Deloitte.

Strate (Proprietary) Limited

Determining the impact of the Collateral Management Solution for the South African Market

Strate Collateral Report

Date: 24 April 2015

Contents

List of Figures

List of Tables

Abbreviations

BESA	Bond Exchange of South Africa
BIS	Bank of International Settlements
CCP	Central Clearing Parties
CGT	Capital Gains Tax
CLF	Committed Liquidity Facility
COF	Cost of Funding
CSD	Central Securities Depository
CSA	Credit Support Annexures
CVA	Credit Valuation Adjustment
EAD	Exposure at Default
EPE	Expected Positive Exposure
EUR	European Euro
FMI	Financial Markets Infrastructures
FSB	Financial Services Board
FSB	Financial Stability Board
FTE	Full Time Equivalent
FVA	Funding Value Adjustment
FVB	Funding Value Benefit
FVC	Funding Value Cost
GMSLA	Global Master Securities Lending Agreement
HQLA	High Quality Liquid Assets
IMM	Internal Models Method
CPMI - IOSCO	Committee on Payment and Market Infrastructures - International Organisation of Securities Commission
ISDA	International Swaps and Derivatives Association
JSE	Johannesburg Stock Exchange
LCH	London Clearing House
LCR	Liquidity Coverage Ratio
LGD	Loss Given Default
MBS	Mortgage Backed Securities
NSFR	Net Stable Funding Ratio
OIS	Overnight Index Swap
OTC	Over the Counter
SAM	Solvency Assessment and Management
SARB	South African Reserve Bank
SARS	South African Revenue Service
SBL	Securities Borrowing and Lending
SCR	Solvency Capital Requirements
SFT	Securities Financing Transactions
STT	Securities Transfer Tax
USD	United States Dollar
ZAR	South African Rand

Introduction

Strate Proprietary Limited ("Strate") in partnership with Clearstream Banking SA has decided to provide a collateral management solution to the South African market.

In order to enable the Strate to offer this solution, Deloitte was requested to assist in the gathering of information relating to the collateral management processes of a selected bank. This process aimed to assist Strate in determining the appetite within the South African market for such an offering as well as the potential implications.

All reporting made to Strate, either orally or in writing, was prepared exclusively as a result of the objectives and scope set out in our engagement letter dated 20 May 2013 and should not be quoted or referred to or used for any other purpose without our prior, written consent. This report is solely for the internal use of the management and the Executive Committee of Strate. It is expressly agreed that our report may be made available to the Bank for informative purposes only.

We are pleased to present this report to you, documenting our findings relating to the key objectives of this project.

Thank you for the opportunity to be of assistance. Please do not hesitate to contact us should you have any questions regarding this report.

Yours faithfully

_____

Wayne Savage
Partner
Deloitte Capital Markets

Executive Summary

In order to obtain an understanding of the future collateral management landscape, we performed an independent review of the current collateral management process and related regulatory changes. In particular, we focused on the collateral management process within a local South African bank and assessed the benefits that might arise should the existing process be replaced by a more automated solution. Our review considered the operational efficiencies that could be achieved, as well as the bank's operational ability to accommodate the increasingly burdensome regulatory requirements. Furthermore, we envisage the future state of the collateral management process and considered how the Strate supported collateral management solution ("Strate solution") could support the changes required.

Our review required an understanding of the operational and regulatory requirements of the market. In order to obtain this understanding, we performed a combined project with Strate[1], and a top tiered South African bank ("the bank"). The main objectives of the review included:

i. Understanding the current related collateral management processes through the development and completion of a questionnaire tailored specifically for the bank;
ii. Understanding the sources of potential collateral that exist within the bank that are currently not used in its collateral management processes;
iii. Defining the aspects of both local and global regulatory reforms that could have an impact on collateral management;
iv. Defining the functionality of the Strate solution; and
v. Establishing key thematic observations relating to changes in the underlying collateral management process based on both regulatory requirements and the proposed Strate solution.

The outcome of this report may have been different had we focused our review in conjunction with a different bank or other financial entity

[1] *Strate (Pty) Ltd is a regulated by the Financial Services Board of South Africa*

Regulatory Changes

Since the financial crisis, a number of regulatory reforms have taken place in order to strengthen the financial markets and rectify the previous shortcomings which contributed to the crisis. While such reforms are being initiated at a global level, they are locally relevant. Some of the key regulatory changes include:

Regulatory Change	Objective	Impact
International		
Basel III & G20 reform	i. Stricter qualifying capital requirements and increased capital demands. ii. Introduction of a capital charge to absorb potential mark-to-market losses arising from deterioration in credit i.e. Credit valuation adjustment (CVA). iii. Introduction of liquidity and funding standards i.e. Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR). These ratios aim to ensure that the bank has sufficient liquidity and funding during periods of financial distress. iv. Prescribe qualitative collateral management requirements to ensure that the bank's collateral management policies control, monitor and report on the various risks associated with the use of collateral. v. Incentives to clear standardised derivatives through Central Clearing Parties (CCPs) as prescribed by Basel III. The G20 mandates that all standardised derivatives should be centrally cleared.	i & ii It is envisaged that the increased requirements, both in terms of quantity and quality of capital, will reduce bank's overall available qualifying capital. Thus, approaches to reduce capital requirements would be explored e.g. use of collateral to reduce credit risk and the CVA capital charge. iii. These new ratios require banks to hold assets that can be quickly converted to cash without losing any value and should meet central bank eligibility requirements (e.g. cash, government bonds, marketable securities etc.). Please refer to section 1.1.1 for further explanation of these ratios and the required assets. The demand for these liquid assets may drive a change in the way such assets are used in the market, i.e. liquid assets previously used as collateral may be replaced by other financial assets. iv. Qualitative prescriptions will require banks to establish an infrastructure (people, process and systems) that would enable them to monitor: • Margining agreements and risk associated with the valuation of the collateral; • Concentration risk of particular types of collateral; • The re-use of collateral; and • The surrender rights of posted collateral. v. Cash is predominantly placed as collateral in meeting CCP margining requirements. The move towards centralised clearing may result in an increase in the demand for cash and other high quality liquid assets. In addition, cash collateral previously held in the market may now be held by the CCP.

Regulatory Change	Objective	Impact
CPMI - IOSCO (Committee on Payment and Market Infrastructures - International Organisation of Securities Commissions) principles	CPMI - IOSCO introduced "*Principles for Financial Market Infrastructures*" in March 2011 in order to strengthen the infrastructure of the financial markets.	Some key principles relating to collateral derive the following requirements: i. Acceptance of collateral which presents low credit, liquidity and market risk. Conservative haircuts and concentration limits should be appropriately enforced. ii. A CCP should cover its exposures through an effective margining system. iii. Settlement should occur daily. iv. A CCP should have rules and procedures that enable segregation of collateral positions.
Local		
Pension Funds Act – Regulation 28	Pension funds may only enter into transactions that are adequately collateralised. The collateral should be held for the benefit of the fund.	Regulation 28 prescribes minimum collateral requirements for securities lending transactions and incentivises the use of centrally cleared derivative transactions. Although this section of the act is still in draft form, we believe that this would require an out-and out cession of collateral received, and a pledge of the collateral placed.
Financial Markets Act	Financial Market Act makes provision for the creation of a trade repository to maintain a central electronic database of the transaction data. In addition this act facilitates the required G20 OTC derivative reform, providing for the clearing of standardised OTC derivatives.	This Act requires that all transactions in OTC derivatives be reported to the trade repository and disclosed to the Registrar to enhance transparency and monitor potential risks to financial stability. In addition this act provides for independent clearing houses.
Solvency Assessment and Management (SAM)	Similar to Basel, SAM (South Africa's adaption of Solvency II) requires prudential capital requirements based on the insurers' counterparty exposures in order to safeguard the financial markets in which they operate.	These capital requirements are calculated taking into account the insurers' counterparty exposures, utilising the loss-given-default (LGD) as a key input in the determinant of the amount of capital that is required to be held. As insurers look to reduce these capital charges, the use of cash collateral is considered a viable feature as it reduces the LGD to 5% thereby significantly reducing the entities exposure, and in turn capital requirements.

Market Overview

This document focuses on key markets where collateral is used. These markets include the OTC derivatives, Securities borrowing/ lending (SBL) and Repurchase (Repo) markets. We investigated the characteristics of these markets, both locally and globally. This was done in order to obtain an understanding of the current collateral management practices followed in these markets and assist in obtaining an understanding of the anticipated changes in collateral management practices as a result of future market changes.

OTC Derivatives market

The Bank of International Settlements (BIS) noted the gross market values of outstanding OTC derivatives, i.e. the cost of replacing all outstanding contracts at market prices prevailing at reporting date, continued their downward trend, declining to USD17 trillion[2] at the end of June 2014. This was down from USD19 trillion reported as at the end of December 2013. It was further noted that the global net mark-to-market exposure of OTC derivatives, taking into account close-out netting[3] but not collateral, equated to USD2.8 trillion[4] at the end of June 2014. This decline is considered to be a consequence of mandatory clearing.

The International Swaps and Derivatives (ISDA) Margin survey 2014 reported global collateral use of USD2.170 trillion, although estimated this use at USD3.171 trillion as at the end of December 2013. Despite the timing difference of the above estimates, it is clear that a large portion of OTC derivative transactions are collateralised. Of these collateralised transactions, approximately 75 percent[5] were collateralised using cash, with the majority of the remaining transactions being collateralised using Government securities. As alluded to earlier, cash and government securities are considered to be liquid assets and could be used to meet the new liquidity standards as prescribed by Basel III.

Furthermore, it was noted that the more fungible the collateral received, the more likely it is to be re-used. 90 percent of cash collateral received was re-used in large-sized[6] entities (please refer to Section 3.5 for a detailed breakdown).

SBL and Repo market

While it is difficult to gauge the size of these markets, a recent Markit[7] survey noted a total of USD56 billion worth of global assets (equities and bonds) on loan, amongst key markets (please refer to Section 2.2), with a total of USD6 billion on loan in South Africa at the end of March 2014. The use of the USD5.9 billion securities in South Africa represents just over 13.18 percent (please refer to table 2) of the total assets held. Limited by market appetite, there is an increased need to lend out unused assets and place remaining assets as collateral as part of the collateral optimisation process. However, recent statistics released by Iress[8], quantified the South African securities lending market at ZAR114.6 billion as at 31 July 2014.

