BANK LIQUIDITY RISK MANAGEMENT: A SOUTH AFRICAN SURVEY TO DETERMINE FUTURE CHANGE

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Abstract

In 2008 the global financial system and, more particularly, the world banking system suffered a financial crisis worse than any earlier crises. The financial crunch brought to light that liquidity risk management in banks poses a problem, and that the world's financial institutions will have to change their current practices as it relates to this risk. Apart from the importance of liquidity and the risk that it may cause, the integrated nature of all risks made banks more aware of the fact that none of these risks can be managed in isolation.

For various reasons, South African banks were not as exposed to the problems experienced in the global context. However, SA banks may have learned new lessons from the crisis and may plan to change the way they manage liquidity risk in particular, in the future. In order to determine how SA banks perceive liquidity management and liquidity risk, a survey of all SA banks was carried out.

The majority of respondents indicated that the financial crisis reminded them of the importance of liquidity risk management in the South African banking system as well as the global banking system. The majority of banks rate all the liquidity risk management tools as extremely important and rate corporate governance, strategy, policy and risk tolerance, liquidity risk measurement and intra-day liquidity as their number one priority. Basel III is generally perceived as being effective, but 30% of respondents perceived it as neither effective nor ineffective, because South African banks already have similar measures in place.

Keywords: Basel III, Bank Liquidity, Liquidity Risk Management

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Introduction and problem statement

In 2008 the global financial system and, more particularly, the world banking system suffered a financial crisis worse than any earlier crises. The financial crunch brought to light that liquidity risk management in banks poses a problem and that the world's financial institutions will have to change their current practices in case of a double-dip scenario (Turner, 2009). Less attention has previously been paid to liquidity risk management because of the great cost implications and lower returns that more liquidity has in store for banks. Happy shareholders and high stock prices had the upper hand. The great cost, one of the repercussions of the financial crisis, is extremely small compared to the cost implications of another crisis if liquidity risk is not properly addressed. The public debt of the G20 countries is predicted to expand to 100% of gross domestic product (GDP) by 2014. Can the world really afford to deny this risk the attention it needs? (The Economist Intelligence Unit, 2009).

Prior to the financial crisis of autumn 2008, financial institutions were experiencing extraordinary growth, and many banks had to leverage their balance sheets by increasing lending and funding this lending on the market, rather than with their own deposits, to handle this rapid growth (Blaha, 2009: 12-15; Ingves, 2011). This had a negative impact on the health of their balance sheets as well as on liquidity management. Numerous banks shifted away from asset-based liquidity strategies[1] to liability-based funding strategies[2]. They started using Federal Home Loan Banks (FHLB) advances, Internet Certificates of Deposits (CDs), and brokered deposits as liquidity barriers, which were previously only used as liquidity sources as a last resort (Blaha, 2009: 12-15). Then the subprime crisis unfolded. Central banks globally had to pay for the risky practices of banks, in order to save the world from a complete economic meltdown (Ingves, 2011). Many banks were taken over by other banks, closed down or nationalised when the US housing credit bubble burst in 2007/2008. South African banks, however, were relatively unaffected and remained profitable, although bad debt increased and revenue growth slowed down.

A number of defenses banks devised against liquidity risk proved to be inadequate during the crisis. One such approach was to liquefy illiquid assets. This proved to work only for individual firms facing liquidity problems. Another measure was to bid for higher volume retail deposits. However, the implementation of this approach takes time to have the desired effect and can only prove effective through eroding margins and a propensity among clients to

[1] Maintaining highly liquid assets to satisfy unexpected funding needs (FDIC, 2008).

[2] Off-balance sheet financing through securitisation, brokered/Internet deposits, or borrowings to meet unexpected funding needs (FDIC, 2008).

save. Conversely, banks can also reduce liquidity risk by slowing down and reducing lending to all customers. This, in turn, also takes time to take effect and can have a negative effect on the economy, because limited funds are available to households and corporations wanting to expand businesses. The crisis again highlighted the interrelationship between credit risk, market risk, operational risk and liquidity risk. These risks were traditionally managed separately. It became clear that these risks should be managed on an integrated basis (Barfield & Venkat, n.d.). All the above defenses will prove viable when an individual firm faces liquidity shortcomings, but because bank risks prove to be contagious and due to the integrated nature of the global economy, the concern at the time was that it may become a global dilemma. As these measures are implemented by numerous banks simultaneously, it could cause an economy-wide increase in costs and a greater risk to financial stability (Jenkinson, 2008).

The change in the financial environment and the integration of financial markets has caused banks to diversify their sources of revenue and risk profile globally, thereby increasing their exposure to liquidity risk (Jenkinson, 2008). Banks have failed to account for this increased risk over the past 10 years (Accenture, 2010). In previous years, banks made use of two to three correspondents that provided them with short-term funding. The financial crisis made correspondents more cautious to take risks, which reduced banks' short-term funding resources (Blaha, 2009:12-15). Another aspect that the financial crisis made apparent was that bank board members are not aware of critical information about the liquidity profile of their institutions (Magstadt, et al., 2010).

Liquidity risk management has become increasingly complicated, because the behaviour of various market participants in a stress scenario must now also be taken into consideration when managing this risk. Behavioural finance has become an important phenomenon in managing liquidity risk, but has not received the attention of most financial institutions (Accenture, 2010). The question is: Why does Basel III not incorporate more behavioural management regulation?

1 Objective of the study

The primary objective of this study was to determine how liquidity risk management in the South African commercial banking industry should change in the years to come according to South African bankers. The important question that needs to be answered is: How would SA bankers change liquidity risk management in the future, given what may have been learnt from the recent financial crisis?

2 Research methodology

Primary information was gathered by way of a web-based survey of all South African banks targeting treasury managers and other liquidity and funding specialists. Secondary information gathered from the literature review was used for an overview of the banking environment and to compile the survey questionnaire.

3 Brief literature review

According to Ernst & Young's 2009 survey, 88% of respondents claimed that loss of liquidity was the most keenly felt repercussion of the financial crisis (Ernst & Young, 2010). Liquidity risk management has become a critical, core, required competency of the banking sector (Accenture, 2010). Liquidity risk has in the past been seen as a theoretical, unseen risk to which too little attention was given (Barfield & Venkat, n.d.). However, this has not always been the case. For instance, in mid-nineteenth century, UK banks held 60% of total deposits in the form of liquid assets because of the high frequency of financial crises at that time. Shortly after the Overend and Gurney crisis of 1866, the Bank of England took on the position of lender of last resort, forcing banks to change their inefficient approach to liquidity by dropping their liquid holdings to 30% of deposits. The Competition and Credit Controls Act (CCC) decreased liquidity reserves even further, to 12.5% by 1971, to strengthen control over monetary policy and improve competition in the industry. After another two cuts in the liquidity reserve, liquid assets were replaced by a cash reserve regime, which ensured that banks had enough liquid assets to survive the first week of a liquidity crisis. Similar measures were implemented in other countries. During the past decade, this measure has not been revised (Jenkinson, 2008).

In general, liquidity may be defined as the capacity to obtain cash when needed. According to the Bank for International Settlement (BIS, 2008), liquidity can be defined as the capacity of a bank to fund asset increases as they become due, without incurring undesirable losses (Matz & Neu, 2007: 3). The most important role that banks play is to transform the maturity of short-term deposits into long-term loans, which makes banks intrinsically vulnerable to institution-specific and bank-specific liquidity risk (BIS, 2008). Banks relying heavily on large corporate deposits, banks with large off-balance sheet exposure and banks experiencing rapid asset growth are exceptionally prone to liquidity risk (SBP, 2003:27). It is challenging, if not impossible, to measure liquidity risk without an appropriate definition (Drehmann & Nikolaou, 2009).

A number of liquidity risks exist. The following are the most important.

- Funding liquidity is a twofold concept (the obligation can either be settled or not). It can be defined as the ability to raise cash on demand, while funding liquidity risk is related to the distribution of future outcomes, and thus takes on endlessly many

values. Furthermore, funding liquidity is considered at a specific point in time, while funding liquidity risk is forward-looking and is calculated over a specific time period (Drehmann & Nikolaou, 2009). Traditionally, banks have produced funding liquidity on the liability side of the balance sheet, by borrowing illiquid assets and funding them with liquid deposits. Today, deposits are less important, and funding liquidity from loan commitments and credit lines has become more popular (Strahan, 2008). According to Matz and Neu (2007:5), funding liquidity risk can be subdivided into two categories, namely:

i. Mismatch or structural liquidity risk, which refers to the risk inherent in the bank's current balance sheet structure, due to the maturity conversion in the cash flows of the individual positions; and

ii. Contingency liquidity risk, which involves the risk that banks may not possess sufficient funds to meet sudden and unanticipated short-term commitments. The following definition, derived from the definition given by the BIS (2008), will be used for the purposes of this study: Funding liquidity risk encompasses the risk that firms will not be able to effectively meet current and future expected and unexpected cash flows and collateral needs without affecting the daily operations or financial conditions of the firm.

- Matz and Neu (2007:5) define market liquidity risk as the risk that assets will not be able to be sold at or near market value. It can also be defined as the risk that a firm will not be able to easily offset or eliminate a position at the market price, because of insufficient market depth, or interference (BIS, 2008). Market liquidity risk can be caused by either market disruptions, which may disable banks to sell large positions, or lower quality positions (Matz & Neu, 2007:5).
- Call liquidity risk emerges when deposits are withdrawn at the earliest date possible, instead of withdrawal being delayed. This risk relates to assets and liabilities, and drawings under an option facility may be executed (Duttweiler, 2009:3).
- Liquidity risk comes into play when payments deviate from contractual conditions. For example, this includes a delay in repayment (Duttweiler, 2009:3).

