liquidity risk should be stipulated and linked. Capital usage, as well as profitability, for respective business units are not allocated or measured and there was no transfer pricing policy or liquidity contingency plan in place within the niche bank at the time of the investigation.

Publications by the BIS should be used to benchmark limits and guidelines for interest rate risk and liquidity risk. With this said, it is crucial that a transfer pricing policy and liquidity contingency plan must be compiled by the ALCO in order to prevent breaching limits set by the BoD and senior management. During the investigation it was found that the roles and responsibilities of the ALCO have a high negative impact (red) on the

functioning of the ALCO process in the niche bank (see Table 5.2) with an overall score of 6. This KRI is now a major concern within the ALCO process and for the management of the niche bank.

5.2.3.3 Roles and responsibilities of the ALM divisions

In the evaluation of the divisions (business units), responsible for ALM in the niche bank, shortcomings have been identified in the monitoring and reporting of interest rate and liquidity risk. The research and proposals for hedging strategies for interest rate risk, in the niche bank, as well as the AC 133 compliance of hedged are far below industry best practices. At the time of the investigation the bank incurred losses due to poor management of the interest rate hedge positions. The absence of a transfer price policy and methodology severely compromised the effective management of the Net Interest Margin (NIM). Once the ALCO policy, including limits and guidelines, has been put in place in the ALCO process, it is believed that the monitoring of limits can be done appropriately, along with the implementation of a transfer pricing policy. During the investigation it was found that the roles and responsibilities of the ALM divisions have a high negative impact (red), scoring 7, and has a severe negative impact on the functioning of the ALCO process and the risk management in the niche bank (see Table 5.2). This KRI should be an important concern the BoD of the niche bank.

5.2.3.4 ALM risk monitoring

In the investigation it was found that, no back testing is performed on ALMAN[4] simulation results and no hedge effectiveness tests were performed. These problems resulted from the fact that the persons responsible for the above tasks lack a sense of responsibility. These guidelines for these processes have not been clearly stated by the BoD and senior management of the niche bank. In the investigation it was found that the ALM risk monitoring has a medium negative impact (amber) on the ALCO process in the niche bank with an overall score of 4 (see Table 5.2). Management should monitor this indicator closely to ensure that it does not deteriorate and move into the high negative impact band.

[4] The ALM simulation model.

5.2.3.5 Control requirements, ALM policies and procedures manual

The niche bank should define policies for the management of balance sheet risk as recommended when discussing the roles and responsibilities of the BoD and senior management. A comprehensive ALM policy and procedures manual should be compiled to cover the following ALM activities that are currently lacking in the niche bank's ALCO process:

- Investment and hedging strategies,
- Organisational model,
- New product approval,
- Methodologies for the management and control of risk and results,
- Limit setting,
- Reporting structure,
- System tools,
- Management of the ALM policies.

The BoD and senior management are responsible for approving the risk policies and procedures, proposed changes, responsibilities as well as approvals of exceptions on the risk policies. The ALCO is responsible for the implementation of the policies and proposals to enhance and delegate the authorities defined by the BoD and senior management. The ALM units take the responsibility for the implementation and measurement of policies and controls as delegated by the ALCO. An ALM policy and procedures manual should be compiled and the ALM units should be added to the internal audit plan to monitor and control the functions of ALM. In the investigation it was found that the control requirements, ALM policies and procedures manual have a high negative impact (red), scoring 5, on the effective functioning of the ALCO process in the niche bank (see Table 5.2). This KRI is now a concern within the ALCO process and for the management of the niche bank.

5.2.3.6 ALCO composition and meetings

The CEO, being familiar with the BoD guidelines, should chair the ALCO. ALCO meetings, as with any other strategic committee meeting, are an essential part of the management and decision making process of senior management. Attendance of and the regular occurrence of the ALCO meetings are crucial to ensure and facilitate timely risk management decisions in respect of the resolution and identification of interest rate and liquidity risk issues.

To ensure efficient decision-making at ALCO meetings, the ALCO secretariat must make sure that the following items and responsibilities form part of the ALCO agenda (see Appendix A):

- Business assessment by the CEO/CFO in respect of current financial/budget variances, board guidelines and changes in regulatory environment.
- An overview of the distributions of funds, from the COO as lending officer, concerning industry trends must be provided. The elasticity and profitability of loans and the potential effect expected lending operations would have on funds.
- The Treasurer should provide a fund acquisitions review that includes an analysis of the elasticity and availability of funds, and funding strategies.
- The marketing officer should provide a competitive assessment in respect of the niche bank's market analysis, competition and consequences in order to adequately allocate funds.

The ALCO agenda should be amended to include the above mentioned items (see Appendix A). All decisions should be made by the ALCO members during the ALCO meetings. Where no conclusion or decision can be reached, based on the available information, the ALCO should request relevant parties to supply them with the appropriate additional presentations before the meeting. Regarding non-ALCO members, these members can attend the ALCO meetings on an *ad hoc* basis, to assist with reports and recommendations by their division/unit. It should be clearly stipulated that non-ALCO members do not participate in the decision-making at the ALCO meetings and are not

considered members of the ALCO. In the investigation it was found that the composition of the ALCO and ALCO meetings has a medium negative impact (amber) on the ALCO process in the niche bank scoring 4 (see Table 5.2), because the ALCO and ALCO meetings were not a priority for the CEO of the niche bank rescheduling/or cancelling the ALCO meetings. This tarnished the image of the ALCO in the niche bank. The ALCO agenda also did not comply with best practices and crucial items for strategic decision making were omitted.

5.2.3.7 Limit breach analysis

An analysis of the relevant interest rates and liquidity limits should be performed to determine whether the niche bank is still operating in line with its internal policies and risk appetite as established by the BoD and senior management. The limit breach analysis should clearly show where and why limits have been breached. It became evident in the investigation that no internal policy or guidance exist at the niche bank for the reporting of limits breached. Once the ALCO policy is in place, a limit breach analysis should be compiled and presented to the ALCO, indicating the following:

- Source e.g. lending or funding,
- Cause,
- Period,
- Resolution.

During the investigation it was found that the breaching of limits have a high negative impact (red), scoring 6, on the functioning of the ALCO process in the niche bank (see Table 5.2). This KRI is now a major concern within the ALCO process.

5.2.3.8 Measurement of authority level indicators

Table 5.2 is a summary of scores obtained for the authority level indicators of operational risk in the ALCO process of the niche bank.