---

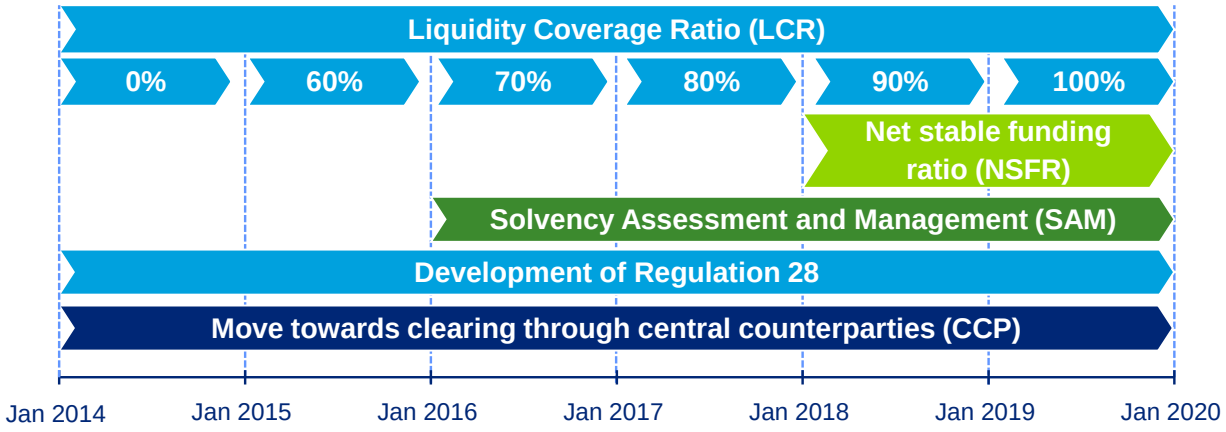
[2] *As per the BIS Statistical release – November 2014*
[3] *Close-out netting, as defined by ISDA, refers to a process involving the termination of obligations under a contract with a defaulting party and subsequent combining of positive and negative replacement values into a single net payable or receivable.*
[4] *As per the BIS Statistical release – November 2014*
[5] *As per the ISDA Margin survey 2014*
[6] *Per the ISDA margin survey 2014, large-sized entities are defined as those with more than 3 000 active agreements*
[7] *As per Securities Finance Review / Q1 2014 conducted by Markit (global financial information and services company)*
[8] *Iress is a software company specialising in the development of software systems and services for financial markets.*

Based on the most recent data available, National Treasury[9] has considered the South African bond market to be one of the most liquid in the world with trading volumes reaching ZAR22.4 trillion for 2013. 68 percent of this volume was attributable to the repo market, highlighting the significance of the bond repo market within South Africa.

The nature of these types of transactions is simply a collateralised loan where the underlying equities/bonds are placed as collateral to raise cash. Thus, all such transactions are collateralised. In the local market, there are currently no mechanisms by which the re-use of this collateral can be tracked.

Future State – Key market changes

Although a number of regulatory changes have been promulgated, the full financial and operational impact of these changes will only be understood once fully implemented. The figure below reflects the anticipated implementation date of each regulatory reform.



We have documented some of the anticipated future market changes below.

Shortage of Cash and other HQLA (High Quality Liquid Assets)

The introduction of the liquidity and funding standards by Basel will result in an increased demand for HQLA. As illustrated in Section 3.1, a large portion of these Government securities are not held by the banks in the current market environment. An increase in demand for these assets may result in banks looking towards a change in their existing collateral management processes in order to free up HQLAs. In addition, this may drive a change towards the use of other non-cash collateral (excluding Government securities) in an effort to retain cash and Government securities in order to meet the new Basel III liquidity standards. In January 2013, the Basel Committee estimated the shortfall against a 100 percent LCR requirement to be about ZAR100 billion[10] for the South African banking sector. However, the South African Reserve Bank (SARB) has provided relief in the form of the Committed Liquidity Facility (CLF). Please refer to Section 3.8 for more detail.

Increase in collateralised trades

In an effort to reduce the impact of increased capital requirements (credit risk and CVA capital charges), it is anticipated that the market will look to reduce their overall credit risk exposure through the increased use of collateral (both cash and non-cash collateral).

[9] *Based on the National Treasury Debt Management report 2013/2014 released September 2014*
[10] *As per SARB guidance note 6 of 2013*

A move towards a more automated process

Should there be an increase in the number of collateralised trades or a move towards the use of a broader base of non-cash collateral, it is envisaged that the existing manual process may no longer be able to handle the volume and variations (i.e. variations of different types of collateral used – price, frequency of margin calls, etc.). In order to respond to these changes, it is anticipated that entities will look to automate the collateral management process in order to reduce operational risk, monitor collateral and appropriately manage market and credit risks inherent in the process.

The use of CCPs

The move towards the central clearing of all standardised OTC derivatives is expected to increase the cash requirements of entities. The increase in cash and other HQLAs requirements is expected, as current CCP structures require participants to fulfil margining requirements by placing cash and other HQLAs as collateral. Given this, entities are likely to receive less cash collateral and funding benefits (other than in the form of reduced margining requirements) as all cash placed and received as collateral will be held by the CCP. While the use of a foreign CCP by South African entities may reduce credit risk, it may expose them to unintended market risk, as they are now exposed to the volatility of foreign exchange rates in instances where ZAR is not accepted as collateral.

Potential re-hypothecation of collateral

A general increase in the use of collateral may place strain on existing assets used as collateral. As a result, entities may look to re-hypothecate (re-use) their collateral in an attempt to address this strain.

A move to a centralised collateral management function ("desk") and a drive towards collateral optimisation

With the increased focus on collateral, it is expected that entities will move to centralising functions within the collateral management function in order to ensure that collateral is optimally used throughout the entity. This move towards centralisation is expected to reduce operational risk (less manual involvement), improve collateral management and reporting requirements and aid in monitoring the overall risks that the entity is exposed to. The consolidation of the collateral functions is expected to reduce resources and systems infrastructure required as the elimination of these functions will lead to a reduction in operational costs.

In assessing the current collateral management process, it was noted that these markets (OTC derivatives, SBL and Repos) each had their own collateral management process. Although these processes were similar it often gave rise to a "silo" approach being followed to collateral management within the entities. This approach resulted in a duplication of tasks, leading to operational inefficiencies, and sub-optimal risk management for the entity as a whole.

The introduction of a centralised desk would eliminate the current "silo" approach to collateral management, ensuring that decisions made around collateral will benefit the entity as a whole as opposed to an individual division. A recent Oliver Wyman survey estimated a reduction in collateral management operational costs of between 20-30 percent through optimising the collateral management process.

Creation of liquid assets

Should an increase in demand for collateral arise, it is anticipated that non-cash assets that were previously not considered eligible as collateral will be used to address this increased demand, albeit with a sizeable haircut. The increased demand for these assets, may indirectly give rise to a secondary market as existing structures evolve to facilitate the trade of such assets, thus increasing their liquidity. In addition, the change in the equity settlement cycle from T+5 to T+3, is expected to somewhat increase the liquidity of these instruments, as they become more readily available.

What the engagement entailed

As noted above, in order to understand the practical implications of the above, Deloitte undertook an engagement in conjunction with Strate and the bank

In obtaining our understanding it was noted that a large part of the current collateral management process was manual, with isolated software packages being used to support certain functionality within the process. Some of the key observations made include:

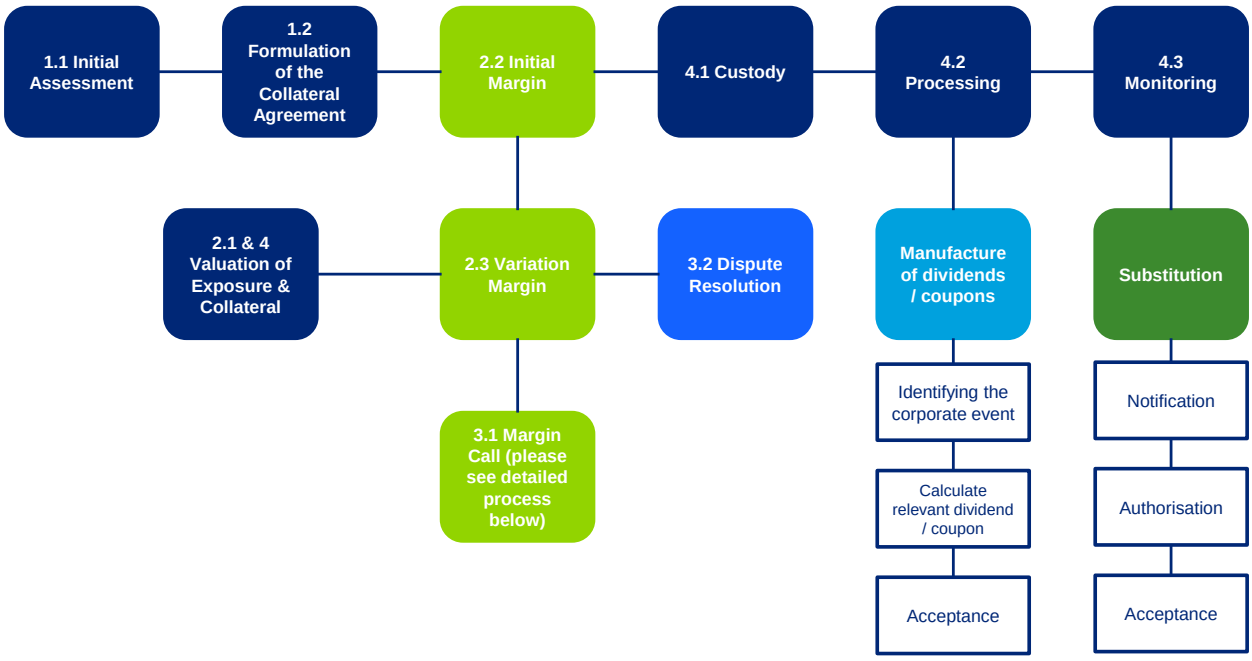
- The majority of collateral received/placed in the OTC derivatives transactions is in the form of cash while the SBL/Repo exposures are collateralised with a combination of equities, bonds and cash.
- A limited number of securities are used as collateral in order to reduce the amount of administration required (system and resource) to manage these on a daily basis.
- Current manual processes include the manufactured dividends/coupons, substitutions/recall of securities and in certain instances manual margin calls.

As noted above, the changes in the future regulatory landscape is expected to have an impact on the current collateral management process. Should there be a significant increase in the number of collateralised trades/number of securities received/placed as collateral, it is anticipated that the current processes would warrant a review to consider requirement to improve process efficiency, increase staff capacity and / or investment in infrastructure technology.

Further consideration was given to the type of collateral and its impact on the funding of the underlying transaction within the bank. It was noted the preference of the bank would be to receive cash collateral, in order to obtain the funding benefit, and place non-cash collateral, in order to save on the costs incurred in raising such funding in respect of the transaction. The complexities behind this preference are discussed in detail in section 6.1.

The Strate solution

The key aspects of the current collateral process can be simplified in the diagram below:



The introduction of the Strate solution is estimated to result in the following benefits:

- As per the above diagram, functions 2.1 to 4.3, between 80 and 90% of the activities which currently form part of the collateral process, are fully automated and outsourced to Strate.

- Should the use of non-cash collateral increase, as well the asset base broaden, the Strate solution is anticipated to have the potential to improve operational efficiency, cost and contribute to business scalability;

- According to a recent Morgan Stanley/Oliver Wyman survey – *Wholesale and Investment Banking outlook* – dated April 2013, an estimated reduction in collateral management operational costs of between 20-30 percent could be achieved through optimising the collateral management process.

- A reduction in software and development costs may also be realised as it appears that the Strate solution has the ability to compliment the functionality of existing systems. It is further considered that the greater the ability to integrate the Strate solution with existing internal collateral software within the bank, the greater the expected cost saving.

- Implementation of the Strate solution has the ability to enhance current risk management practices (operational and counterparty credit risk), as a holistic view of the collateral management process across the bank is presented when utilising the Strate solution.

- It is envisaged that the Strate solution would meet a number of the requirements set out by the CPMI - IOSCO principles discussed in Section 1.1.2. As the bank is impacted by FMI, it is considered that the adoption of the Strate solution would help it meet the requirements set out by these principles.

- The Strate solution collateralises on a T+0, as opposed to the current T+1 settlement for non-cash collateral. Similarly, cash collateral will be settled within a 15 minute time frame after receiving the exposure. In the event that there is insufficient collateral to meet these calls, the bank would be notified immediately. These features reduce the settlement risk that the bank may be exposed to as a result of the non-delivery of collateral.