Liquidity risk may briefly be characterized from the sources and its correlation with other risks. Liquidity risk may be present on the liability and asset sides of the balance sheet. The risk arises mostly because of the mismatch between assets and liabilities. According the BIS (2006), liquidity risk may occur as a result of three main sources, namely:

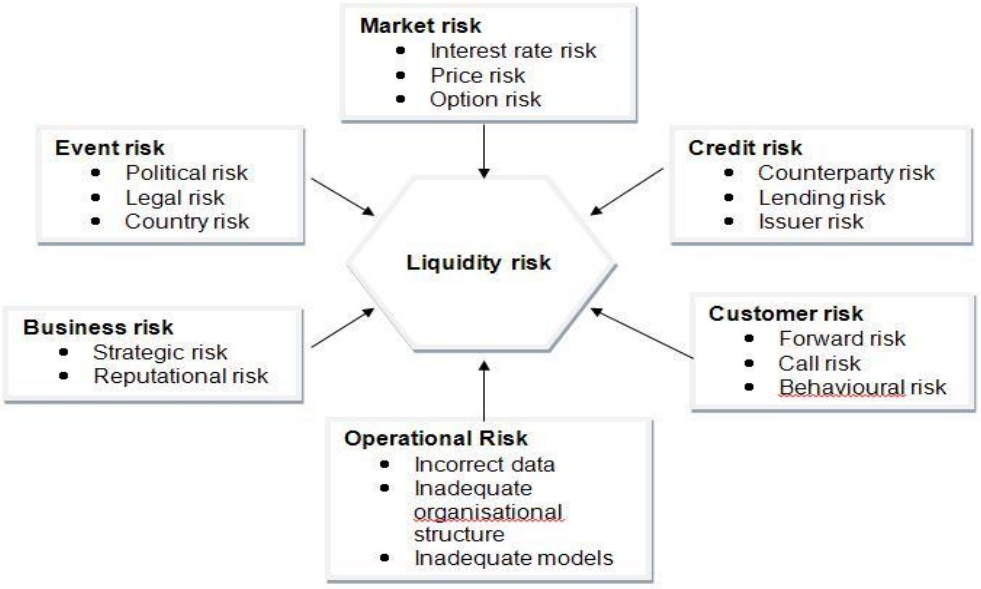
- Event-driven sources such as rating downgrades which may restrict access to markets.
- Transaction- and product-driven sources which may mainly arise due to OTC derivatives and stock borrowing transactions and other off-balance sheet instruments embedded in portfolios. Sudden negative market movements may require posting of additional margin in the case of OTC derivatives which may be very inconvenient.
- Market trends due to volatile market movement necessitating the move to more volatile sources of funding.

Many institutions manage risk in silos. Recent events proved that different types of risks can and do impact one another. It has been observed numerous times during stress scenarios that one type of risk has the tendency to suddenly transform into another type of risk (Barfield & Venkat, n.d.). Financial risks is not mutually exclusive and liquidity risk is often triggered as a consequence of other financial risks, such as credit risk, market risk etc (SBP, 2003:27). Therefore, liquidity risk is not a driving element, but rather of subsequent nature (Duttweiler, 2009:3). An increase in liquidity risk always follows increases in other financial risks (Matz & Neu, 2007:15). Therefore, an integrated risk management framework should be used across a bank's entire risk profile (Magstadt et al., 2010).

The different types of risks influencing liquidity risk are illustrated in Figure 1 below. HKMA (2004:55-56), in Jacobs and Styger (2008:13), points out the most important risks that influence liquidity risk as being the following:

- Market risk may give rise to a reduction in the market or sale value of instruments, also causing a reduction in cash flow in case of forced sale of assets.
- Credit risk where default reduces cash flows from lending activities negatively affecting liquidity.
- Customer risk which relate to a large extent to human behavior.
- Operational risk defined by the BIS (2004:137), in Jacobs and Styger (2008:13) as the risk of loss resulting from insufficient or unsuccessful procedures, people, systems. Clearly, an unsuccessful procedure may also negatively impact liquidity.
- Business risk (also called "coincidental risk") may be broken down into strategic risk and reputational risk. Both these risks may negatively impact liquidity under unforeseen circumstances.
- Event risk caused by unforeseen events such as political, legal or country specific events giving rise to increased volatility and uncertainty.

Figure 1. Liquidity risk components



Source: Bartetzky (2008:12) in Duttweiler (2009:4)

The management of liquidity risk is, of course, firstly the responsibility of each and every bank. However, due to the ever increasing complexity of the financial environment and the inherently flawed human behavior, regulation by a higher authority is needed to protect the depositor and the economy. Bank management does not always do what it is supposed to. Apart from the Banks Act, 94 of 1990, and the role of the South African Reserve Bank (SARB) as it relates to bank supervision, other important regulation in the global context is put forth by the Basel Committee on Banking Supervision (BCBS). The BCBS was established in 1975 and is intricately involved in bank regulation and supervision. Proposals put forth by Basel I and II, has been criticized intensely recently as being insufficient to properly regulate the risks involved in banking and especially liquidity risk since the 2008 crisis. Past proposals as set forth by Basel were improved in Basel III. The BIS recently proposed a number of recommendations or principles based on the recent experiences, which are summarized below:

- Fundamental principles for the management and supervision of liquidity risk.
  - Principle 1: Develop a vigorous liquidity framework which ensures that the bank owns sufficient liquid assets to survive a range of stress tests. These tests include the loss of secured and unsecured funding sources.
- Governance of liquidity risk management
  - Principle 2: Determine the appropriate liquidity risk tolerance of the bank that is appropriate to use in conjunction with the bank's business strategy.
  - Principle 3: Senior management should establish strategies, policies, and practices to manage liquidity risk in accordance with the bank's liquidity risk tolerance level.
  - Principle 4: Integrate liquidity cost, benefit and risk into the internal pricing performance measurement and new product consent process for all noteworthy on- and off-balance sheet business activities.
- Liquidity risk measurement and management
  - Principle 5: Develop a process for the identification, measurement, monitoring, and control of liquidity risk.
  - Principle 6: Monitor and control liquidity risk exposure and funding needs internally, across entities, business lines, and currencies, taking legal, regulatory and operational restrictions into consideration.
  - Principle 7: Establish a funding strategy to provide efficient diversification in the sources and tenor of funding.
  - Principle 8: Develop appropriate measures to manage intraday liquidity, in such a way that payment and settlement obligations are met within the appropriate time frame under both normal and stressed conditions.
  - Principle 9: Monitor collateral positions, as well as the legal entity and physical locations where the collateral is held, and how to mobilise it at the right time.
  - Principle 10: Conduct individual and market-wide stress tests regularly to ensure that exposure to liquidity risk remains within the bank's liquidity risk tolerance framework, and identify potential liquidity risk strains on a timely basis.
  - Principle 11: Set a formal contingency plan in place that outlines strategies for managing liquidity shortfalls in emergency situations.

- Principle 12: Maintain a liquidity buffer of high-quality unencumbered[3] liquid assets, to protect against numerous liquidity stress scenarios.

• Public disclosure

- Principle 13: Regularly disclose information to the public to ensure that market participants are aware of the soundness of the bank, and so that the bank is able to avoid a run.

• The role of supervisors

- Principle 14: Supervisors should regularly monitor and assess the bank's liquidity position and liquidity risk management framework to ensure an adequate level of buoyancy to liquidity stress.
- Principle 15: Principle 14 should be supplemented with the monitoring of internal and prudential reports, as well as market developments.
- Principle 16: Banks should act in a timely manner and effectively to address deficiencies in their liquidity position or liquidity risk management process. This may require the intervention of supervisors.
- Principle 17: Supervisors should communicate regularly with other supervisors and central banks within and across national borders, to ensure cooperation in the oversight and supervision of liquidity risk. The frequency of information sharing should increase during stressful times.

The Basel Committee developed two internally consistent regulatory standards for liquidity risk management to strengthen liquidity risk management and supervision. These standards stipulate the minimum levels of liquidity required for internationally active banks. These standards should be viewed as a minimum supervisory requirement, and banks should conduct their own stress tests with longer time horizons (BIS, 2009).

A number of shortcomings of the Basel proposals have been mentioned. The most important shortcomings are the following:

• Lack of infrastructure: Most institutions do not have adequate infrastructure to manage liquidity at the required level of erudition, due to cost implications. This forces smaller banks with inadequate resources to consider acquisition by larger banks, which, in turn, limits competition in the financial sector, thereby making the consumer carry the burden of a flawed system (Magstadt et al., 2010).

• No flexibility: Basel III does not acknowledge different business models and risk measures across borders, despite there being differences in the degree of sophistication of banks' implementations of liquidity measures (Matz & Neu, 2007:9).

• Long implementation time frame*:* Basel III will not be implemented until 2013, and its full effect will be felt only after January 2019 (Barfield et al., 2010).

• Higher cost implications: Portfolios have to be more capital-intensive and they have to be invested in less profitable lines of business, with more low-yielding liquid assets with negative carry cost implications. This will negatively affect banks' long-run earnings profiles, by putting pressure on net interest margins and decreasing leverage, because banks will be required to be heavily invested in more expensive equity (Ernst & Young, 2010; Dammers, 2010:65-67). One of the respondents in Ernst & Young's (2010) survey reported that the amount of liquidity and capital required will negatively affect banks' current business models. The higher cost of funding and cost of capital will mean that banks will limit lending and other activities.

• Stable Funding Ratio: Central banks across the globe are concerned as to whether market-based funding sources will be sufficient to survive another crisis (Magstadt, et al., 2010).

Liquidity Coverage Ratio: This ratio will change the way banks operate. 100% liquidity will have to be provided for any bond redemption that falls within the 30-day range, thus making commercial papers less valuable. The United States has many outstanding commercial papers, and this ratio will therefore have a more severe impact on the tenor of bank funding than the stable funding ratio has (Dammers, 2010:65-67).

Quantitative Impact Studies (QIS) were conducted in each of the member countries, including South Africa, to approximate the effect of the new standards on individual banks. Due to the results of the QIS, the Basel Committee suggested several changes to the original proposals put forward in July 2010. In September 2010, bank governors and heads of supervision of the member countries agreed to the final proposal and set a timetable for implementation (National Treasury, 2011:17). The key reform proposals include (National Treasury, 2011):

• Improving bank capital: Banks are now required to hold a higher percentage of high-quality liquid assets as loss-absorbing capital. The minimum capital ratio, to be phased in by 2015, has been set at 4.5% of risk-weighted assets.

• Reducing pro-cyclicality: The pre-crisis regulatory framework amplified pro-cyclicality in the financial system, because banks were allowed to hold less capital to protect against expected losses in low-risk periods, but were required to increase their capital holdings in high-risk periods, when they were least able to do so. The reformed Basel III seeks to mitigate this pro-cyclicality by requiring a countercyclical capital conservation buffer of a maximum of 2.5% of risk-weighted assets.

• Leverage ratio: A minimum leverage ratio of bank capital to total assets will preliminarily be required to be 3% and will only become a mandatory requirement in 2018.

• Liquidity ratio: Two new global liquidity standards have been proposed: the liquidity coverage ratio and net stable funding ratio (see Table 1 above) which observation period will start in 2011.

[3] "Unencumbered" means that it cannot be implicitly or explicitly pledged to hedge or collateralise, credit enhance or secure any transaction (BIS, 2009).