Table 5.2 Scores of Authority level risk indicators

Authority levels		Score
a.	Roles and responsibilities of the Board and senior management	4
b.	Roles and responsibilities of the ALCO	6
c.	Roles and responsibilities of the ALM	5
d.	ALM risk monitoring	4
e.	Control requirements, ALM policies and procedures manual	5
f.	ALCO composition and meetings	4
g.	Limit breach analysis	7

Source: (Compiled by the author)

Table 5.2 shows that Indicators b (roles and responsibilities of the ALCO), c (roles and responsibilities of the ALM), e (control requirements, ALM policies and procedures manual) and g (limit breach analysis), with a score of 6, 7, 5 and 6 respectively, are the indicators with the highest negative impact within the authority level indicator in the ALCO process. From the case study it was concluded that the severe negative impact of these indicators are resulting from the lack of limits and guidelines in the ALCO charter/policy document. The ALCO needs to be enhanced in that an ALCO policy, limits and guidelines should be compiled, and be proposed by the ALCO to the BoD for approval and ratification. When the ALCO policy is adopted and enhanced in the niche bank's ALCO process, the appropriate monitoring of limits can be done. The severity of indicators b and c are as a result that the control requirements, ALM policies and the procedure manual are not implemented in the ALCO process, hindering the efficiency of the process. Dealing with the negative impact of indicator e, as mentioned, an ALM policy and procedures manual should be compiled and the ALM units should be added to the internal audit plan to monitor and control the functions of ALM. The remaining three indicators, with a score of 4, have a medium negative impact on the ALCO process. This is due to the fact that the suitability of the guidelines is not bench marked against the industry norm. The ALCO policy must clearly indicate the roles and responsibilities of the ALCO members, as well as the relevant parties that will be held accountable for non-

compliance to the ALCO policy guidelines. It can be concluded from Table 5.2 that authority levels within the ALCO process should be an area of high concern for the BoD and senior management of the bank.

The above section then concludes the discussion of the authority level indicators of operational risk in the ALCO process. The following section will discuss model risk indicators of operational risk in the ALCO process.

5.2.4 Model risk indicators

Model indicators are the third group of operational risk indicators in the ALCO process and will be evaluated in the following sections. Model risk indicators are usually related to the analysis of the interest rate risk as well as the liquidity risk the bank is exposed to, and the assumptions made on which the strategies for the management of these risk are based upon.

5.2.4.1 Interest rate risk

During the investigation into the niche bank's ALCO process it was established that the reporting on the NII is appropriate and adequate. The current interest rate Gap Report provides sufficient information for decision-making purposes. One problem identified, is that the nonperforming loans included in the 1-month time bucket should be included in >12 month bucket as these loans will not necessarily reprice. It is essential to be able to measure the risk of financial transactions as accurately as possible in order to price individual transactions, hedge for risk control, calculate the required total capital required for the risk of the whole portfolio, and make decisions on the best resource allocation, with special attention devoted to the trade-off between profitability and risk. The investigation found that the VaR model is not being used to calculate the size of the bank's exposure to interest rate risk in the Treasury's portfolio. It was concluded that interest rate risk measurement has a medium negative impact (amber) on the efficiency ALCO process in the niche bank, with an overall score of 4 (see Table 5.3).

5.2.4.2 Liquidity risk

The investigation showed that for the purpose of liquidity risk management, the current maturity gap and projected cash flow analyses provide insufficient information. Shortcomings have also been found in terms of the liquidity limits set and a liquidity contingency plan does not exist and must be formulated and implemented. The ALCO sets limits but no evidence has been found that the BoD and senior management have approved these limits. In the investigation it was found that liquidity risk has a high negative impact (red) on the ALCO process in the niche bank, with an overall score of 5 (see Table 5.3). it was indicated that, given the importance of liquidity in banking, the BoD should urgently pay attention to this problem.

5.2.4.3 Key assumptions for the scenario simulations

It is essential that the assumptions underlying the scenario simulations are clearly understood by risk managers and bank management. In particular, simulation techniques should be used with caution to avoid results that are in fact inaccurate when specific assumptions and parameters are revealed. In addition, management should have at least quarterly reviews to approve the assumptions and parameters used, and ensure that the results from the simulations are valid. The investigation found that, amongst others, the underlying assumptions for the interest rate projections are not clearly stated. This is a very important input in the pre-ALCO work of the ALCO secretariat. The ALCO also need it for its decision for the appropriate ALM strategy. Underlying assumptions to the interest rate forecast should, therefore, be included in the ALCO pack. It was concluded that the key assumptions for the scenario analysis have a high negative impact (red), scoring 5, on the functioning of the ALCO process in the niche bank (see Table 5.3). This KRI is a major concern within the ALCO process and for the management of the niche bank.

5.2.4.4 Measurement of the model risk indicators

Table 5.3 is a summary of the scores obtained for the model risk indicators of operational risk in the ALCO process of the niche bank.

Table 5.3 Scores of Model risk

Model risk	Score
a. Interest rate risk	4
b. Liquidity risk	6
c. Key assumptions for the scenario simulations	5

Source: (Compiled by the author)

From Table 5.3, as already discussed in the above sections, it can be seen that Indicator b (liquidity risk) and c (key assumptions) with a score of 6, and 5 respectively, are the model risk indicators with the highest negative impact on the ALCO process. The underlying assumptions to the interest rate forecast should be included in the ALCO pack. The severity of these indicators is the results of assumptions on which the ALM simulations are based are not being evaluated on a regular basis to incorporate the changes of the external environment of the niche bank. If it is necessary to make amendments to the current assumptions in the ALM simulations, the responsible senior manager should report these adjustments to the BoD. Indicators a (interest rate risk) has a medium negative impact within the ALCO process, with both scoring 4, indicting that it needs to be monitored by management.

The above section then concludes the discussion on model risk indicators of operational risk in the ALCO process of the niche bank. The following section will discuss the system technology indicators of operational risk in the ALCO process.

5.2.5 System technology indicators

System indicators are the fourth group of operational risk indicators in the ALCO process and are evaluated for the niche bank in the following sections. System indicators are usually related to the IT system, in other words related to computers, computer software, telecommunications, information systems, etc.

5.2.5.1 ALM application system

Although no changes or updates to the ALMAN system have been planned in the niche bank, it was found in the investigation that a need exists to integrate the profitability analysis with the analysis of other risks i.e. credit risk and market risk forming an enterprise wide analysis of risk. Various applications systems exist to assist ALM with the control and the management of the balance sheet risk. Well known international systems include Profit Master, Sungard/Bancware, IPS-Sendero, Kamakura, Almonde, Algorithmics, QRM and Pro Internal Solution. It was concluded that further development on the ALMAN system by the vendor should be requested. If the request is unsuccessful the purchase of a new ALM simulation system should be explored. In the investigation it was found that the ALM application system has a medium negative impact (amber) on the ALCO process in the niche bank, with an overall score of 4 (see Table 5.4).