The following further considerations should be noted:

- The current tax charges made on transfers of non-cash collateral further discourage its use since it increases the cost of managing the non-cash collateral.

- An in depth cost vs. benefit analysis will need to be performed to quantify the internal cost of implementation of the Strate solution as well as the direct and indirect costs of using and maintaining the system vs. the incremental benefits it will bring;

- The ability to fully optimize an entity's collateral management process from a financial point of view is restricted by the eligibility criteria set out by counterparties as well as industry practice. For example in its current form gold standard OTC CSA agreements does not allow for equities as collateral.

- The efficiencies obtained using the closed system solution proposed by Strate will be limited to the number of participants within the system. If a large number of counterparties, both local and international, remain outside of the system then it can be argued that certain inefficiencies are increased due to the inability to match collateral received with collateral placed between counterparties.

- The benefits offered by the system will be unique to each entity using it.

- Consideration needs to be given to duplicated functionality, and the costs associated with that, between either existing systems within the bank or alternative vendor solutions that can be implemented.

- The concept of cheapest to deliver collateral needs to be considered in context of the counterparties eligibility criteria and hence appetite to accept the collateral as it is anticipated that these counterparties will have similar optimisation rules in their collateral processes

The table below highlights some of the key thematic observations noted during this review as well as further considerations that need to be taken into account:

Observation	Use of the Strate solution	Further considerations
Increased qualitative collateral management requirements as set out by Basel III and CPMI - IOSCO including: • **Monitoring of re-use.** • **Identification of concentration risk.** • **Surrender rights of collateral**.	The Strate solution enhances the reporting requirements of the collateral management process. As all collateral is placed within a closed system, it allows the collateral to be tracked, valued and monitored (ensuring that collateral is in line with the parameters defined by the Credit Support Annexure (CSA)) on a real time basis. The facilitation of all collateral movements within a closed system ensures that all transactions are centrally tracked (including re-use) and the relevant data is reported.	At present, there is no prescribed format through which such information is required to be presented. While it is clear that the relevant information can be provided in the solution, there are currently no outputs that present this information. However, as market regulators prescribe these requirements, it is expected that the format of the required output will evolve.
Facilitates the use of cash and non-cash collateral.	The use of non-cash collateral presents a number of challenges, including: • Operational processes of selecting and booking collateral; • The valuation of collateral; • Monitoring of concentration and wrong way risk; • Assessment of the eligibility criteria; • Calculation of manufactured coupons / dividends; and • Additional challenges are discussed further below. The use of the Strate solution allows the collateral to be valued to an agreed upon market price[11] and assessed for eligibility on a real time basis. In addition the solution has the ability to present a holistic view of the collateral (non-cash and cash) held within the solution, assisting in the monitoring of concentration risk. The Strate solution can facilitate cash collateral as a last resort in instances where there are no other eligible assets to place as collateral. The Strate solution has the ability to facilitate both pledge and	The receipt of cash collateral provides funding to the receiver, as such cash is fungible and can be used by the bank to fund the underlying transaction. The receipt of non-fungible (typically viewed as non-cash) collateral requires the bank to raise additional funding to finance the deal and this results in a funding cost to the bank. Should the bank be able to repo the collateral received and raise the cash, no additional funding is required (please refer to section 6.1. for more detail in this regard). The use of non-cash collateral gives rise to a number of valuation complexities, in particular the Funding Value Adjustments (FVA) – please refer to section 6.1 for more detail. As this concept is relatively new to the market, it may take some time for entities to understand how it can be applied to non-cash collateral. In the short term this may detract from the market's adoption of non-cash collateral. In order to obtain recognition of the collateral, for regulatory purposes, an

[11] *Collateral will be priced using a source/market standard valuation technique agreed upon between participants of the transaction. These values will be uploaded into a pricing file which will be used to value the collateral.*

Observation	Use of the Strate solution	Further considerations
	cession constructs in line with the Financial Markets Act (FMA) Manufactured dividends / coupons[12] are currently done manually and on a limited basis given the use of pledges. The calculation of dividend withholding tax further complicates this process. However, this current process may not cope, should the use of out-and-out cession increase in future. The adoption of the Strate solution would perform the recall of the securities, marking them as ineligible collateral, on the date that such dividends /coupons accrue, ensuring that payment is made to the original owner of the security. This would reduce the current manually intensive process.	out-and–out cession of the non-cash collateral is required. Under current legislation, such a transfer would attract a tax charge (Securities Transfer Tax (STT)/Capital Gains Tax (CGT)) which would negatively impact on the pricing of the trades.
Enables the substitution of collateral	In instances where one is looking to substitute non-cash collateral, the Strate solution's algorithms automatically source suitable replacements based on the eligibility criteria defined in the collateral agreement (e.g. CSA, GMSLA, etc.). This will allow optimisation of the collateral process making it easier to substitute collateral in instances where: • a "cheaper to deliver" asset is identified; or • concentration risk needs to be reduced.	
Tracking of non-cash collateral	Globally, a large portion of collateral is re-used (please refer to figure 13). It is important, as well as a Basel requirement, that entities have the ability to track the collateral, should it be re-used, in order to reduce systemic risk. Refer to section 4.1.2 for further detail. The Strate solution ensures that the collateral cannot be sold by the receiver, but only transferred to the counterparty under cession, with an optional restriction on re-use. This gives the entity the ability to track all collateral placed within the solution.	
A risk management tool	The Strate solution would facilitate the monitoring of the following key risks: • Concentration risk as discussed above; • Eligibility of collateral as discussed above; • Identification of wrong way risk [13]through the regular valuation of collateral against exposures; and	The frequency at which these risks can be monitored is dependent on the frequency at which market participants submit their exposure, as the solution does not determine the value of the underlying exposure.

[12] *Manufacturing of dividends/coupons is a payment made to pass through the dividend/coupon from the borrower to the lender of those securities. This occurs in instances where title of the underlying security is transferred, however the lender maintains the right to payments which accrue on the security.*
[13] *Wrong-way risk occurs in instances where the value of posted collateral deteriorates as the likelihood of the counterparty defaulting increases.*

Observation	Use of the Strate solution	Further considerations
	• Reduction in settlement risk as the collateral (cash and non-cash collateral) required to be placed against exposures is recorded within the solution, thus margin calls are fulfilled and instances of non-delivery are identified immediately.	
A centralised infrastructure and market standardisation	The adoption of the Strate solution would provide a centralised infrastructure and have the potential to further enhance the standardisation of the market, standardising: • The use of an electronic messaging platform; • Pricing files to determine the value of collateral; • Operating windows e.g. settlement of collateral timeframes; and • Defined collateral baskets meeting defined eligibility criteria. The solution conforms to international collateral standards, allowing integration with existing tri-party collateral management systems. In addition, should the solution integrate with existing market infrastructures, additional collateral optimisation could be achieved. Please refer to section 4.1.11 for more detail.	A key benefit of the Strate solution is its anticipated integration with the key market players, thus serving as a centralised infrastructure as opposed to a fragmented bi-lateral collateral management solution. However, until key market players subscribe to these services, such a benefit is not fully realisable.
A move away from existing process to a more automated approach	The Strate solution would automate a large portion of the existing processes currently performed manually by the bank and other market entities (please refer to section 6.2). This would improve the operational efficiency and reduce operational risks associated within the current processes, with an expected cost savings arising from a reduction in staff and software infrastructure expenditure. Should the number of collateralised trades/use of out-and-out cession increase, it is expected that additional costs savings could arise. In addition, market changes such as a move to a T+3 settlement cycle will place increased pressure on non-cash collateral administration as securities would need to be recalled significantly faster than is the case today. This requirement would further drive the need for automation.	The Strate solution requires the users to upload their calculated exposures in order to determine the appropriate margin calls. Current software used to quantify these exposures may also have certain embedded collateral management features. This may result in duplication/overlap in software costs.
Facilitates conversion of assets into eligible collateral and	The increased use of non-cash collateral assets and the ability to track these assets may stimulate trade and develop a secondary market for these assets. In addition, the formulation of standardised eligibility baskets may assist in	While the introduction of the global liquidity hub may present some long-term benefits, its success is dependent on the willingness of foreign entities to accept South African originated assets against these exposures.

Observation	Use of the Strate solution	Further considerations
enhances the liquidity of these assets	converting these assets into eligible collateral through the application of haircuts. The use of the global liquidity hub (please refer to section 4.1.1) could enhance the liquidity of local securities and debt instruments, potentially creating more eligible types of collateral, as it would provide foreign entities with access to the South African market.	

1. Regulatory Changes

The occurrence of the financial crisis highlighted the importance of two key fundamentals – credit risk and liquidity risk. In order to address the shortcomings of pre-crisis regulation, a number of regulatory reforms have taken place. These changes are being made globally, and in turn are being implemented locally as part of South Africa's G20 commitment and Basel Committee membership. Such reforms will require a transformation to the existing way of doing business. We focus on the key regulatory reforms and consider their potential impact below.

1.1 International Regulations

1.1.1 Basel III & G20 reform

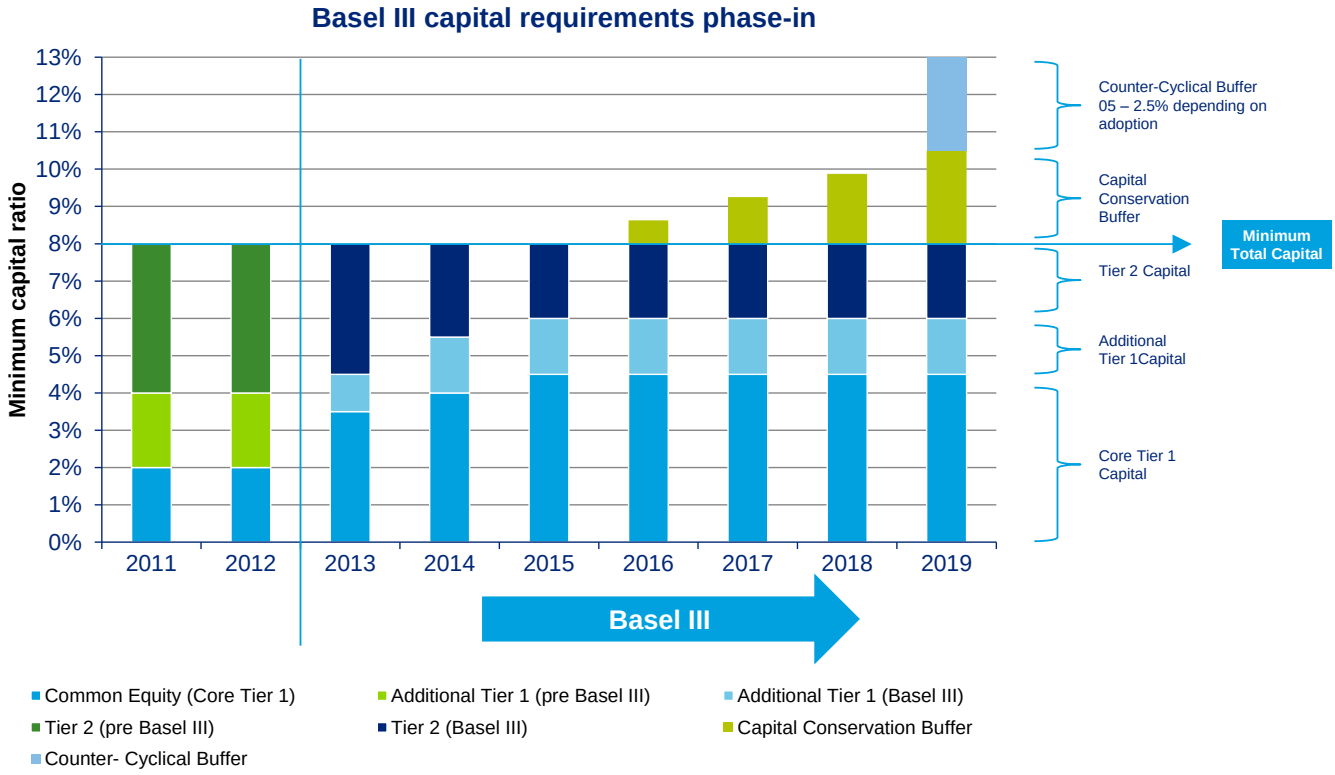
Basel III has redefined the definition of qualifying capital (from Basel II), ensuring that the features of such capital are more loss absorbing, do not contain incentives to redeem prior to their stated maturity and may be written off or converted to equity at the determination that the bank may no longer be viable/that a public injection is required to be made. The redefining of qualifying capital[14] as well as the increased capital requirements[15] set out by Basel III will lead to greater demand in qualifying capital. As the new requirements of Basel III are introduced in a phased approach, an indication as to whether there will be a shortage of qualifying capital will not be fully understood until 2019, at which all these requirements will need to be met.