Table 1. Regulatory liquidity standards

Ratio	Purpose	Calculation
Liquidity coverage ratio	To assess the short-term risk profile of a bank, and to determine whether it has sufficient high-quality, liquid resources to survive a one-month stress period.	$\frac{\text{Stock of high quality liquid assets}}{\text{Net cash outflows over a 30 day time period}} \geq 100\%$ (BIS, 2010).
Net stable funding ratio	This ratio was developed to promote long-term structural liquidity for illiquid long-term assets. This standard requires a minimum amount of funding that is expected to remain stable over a one-year period that funds assets and off-balance sheet liquidity (BIS, 2009).	$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} > 100\%$ (BIS, 2010).

Liquidity risk problems may initially be revealed in a bank's financial monitoring system as a downward trend in capital or earnings with possible long term consequences. Some common early warning indicators of liquidity risk that may lead to liquidity problems in a bank are listed below. Management should carefully monitor these indicators and take appropriate action if needed. These internal indicators include (SBP, 2003:27):

- Rapid asset growth funded by large volatile deposits
- Concentration of funds in assets or liabilities
- Loss of confidence in the bank
- Declining current or projected earnings performance
- Deterioration in quality of credit portfolio
- Extensive exposure to off-balance sheet items
- A significant increase in risk or negative trend in any area or product line

Banks have developed a number of defenses against a sudden decline in the availability of wholesale funds. The financial crisis has pointed out a range of limitations regarding these mitigators (Jenkinson, 2008):

- Transform illiquid assets into cash: In situations of increased pressure, numerous banks use securitisation techniques to liquefy assets such as mortgages. Such an approach would prove to be successful if a single firm faces a liquidity problem, but if the change in market conditions is the result of a decrease in international demand for securitised products and a widespread closure of term-lending markets, this counter-measure may prove to be inadequate.
- Bid for higher retail deposits: This measure involves banks offering higher interest rates on term deposits, to limit their movement. It is a time-consuming process, because many retail savers react slowly to change in relative interest rates. This counter-measure proves to be successful only if banks erode margins by offering rates above those of their competitors. However, in a stressful environment with significant liquidity strain, banks are more likely to lower rates to protect their own market share. Therefore, the impact of this measure will be limited to a share in any rise in aggregate retail savings over the medium term.
- Slowing or reducing lending: A bank can respond to a liquidity shortfall by acting on the asset side of its balance sheet, by lowering its lending activities. Although this strategy would boost liquidity and reduce funding pressure, it takes time to take effect and can have an adverse effect on the economy. Most lending is agreed upon weeks, and even months, in advance and is difficult to reverse. As one bank restricts its balance sheet growth by tightening lending conditions, banks facing similar pressure, will react to limit any additional diversion of funding pressure onto their own balance sheets. This has severe implications for the wider economy, as it limits the amount of funds available to households and companies to support consumption and long-term investments.

All these defenses have one mutual shortcoming. Although they work well for individual firms facing funding pressure, they do not work when numerous banks face a liquidity shortfall. When liquidity pressure is widely experienced, every bank will attempt to use the above measures to mitigate liquidity risk. The actions of one bank will counteract the actions of competitors, and the gains and losses of market share will net out. This will cause an increase in economy-wide costs and will increase the risk of financial instability (Jenkinson, 2008).

One last defense is for banks to hold a liquidity buffer of reliable high-quality assets such as treasury bills or other government securities. Banks can immediately draw on this buffer in the event of a run-on-the-bank or an unexpected increase in their funding requirements. The opportunity costs of this defense involves lower returns on assets. Unfortunately, these liquidity buffers proved to be inadequate during the recent funding shock. This is attributed to the incentives to raise the efficiency of maturity transformation, which lowered this safety measure by too much (Jenkinson, 2008).

4 Liquidity risk measurement

Ernst & Young's (2010) survey pointed out that executives agree that the complexity of measuring and forecasting liquidity risk is still underestimated. No single statistical measure exists to measure liquidity risk (Matz & Neu, 2007:8-9). However, banks use a wide range of measures to monitor their liquidity risk profiles (BIS, 2009). Measuring liquidity risk can be challenging, because the underlying variables can be dynamic and unpredictable. Until recently, no agreement existed in the international financial community on the proper measurement of liquidity risk (La Ganga & Vento, 2009:83). A 2009 survey conducted by Basel Committee members found that more than 25 different measures are used globally by supervisors to monitor liquidity risk. These tools form a more macro prudential approach to liquidity supervision and include measures such as the evaluation of the liquidity implications of specific balance sheet profiles, contractual and bank-estimated cash flows and maturity gaps across time frames, and the use of market data to evaluate liquidity risk. The Basel Committee developed four minimum metrics that should be used by supervisors in monitoring liquidity risk (BIS, 2009):

- Contractual maturity mismatch: This measure provides a baseline of a bank's contractual commitments and is used to compare liquidity risks profiles across firms and point out liquidity needs to banks and supervisors.
- Concentration of funding: This metric involves analysing the concentration of wholesale funding and is used by supervisors to assess the extent of funding liquidity risk in the case of the withdrawal of one or more funding sources.
- Available unencumbered assets: This measure quantifies the amount of unencumbered assets a bank may potentially use as collateral for secured funding, making banks aware of their capacity to raise additional funds.
- Market-related monitoring tools: Market-related data is a useful supplement to the metrics listed above, as it is a source of instantaneous data. Useful measures include institution-related information, such as equity prices and credit-default swap spreads, and the monitoring of market-wide data on liquidity and asset prices.

The Basel Committee requires that these metrics be calculated and reported at least monthly, and weekly or even daily, in stressed situations (BIS, 2009). According to Matz & Neu (2007:18-22), banks mainly use three metrics to quantitatively manage liquidity risk namely balance sheet liquidity, cash capital and maturity mismatch analysis.

Balance sheet liquidity analysis relates to different balance sheet items on the asset side and liability side, depending on the liquidity and funding of the assets. Assets can be either liquid or illiquid, and the funding thereof can be stable or volatile. In an optimal balance sheet structure, illiquid assets should be financed by stable liabilities, and liquid assets should be funded by volatile liabilities (Matz & Neu, 2007:18). A bank's annual report is the only document needed to evaluate liquidity risk with this approach. Due to the simplicity of this approach, it is faced with numerous shortcomings such as missing time frames, market value of securities as shown in the balance sheet may be different from the value as determined for liquidity quantification purposes, accounting value may be different from the economic values, off balance sheet obligations are not reflected in the financial statements, commercial paper may be reclassified as unsecured money market funding, non-bank deposits for liquidity purposes may be classified as core or volatile money market funding as opposed to otherwise stable funding (Matz & Neu in Jacobs & Styger, 2008:34-35).

Many banks are now using stress tests in conjunction with balance sheet analysis. The analysis is performed over a long time horizon and determines the combined impact of market, economic and other factors on capital, earnings, liquidity, and solvency.

The cash capital position was originally invented by Moody's and measures a bank's ability to fund its assets on a fully collateralised basis, assuming that any access to unsecured funding has been lost. Access to unsecured funding will be lost after a rating downgrade. Moody's developed this concept to analyse the liquidity structure of a bank's balance sheet, in order to give the bank a credit rating (Matz & Neu, 2007:22).

Cash capital can be defined as the gap between the collateral value of unencumbered assets and the volume of inter-bank short-term funding and volatile parts of non-bank deposits (Matz & Neu, 2007:22). The cash capital approach is used in the evaluation of balance sheet liquidity and assists in the determination of the appropriate debt financing term structure (Royal Bank of Canada 2003:62A in Jacobs & Styger, 2008:34). The objective of this approach is to maintain sufficient cash capital to fund illiquid assets (Clarke, 2007:59, in Jacobs & Styger, 2008:34). The cash capital position measures a bank's ability to fund its assets on a fully collateralised basis and ensures that banks survive stress scenarios (La Ganga & Vento, 2009:84).

It is generally known that illiquid assets should be funded by stable liabilities, to guarantee an appropriate balance sheet structure regarding liquidity risk. Thus, total marketable assets (TLA)[4] should be funded by total volatile liabilities (TVL)[5] (La Ganga & Vento, 2009:84). The following formula can be deduced (La Ganga & Vento, 2009:84):

[4] Total marketable (liquid) assets include cash, encumbered assets, and reimbursable loans (La Ganga & Vento, 2009:84).
[5] Total volatile liabilities primarily comprise of short term customer demand deposits and overnight and other short-term wholesale funds (La Ganga & Vento, 2009:84)

$$CCP = TLA – TVL – CLT,$$

where CCP = Cash capital position;
CLT = Commitments to lend[6]

The cash capital position addresses some of the shortcomings of balance sheet liquidity analysis. Although it is perceived to be comprehensive it has the following drawbacks (La Ganga & Vento, 2009:85):

- It does not take into account bank generated cash earnings;
- It does not consider unfunded commitments which the bank may be obliged to pay at any time;
- The discount applied to marketable securities may be too low and could increase during periods of extreme illiquidity;
- It does not consider long term liabilities with short maturities;
- This approach does not specify when the positions can be liquidated, because balance sheet items are divided into liquid and illiquid items. Thus, this approach does not appropriately consider the diversity liquidity degrees.

The maturity mismatch is another measure that aims is to protect the bank's ability to meet its payment obligations and to calculate, as well as limits, liquidity transformation risk based on the liquidity-at-risk figures. Information regarding this approach seems to differ across banking industries. This approach is also called the "cash flow-based approach", and it is based on a maturity ladder that is used to compare the future cash in- and outflows of banks and understand trends in cash flows. It allows banks to measure "cash flow mismatches" or "liquidity gaps" by identifying gaps between contractual in- and outflows of funds during specified periods. When estimating cash flows the following factors should be considered (SBP, 2003:33):

- Some cash flows may be seasonal or cyclical.
- The funding requirement of off-balance sheet commitments should also be accounted for.
- Management should consider the various phases of the economic cycle, which cause increases and decreases in liquidity.
- Management should take human behavioral patterns and interest rates levels into consideration.

The traditional gap analysis measures the difference between the volume of repricing interest earning assets and interest bearing liabilities over numerous time frames (Brar, 2005:2, in Jacobs & Styger, 2008:36). Table 2 illustrates the liquidity gap profile of a bank's simplified balance sheet from overnight to more than one year.

The net cumulative liquidity gap can be calculated by subtracting the net cumulative inflows from the net cumulative outflows. Positive gaps indicate that the bank can roll over its outflows by liquidating its encumbered assets (Matz & Neu, 2007:26). Banks usually have sizeable negative funding gaps over the long-term and will try to offset these gaps by influencing the maturity of transactions (La Ganga & Vento, 2009:86). Negative gaps is not always an indication of insolvency and may mean that the liquidation of a bank's inventory will not be sufficient to cover outflows with regard to the current balance sheet (Koch & MacDonals, 2006:469 in Jacobs & Styger, 2008:39).

A maturity ladder can assume multiple structures and cash flows, depending on the objectives, time frames, and business units involved, as illustrated in Figure 2 (La Ganga & Vento, 2009:87).