5.2.5.2 Technological capacity

The investigation concluded that limited ability exists in the ALMAN system to add, modify or delete a specific field. The system can, therefore, not be adapted to be more tailor-made for the niche bank. This restricts the ALM simulation capabilities. It was estimated that technological capacity has a medium negative impact (amber) on the ALCO process in the niche bank with an overall score of 3 (see Table 5.4).

5.2.5.3 Back testing results

Ex-post evaluation of the model forecasting ability, the accuracy of the interest rate views, as well as the Asset and Liability strategies, should be conducted with the actual figures as they become available. The investigation showed that, no back testing or policy regarding back testing exists in the niche bank, to take this into account. Back testing should be performed and reported at the ALCO meeting. In the investigation it was found that back testing results has a high negative impact (red) on the ALCO process in the niche bank with an overall score of 5 (see Table 5.4) and require urgent attention from the BoD.

5.2.5.4 Data management

Although ALMAN imports data directly from the different financial and treasury systems and databases, the investigation highlighted that the reconciliation of the data in ALMAN, with the financial statements, is a manual process. This includes the manual input of journal entries etc., which is a time consuming process that depends on the goodwill of the financial departments. In the investigation it was found that data management has a low negative impact (green) on the ALCO process in the niche bank with an overall score of 2 (see Table 5.4).

5.2.5.5 Data processing

The data capturing and reporting process in the niche bank is found to be inefficient because control measures in place to ensure that data mistakes are corrected before the data is used in the modelling of the different scenarios and presented to the ALCO, are not in place. Decisions are, however, based on these analysis reports, thus, resulting in ineffective strategies being implemented by the ALM units. In the investigation it was found that the data processing has a medium negative impact (amber) on the ALCO process in the niche bank with an overall score of 3 (see Table 5.4).

5.2.5.6 System security level

The investigation showed that there is no policy regarding access to the financial systems and data. The level of security on the systems used in the niche bank is found wanting in that the number of points of entry into the system at a specific time (for example one week) is not controlled and could be an indication of the exposure to operational risk. The result is that different heads of departments may "hack" the system and make changes in terms of his/her daily/monthly limits. The latter may result in significant losses should the limits be breached. In the investigation it was found that the system security level has a high negative impact (red), scoring 5 (see Table 5.3). This KRI is now a major concern within the ALCO process and for the management of the niche bank.

5.2.5.7 Intranet between departments

An insufficient intranet facility between departments results in the inadequate flow of information between the various departments involved in presenting the ALCO secretariat with data for its various simulations. The staff of the ALCO secretariat has to go to the departments and personally collect the data. In the investigation it was found that an insufficient intranet between departments has a medium negative impact (amber) on the ALCO process in the niche bank with an overall score of 4 (see Table 5.4).

5.2.5.8 System downtime

System availability is one of the most important prerequisites of any front and back office function. If the system is down, no trading can be done as most prices (rates) are calculated and quoted and traded by means of a system. The back office cannot process transactions if the system is down. The ALCO secretariat depends on the systems for its information. The longer an IT-system is down, the more likely a system-related error will occur. In the investigation it was found that system downtime in the niche bank has a high negative (red) impact on the ALCO process (see Table 5.4). Contingency plans should be formulated by management and approved by the BoD.

5.2.5.9 Measurement of the system technology indicators

Table 5.4 is a summary of the scores for the system technology indicators of operational risk in the ALCO process of the niche bank.

Table 5.4 Scores of System technology

System technology	Score
a. ALM application system	4
b. Technological capacity	3
c. Back testing results	5
d. Data management	2
e. Data processing	3
f. System security level	5
g. Intranet between departments	4
h. System downtime	5

Source: (Compiled by the author)

It can be seen, as already described in the sections above, from Table 5.4 that Indicators c (back testing results risk indicator), f (system security level), and h (system downtime) with a score of 5 respectively, are the system technology indicators with the largest negative impact on the efficiency of the ALCO process. The severity of these indicators is caused by the lack of a centralised IT unit in the niche bank. This unit should ensure stable hard- and software platforms for the various systems and data bases to enable the ALCO secretariat to run the necessary simulations and scenarios for the pre-ALCO meetings. The IT-unit, in accordance with the drafted policy, should regulate access to data and information. Indicators a (ALM application system risk indicator), b (technological capacity risk indicator), e (data processing risk indicator), and g (intranet between departments risk indicator) score 4, 3, 3 and 4 respectively and are judged to be the indicators with a medium negative impact on the ALCO process. Although there is a shortage of skilled programmers, the largest problem encountered with regard to the

ALMAN system, during the investigation, is the poor system support and maintenance by the vendor. In terms of the ALM application system and technological capacity it is recommended that the niche bank should explore a new system to run ALM simulations. The system technology indicator with the lowest negative impact on the ALCO process is indicator d, the data management, with a score of 2, and this indicator of operational risk is thus currently not of concern for management.

The above section then concludes the discussion on system technology risk indicators of operational risk in the ALCO process. The following section will discuss other indicators identified in Chapter 4.

5.2.6 Other

Other risk indicators of operational risk are regarded as the fifth group of operational risk indicators in the niche bank and include all the indicators that do not fall under one of the four above-mentioned categories. The following sections will evaluate and describe some of these indicators of operational risk.

5.2.6.1 Scenario analyses (e.g. positive, neutral, negative economic environment)

A detailed description of scenarios analysis should be provided for simulation purposes, e.g. unforeseen changes in weather conditions etc. The underlying assumptions of various scenarios should accompany the simulation results so that ALCO members will be able to understand what these scenario analyses are based on to ensure optimal decision making. Through the investigation it was found that the scenario analyses performed, by the ALCO secretariat, have a medium negative impact (amber) on the ALCO process in the niche bank with a score of 3 (see Table 5.5) because not all the assumptions are discussed at the ALCO meeting.

5.2.6.2 Credit risk

The investigation established that unauthorised credit transactions could be executed in the niche bank. A system to control transactions needs to be implemented that sets and controls limits on a daily basis. With the implementation of such a control system it is advised that the monthly reporting should be changed to daily reporting for better management. It was adjudged that credit risk has a medium negative impact (amber) on the efficiency of the ALCO process in the niche bank with a score of 3 (see Table 5.5), although it will have a much larger negative impact on the bank in total.