[14] *Core Tier 1 Capital refers to common shareholders funds i.e. ordinary shares and disclosed reserves or retained earnings. Additional Tier 1 Capital refers to instruments that are able to absorb losses on a going concern basis, either through a write down or conversion to ordinary shares. Tier 2 Capital is supplementary capital that includes items such as revaluation reserves, undisclosed reserves, hybrid instruments and subordinated term debt.*

[15] *This includes the introduction of the Counter-Cyclical buffer and the Capital Conservation buffer which require Core Tier 1 Capital.*

The graph below shows the expected increase in Basel III capital requirements globally.

Figure 1: Basel III phase in requirements



**As required by Basel III (refer to Annex 4 in BIS document page 69)*

In addition to these increased capital requirements, Basel III further introduces strengthened counterparty credit risk capital charges through the implementation of the following:

i. When using the Internal models method (IMM) the default risk capital charge for counterparty credit risk must equal the greater of the portfolio–level capital charge based on the "Effective Expected Positive Exposure (EPE)" using current market data and portfolio-level capital charge based on Effective EPE using stressed data. *(Basel III paragraph 98)*

ii. In addition to the default risk capital requirements, banks must add a capital charge for potential mark-to-market losses associated with a deterioration in the credit worthiness of a counterparty i.e. Credit Valuation Adjustment (CVA). *(Basel III paragraph 99).*

iii. Increased margin period of risk, whereby the risk period covered will be extended from 10 to 20 days for OTC derivatives and securities financing transactions (SFTs) netting sets[16] that exceed 5 000 trades, have illiquid collateral, or represent hard-to-replace derivatives. In addition the risk margin period will be doubled for netting sets with more than two collateral call disputes in the past two quarters that last longer than the margin risk period. This is applicable where the IMM approach is adopted. *(Basel III paragraph 103)*.

iv. Preclude recognition of downgrade triggers preventing banks, using the IMM approach, capturing the effect of a reduction in Exposure at Default (EAD) due to any clause in a collateral agreement that requires the receipt of collateral when counterparty credit quality deteriorates. *(Basel III paragraph 105).* It is common practice for margining thresholds to be a function of the counterparty's credit rating. However this scenario can act as a self-fulfilling prophecy in the market, as the subsequent margin calls can intensify the counterparty's financial difficulty through creating a further liquidity strain. This was noted during the financial crisis resulting in Basel III precluding the inclusion of additional collateral required as a result of a credit downgrade in calculating EAD.

[16] *Netting sets allows the offsetting of a positive and negative value to set-off partially or entirely cancel each other out.*

v. Impose additional haircuts to securitisation collateral, while re-securitisation exposures are no longer eligible as financial collateral. *(Basel III paragraph111).*
vi. Incentives to clear standardised OTC derivatives through Central Clearing Parties (CCPs), by assigning a 2 percent risk-weight for a bank's exposures to "qualifying" CCPs. Strengthened capital requirements for bilateral OTC derivatives exposures as well as G20 derivatives reform further incentivise the move of such exposures to CCPs. *(Basel III paragraph 14).*

The increased focus on counterparty credit risk will result in banks seeking credit risk mitigation strategies in order to reduce these capital charges. Such strategies may include the use of collateral, purchasing of credit protection and or netting and set off. Where collateral is used as a risk 'mitigant', *Basel III, paragraph 110* prescribes qualitative collateral management requirements to ensure that bank's collateral management policies control, monitor and report:

i. The risk to which margin agreements exposes them (such as the volatility and liquidity of the securities exchanged as collateral);
ii. The concentration risk to particular types of collateral;
iii. The reuse of collateral (both cash and non-cash) including the potential liquidity shortfalls resulting from the reuse of collateral received from counterparties; and
iv. The surrender of rights on collateral posted to counterparties.

In addition to the revised capital requirements, Basel III also introduces liquidity and funding standards in the form of the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). These ratios aim to ensure that the banks have sufficient funding over a 30 day and 365 day period respectively should a sudden shock in the financial system occur.
Essentially, the introduction of the LCR requires banks to hold sufficient unencumbered High Quality Liquid Assets (HQLA). The NSFR requires banks to have stable funding over the longer term to support longer term assets. The use of collateral may reduce the bank's exposure and ultimately reduce the bank's associated funding costs associated with the LCR and NSFR.

The objective of these ratios is to ensure that in times of financial distress, the necessary assets are available to meet the net cash outflows over the relevant time period and to safeguard banks against a significant stress that may arise as a result of:

i. A significant downgrade of the institutions public credit rating;
ii. A partial loss of deposits;
iii. A loss of unsecured wholesale funding;
iv. A significant increase in secured funding haircuts; and
v. Increase in derivative collateral calls and substantial calls on contractual and non-contractual off-balance sheet exposures, including committed credit and liquidity facilities.

HQLA needs to be Central Bank eligible and can be broadly defined as cash, treasury bills, government bonds and deposits held with central banks or other transferable assets guaranteed by the Central government.

The LCR and NSFR will be introduced on 1 January 2015 and 1 January 2018 respectively. *(Basel III paragraph 41, 42 & 45).*

Another finding of the financial crisis was the major deficiencies within the OTC derivatives market. Two deficiencies considered to be the most pertinent were:

i. *Counterparty credit risk and systemic risk:* the default of a major market participant could result in spill over risk transmitted through OTC contracts due to bilateral exposures being inadequately collateralised, and
ii. *Lack of transparency*: regulators and the market as a whole could not accurately gauge the deterioration in the credit worthiness of the OTC derivatives counterparties.

As a result, the G20 made its aspirations clear that standardised OTC derivatives would be required to be centrally cleared and that stricter requirements would be imposed for non-cleared trades. This has led to policy makers and regulators proposing new regulations to:

i. Channel all standardised OTC derivative contracts through an organised trading market with clearing through central counterparties;
ii. Increase regulatory capital requirements for non-centrally cleared contracts; and
iii. Collateralise non-centrally cleared derivatives.

1.1.2 CPMI - IOSCO (Committee on Payment and Market Infrastructures - International Organisation of Securities Commissions) principles

Financial market infrastructures (FMIs) that facilitate the recording, clearing, and settlement of monetary and other financial transactions have been identified as infrastructure development that can strengthen these markets. However, they can also pose a significant risk in periods of market stress. As a result, CPMI - IOSCO formulated *"Principles for Financial Market Infrastructures"* in March 2011. Some of the principles relevant to collateral management are listed below:

Principle 5: Collateral
An FMI that requires collateral to manage its or its participants' credit risk should accept collateral which presents low credit, liquidity, and market risk. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

Principle 6: Margin
A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

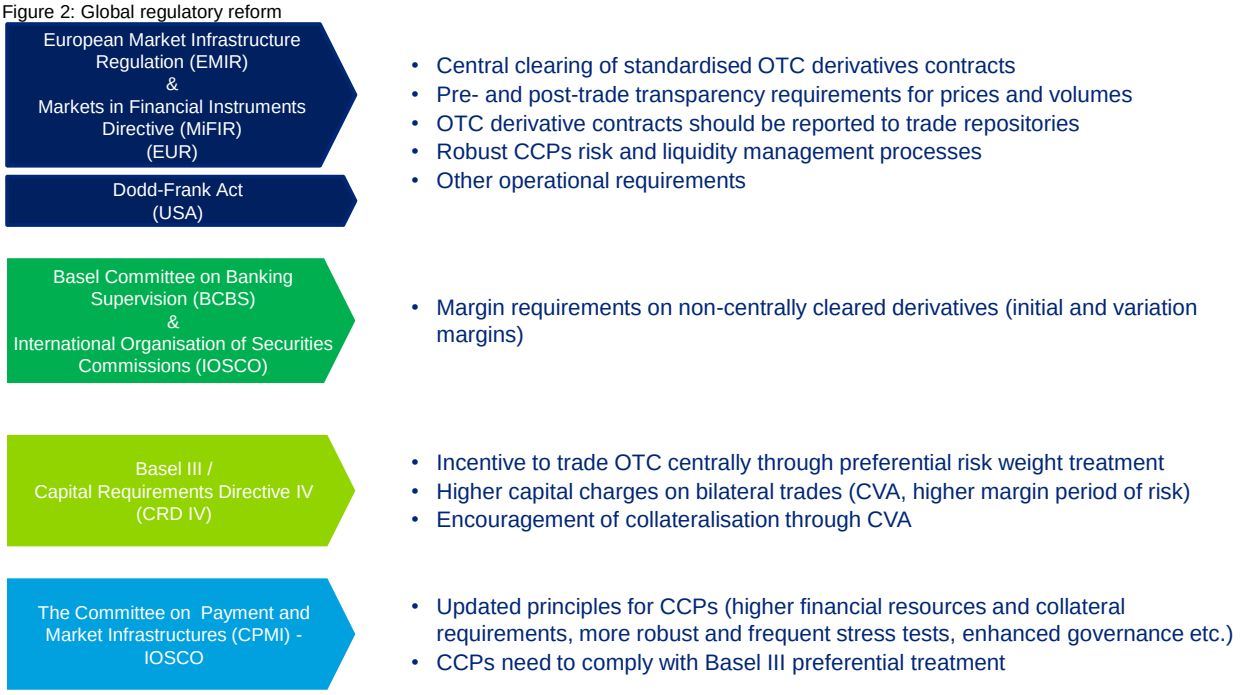
Principle 8: Settlement finality
An FMI should provide clear and certain final settlement, at a minimum, by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

Principle 14: Segregation and portability
A CCP should have rules and procedures that enable the segregation and portability of positions and collateral belonging to customers of a participant.

The above principles will require a change in existing collateral management processes both locally and globally for entities that are impacted by FMI.