This maturity ladder simulates the path of short-term liquidity gaps, assuming no future balance sheet growth. Because of the short time horizon of the operational maturity ladder, which can reach only three months, the balance sheet items included in the ladder are all treasury book items, such as repurchase agreements, short-term cash and derivative instruments, currency swaps, etc. Highly volatile trading assets such as credit cards and cash accounts do not form part of the analysis, because they are considered too tricky to predict. They are, however, included in contractual maturity ladders (La Ganga & Vento, 2009:87).

Banks make use of numerous ratios to quantify liquidity risk and set liquidity risk limits. Ratios should not be used in isolation and rather be used in conjunction with qualitative information of borrowing capacity such as the probability of a decrease in credit lines, increase in early withdrawals, shortening of term funds available and decrease in transaction size. Some examples of ratios include the following (SBP, 2003:14):

- Cash flow ratios are used to control the amount of maturing liabilities during a certain period of time. The inability to roll over maturing liabilities may have serious implications for banks.
- Limits are used by banks to move away from concentrated funding sources denominated in the same currency or with similar maturities. Limits can be expressed either as a percentage of liquid assets, or as an absolute amount.
- Total loans/total equity, borrowed funds/total assets, total loans/total deposits, net short-term liabilities/assets, reliance on wholesale funding, net non-core funding dependences and on-hand liquidity/total liabilities are some of the common measures used by banks to supervise current and future funding levels.

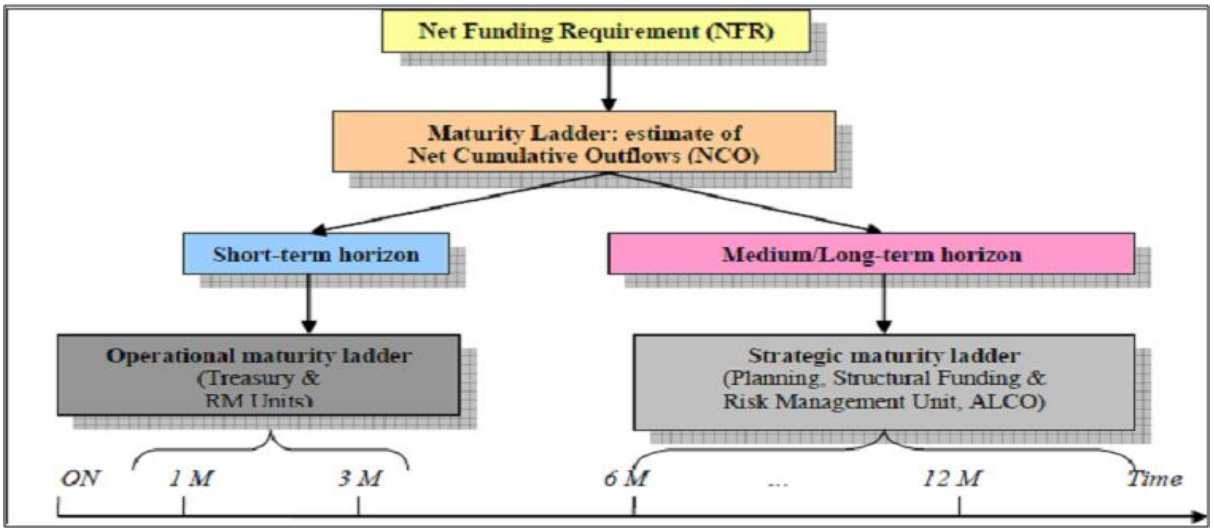
[6] Commitments to lend mainly comprise core and illiquid assets (La Ganga & Vento, 2009:84).

Table 2. Example of liquidity gap profile

Bands (upper limits)		ON	1 W	2 W	1 M	3 M	6 M	1 Y	>1 Y	TOT
Main expected Inflows	Loans	40	80	110	170	250	400	650	900	2600
	Securities			10	100	130	110	200	350	900
	Cash & Other	35								35
Main Expected outflows	Deposits	-10	-30	-50	-90	-200	-350	-590	-650	-1970
	Other Funding	-30	-30	-50	-50	-60	-50	-110	-80	-460
	Bond				-130	-160	-200	-300	-770	-1560
	CTL	-5	-25	-30	-20	-30	-110	-100	-100	-420
Net Funding Req. (NFR)		30	-5	-10	-20	-70	-200	-250	-350	-875
Cumulative Fund. Req. (CFR)		30	25	15	-5	-75	-275	-525	-875	

Source: La Ganga & Vento (2009:85)

Figure 2. Cash flow projections – different time horizons



Source: La Ganga & Vento (2009:87)

In addition to cash reserve requirements and statutory limits of liquid asset requirements**,** management should place limits on the amount and nature of liquidity risk that they are willing to assume. When placing limits on liquidity risk exposure, management should consider the nature of the bank's strategies and activities, the board's risk tolerance, the bank's earnings, past performance and available capital to absorb losses. These limits should be reviewed and adjusted periodically as the bank's risk tolerance changes (SBP, 2003:34). Placing limits on risk exposure will not prevent a crisis, but may be an early warning signal of excessive exposure to risk or inadequate liquidity risk management

Banks use numerous qualitative measurement tools for liquidity risk management, but some of the more commonly used measures include stress-testing and scenario analysis and contingency funding plans. Stress-testing has become the basis of the strategic and capital planning process. (Ernst & Young, 2010). Stress-testing and scenario analysis is used to identify potential weaknesses and vulnerabilities in a bank's liquidity position, and to determine the techniques that senior management will use to manage a negative impact on the funding and liquidity strategies of a bank (BIS, 2008). Leading commercial banks are incorporating various scenarios with different degrees of severity at both group and subsidiary levels. The techniques involved include the implementation of institution-specific and systemic assumptions, instrument-specific haircuts, and the consideration of the impact of contingent liabilities (Magstadt et al., 2010).

Since the financial crisis, stress-testing has been adjusted to encompass a longer time horizon and include numerous worst-case scenarios (Ernst & Young, 2010). A contingency funding plan follows on the stress-testing process and allows institutions to devise detailed plans to manage the possible repercussions of a wide range of liquidity events (Magstadt et al., 2010).

A contingency funding plan (CFP) is a set of policies and procedures that serves as a map to banks to meet their funding needs in a timely manner at

reasonable cost (SBP, 2003:31-32). The purpose of the CFP is to document the institution's planned response, role, and responsibilities in diverse market scenarios, including rapid liability erosion, and aggressive asset growth over short, and long periods of time. Steps in developing a CFP include (Blaha, 2009:12-15):

- Gathering an appropriate team to collect and analyse funding and liquidity data.
- Discussing the bank's specific funding philosophies and challenges.
- Developing a model which encompasses the bank's current balance sheet and pro forma cash flows.
- Reviewing policy limitations and key liquidity and balance sheet funding ratios.
- Modeling and discussing stress events.
- Discussing the results of stress events and determining how best to manage such events.
- Documenting the appropriate measures management should employ when dealing with a stressed liquidity event.
- Developing monitoring tools for the liquidity funding plan.
- Appointing a liquidity plan execution team.

5 Liquidity risk during the financial crisis

Before the financial crisis, markets were buoyant and low-cost funding was abundant. The sudden reversal of market conditions proved how quickly liquidity can evaporate, and that illiquidity can last for a long period of time. Central banks had to support the functioning of money markets, and even some individual institutions, due to the stress that the crisis placed on the banking sector (BIS, 2008).

The increase in interest rates in the US and the decrease in house prices caused the default rate of sub-prime mortgages to increase significantly. This resulted in structured securities being downgraded and special-purpose vehicles experiencing difficulties in raising funds in the money market. The entire system spiralled out of control, and sponsoring banks had to intervene by providing liquidity. Liquidity in the US interbank market quickly dried up, and the crisis spread all over the world. Central banks had to intervene to prevent the complete downfall of the financial system as we know it (La Ganga & Vento, 2009:79-80).

A respondent in Ernst & Young's (2010) survey made the following comment concerning risk management: "Working through the crisis, we gained insight into how to strengthen our risk management and control. It allowed us to shore up our weaknesses and further develop the risk management team." The financial crisis re-emphasised the importance of liquidity to the functioning of the banking sector and proved that insufficient liquidity risk management could threaten the financial system as we know it (Dammers, 2010:65-67; BIS, 2008). Many commercial banks had appropriate liquidity risk management measures in place, but they did not exit the crisis much better than banks with fewer measures. Accenture (2010) described as follows the challenges that banks face today: "It was never easy being a financial institution, but the challenges today rival any in history."

Effective risk management has gained priority in most banks as they are mobilising to address and identify deficiencies. Banks have undergone a noteworthy shift in approach, policies, systems, and processes, by making risk "everyone's business" (Ernst & Young, 2010). Good liquidity risk management can certainly not prevent the next financial crisis, but it can mitigate the impact, and also enable banks that have the ability to act faster than their competitors to gain a competitive edge (Accenture, 2010). Though the worst seems to be behind us, financial markets remain fragile. As the world economy shows signs of recovery, many countries still experience high unemployment rates. Consumer confidence in financial institutions and government remains at an all-time low. Executives still fear what they call the "ripple threat", which is the economic, political and regulatory aftershocks of the financial crisis (Ernst & Young, 2010). Firms should not assume that, because they survived the last liquidity crunch, they are immune to failure if another crisis occurs. Major credit events will bring about new challenges that could prove to be fatal for the most successful of firms (Magstadt, et al., 2010).

Many banks failed to account for numerous important principles in bank liquidity risk management prior to the crisis, when liquidity was plentiful (BIS, 2008). However, the recent crisis underlined the following for better understanding and management of liquidity risk.

- Banks need to develop a more in-depth and complete or overall understanding of the various forms in which liquidity risk can arise. This requires a careful analysis of the potential sources of liquidity risk, as well as how this risk may crystallise under stressful market conditions (Jenkinson, 2008).
- Banks that were most exposed to liquidity risk did not have an adequate liquidity framework that accounted for product and business-line liquidity risk. Therefore, incentives at business level could not be properly aligned with the overall risk tolerance of the bank. Numerous banks viewed stress tests as unnecessary practices, since prolonged liquidity disruptions were perceived as implausible (BIS, 2008). Stress scenarios were not tough enough or comprehensive enough and did not address the most traumatic conditions (Accenture, 2010).
- Stress tests should span individual group and market scenarios. Stress tests should also consider the impact of "crowded trades", the dynamics of liquidity hoarding, and the loss of market confidence and funding lines caused by signaling weakness. They should also consider the closure of funding markets, determine the effect of several markets being closed

simultaneously, and consider longer horizons, because liquidity crises could persist for fairly long periods of time (Jenkinson, 2008). Accenture (2010) offers the following advice: "Test often. Test widely. Test rigorously."