5.2.6.3 Risk reporting in respect of higher risk treasury products

In order to reflect the impact of both movements in interest rates and changes in the fair value of interest rate sensitive assets and liabilities it is recommended that the reporting in the income statement should be expanded. It was concluded by the investigation that the group compliance department must ensure that the niche bank conforms to the changes in accounting standards and the ALMAN model is adjusted accordingly. In the investigation it was found that the reporting, in respect of the impact higher risk treasury products on the financial results, have a medium negative impact (amber) on the efficiency of the ALCO process in the niche bank with a score of 4 (see Table 5.5).

5.2.6.4 New products proposals

In terms of new product proposals for approval by the ALCO, the investigation established that the proposals can be enhanced by including the simulation results of the proposed risk mitigation actions. The proposed products' characteristics, i.e. maturity, repricing and repayment terms, on current interest rate risk and liquidity risk profiles of the balance sheet must also be simulated and reported to the ALCO. In the investigation it was found that current procedure of the scenario analysis of proposed new products have a medium negative impact (amber) on the efficiency of the ALCO process in the niche bank with a score of 3 (see Table 5.5).

5.2.6.5 Measurement of other indicators

Table 5.5 is a summary of the appraisal of the other indicators of operational risk within the niche bank as it pertains to the ALCO process.

Table 5.5 Scores of other indicators

Other	Score
a. Scenario analysis risk indicator (e.g. positive, neutral, negative economic environment)	3
b. Credit risk, risk indicator	3
c. Risk reporting in respect of higher risk treasure products	4
d. New product proposals	3

Source: (Compiled by the author)

As can be seen from Table 5.5 all 4 indicators have a medium negative impact on the efficiency of the ALCO process with respective scores of 3, 3, 4, and 3, and can be controlled as discussed in their respective sections above.

The following section will then conclude the evaluation and discussion of the identification and measurement of indicators of operational risk in the ALCO process of this niche bank.

5.2.7 Overall risk indicator for the ALCO process

Table 5.6 is a summary of the overall scores of the 5 main categories of operational risk indicators in the ALCO process. Each category indicates the average scores of the sub-categories as represented by equation 5.1.

$$Trigger\ Value = \frac{\sum Indicator\ Scores}{\sum Sub-category\ Indicators \times\ Maximum\ Likelihood} \qquad (5.1)$$

It adds the total sub-categories scores and expresses total as percentage of the worst possible score, thus, the worst scenario. This is why a relatively high score indicates high risk areas, as evaluated by the managers.

A score of 30 percent or lower is an indication that the specific risk category has a low possible negative impact on the efficiency of the ALCO process. The risk category is, therefore, currently not a concern for the management and BoD. A score between 31 percent and 69 percent is an indication that the particular risk category presents a medium risk of a negative impact on the efficiency of the ALCO process. The risk category is a concern to the management and BoD. Management must focus on it to establish any changes in the trend and take steps to control it. A score of 70 percent or higher is an indication that the risk category poses a high risk of a negative impact on the efficiency of the ALCO. This risk category should be a major concern for management and the BoD. It is important that management now determines whether this may cause a loss (direct or indirect) and formulate and implement corrective steps and actions.

Table 5.6 Scores of overall risk indicators

Overall Risk Indicator	Score
a. Employee indicator	37%
b. Authority levels	71%
c. Model risk	67%
d. System technology	63%
e. Other	46%

Source: (Compiled by the author)

From Table 5.6 it can be seen that the category with the largest possible negative impact on the ALCO process is category 2, authority levels, with a percentage higher than 70 percent. The other 4 categories (employee, model, system and other indicators) have a medium negative impact within the ALCO process. All of these categories must be brought under the attention of the BoD and senior management of the niche bank for review. The

necessary management strategies need to be implemented in order to prevent the ALCO process from failing its duties due to sub-optimal performance or even failure.

5.3 Summary of the main results of the investigation

The main problem areas, in the niche bank, as identified from the case study are the following:

- Roles and responsibilities of the Board and senior management fall short of their intended aim in that the existing charters/policy documents of the niche bank does not include the specific ALM responsibilities to ensure effectiveness of the ALCO process.
- The roles and responsibilities of the ALCO are lacking. The ALCO charter/policy document does not address specific policies, limits and authorities in respect of interest rate risk and liquidity risk or any applicable regulations.
- Roles and responsibilities of the ALM divisions fall short in terms of monitoring and reporting of interest rate and liquidity risk.
- Control requirements, ALM policies and procedures are not defined in terms of balance sheet risk.
- Limit breach analysis of the relevant interest rate and liquidity are currently lacking in the niche bank. It was not indicated where and why limits are breached, at the time of the investigation.
- The lack of contingency plans in the ALCO.
- The management of liquidity in the niche bank is lacking, because the current gap and projected cash flow analyses provide insufficient information.
- The key assumptions on which the scenario analysis are based upon, are not clearly understood as well as the parameters used, are not regularly reviewed.
- During the investigation it was found that no back testing or policy regarding back testing, exists in the niche bank,
- The security level of the systems and data are lacking. There is no policy regarding access to the financial systems and data, allowing heads of departments to hack the system and make changes in terms of his/her limits.

- System availability is one of the important prerequisites in the ALCO of the niche bank. If the system is down no trading can be done as most prices (rates) are calculated, quoted and traded by means of a system.

It was found, during the investigation of the niche bank, that the CEO does not regard the ALCO as a main priority as is evident from his low commitment to the ALCO process and meetings. With the composition of the ALCO, non-ALCO members are attending ALCO meetings on a regular basis and not just on an *ad hoc* basis. The attendance of non-ALCO members affects the efficiency and decision making process of the ALCO negatively and prevents the attainment of objectives as set by the BoD. The members of the pre-ALCO do not have clearly stated goals, leading to the use of vague assumptions and invalid parameters. The unclear delegation of responsibilities lead to invalid results obtained from the scenario/simulations. The software used in the pre-ALCO process is worrying. Back testing of the ALMAN results is not done. The system is unable to produce daily risk reports. The IT system cannot provide sufficient data for the estimation of the risk indicators. There is a shortage of skilled programmers. The largest problem encountered with regard to the ALMAN system, during the investigation, is the poor system support and maintenance by the vendor.