The new regulatory landscape underlines the increasing need of collateral, and especially high quality collateral. Some of the new international regulations and their pertinent requirements include:

Figure 2: Global regulatory reform



1.2 Local Regulations

In addition to the above requirements, the South African Reserve Bank (SARB) has prescribed additional capital requirements on top of those required by Basel III. These amounts (as of 1 January 2019) are shown in the table below:

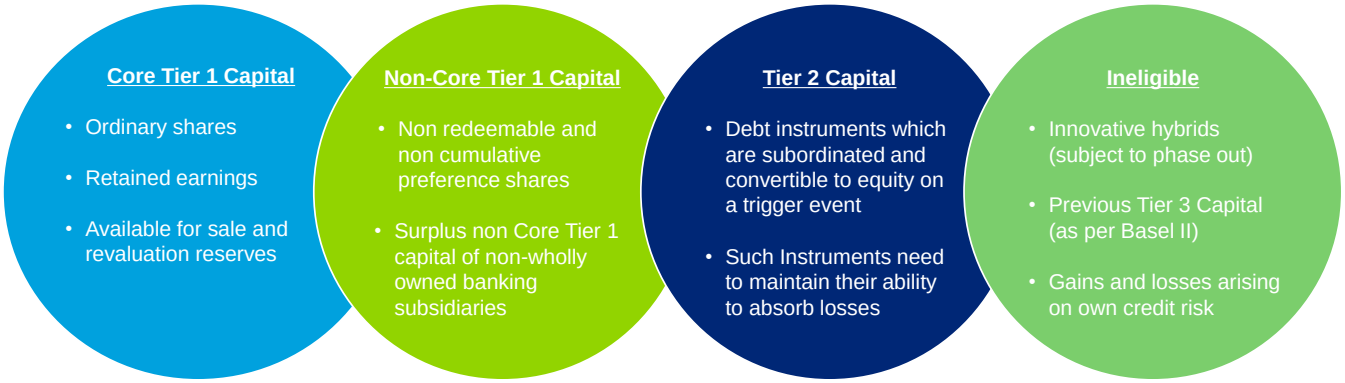
Table 1: SARB capital requirements

South African capital requirements - as required by SARB				
	Core tier 1	**Tier 1 capital**	**Total capital**	
Basel III minimum	**4.50%**	**6.00%**	**8.00%**	
Pillar 2A systemic add-on	2.00%	2.00%	2.00%	SA-specific
Pillar 2B idiosyncratic add-on	0.16%	0.20%	0.25%	
SARB minimum capital before buffers	**6.66%**	**8.20%**	**10.25%**	
Capital conservation buffer	2.50%	2.50%	2.50%	
Countercyclical capital buffer	2.50%	2.50%	2.50%	0% – 2.5% depending on adoption
Max SARB requirement after buffers	**11.66%**	**13.20%**	**15.25%**	
Current SARB requirement	**5.41%**	**7.20%**	**9.75%**	
Max increase in capital ratio	**6.25%**	**6.00%**	**5.50%**	

Source: SARB directive D5/2013 Annexure A & B

The figure below illustrate the type of instruments that would qualify as capital under Basel III

Figure 3: Definition of qualifying capital



Locally, a number of other regulations have evolved with the intention to better manage counterparty credit exposure in the trades undertaken. These changes will have an impact on current collateral management practices, as well as the number of collateralised trades. Some of these regulations include:

1.2.1 Pension Funds Act – Regulation 28:

Regulation 28, in the most recent draft format, prescribes that pension funds may only engage in securities lending transactions provided that there is adequate collateral. Such collateral must be regularly valued and separately identifiable. The collateral should be held for the benefit of the fund and should equate to:

- 105 percent of the fair value of the total securities lent where the collateral placed is cash;
- 110 percent of the fair value of the total securities lent where the collateral placed is debt instruments; or
- 115 percent of the fair value of the total securities lent where the collateral placed is equities.

While the above is not clear, we believe that this would require an out-and-out cession of the collateral received, and a pledge of collateral placed. This could lead to asymmetry in the market, in order to ensure that the collateral is held for the benefit of the fund.
(Notice 2 of 2012 – 31 May 2012)

In addition, pension funds may not use derivative instruments for the purpose of speculation or to obtain leverage. However, derivatives may be used for hedging purposes and may only be entered into with approved counterparties. A fund is required to calculate the effective economic exposure of a derivative taking into consideration the counterparty as well as the collateral held against that counterparty. In instances where such a derivative is traded on an exchange and cleared through a clearing house, such exposure may be excluded, therefore incentivising the clearing of derivatives centrally. Furthermore, the notice prescribes that the collateral received must be:

i. liquid;
ii. transparent and identifiable;
iii. valued daily;
iv. held by the fund or an approved nominee or an independent custodian in a segregated depository account on behalf of the fund, thus requiring an out-and out cession of the collateral ; and
v. subject to appropriate level of discount (haircut), if it consists of securities.

Where funds post collateral to a counterparty with transfer of legal title, the over collateralised amount (where the collateral posted is greater than the exposure to that counterparty) must be taken into account when calculating the counterparty exposure. *(Financial Services Board (FSB): Pension Funds Act, 1956: Regulation 28 of regulations made under section 36 of the act: Conditions for the use of derivative instruments -30 October 2013).*

1.2.2 Financial Markets Act:

The Financial Markets Act makes provision for the creation of a trade repository to maintain a central electronic database of the transaction data. All transactions in OTC derivatives will be required to be reported to the trade repository and disclosed to the Registrar[17] and other regulatory bodies to enhance transparency and monitor potential risks to financial stability and for the purposes of market surveillance. In addition, this Act provides for independent clearing houses that are not directly appointed by an exchange.

1.2.3 Solvency Assessment and Management (SAM) – South African version of Solvency II

Similar to Basel III, SAM establishes prudential capital requirements (Solvency Capital Requirements (SCR)) for re/insurers based on a market consistent balance sheet. Counterparty default risk is one of the aspects considered in the computation of the SCR. SAM establishes a capital charge for any instrument which form part of a financial risk mitigation technique, such as an over-the-counter (OTC) derivative. Most OTC derivatives are entered into to hedge the insurer's exposure to market risk factors such as interest rates or equity prices.

In the market risk module of the SCR these market risk factors are stressed to arrive at the portfolio's market risk capital. The risk mitigating derivatives will typically have an offsetting influence, or a benefit, when the prescribed market risk shocks are performed. The current market value of the derivatives plus the benefit obtained through the risk mitigating technique effectively becomes the expected positive exposure (EPE) to the counterparty. This exposure is then impaired through a capital charge for counterparty default risk. One of the key inputs in the SCR calculation is the loss-given-default (LGD) estimate. The LGD estimate is dependent on the level of collateralisation. Fully cash collateralised OTC derivatives only attract a 5 percent LGD, resulting in a very low capital charge. Uncollateralised OTC derivatives, which rank pari-passu with other unsecured claims in liquidation, attract LGD estimates of up to 45 percent. As a consequence, the calculation of the SCR allows for the effect of financial risk mitigation both through a reduction in requirements commensurate with the extent of the risk mitigation and the appropriate treatment of collateral.

[17] *The Financial Markets Act defines the Registrar as the executive officer and a deputy executive officer referred to in section 1 of the Financial Services Board Act.*

2. Market Overview

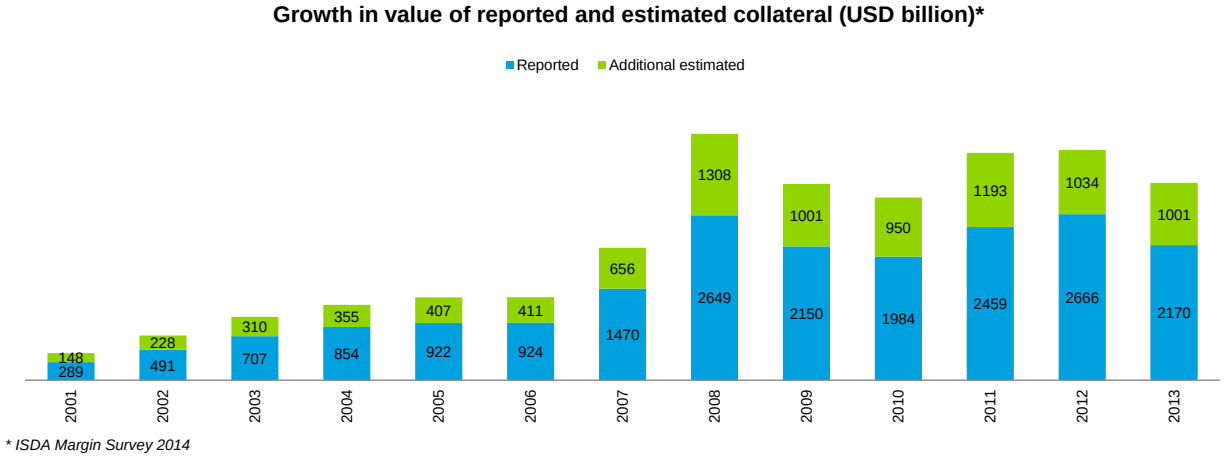
In understanding the impact of changing regulation, one needs to understand the current size of these markets and underlying collateral management processes. In assessing these markets we have focused on OTC derivatives, Securities borrowing/lending and Repurchase (Repo) markets.

2.1 OTC derivative market

Given the increased capital requirements previously highlighted, banks are looking to reduce their counterparty exposure. The Bank of International Settlements (BIS) noted the gross market values of outstanding OTC derivatives, i.e. the cost of replacing all outstanding contracts at market prices prevailing at reporting date, continued their downward trend, declining to USD17 trillion[18] at the end of June 2014. This was down from USD19 trillion reported as at the end of December 2013. It was further noted that the global net mark-to-market exposure of OTC derivatives, taking into account close-out netting[19] but not collateral, equated to USD2.8 trillion[20] at the end of June 2014. This decline is considered to be a consequence of mandatory clearing.

Collateral has been used as a key technique to reduce counterparty exposure, with the growth in the value of collateral used steadily increasing over the past 10 years. This is illustrated in the graph below:

Figure 4: Increase in the use of collateral over the past 10 years

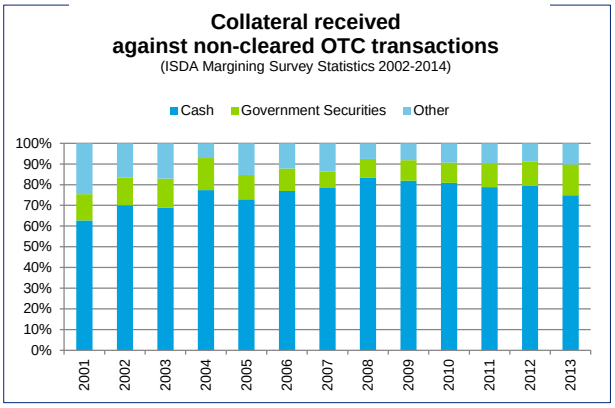


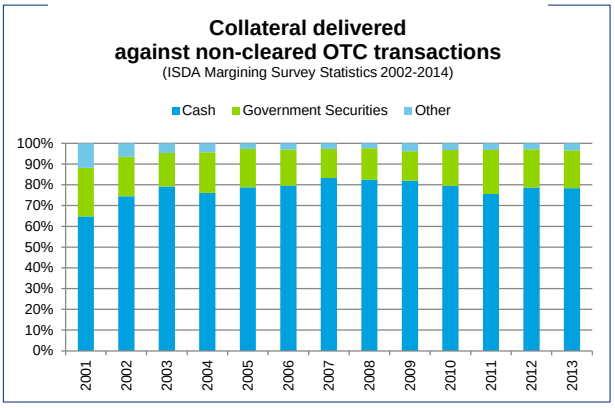
** ISDA Margin Survey 2014*

The International Swaps and Derivatives (ISDA) Margin survey 2014 reported global collateral use of USD2.170 trillion, although estimated this use at USD3.171 trillion as at the end of December 2013. With respect to collateral types, cash used as collateral represented 74.9 percent of collateral received and 78.34 percent of collateral delivered. Government securities constituted 14.84 percent of the collateral received and 18.23 of the collateral delivered during 2013. Combined, cash and government securities make up just under 90 percent of the collateral received and 97 percent of the collateral delivered. These are both key assets required to address the future liquidity and funding requirements set out by the introduction of the LCR and NSFR. The use of cash and government securities as collateral has been a common trend for a number of years. This is illustrated on the following page:

Figure 5: Use of cash vs. government bonds as collateral

[18] *As per the BIS Statistical release – November 2014*
[19] *Close-out netting, as defined by ISDA, refers to a process involving the termination of obligations under a contract with a defaulting party and subsequent combining of positive and negative replacement values into a single net payable or receivable.*
[20] *As per the BIS Statistical release – November 2014*





**Based on data compiled from the International Swaps and Derivatives Association Margin Survey 2014*

Currently the available information on the size and structure of the South African OTC derivatives market is limited. Preliminary estimates published by the Financial Stability Board (FSB) – "*Peer Review of South Africa"* noted the local OTC derivatives market had a notional value ZAR27.7 trillion as at 30 June 2012. Approximately 85 percent of this total was made up of interest rate contracts with the remaining amount was made up of foreign exchange related contracts, equities, credit and commodities contracts. This review further noted that interbank interest rate transactions constituted 59 percent of the outstanding OTC derivative markets with 61 percent of these transactions involving a South African bank and a foreign bank as counterparties.