- Many banks did not estimate the level of liquidity they needed to satisfy both contractual and non-contractual contingent obligations because funding of these obligations was perceived as highly unlikely. Contingency funding plans (CFPs) often failed to consider potential closure of some funding sources and were not always suitably linked to stress tests (BIS, 2008).
- Disclosure practices with regards to liquidity risk management differ significantly between banks. During times of increasing uncertainty, inadequate disclosure could lead to defensive reactions by counterparties, which could have been prevented by disclosing detailed information (Jenkinson, 2008). Banks are, however, reluctant to disclose information that may place them at a competitive disadvantage or make them vulnerable to other market participants (Barfield & Venkat, 2010).
- It is the responsibility of regulators and authorities to preserve financial stability by decreasing the probability and impact of bank failures which could threaten the sound functioning of global financial markets through spillovers, contagion, and damage to financial networks. Private banks struggle to bear the high costs of these regulations because their responsibility to their shareholders is considered more important for their stock prices (Jenkinson, 2008).

Banks have failed to account for changes in the liquidity market over the past 10 years and these changes brought to light the complexities (mentioned below) in the management of liquidity during the 2007 financial crisis (Accenture, 2010).

- Complex financial instruments/exotic investment products that carry embedded options or contingencies have grown in importance in the banking sector (Accenture, 2010). The liquidity profile assessments of these instruments are complicated due to credit rating downgrade clauses and embedded call features. Assessing the price and secondary liquidity of complex, highly tailored instruments is challenging, because they are not actively traded. Due to the short track record of these instruments, it is difficult to predict their cash flows and correlation with other assets during stress scenarios (BIS, 2008).
- As a result of increased funding from capital markets, banks have become more reliant on wholesale funding sources, including commercial money market instruments such as commercial papers and repurchase agreements. Volatile sources of capital market funding make commercial banks vulnerable to margin and collateral calls and sudden changes in funding demand (Accenture, 2010). In times of market-wide stress, investors are more risk-averse and they demand higher compensation for risk, requiring banks to roll over liabilities at considerably shorter maturities, or refusing financing altogether (BIS, 2010). An isolated event can spread to international markets, because of the interconnectivity of international economies (Accenture, 2010).
- Poor data quality can inhibit the development of adequate enterprise-wide stress testing tools. Banks need to use standardised data (Marshall, 2010:9).
- Predicting future liquidity needs is much more complicated than it used to be. It involves making assumptions about the reaction of consumers, counterparties, and customers in future situations, as well as predicting human behavior in a stress scenario. The financial crisis caused market participants to mistrust the banking sector. The only way trust can be restored is if banks improve transparency and enhance communication with market participants (Accenture, 2010).
- Globalisation has caused banks to operate in other countries with varying legal constructs, which has cash implications (Accenture, 2010). Strong cross-border flows may cause liquidity disruption across different markets and settlement systems. Some banks centralise their liquidity model and meet shortfalls in one currency with funds in another currency. These banks need to factor into their plans the conditions of overseas markets, as well as the time it takes to complete the transfer of funds or collateral across different jurisdictions (BIS, 2008).
- Securitisation is used by banks to expand sources of funding, free up additional balance sheet capacity, and create revenue through buying and distributing third-party assets. These financial market innovations enable firms to obtain liquidity from illiquid assets through special-purpose vehicles[7]. This is time-consuming and can result in banks having to warehouse assets for longer than expected. Under stressed conditions this can lead to a build-up of assets that have to be warehoused, which requires financing. Asset-backed commercial papers give rise to contingent liquidity risk because the firm may be required to provide liquidity unexpectedly usually under stressed scenarios. Early amortisation provision incorporated into securitisation of revolving credit may also cause contingent liquidity risk. The reputation of banks can be severely affected if they do not provide liquidity to conduits and off-balance sheet vehicles (BIS, 2008).
- Banks increasingly use collateral as a risk diversifier. Collateral has become more sensitive to liquidity risk, due to changes in risk management practices. Collateral is used to mitigate counterparty credit risk, but it negatively affects funding liquidity risk as counterparties have to provide additional collateral at short notice if conditions change (BIS,

[7] Banks pool assets together and sell them to special-purpose vehicles to obtain a better credit rating and receive a higher interest income (BIS, 2008).

2008).

• Intraday liquidity management has become more complex, not only in banks' own activities, but also in the activities of their customers. These complexities can partly be explained by the improvements made to the design of payment and settlement systems. These measures have reduced interbank credit risk and operational risk, but have at the same time increased the collateral needs and time-criticality of certain payments, resulting in banks facing new forms of intraday liquidity risk. If banks fail to meet time-critical payments, it could escalate to domestic and even international liquidity shocks (BIS, 2008).

The South African financial sector did not experience the distress that developed economies experienced. The most important policy components that may have limited the effect, are the following (National Treasury, 2011:13-15):

• Sound framework for financial regulation and well-regulated institutions

• Conservative risk management practices at domestic banks

• Limited exposure to foreign assets

• Subsidiary structure and listing requirements.

6 Analysis of survey results

The results from the survey are briefly discussed next. All seventeen commercial banks (locally and internationally controlled) in South Africa were surveyed. The response rate was nine out of the fifteen banks that were willing to participate in the survey. Two banks indicated that they were not prepared to participate in the survey.

Table 3. Survey response rate

	First e-mail		Reminder e-mail		Overall	
	f	%	*f*	%	*f*	%
Sent to	15	100%	11	73.33%	15	100%
Response rate	4	26.67%	6	40.00%	9	67%

Table 4. Sections covered in the survey questionnaire

Section	Type	Questions relating to:
Section 1	Demographic information	• Size of bank. • Area of responsibility of respondent.
Section 2	Effect of financial crisis on liquidity risk management.	• Problems experienced during financial crisis. • Current status with regards to liquidity risk. • Areas of change after financial crisis. • Lessons from the financial crisis.
Section 3	Current management techniques.	• Importance and effectiveness of liquidity risk. • Liquidity risk management techniques. • Frequency of use of ALM techniques.
Section 4	Perception on Basel III.	• Implementation. • Effectiveness.
Section 5	Areas for future change.	• Proposed change in local and global liquidity risk management.

The size of each institution was measured in terms of market capitalization. Very small banks could be identified by their lack of market capitalization, because they are not listed. The responding banks were divided into three categories according to an ordinal scale: small (less than R20 billion), medium (R20 billion to R100 billion) and large (more than R100 billion). Half of the respondents were from small sized banks, while 20% of the remaining respondents were from medium sized banks and 30% from large banks.

An open-end question was used to determine the position and area of responsibility of each respondent. The responses are illustrated by the Figures 3 and 4 below. The asset and liability manager position as well as the "other" position were the least representative positions held, each representing 10% of respondents. The remainder of the positions each represented 20% of respondents; this included the position of head of liquidity and funding, treasurer, chief dealer and liquidity analyst. It is important to note that many small banks do not have the resources to appoint treasury managers and therefore many chief dealers of small banks also perform the liquidity risk management function.

Figure 3. Positions held by respondents

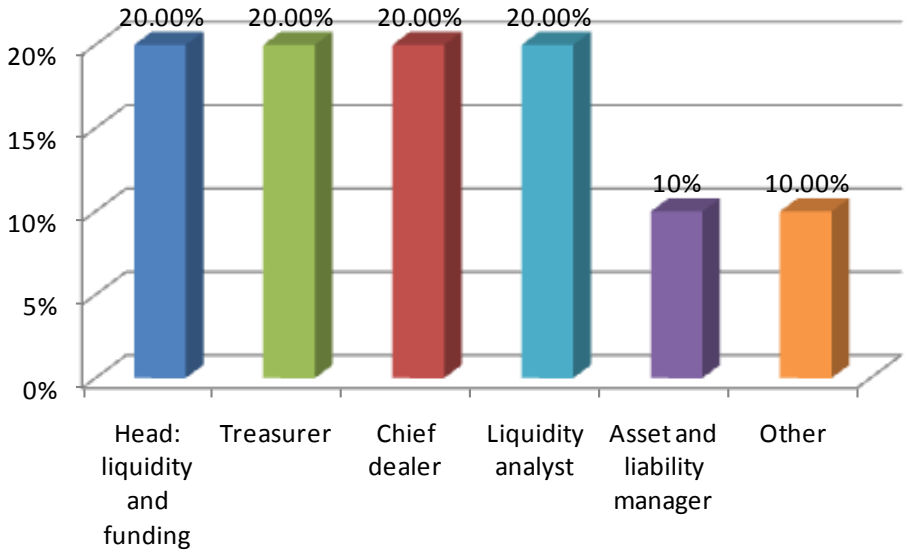


Figure 4. Area of responsibility

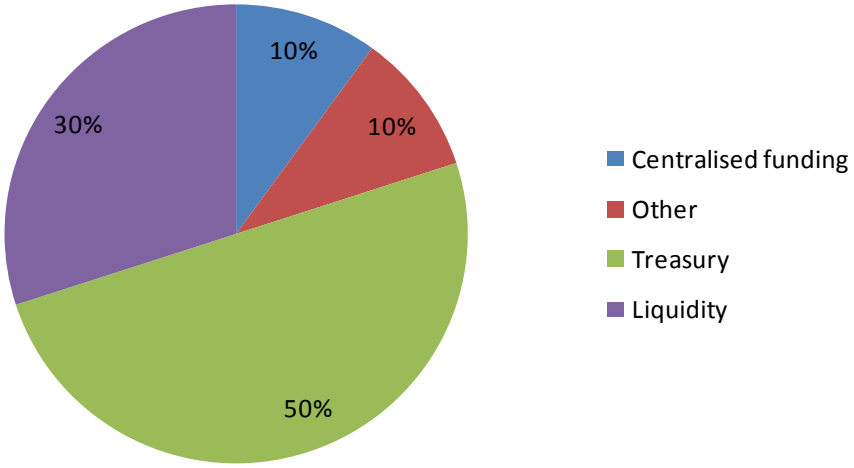


Figure 3 illustrates that the majority of respondents (50%) indicated the treasury function as their area of responsibility. The treasury function includes the management of liquidity risk. 30% of respondents' area of responsibility is liquidity and the remainder of the respondents are responsible for centralized funding (10%) and other functions (10%). Note that 30% of respondents focus solely on liquidity risk management. Of the three respondents that indicated liquidity as their area of responsibility, two were from large institutions and one from a small institution. It can therefore be concluded that 66.67% of large commercial banks rate the liquidity risk management function as so important that they appointed professionals whose sole responsibilities it is to manage this risk. Figure 4 indicates the area of responsibility of the respondents.