Internal policies and procedures are ignored resulting in the breaching of limits set by the BoD. An ALCO policy must be formulated and implemented to ensure the efficient flow and execution of the ALCO process. The bank should define policies, amongst others, for the management of the balance sheet risk in an ALM policy and procedures manual that covers all the ALM activities.

The ALCO liquidity contingency plan is outdated. The plan must be updated to include mechanisms that can identify a crisis in a timely manner, whether internal or systematic, and propose alternative ways to finance the daily funding with short fall and provide the required level of liquidity.

5.4 Conclusion

The ALCO process is a strategic risk management process in a bank and forms the mechanism for the determining and evaluating of strategies, given the future direction of the bank as determined by the BoD and the concomitant risks and risk appetite. The aim of this chapter was to identify various problems within the ALCO process of the niche bank, which could lead to the ultimate failure of the ALCO process in the bank. With the operational risks identified and rectified in reaction to these warning signs, the ALCO process can be managed appropriately, ensuring the effective functioning of the ALCO. This will, in turn, ensure that the BoD's goals are achieved, contributing to the maximisation of the bank's NII. It was, therefore, concluded that the current sub-optimal (failed) ALCO process in the niche bank, can be rectified. This will ensure that the ALCO process, and therefore the strategic ALM and risk management, can be improved to comply with international best practices, e.g. the Basel II requirements. Chapter 6 will conclude the study and will also make recommendations regarding operational risk management in a bank's ALCO process.

Chapter 6

Conclusion

6.1 Introduction

The main goal of this study was to evaluate the measurement of operational risk in the ALCO process of a bank. The study firstly looked at the importance of the Asset and Liability Management Committee's process as well as Asset and Liability Management and how it contributes significantly to the strategic management and the strategic risk management in a bank. Secondly, an overview of operational risk measurement and management regulations, as described by the Basel Committee and Basel II, was given and the recommendations for implementation were also mentioned. The third objective was to determine what key operational risk indicators are, and how to identify and control these KRI's of operational risk within an ALCO process of a bank. Fourthly, the study concludes with a case study that provides a theoretical, as well as a practical, evaluation of the key risk indicators of operational risk in a specialised niche bank in South Africa.

To achieve the goal and above-mentioned objectives, the literature was reviewed and a case study was conducted, in a specialised niche bank in South Africa, by means of in-depth interviews with specialists in the banking sector and an ALCO expert. The next section draws conclusions based on the literature review (Chapter 2, 3, and 4) as well as the results of the case study (Chapter 5).

6.2 Brief overview of the study

The aim of Chapter 2 was to demonstrate the importance of strategic management guided by the vision, mission, goals and objectives set by the BoD. The efficient and cohered enterprise wide implementation of the strategic plan requires an efficient strategic management process. In a bank this process is the ALCO process. If the ALCO process,

therefore, has deficiencies which lead to a sub-optimal or total failure of the ALCO process, it will severely compromise the profitability of the bank.

Chapter 3 provided an overview of Basel II's proposals on how to measure and manage operational risk. It is stressed by the Basel Committee that the four key elements in operational risk management are not the only elements that banks should consider when managing operational risk, but it does regard them as the foundation for an effective operational risk management programme or strategy. It is clear that operational risk differs from other banking risks in that it is typically not directly related to a return of an expected reward (i.e. higher risk, higher reward), but exists in the natural course of banking activity. At the same time, failure to properly manage operational risk can result in a misstatement of a bank's risk profile and expose the bank to significant losses. The guidelines on management's responsibilities are highlighted in the last section of Chapter 3 to emphasise the effective management of operational risk in a bank.

Chapter 4 placed great emphasis on KRIs, determining what key operational risk indicators are and how to identify and control these key operational risk indicators. KRIs should thus, when applied and reported effectively to the BoD and senior management, serve to identify important business vulnerabilities or provide a set of warning lights, to navigate the bank clear of the dangers presented by the operating environment of the bank. Without these KRIs banks will not be able to identify potential operational risks and will ultimately be more exposed when an operational risk event takes place unexpectedly. With identifying KRIs of operational risk, the key challenge is to find the interaction between the business-specific and firm-wide risk indicators. It is important that KRIs must be confirmed as indicators of operational risk and then only can they serve as part of an early warning system and be used in risk modelling. The best risk indicators will ultimately be those which are forward looking or predictive in order to be useful in either modelling or as a pro-active management tool.

Chapter 5 describes the practical application of the theory described in the previous chapters. In a case study, conducted in a small niche bank, it was demonstrated how KRIs are identified and measured. The investigation identified several KRIs, which were able to

explain the current sub-optimal operation of the ALCO process in the niche bank. Actions to rectify these problems could be formulated.

In conclusion, the following general recommendations can be made:

- It is important to ensure that a bank measures and manages at least the four main levels of operational risk as required by Basel II, namely: process/systems, people, technology, and external events.
- The ALCO policy document must connect the components of strategic ALM and risk management processes together. This document must not stand on its own but must be part of the strategic management process as a whole.
- Operational risk and operational inefficiencies in the ALCO process can have a very negative impact on a bank and should, therefore, be identified and managed.
- It is important that KRIs are confirmed as indicators of operational risk to be able to serve as part of an early warning system used in risk modelling in the niche bank's ACO process.
- Operational risk must not just be identified on a firm-wide basis, but also on a business-specific level. Every business unit must take responsibility for the identification of operational risk.
- Operational risk must not just be managed by a central unit, but business units should be managing its own operational risk.
- The extent of operational risk in the ALCO process can be measured in the South African banking environment.
- South African regulators, at least, should include an evaluation of ALCO in operational risk measurement and capital charge giving the severe impact as highlighted by the case study.

6.3 Further research

The study was based on qualitative approaches. The use of quantitative measures allows for the more accurate identification of operational risk losses and exposures rather than relying on experience (gut feel) in a certain field and categorising key risk indicators

accordingly. It is also the view of this study that there is not enough theoretical background on key risk indicators of operational risk in the South African banking sector, let alone key risk indicators for operational risk in the ALCO process. Almost no research has been done to identify the key risk indicators existing in the ALCO's of South African banks. Therefore, more research is necessary to identify and evaluate the key risk indicators, of managing operational risk, in the ALCO process, in the South African banking environment. The niche bank does not have a firm-wide operational risk framework which could be used to bench mark the measured operational risks in the ALCO process against. To fully substantiate the question whether strategic ALM must be a unit included within the Basel II standardised industry business lines, operational risk in a bank's ALCO process must be compared to that of the whole bank.