Based on our interactions with key market players, the majority of these interbank trades are collateralised (trades with corporates are generally uncollateralised in the South African market), with general collateral practices within the South African market utilising either cash or government bonds should a trade be collateralised. Only recently have South African banks started clearing a small number of these trades centrally through London Clearing House (LCH Clearnet). Based on the revisions to the regulations discussed previously, we would expect to see changes to this current behaviour going forward. As noted, this might lead to an increase in the cash requirements of local banks.

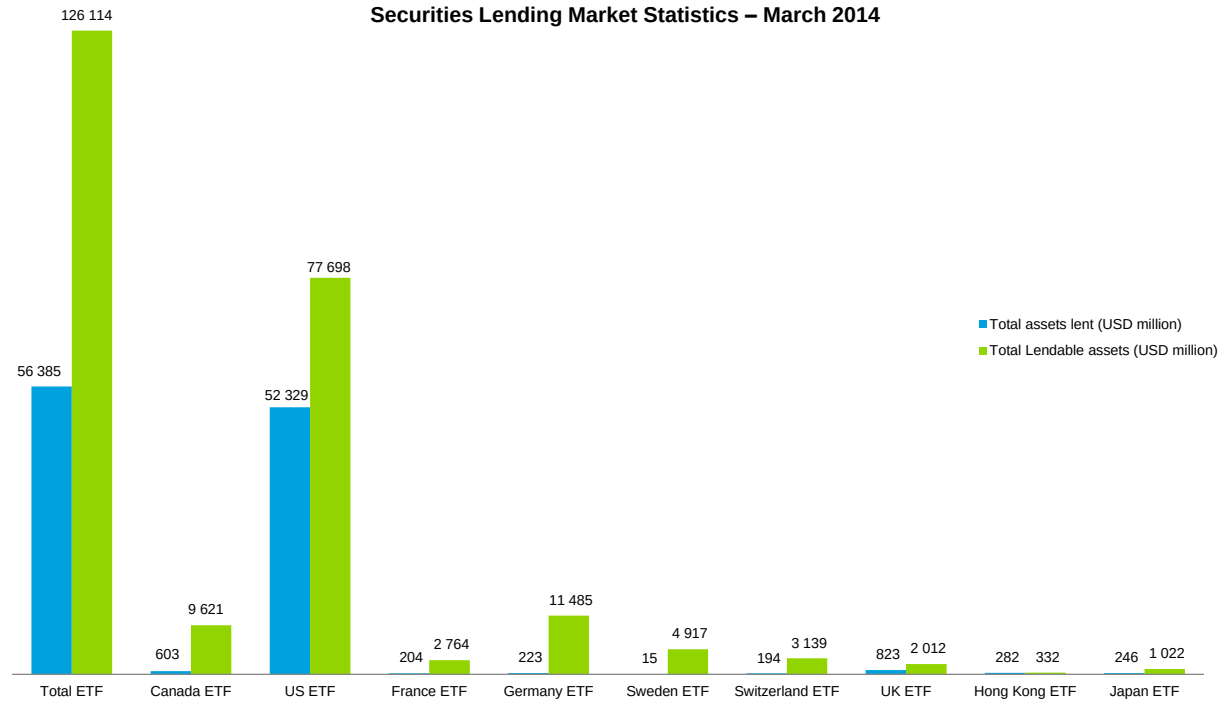
Furthermore, it should be noted that as the drive towards centralised clearing gains momentum, it is important to consider that clearing through any foreign CCP will require collateral in the form of foreign currency (i.e. Euro, US Dollar etc.). Thus banks will be required to raise foreign currency for use as collateral. While the use of a foreign CCP may help mitigate credit risk, it may give rise to unintended market risk as banks would now be exposed to foreign currency movements in the form of the collateral posted/received.

2.2 Securities Lending and Repo markets

Similar to the OTC derivatives markets, the increased regulatory capital requirements will give rise to an increased demand for collateralised trades in the securities lending market, as well as emphasise the importance of the collateralised local repo market in reducing counterparty credit exposure. The size of these markets both globally and locally, gives one an indication as to the volume of trades made, as well as the potential collateral requirement.

Although it is difficult to gauge the size of these markets, a Securities Finance Review / Q1 2014 conducted by Markit[21] noted a total of USD56 billion worth of global assets on loan, amongst key markets, at the end of the quarter. The key markets making up this figure are presented below:

Figure 6: Securities lending market statistics



Source: Securities Finance Review \ Q1 2014 conducted my Markit

In addition it was noted that value of stock on loan in South Africa equated to USD6 billion at the end of March 2014. The instruments lent were broken down as follows:

Table 2: Market value of stock on loan in South Africa at March 2014

Asset Class	Total assets lent (USD million)	Total lendable assets (USD million)	% used
South African Equity	**6 031**	**53 430**	**11.29%**
South African Equity (JSE 40)	*4 503*	*44 008*	*10.23%*
South African Equity (Others)	*1 528*	*9 422*	*16.22%*
South African Govt Bonds	**2 119**	**8 402**	**25.22%**

Source: Securities Finance Review \ Q1 2014 conducted my Markit

Looking at the figures presented above, it is clear that there are large amounts of securities on loan both globally and locally. However, there are still a number of securities that can be lent with the global utilisation of only 44.71 percent of lendable[22] assets and a local utilisation of 13.18 percent. Based on data collected by Iress at the end of July 2014, equities represented 45 percent and cash represented 40 percent of the collateral posted for the open loan positions in the South African SBL market, highlighting the use of cash as collateral.

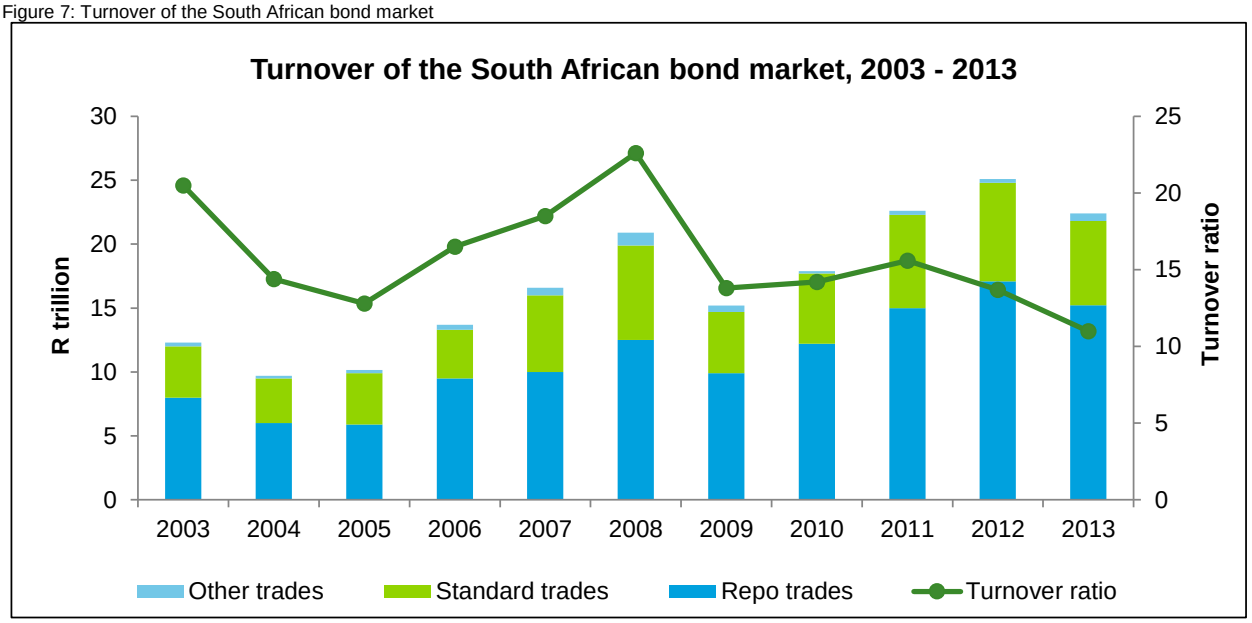
With an expected increase in the use of collateralised trades and a potential increased demand for liquid assets (these are discussed in more detail in section 3.1.) it is expected that an increase in the use of non-cash collateral will occur. The above figures may give an indication that should other lendable securities be used as non-cash collateral, cash and other HQLAs may be made available for use in meeting regulatory requirements. Alternatively, one may be able to convert these securities into cash by way of the repo or SBL market.

[21] *A global financial information and services company.*

[22] *Lendable assets are the total equities and bonds held by the entity that can be lent out.*

Based on the most recent data available, National Treasury[23] has considered the South African bond market to be one of the most liquid in the world with trading volumes reaching ZAR22.4 trillion for 2013. Of the volume traded, a significant portion of turnover of these bonds is attributable to the repo market which accounted for ZAR15.23 trillion of the volume traded during 2013. Over the past few years the repo market has accounted for almost two thirds of the volume traded in the South African bond market (please see graph below), illustrating the size of the local repo market as well as its importance.

Figure 7: Turnover of the South African bond market



Source: Johannesburg Stock Exchange per National Treasury's Debt Management report 2013/2014

2.3 High level collateral management process

The use of collateral requires a number of processes to be performed. The collateral process needs to ensure that eligible collateral is obtained, valued and monitored[24]. In addition, this process needs to identify when and what margin (initial and variation) calls are required to ensure that the entity remains adequately collateralised when receiving collateral and posts the correct amount of collateral when posting collateral. The process can be broken down into more detail as per the high level diagram on the following page. This diagram would depict a representative process for the OTC derivatives, Securities Lending and Repo Markets.