Question four, eight, nine and fourteen of the survey questionnaire were designed to assess the impact of the financial crisis on liquidity risk management in South Africa. Respondents were asked if they experienced liquidity problems during the financial crisis and were asked what lessons they learned from the crisis. They were also asked to indicate the changes (if any) they made to their liquidity risk management strategy. They were asked to respond by making use of multiple and single response multiple choice questions in conjunction with open ended options. All of the respondents indicated that their banks did not experience liquidity problems during the financial crisis. The following reasons were provided (categorised according to bank

size):

• Large Banks

1. South African banks hold liquidity buffers, have strict contingency plans in place and have been extending their funding tenor.

2. Local banks perform liquidity simulation exercises to ensure that their management procedures remain efficient and up to date.

3. The closed nature of rand currency market sheltered local banks to some extent against the impact of the financial crisis.

4. Weekly Asset Liability Committee (ALCO) meetings were held during the crisis to ensure quick reaction if needed.

• Medium Banks

5. There is a robust liquidity framework in place.

6. A conservative liquidity risk management approach is followed.

• Small Banks

7. These banks have a strong customer base.

8. There is no off-shore exposure.

9. There are large cash reserves.

10. The banks fund short and lend long, resulting in a long position held with the net carry cost serving as insurance against liquidity risk.

40% of respondents indicated that they did not learn any (new) lessons from the financial crisis. 60% of respondents indicated the following lessons were learnt regarding bank liquidity risk management during the financial crisis:

• Liquidity risk should be managed with the same level of effort and focus as the bank's capital position.

• There is no space for compromise in terms of liquidity risk management.

• No matter how sound a bank's policies are, they can be impacted indirectly by others bank's actions.

• Banks should limit their exposure to risky investments and consider counterparty risk.

• Banks should consider the importance of pro-active risk management.

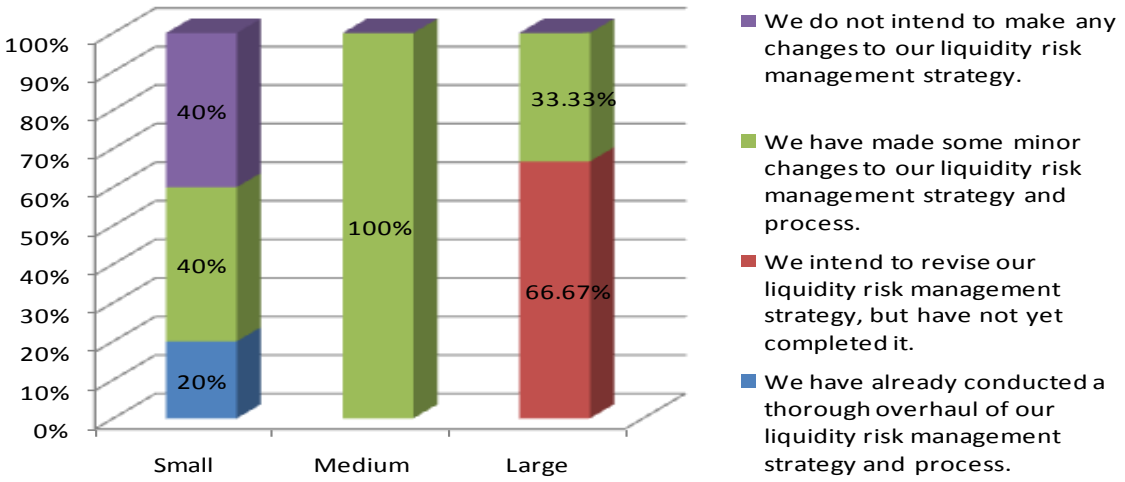
• Banks should keep in mind the consequential nature of liquidity risk and the importance of clear and concise communication of action plans and relative roles and responsibilities in a crisis situation.

The 40% of respondents that indicated that they did not learn anything from the financial crisis consisted of 50% small banks, 25% medium sized banks and 25% large banks. Thus 40% of small banks and 50% of medium sized banks indicated that they learned nothing new from the financial crisis.

50% of respondents indicated that they have made minor changes to their liquidity risk management strategy and process, while only 10% of respondents have conducted a thorough overhaul of their liquidity risk management strategy and process. 20% of respondents admitted that they intend to revise their liquidity risk management strategy, but have not yet completed it. The remaining 20% indicated that they do not intend revising their liquidity risk management strategy.

The majority of small banks either do not intend making any changes to their liquidity risk management strategy or have made some minor changes. Medium banks have all made minor changes to their strategy, while the majority of large banks indicated that they have not yet completely revised their liquidity risk management strategy (see Figure 5).

Figure 5. Stage of implementation of liquidity risk management procedures (categorised by bank size)



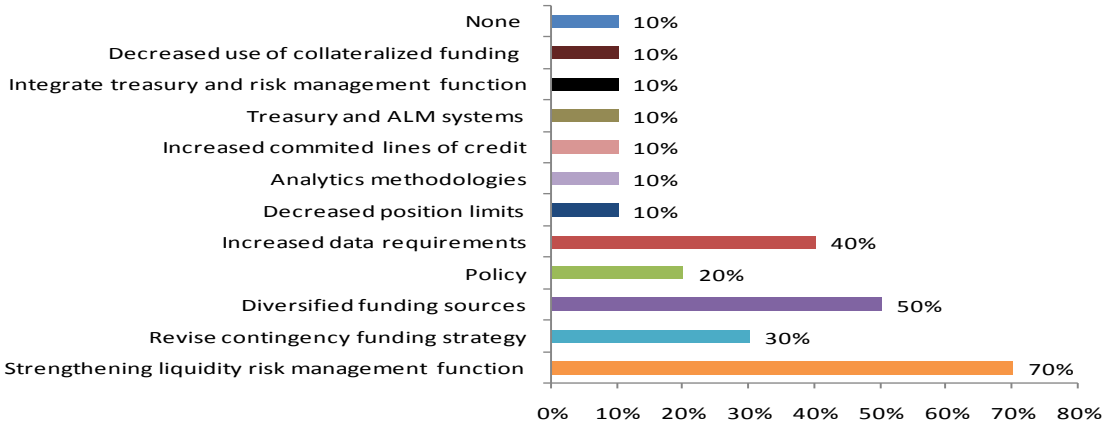
Large institutions specified that they have made as well as are planning to make the following changes to their liquidity risk management strategy:

• Enhance their liquidity risk appetite.

- Enhance liquidity risk measurement systems and increase frequency of monitoring and reporting liquidity risk metrics.
- Increase liquidity buffers.
- Extended forecasting period.
- Conduct simulation exercises in line with the recent financial crisis to test their contingency plans.
- Develop models to determine Basel III liquidity metrics.

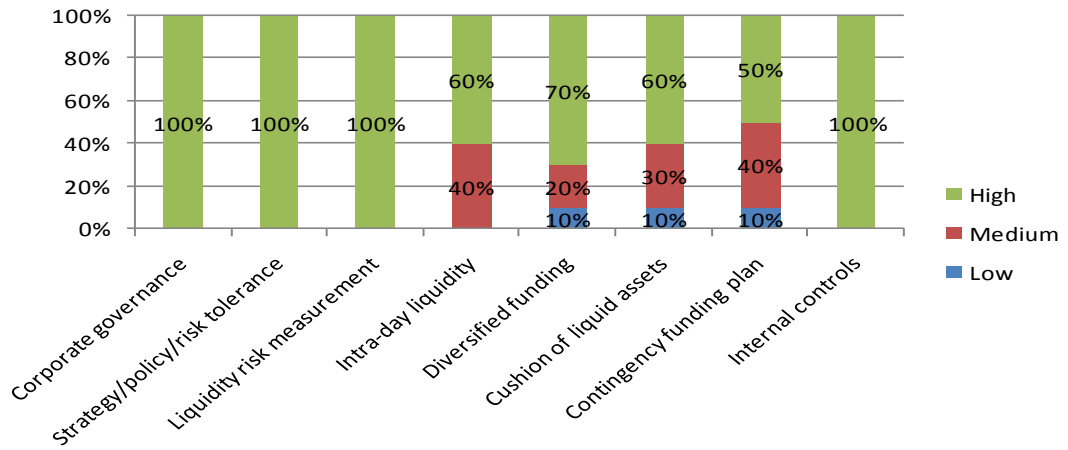
Most banks (70%) have strengthened their liquidity risk management function and many have increased their data requirements and made changes to their diversified funding sources. Only 30% have revised their contingency funding strategy. Only 10% of respondents have made no changes to their liquidity risk management strategy. It can therefore be concluded that although South African commercial banks did not experience liquidity problems during the recent financial crisis, some minor changes have been made or will be made to their liquidity risk management strategies in response to the financial crisis. Figure 6 indicates the areas identified for change.

Figure 6. Areas of change in response to financial crisis



Questions four, five, six, seven and ten of the questionnaire aimed at determining the importance, priority, effort and effectiveness of liquidity risk management in South African commercial banks. A five-point Likert scale was used to determine the importance of liquidity risk management. All respondents rated liquidity risk management as very important. A three-point Likert scale was then used to determine the importance of the different liquidity risk management tools to commercial banks. The results are illustrated in Figure 7 below. The majority of respondents rated the importance of all the liquidity risk management tools as high, placing emphasis on corporate governance, strategy, policy, risk tolerance, liquidity risk measurement and internal controls.