APPENDIX A: ALCO Agenda

	MEMBERS OF THE ALCO	
Permanent members	Chief Executive Officer	(Chairman)
	Head of Treasury	
	Head of Finance	
	Heads of Operations	Corporate sector
		Retail business
		Investments
		Foreign markets
	ALCO Officer	(Secretary)
By invitation	Economist	
	Head of Personnel	
	Head of IT	
	Other	

	AGENDA	Page No.
1.	Approval of minutes of previous ALCO	i - iv
2.	Items arising from the previous meeting	v
3.	Overview of the current economic situation and projections on:	2 - 3
	- Interest rates	3 - 4
	- Currency exchanges rates	5
4.	Status of current strategies	
	- Variance analysis	6 - 7
	- Ratio analysis	8 - 9
5.	Budgets & Growth assumptions	10
6.	Overview of asset and liability management	11
	- Interest rate risk	11 - 12
	- Liquidity risk	12 - 13
	- Forex risk	13
	- Capital adequacy	14
8.	Strategy targets	15
9.	General	
	- Next ALC0 meeting	

SUPPORTING SCHEDULES

(These schedules are included for review only if further detail is required on information supplied)

OVERVIEW OF CURRENT ECONOMIC SITUATION

Discussion by Economist present at ALCO meeting:

The purpose of this section is to give an overview of the economy (exogenous factors) and the implications it has for the bank. This section includes the banks forecast on interest and exchange rates.

Aspects that can be covered in this section are the following:

- Economic growth / Inflation
- Weather - floods / agriculture
- Production - manufacturing
- Imports / Exports
- Economic conditions in major trading partners
- Domestic consumer and business confidence
- Political Stability
- Monetary policy
- Fiscal situation - net flow of foreign capital
- Liberalization of the banking industry

Example of such report

1. Key Economic Indicators	1st Quarter	2 nd Quarter
Total GDP	7.2%	8.1%
Manufacturing	8.3%	7.5%
Construction	3.4%	8.0%
Commerce	8.8%	9.3%
Transport & Communications	10.0%	11.4%
Financial & Business Services	5.3%	8.2%
Productivity	2.7%	3.6%
Unit Business Cost	5.5%	6.4%
Inflation rate	2.5%	2.1%
Investment Commitments	$1.2 b	$1.6 b

OVERVIEW OF CURRENT ECONOMIC SITUATION

The economy is expected to grow by 7 to 8 per cent this year. All sectors of the economy are expanding. Productivity growth is high and consumer prices had remained stable, despite the introduction of the Goods and Services Tax in April.

Apart from overall annual growth, the latest Nanyang Technological University study projected that "the economy appears to be heading for a mild dip in the third quarter at 5.42% after hitting 7.44% in the first half of 1995. Thereafter it will be up again in the last quarter at 7.4 %".

They said that the cooling off this year was a combined result of a slowdown in the external environment - mainly lower growth in the United States - and to the strong exchange rate policy of the Singapore authorities.

"We might see weak growth in 1995 - 96, but there is no threat of recession."

4. Projected interest rate forecast

Supporting Schedule	Annexure
3 Month SIBOR Rate	A
Shape of Yield curve	B

It is expected that interest rates will continue to rise/drop towards the end of the year, after which it will start to move side ways before it drop/rise further.

The sensitivity of the interest rate projection for the next 12 months could be seen in the graph as dispalyed in annexure A and the uncertainty about rate movements become wider the further we forecast into the future.

Yield curve analysis

INTEREST RATE FORECAST
Currency SGD
Prepared for SPL

Date: AUG 94
Time horizon: 3 months, NOV 94

INSTRUMENTS	BASIS RATE	LOW	EXPECTED	HIGH
SIBOR 1 Month	2.75%	3.00%	3.15%	3.50%
SIBOR 3 Months	3.12%	3.17%	3.42%	3.87%
SIBOR 6 Months	3.62%	3.72%	3.97%	4.12%
SIBOR 12 Months	3.93%	3.93%	4.23%	4.43%

The current shape of the yield curve is positive with longer term interest rates higher than short term interest rates. It is expected that, closer to the peak of interest rates,

the yield curve will flatten and change into a negative shaped curve where the shorter term rates will be higher than the longer term rates. See annexure B

Key rates (drivers or reference rates)

About 30% of total assets are linked to prime with another 20% linked to the BLR (base lending rate or cost of funds rate). A further 20 % is discretionary rates and can be adjusted within the bank's own discretion. The following key interest rates are detrimental to the bank.

Prime rate

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expected												
Low												
High												

Cost of funds rate

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expected												
Low												
High												

Overnight call rate

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expected												
Low												
High												

Interest rates in foreign currencies

INTEREST RATE FORECAST
Currency USD

Date: OCT 92
Time horizon: 12 months, OCT 93

INSTRUMENTS	BASIS RATE	LOW	EXPECTED	HIGH
USD - 1 Month	3.24%	3.74%	4.44%	5.24%
USD - 2 Months	3.73%	3.98%	4.63%	5.23%
USD - 3 Months	3.71%	4.21%	4.66%	5.21%
USD - 6 Months	3.73%	4.23%	4.93%	5.73%
USD - 9 Months	3.85%	4.35%	5.25%	6.85%
USD - 12 Months	4.04%	4.54%	5.49%	7.04%

OVERVIEW OF CURRENT ECONOMIC SITUATION

5. Projected exchange rate forecast

Supporting Schedule	Annexure
Deutch Mark	C

Basket of currencies

The following rates are used in the basket of currencies from which all the other currencies are derived:

Singapore dollar
Japanese Yen
Deutsch Mark

The correlation between the different exchange rates seemed to vary quite a lot over the last 90 days of trading which made the forecast difficult and we see a big variation in the boundaries of the exchange rate forecast. See currency sensitivity graph in Annexure C.

Singapore dollar

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expected												
Low												
High												

Thai Baht

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expected												
Low												
High												

Deutch Mark

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expected												
Low												
High												

STATUS OF CURRENT STRATEGIES

The purpose of this section is to reflect the success or failure to achieve the targets as set in the previous ALCO meeting and to assess the balance sheet.