[23] *Based on the National Treasury Debt Management report 2013/2014 released September 2014*
[24] *Monitoring includes the assessing the collateral against the eligibility criteria and any other contractual terms, concentration limits, wrong-way risk and margining requirements.*

Figure 8: The collateral process

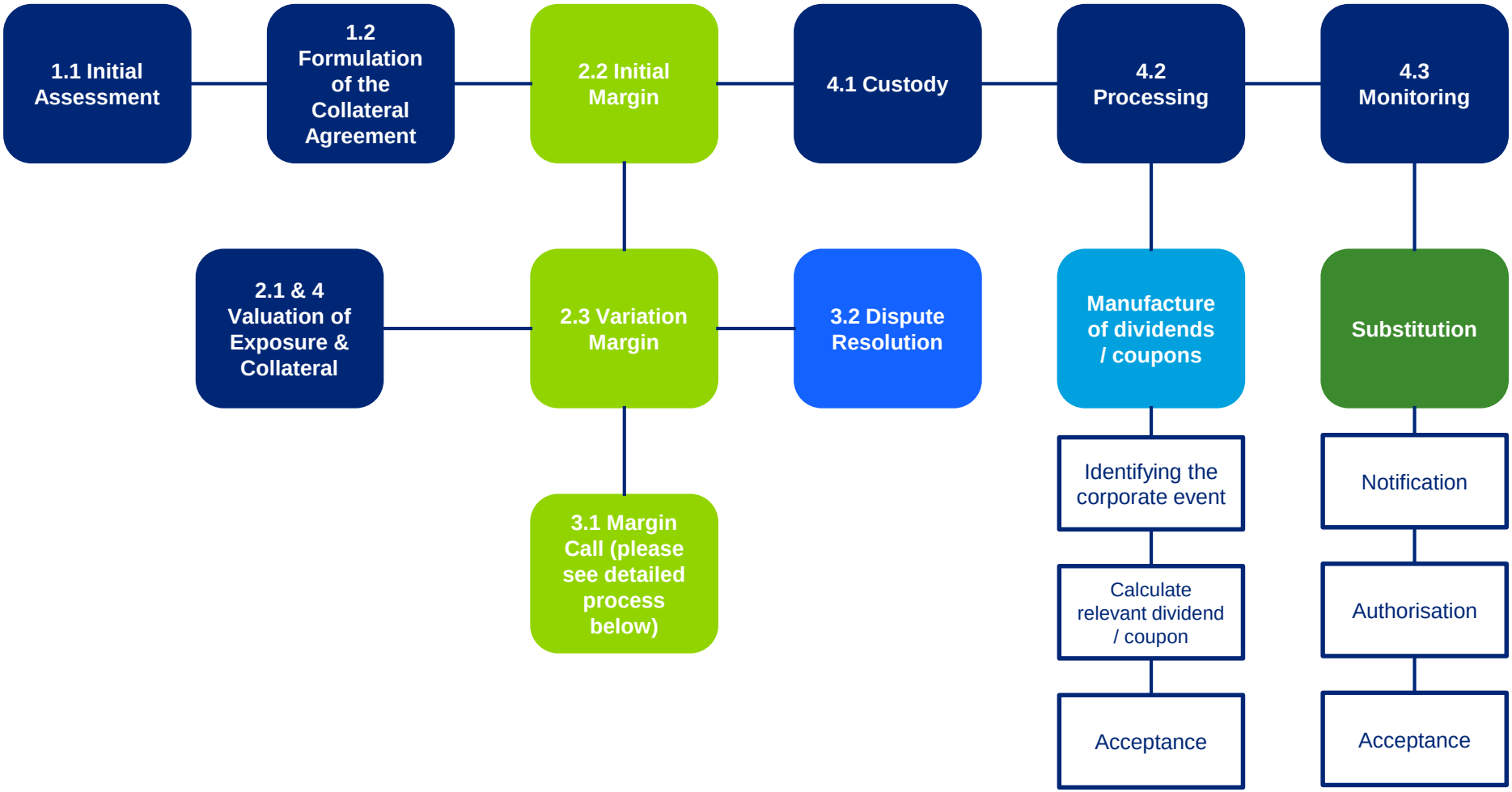
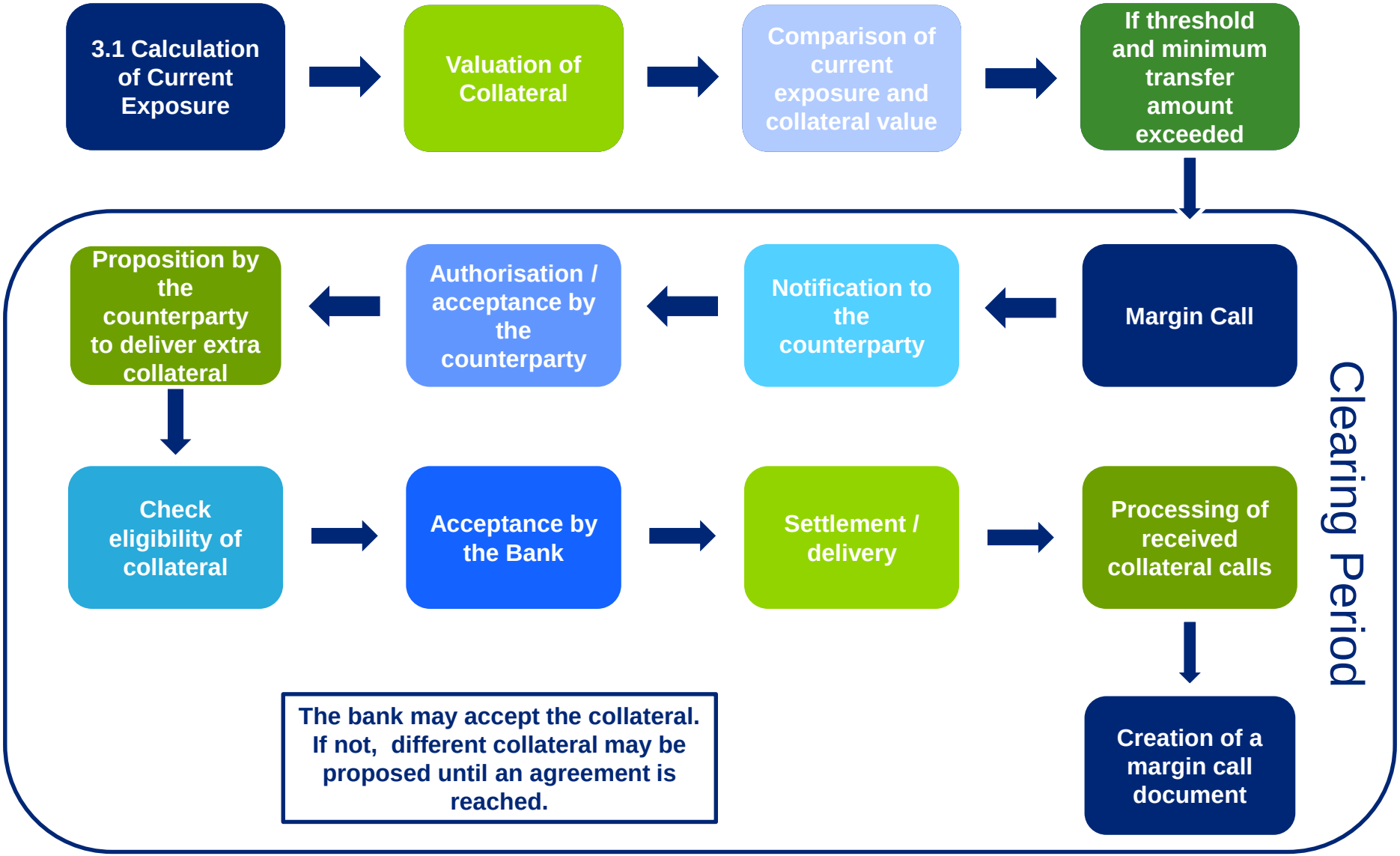


Figure 9 : The margin call process



1. Step One concentrates on the formulation of the collateral arrangement.
The initial assessment evaluates if collateral as a credit risk mitigating technique is the appropriate way to manage the specific counterparty credit risk and encompasses:

- Evaluation of collateral portfolio risk profile;
- Evaluation of client;
- Evaluation of collateral; and
- Evaluation of entity's risk profile.

While the collateral agreement would formulate either a Credit Support Annexures (CSA), Global Master Securities Lending Agreement (GMSLA) or Global Master Repurchase Agreement (GMRA) in order to define:

- Margining requirements – amounts, thresholds, frequency;
- Acceptable collateral and prescribed haircuts;
- Eligibility criteria;
- Rights to re-hypothecation; and
- Valuation methodology.

Settlement of the initial margin would take place once the terms of the collateral agreement have been set and requires the delivery of the collateral defined as prescribed in the CSA/GMSLA/GMRA agreements.

2. Step Two requires the valuation of the exposure on the underlying deal. The initial exposure may have changed as a result of movements in market rates. Any changes in exposure falling outside the thresholds defined in the collateral agreement will be collateralised via a variation margin call.

3. Step Three provides a detailed breakdown of the margin call process. Once it has been established that a margin call is required, the entity will need to inform the counterparty of the margin call. The counterparty will perform their own assessment of the collateral required to be posted, and will come to an agreement on the required margin call. Once the collateral has been delivered to the entity, an assessment of the collateral will be made to ensure that the collateral received meets the requirements specified in the collateral agreement. Should the collateral meet the prescribed requirements, the entity will confirm the acceptance of this collateral, record it in their books and deliver it to their custodian division. Should there be a differential in either the margin call or the collateral value, a dispute resolution will be undertaken in order to resolve these differences and come to a common agreement on the disputed values.

4. Step Four ensures that the collateral received is separately identifiable and entails the valuation of the collateral to ensure that the entity's exposure is adequately covered.

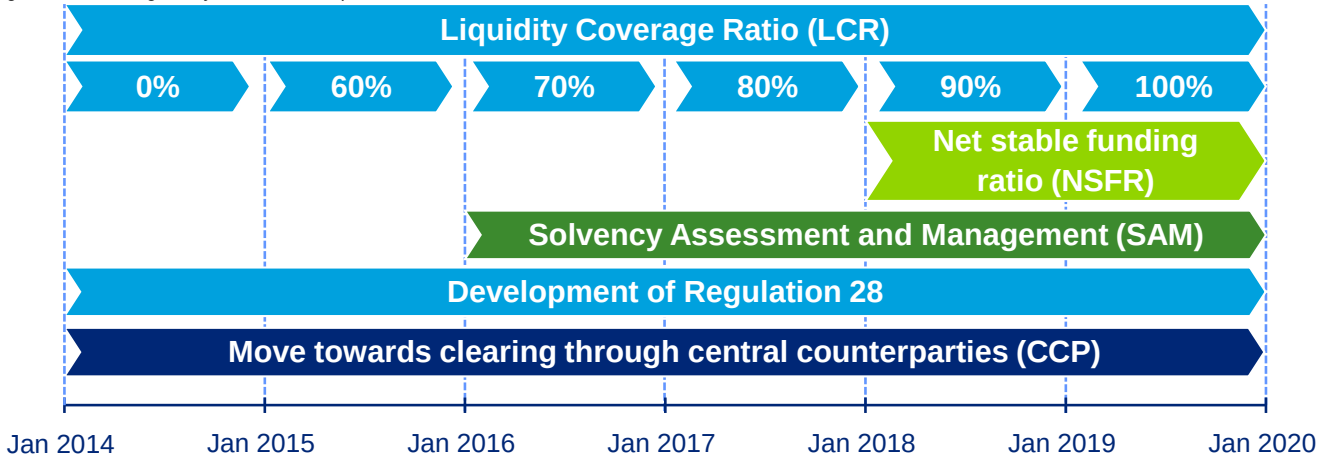
Should the collateral received be non-cash, the relevant collateral will need to be adjusted for any capital events, coupon or dividend payments.
Step 4.2 requires the entity to identify instruments that will require an adjustment as a result of a corporate event, dividend or coupon payment. In respect of equities, the entity will inspect the Johannesburg Stock Exchange (JSE) corporate calendar to identify dates where such events occurred. Based on the identified dates, the entity will monitor their position in these instruments up to the event date. On occurrence of the event date, the entity will assess their open position and calculate the impact of the event i.e. adjust for a corporate event or recalculate the dividend/coupon for distribution to the collateral giver. The calculation of the event's impact is often done manually. Any outstanding amounts will be confirmed with the collateral giver and payment will be made in this regard.