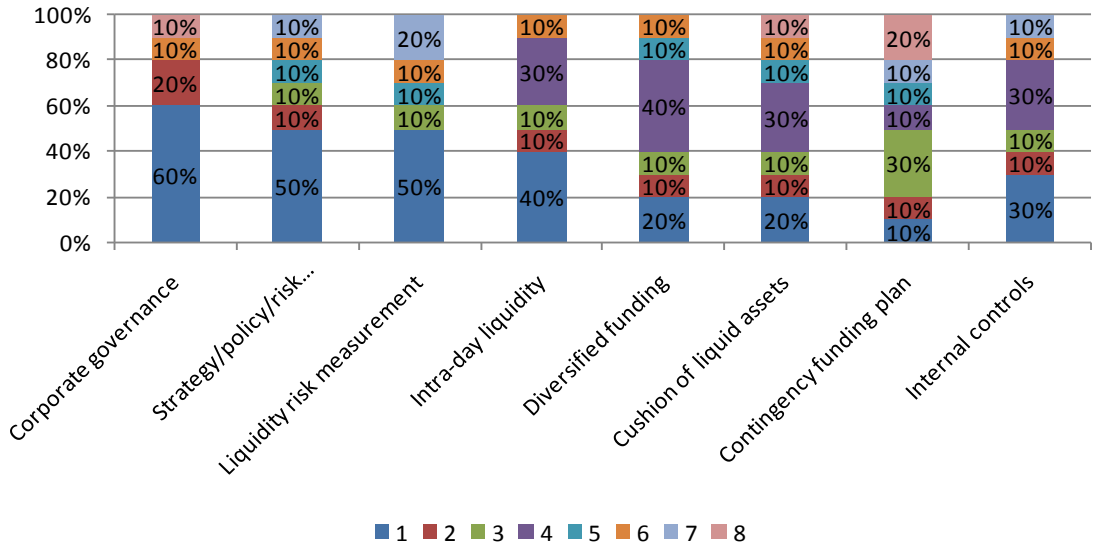
Figure 7. Importance of liquidity risk management tools



An eight-point Likert scale was used to determine the priority of use of each liquidity risk management tool in each commercial bank (see Figure 8). A value of one being the bank's first priority and

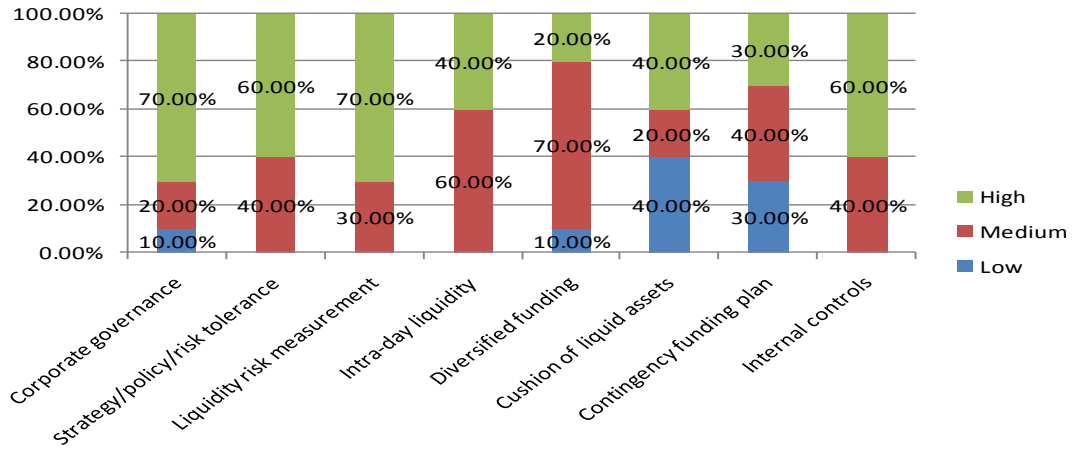
eight, its lowest. When prioritizing the different liquidity risk management tools the majority of respondents rated corporate governance, strategy, policy and risk management, liquidity risk measurement and intra-day liquidity as their number one priorities. Respondents were divided in indicating the priority of internal controls, 30% rated this as their number one priority and 30% as their fourth priority. Contingency funding plans were rated by the majority of respondents as their third priority and diversified funding and liquidity buffers were rated as most banks' fourth priority.

Figure 8. Priority of use of liquidity risk management tools



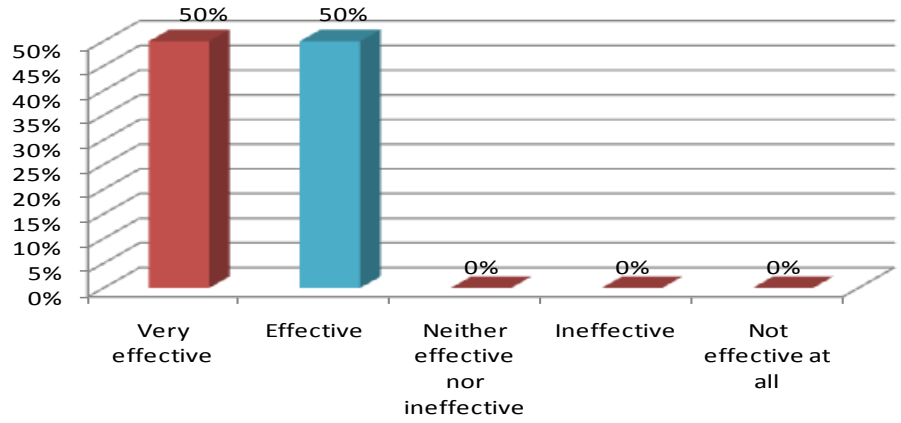
The majority of respondents indicated that their bank spends a high level of effort on corporate governance, strategy, policy and risk tolerance, liquidity risk measurement and internal controls. 40% of respondents indicated that liquidity buffers require a high level of effort, while 40% indicated that this measure requires a low level of effort. Intra-day liquidity and contingency funding plans generally enjoy a medium level of effort (see Figure 9).

Figure 9. Effort required by liquidity risk management tools



A five-point Likert scale was used to determine the effectiveness of the commercial banks' own liquidity risk management strategies and this is illustrated in Figure 10.

Figure 10. Effectiveness of liquidity risk management strategy

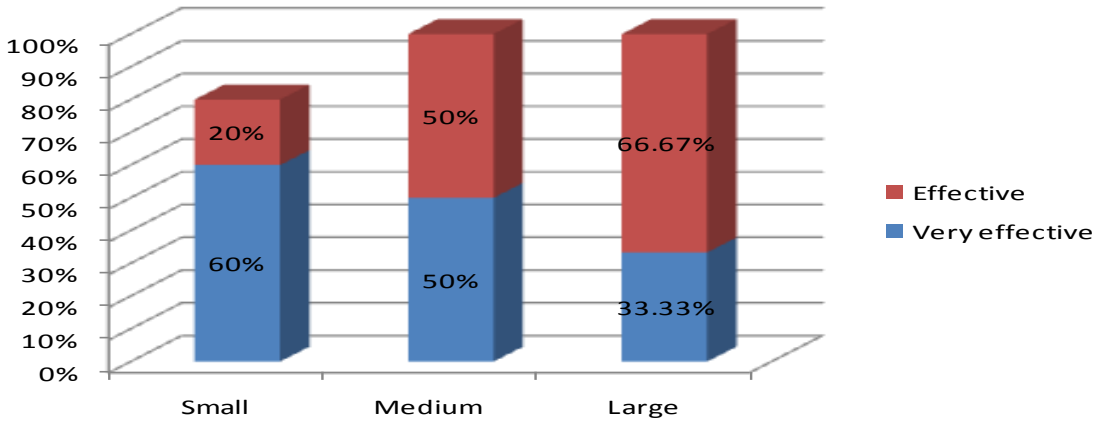


50% of respondents indicated that their liquidity risk management strategy is very effective and 50% indicated that their liquidity risk management strategy is effective. The banks who indicated a very effective liquidity risk management strategy, provided the following reasons:

- Liquidity risk management practices are in line with new local and global best practices.
- The appropriate systems combined with appropriate skills are in place.
- The bank did not experience any liquidity problems during financial crisis.

To draw a definitive conclusion regarding this response, banks were also categorised by size as indicated by Figure 11.

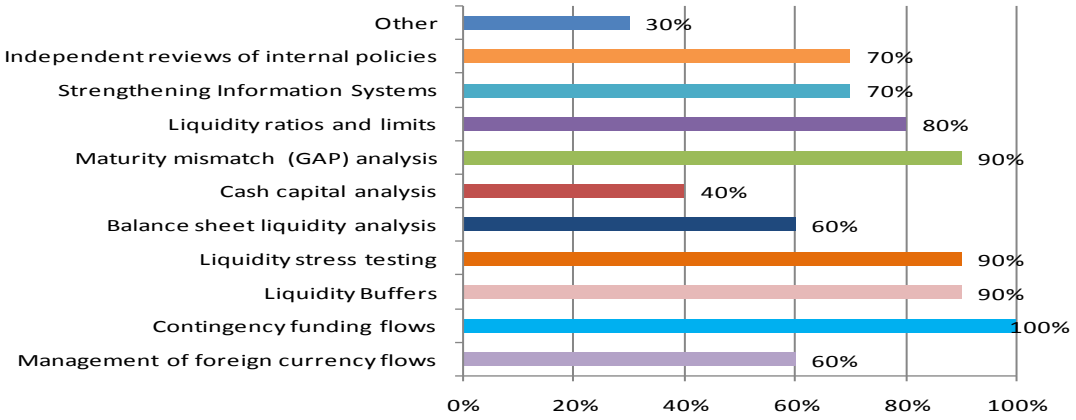
Figure 11. Effectiveness of liquidity risk management strategy (categorised by size)



This response indicates that most large banks rate their liquidity risk management strategy as effective, because they survived the financial crisis, but still see room for improvement. A multiple response, multiple-choice question was used to determine which liquidity risk management techniques local banks employ. It is doubtful whether banks would be completely honest about this The results are illustrated in Figure 12.

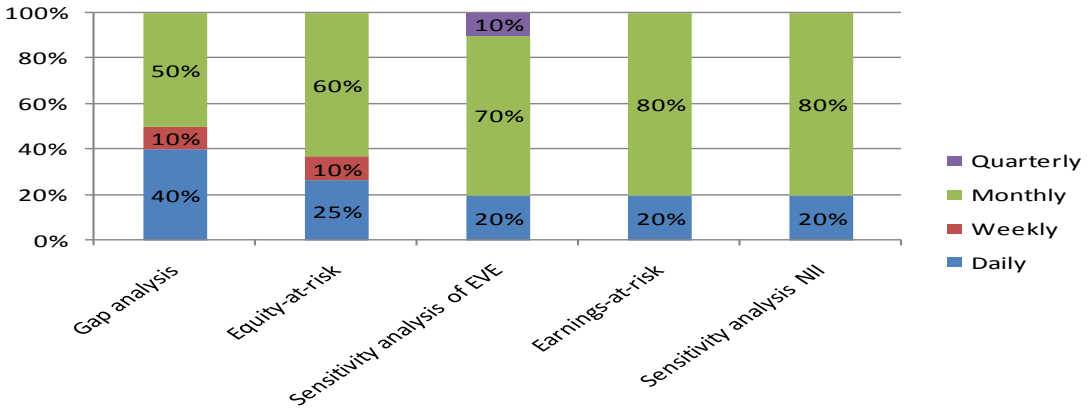
Most respondents indicated that their bank makes use of independent reviews of internal policies, strengthening information systems, liquidity ratios and limits, maturity mismatch analysis, liquidity stress testing and liquidity buffers. All respondents make use of contingency funding plans. One respondent indicated that his/her bank only makes use of contingency funding plans. 30% of respondents also indicated that they make use of additional measures, which include daily liquidity reporting to management, retail call deposits, utilization of funding cash flows and funding plans in line with anticipated balance sheet growth. Less than half of the respondents make use of cash capital analysis, which is described in the literature review as one of the main measures used by global banks for liquidity risk management purposes. Balance sheet liquidity analysis, another main quantitative measure employed by global banks is only employed by 60% of SA respondents.