1. Growth in Assets

Supporting Schedule	Annexure
Variance report	D

The growth targets of $ xxx,xxx,xxx as set in the previous ALCO meeting for home loans and syndication loans could not be achieved which resulted in:

- surplus funds that was available for investment in the money market
- less funds required from the wholesale market

2. Funding of cash short fall

Supporting Schedule	Annexure
Variance report	E

Results of funding strategy				
Month	**Targeted strategy**		**Actual funding**	
	Amount	%	Amount	%
Overnight call	$xxx,xxx,xxx	30%	$xxx,xxx,xxx	26%
Time deposits	$xxx,xxx,xxx	70%	$xxx,xxx,xxx	.74%
1 month	$xx,xxx,xxx	30%	$xx,xxx,xxx	37%
2 months	$xx,xxx,xxx	15%	$xx,xxx,xxx	22%
3 months	$xx,xxx,xxx	10%	$xx,xxx,xxx	7%
4 months	$xx,xxx,xxx	5%	$xx,xxx,xxx	4%
5 months	$xx,xxx,xxx	5%	$xx,xxx,xxx	8%
6 months	$xx,xxx,xxx	10%	$xx,xxx,xxx	12%
7 - 12 months	$xx,xxx,xxx	25%	$xx,xxx,xxx	20%
Total	$xxx,xxx,xxx	100%	$xxx,xxx,xxx	100%

Total wholesale time deposits obtained during the previous month amounted to $xxx,xxx,xxx (expected $xxx,xxx,xxx) The main reason for the $xxx,xxx,xxx additional funding being as a result of a decrease in call funds of $xx,xxx,xxx.

3. Total cash flow position

Call funds decreased by $xxx,xxx,xxx from previous month. The reduction was mainly funded via additional term funds. The reduction in cash flow from March to April being mainly as a result of the longer wholesale funding strategy adopted over the last few months as well as an increase in retail funding of $xxx,xxx,xxx from March to April.

4. Liquid asset strategy

4.1 Liquid asset investment

STATUS OF CURRENT STRATEGIES

In accordance with the approved liquid asset strategy, $xxx,xxx,xxx (short term bonds) has thus far been switched into.

4.2 Surplus liquid assets held

A comparison between the surplus liquid assets to be held as suggested in the previous ALCO report and the actual surplus held is given below per certification month ending May 1995.

The actual surplus held before discounting was higher than the approved surplus. This surplus resulted from a position of $xxx,xxx,xxx which also qualify as statutory liquid assets and as such were taken into account into the calculation of total liquid assets.

5. Interest rate risk strategy

5.1. Comparison of recommended and actual three month cumulative gap for the previous month

	Cumulative Gap
Recommended gap	
Actual gap	
Difference	

Main reasons for variance:
1. Decrease in call
2. Shorter than targeted term funding
3. Liquid bills purchased in accordance with liquid asset strategy

5.2 Swap and FRA position as at the end of the month

ALCO Hedging	Nominal	Derivatives done on Last month	Previous
Derivatives executed:			
Pay floating and receive fixed rate			
Position closed:			
Pay fixed and receive floating rate			
Current holding position			

Impact on NII	Profit/Loss
Financial year Next 12 months	

6. Ratio analysis

Ratio analysis is only indicative of the bank's business and analysts should be aware not to go overboard with ratios. Here are some that may be useful.

DEBT RATIOS

Loan to Deposit Ratio (LDR)

Total loan divided by total deposits. This ratio indicates how much of the loan is supported by deposits as opposed to equity.

Risk weighted Assets Off B/S to Risk Weighted Assets on B/S Ratio

This follows the capital adequacy requirements set in Basle. The off B/S items e.g. outstanding foreign exchange contracts, FRA's etc. are weighted against the risk of its counterparty e.g. private corporations or banks which carry different risk weightage.

Customer deposit to total deposits

Ratio of deposits from customers divided by total deposits. It indicates how much reliance the bank has on customer deposits as opposed to interbank deposits.

CAPITAL RATIO

Gearing Ratio

This is the British term (Americans call it the leverage ratio) of equity divided by total borrowings.

Capital Adequacy Ratio (CAR)

This is total equity i.e. Tier 1 and Tier 2 capital divided by total risk weightage assets.

Equity Ratio

Total equity divided by the total liabilities (i.e. equity plus all liabilities). This is similar to the gearing ratio described above.

STATUS OF CURRENT STRATEGIES

Loan Capital Ratio (Debt equity ratio)

Loan divide by the equity of the bank. It indicates how much equity is being used for loans.

AREAS OF INCOME MAXIMIZATION

Net Interest margin

Net interest income divided by total interest income.

Cost Income ratio

Total operating cost as a percentage of total income.

Provision for loan losses

Provision item divided by the total loans.

Productive Assets to Total Assets Ratio

Productive assets divided by the total assets. This is the proportion of those assets that are contributing to income as opposed to those assets that are doubtful but still booked in as well as other fixed assets items.

Return on Assets (ROA)

The ratio is simply the net profit before tax divided by total assets.

Return on Equity (ROE)

This is the net profit after tax divided by equity.

Growth of Assets Ratio

From the various simulated future months, we can take the difference between the assets of period 1 and period 2 and find the growth rate into the future.

BUDGETS AND GROWTH ASSUMPTIONS

In this section you specify the budgets and growth targets that were assumed for the banks in the planning period. Original budgets must be adjusted to reflect the achievement of realistic business targets as closely as possible.

Budget

Supporting Schedule	Annexure
Original budget	F
Revised budget	G

The growth targets and the achievement thereof should include the growth of all core asset components and may only exclude liquid asset reserves and requirements.

The growth for customer deposits should be clearly stated. Treasury deposits and assets form part of the risk strategies and are excluded here.

Under target assumptions are included non interest income, operational and non operational expenditure, other liabilities and provisions, fixed assets and other assets and provisions.

OVERVIEW OF ASSET AND LIABILITY MANAGEMENT

The overview presents, in brief, a summary of the different risks applicable, the proposed strategies per risk type and other relevant asset and liability aspects. A thorough evaluation and analysis of each risk type and proposed strategies are covered in the executive summary.

1. Interest rate risk

Supporting Schedule	Annexure
NII for next 12 months	H
Interest Sensitivity Anl	I
Balance Sheet Sensitiv.	J
Gap analysis	K
Duration of bond portf	L

Interest Rate risk is the exposure of an institution's financial condition to movements in market rates of interest. Changes in interest rates affect both earnings (Net Interest Income) and the value (market value) of its fixed rate financial assets.

When does interest rate risk exist?
Interest rate risk exists when any of the following conditions apply:

- *When assets and liabilities have different contractual reprising abilities.*
- *When assets and liabilities are not perfectly matched in terms of cash flows.*
- *When fixed rate financial assets/liabilities are held and value is determined by a NPV type calculation and such NPV rate is determined by market forces.*

Example comments:

The Delphi interest rate view expects rates to increase considerably earlier than previously anticipated with the third increase falling within the 18 month period for which the Delphi rates are forecasted.

Coupled with the current increase in market rates especially call to three months, the latest view has the effect that the forecasted rates in the short term are considerably higher than the previous interest rate view.

The latest SPL view indicates a 50% probability that rates would increase to 18.5% in June 1995 and a 30% probability for a further increase to 19.5% in September 1995 but with a 56% probability that the rate would be 19.5% by March 1996.

The interest rate sensitivity that should now be noted is where the prime only increases by 1% in June 1995, whereafter no further increase is expected (refer ALT 3 below). Expected interest rate patterns would, therefore, have to be carefully monitored in the following months to timeously adjust funding strategies and make use of possible derivative instruments.

OVERVIEW OF ASSET AND LIABILITY MANAGEMENT

The current forecast of NII for the next 12 months ending 30 April 1996 indicates an expected NII of $xxx,xxx,xxx.

The forecast of expected NII to 31 March 1996 (i.e. one month actual and 11 months forecast) is $xxx,xxx,xxx compared to the budget $xxx,xxx,xxx.

The interest rate sensitivity under the high scenario (prime rate increases by 1% (18.5%) in May 1995, 1% (19.5%) in September 1995 and 1% to 20.5% in February 1996) indicates a positive impact on NII of $xxx,xxx,xxx.

The low interest rate scenario whereby prime decreases in October 1995 (18.5%) and August 1996 (19.5%) indicates a decline in NII of $xxx,xxx,xxx.

Alternative 3 rate scenario where prime increases in June 1995 with no further increase in rates, but a decline to 17.5% in October 1996 indicates a $xxx,xxx,xxx

Given the expected interest rate view and current liquidity position, a maximum long funding strategy whereby 40% of the funding is done in the one to three months, 30% in the four to 6 months and 30% in the 12 months area is suggested.

The recommended gap for next month is $xxx,xxx,xxx, based on current projections and the proposed funding strategy. Increasing the gap by means of derivative instruments is not suggested at this stage, due to the unfavourable impact on the cost of funds on the expected interest rate scenario.

2. Liquidity risk

Supporting Schedule	Annexure
Cash flow analysis	M
ALCO Liquid Need	N
Liquid asset comp.	O
Capital maturity	P
Distribution Corp dep	Q

Liquidity is the ability to generate sufficient cash to pay off financial commitments.

Example comments

Cash flow

The total cash flow for April was $xxx,xxx,xxx (targeted $xxx,xxx,xxx). Call funds decreased $xxx,xxx,xxx from basic and $xxx,xxx,xxx from prior month. The reduction was mainly funded via additional term funds $xxx,xxx,xxx and accommodation of $xxx,xxx,xxx.

OVERVIEW OF ASSET AND LIABILITY MANAGEMENT

Liquid assets

The execution of the liquid asset strategy is proceeding according to the approved strategy. It was approved that a proposed ratio of 55:45 bonds to bills be reached in the next two months. The following procedures still require action before the next ALCO:

- $xxx,xxx,xxx E168 bonds (15/09/95) and $xxx,xxx,xxx R004 bonds (30/11/95) should be switched into liquid bills and longer term bonds.

- The switch should comprise the following:
  - $xxx,xxx,xxx into treasury bills,
  - $xxx,xxx,xxx into R145 bonds (30/05/96) and
  - $xxx,xxx,xxx into P003 bonds (15/08/97).

The implementation of this strategy will result in a balance between the expected return on the portfolio and the flexibility to adjust the portfolio more readily should interest rate expectations change.

3. Forex risk

Supporting Schedule	Annexure
Cash flow analysis	R
GAP analysis	S

Currency risk is the exposure of an institution's financial condition to movements in exchange rates. Such changes affect both income and expenses and the value of its foreign debtors and commitments.

Example comments:

The NII sensitivity analysis shows a $xxx,xxx,xxx negative impact on the net Forex position (including derivatives) with an adverse movement of xxx.

4. Capital risk

Supporting Schedule	Annexure
Capital adequacy	T

Capital adequacy risk is the risk of not being able to continue business due to required tier 1 or tier 2 capital not being sufficient in terms of local or international banking standards.

OVERVIEW OF ASSET AND LIABILITY MANAGEMENT

Example comments:

Capital projections to 1998 (excluding overseas expansion) as compared to requirements shows the following:

31/12/1996: Surplus $xxx,xxx,xxx
31/12/1997: Surplus $xxx,xxx,xxx
31/12/1998: Surplus $xxx,xxx,xxx

Risk capital to equity ratios:

- Allocated risk capital
- Actual risk capital
- Risk capital after all possible hedging strategies

PROPOSED STRATEGIES

1. Proposed funding strategy

1.1 Corporate/Treasury funding

Tenure	Percentage	Amount
1 month		
2 months		
3 months		
4 months		
5 months		
6 months		
9 months		
12 months		

If 30% of the funding requirement cannot be funded in full in the 12 months area, the remainder of the 30% should be funded in the 7 - 11 months area.

1.2 Time deposits

Tenure	Percentage	Amount
1 month		
2 months		
3 months		
4 months		
5 months		
6 months		
9 months		
12 months		

1.3 Certificates of deposits

Tenure	Percentage	Amount
1 month		
2 months		
3 months		
4 months		
5 months		
6 months		
9 months		
12 months		

PROPOSED STRATEGIES

1.4 Overnight funds

Proposed average call balance:

2. Strategy of derivative instruments for hedging

- Hedging the interest rate cycle

  In light of the expected rising interest rate scenario and the current rate for derivative instruments, it is suggested that no derivatives be done at this stage, to increase the expected three month cumulative gap.

- Hedging specific expectations

  Short term hedging instruments like FRA's and options are available to hedge effects of specific events that could have an influence on interests rates. Based on the expected interest rate view, the current market rates of these instruments do not warrant investment in short-term hedging instruments at this stage.

Recommended three month cumulative gap:

- Calculated gap
- Calculated gap (before future deriv.)

Future specific strategies:

- Deriv. instruments to increase the gap
- Asset and liability structure

  Fixed rate mortgages

  Retail funding

Recommended total gap

3 Month gap	% of total assets	Expected Annual NII

3. Investment strategy

Investment strategy for liquid assets:

Instruments	May - June 1995	July - Sep 1995	Oct - Dec 1995	Jan - Mar 1996	April - Jun 1996
Bonds	60%	55%	55%	55%	55%
T-bills	40%	45%	45%	45%	45%

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