Figure 12. Liquidity risk management techniques used



The majority of respondents indicated that they perform analyses monthly. Gap analysis seems to be performed as often as daily by many institutions (see Figure 13).

Figure 13. Frequency of asset liability management (ALM) reporting



From the results discussed so far, it can be concluded that South African commercial banks rate liquidity risk as very important and most liquidity risk management tools are considered to be of high importance and priority. Liquidity risk management is effective, but can still be improved. A wide range of management tools are utilized and monitoring and reporting are performed regularly.

Question 11, 12 and 13 aimed at determining the effectiveness, according to SA banks, of Basel III in addressing liquidity risk (see Figure 14). A multiple-choice, single response question was used in conjunction with an open-ended option to determine whether banks have started implementing Basel III. Most banks have started implementing Basel III. The 20% of respondents who have not yet started implementing Basel III are all small institutions which will be implementing the strategy according to the guidelines of the South African Reserve Bank and are in the planning phase of implementing changes. A five-point Likert scale used in conjunction with an open ended option was used to determine the effectiveness of Basel III. The majority of banks indicated that Basel III is effective, but not very effective. Respondents pointed out that the Basel framework largely aligns with the risk metrics already employed by South African banks. One respondent argued that there is no need for the implementation of Basel III, because their bank made it through the crisis without any problems and the implementation of Basel III will put pressure on the current operation of the bank. Note that this respondent also indicated that they have not yet started implementing Basel III.

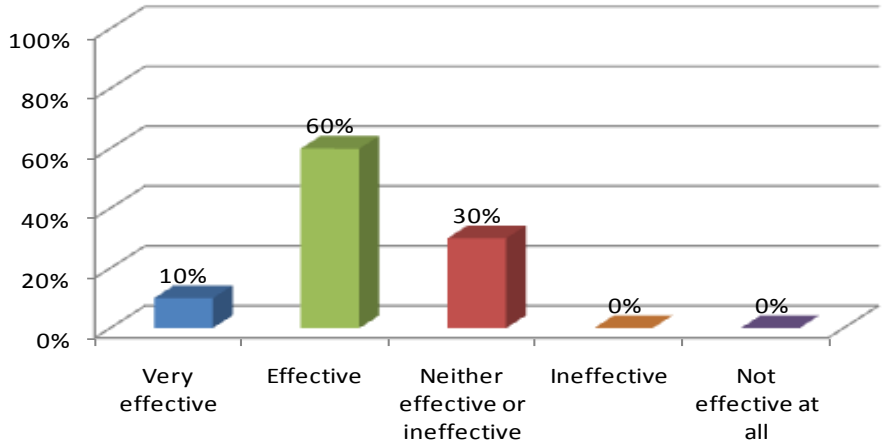
Two large banks rated Basel III as effective, but indicated that they perceive it to be only partially effective due to the following shortcomings:

- Basel III ignores the economic and market-related nuances of different jurisdictions.
- Basel III only addresses the causes of the recent financial crisis.
- The liquidity coverage ratio requires a substantial holding of government debt and this

effectively results in banks being all aligned in terms of liquid asset instruments and minimizes the benefit of diversified portfolios.

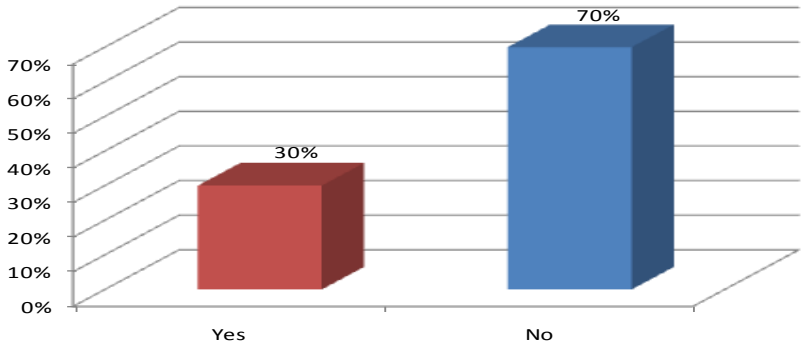
- The unintended consequences of implementing Basel III include potential increases in shadow banking, dampened economic growth and additional costs to the consumer.

Figure 14. Effectiveness of Basel III



Whether additional measures should be implemented in conjunction with Basel III was determined by making use of a multiple choice, single response question combined with an open ended option as illustrated in Figure 15 and 16.

Figure 15. Need for implementation of additional measures in conjunction with Basel III



The majority of respondents indicated that there is no need for the implementation of additional measures in conjunction with Basel III, while 30% of respondents indicated that additional measures should be implemented in conjunction with Basel III (see Figure 16). Note that this question was answered from a local perspective and does not provide a global view. The majority of large commercial banks indicated that additional measures should be implemented, while the majority of small and all medium sized institutions saw no need for the implementation of additional measures.

The additional measures that banks propose should be implemented, include:

- More South African specific metrics.
- Banks should adopt a low tolerance towards retail call deposits. Large banks have big mismatches between loans and deposits, because they use call deposits to fund home loans. This prevents them from paying back call depositors.

It can therefore be concluded that commercial banks have started implementing Basel III, and view it as only partially effective due to numerous shortcomings. Most banks see no need for the implementation of additional measures in conjunction with Basel III, while the majority of large banks are of the opinion that additional measures should be implemented.

An open-ended question was used to identify the liquidity risk management areas that respondents felt should change in the coming years to better manage liquidity risk from a local and global perspective. The results are represented in Figure 17 below.

Figure 16. Need for implementation of additional measures in conjunction with Basel III (categorised by bank size)

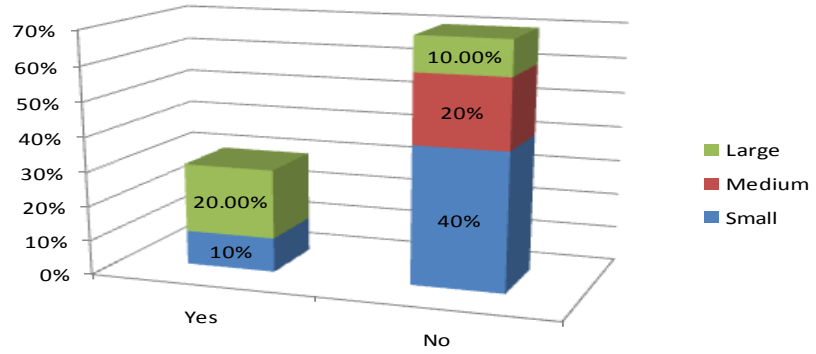
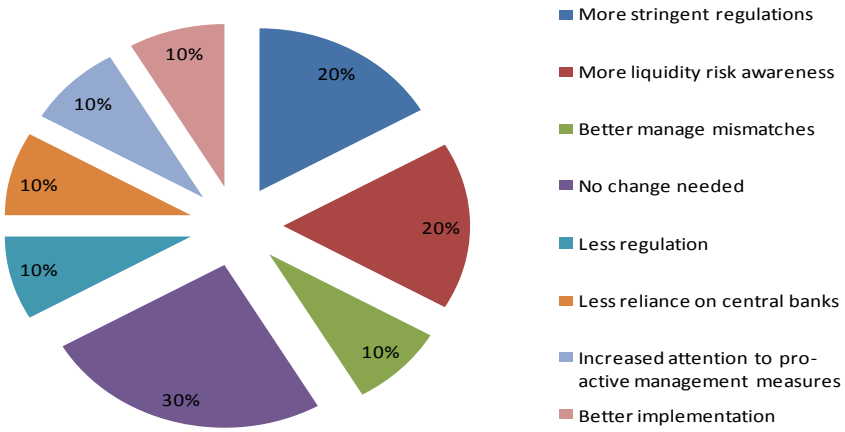


Figure 17. Proposed future change in liquidity risk management



The majority (60%) of respondents indicated that liquidity risk management should change in the following ways:

- More stringent regulations and the enhancement of skills and systems that regulators utilize.
- Less stringent regulations, because lack of regulation is as bad as over-regulation. Free market choices should not be regulated, but regulators should protect investors against conflict of interest and negligence by investment bankers. We have to move to a principle-based regulation system rather than a rule-based system, because a rule-based system is incapable of dealing with the complexity and speed of the modern globalised financial system.
- Local and global banks should be able to sustain liquidity during a crisis situation without relying on government or central banks.
- Banks should be aware of liquidity on a daily basis.
- Maturity mismatches should be better managed.
- Liquidity risk management techniques should be better implemented.
- Banks should increase their attention to pro-active management measures and be alert to changes in the economic environment.

Note that respondents generally agreed that no additional measures should be implemented in conjunction with Basel III. However, 20% indicated that more stringent regulations should be implemented. Respondents also indicated that they perceive liquidity risk to be of very high importance. However, they indicated that the banks should become more aware of liquidity risk. This indicates that respondents generally answered this question from a global perspective.

30% of the respondents felt that nothing should change, because the financial crisis proved to them that their management techniques are adequate to survive a liquidity crunch. Some respondents did previously indicate they have made some minor changes to their liquidity risk management strategy in response to the financial crisis which indicates a slight contradiction. This indicates that no further changes are needed from a local perspective, besides for some minor changes that are also applicable to global institutions. This includes the better implementation of liquidity risk management, less reliance on central

banks, better management of mismatches, less regulation and increased attention to pro-active management.

It can therefore be concluded that liquidity risk management should change in the years to come mainly by banks increasing regulations and awareness of liquidity risk from a global perspective. Minor or no changes should be made from a local perspective.

7 Conclusions and recommendations

The majority of respondents indicated that the financial crisis reminded them of the importance of liquidity risk management in the South African banking system as well as the global banking system. The majority of banks rate all the liquidity risk management tools as extremely important and rate corporate governance, strategy, policy and risk tolerance, liquidity risk measurement and intra-day liquidity as their number one priority. Basel III is generally perceived as being effective, but 30% of respondents perceived it as neither effective nor ineffective, because South African banks are of the opinion that similar measures to those proposed by Basel III are already in place as the financial crisis had little effect on them. However, that said, SA banks were not as exposed to the crisis as their international counterparts. Would the picture have been different, were our banks as exposed as their global counterparts? Apart from this, if a bank did experience liquidity problems, would it be always admitted?

Further research may be undertaken in future to determine the perception of SA banks about the management of all types of risk and their view of the importance of an increased capital buffer and the effect on these risks (and specifically liquidity risk). The question is: Will an increased capital buffer not again mean that banks will eventually take on more risk than they should and in this way counter the proposals of Basel III and SA bank supervision?

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