The acceptance of non-cash collateral requires the collateral department to perform continuous monitoring to ensure that the collateral received meets all of the requirements set out in the collateral agreement, and ensures that the entity is adequately collateralised.

3. Future State – Key changes

Given the extent of changes occurring in both global and local financial markets, existing ways of doing business will need to be reconsidered in order to adapt to these changes. Although a number of the regulatory changes have been promulgated, the full impact of these changes will only be understood as these are implemented. The figure below reflects the anticipated implementation date of each regulatory reform.

Figure 10: Local regulatory reform roadmap



The implementation of these reforms will have an impact on the demand for liquid assets, with the following reforms driving this in particular:

- The implementation of the LCR and NSFR will require the bank to hold more liquid assets. As a result, the demand for such instruments is expected to increase in order to meet these revised regulatory requirements.
- The move towards central clearing of OTC derivatives will generate an increase in the demand for cash, as CCPs require cash collateral to be posted. The bilateral posting of collateral will result in more cash being placed with CCP's, and thus an overall reduction in the cash held by the entities.

Key considerations expected are discussed below:

3.1 Shortage of Cash and other HQLA

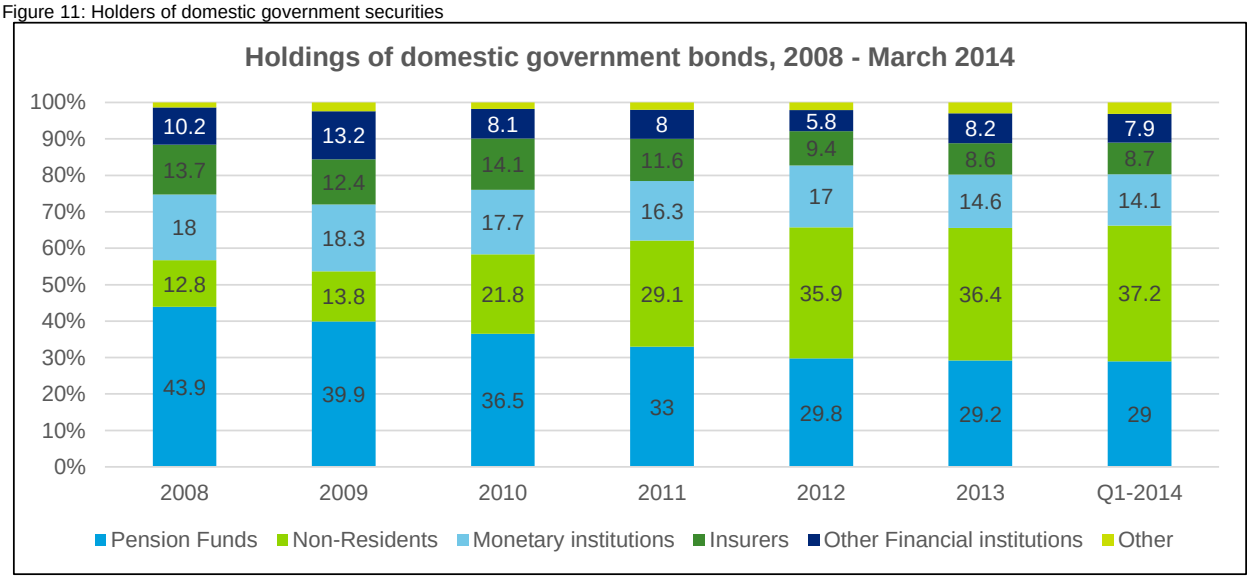
The introduction of the LCR and NSFR will require banks to maintain a specific level of HQLA, and this will require them to optimize their use of liquid assets. The full extent of this shortage will not be known until implementation of these ratios. In January 2013 the Basel Committee[25] estimated the shortfall against a 100 percent LCR requirement to be about R140 billion in the South African banking sector.

This shortfall was acknowledged by SARB who have provided partial relief in the form of the CLF. This is discussed in detail in Section 3.8.

In addition, the high demand for domestic government bonds, qualifying as HQLAs, amplifies this shortage as banks struggle to acquire these assets to meet in increased regulatory requirements. The graph below illustrates the relatively small portion of government bonds held by South African Banks, with pension funds holding a significant portion of these bonds over the last couple of years. Furthermore, the current low interest rate environment in Europe and the United States has resulted in local bonds becoming considerably more attractive to non-residents as they seek higher yields.

[25] *As per SARB guidance note 6 of 2013*

Figure 11: Holders of domestic government securities



Source: STRATE per National Treasury's Debt Management report 2013/2014

The above figure highlights the percentage of government bonds held by various market participants. As the shortage of HQLA becomes apparent, banks may encourage their counterparties, particularly pension funds, to post government securities as collateral through an out-and out cession in order to utilise these assets to meet their liquidity requirements. Furthermore, a general demand for cash may result in a shift in the types of collateral posted as counterparties look to optimise their balance sheet assets. However, one would still need to consider that banks would have a preference to receiving cash collateral as a result of the funding implications (see further detail in Section 6.1). Given the above, a change in the current types of collateral posted/received is anticipated.

As highlighted in Section 2, cash and government bonds form the majority of collateral placed worldwide. The increased demand for cash and other HQLAs (i.e. government bonds) could result in such assets no longer being used as collateral, but rather used to meet regulatory requirements. In addition to this, the significant increase in collateralised trades would create a further demand. Collateral practices may move from cash to non-cash collateral in an attempt to address this demand. New and existing market infrastructures may be developed to create secondary markets in the local bond market. This will facilitate increased trades in these types of bonds and potentially allow a natural evolution towards the creation of more eligible collateral.

While there may be a move to non-cash collateral in an attempt to address this gap, this in itself has its own challenges. The use of non- cash collateral may reduce liquidity risk, however it also gives rise to the banks susceptibility to wrong way risk and concentration risk if not adequately managed.

3.2 Increase in collateralised trades

The financial crisis highlighted the importance of managing counterparty credit risk. The use of collateral is one of the most common technique used to mitigate this risk. As a consequence of the use of collateral, the impact of the additional capital charges required by Basel III would be softened, reducing both the counterparty credit and CVA capital charges currently required. Thus, it would seem logical for banks to enter into more collateralised trades. However, the revised Basel requirements are not the only consideration that would drive this increase, the G20 reform requiring all OTC derivatives to be collateralised would also drive this.

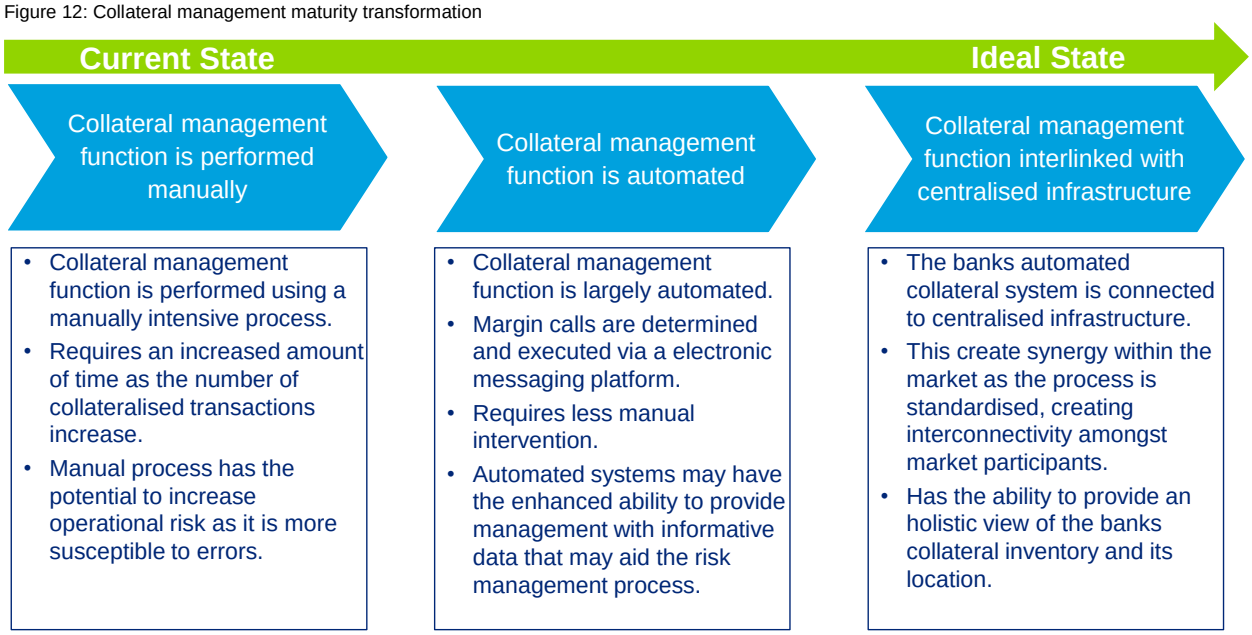
A recent IMF Working Paper (WP/13/25) dated January 2013, noted that the use of collateral is expected to increase significantly with a current global under collateralization in the OTC derivatives market of about $3 to $5 trillion.

3.3 A move towards a more automated process

With the increase in the volume of collateralised trades, existing collateral management process may no longer be able to cope. A move towards a broader asset base to place or receive as collateral raises complexities for entities attempting to manage these collateral assets in-house. In addition one needs to consider the inherent risks (i.e. wrong way risk, concentration risk) of non-cash collateral as well as additional processes required to manage such collateral (i.e. valuation of collateral, manufactured dividends, capital events, substitutions etc.).

There is also the potential that operational risks may increase if the technology used to address these increased volumes is not appropriate. In order to obtain a holistic view of collateral and eliminate silos, existing manual collateral management practices will need to be replaced by automated processes supported by appropriate technology. This will not only allow an entity to identify its concentration risk, but also reduce potential capacity problems that may arise from the increased volumes or a possible market stress. The figure below illustrates the perceived changes required:

Figure 12: Collateral management maturity transformation



The benefits of automating the process would include:

- **Real time valuation of collateral** would identify wrong way risk and asset correlation of non-cash collateral. Furthermore, it would provide a mechanism to assess the liquidity of the collateral held which is of importance in times of market stress.
- **A holistic and transparent view of collateral** across parties, geographies and asset classes would allow suitable monitoring of concentration risk. Physical collateral settlements confirmed through a secure 3rd party solution would provide an independent inventory check for collateral balances on a daily basis.
- **Automated margin calls** would reduce the susceptibility to manual error, thus reducing operational risk.
- **Facilitating the use of non-cash collateral** may reduce the liquidity impact arising from increased margining requirements as a result of the drive towards central clearing and the regulatory requirements within the LCR.
- **A market integrated management system** would allow the tracking of collateral and identify where such collateral has be re-hypothecated. It would also facilitate optimisation strategies across market participants.
- **Real time margin calls** provide the opportunity to reduce settlement risk as it allows one to move away from the standard T + 1 settlement convention to intraday settlements.
- **Establishing collateral agreements** with counterparties will clearly define eligible collateral, margin thresholds, etc. clearing up potential miscommunications.

In addition it would enhance the bank's ability to meet the revised requirements of *Basel III, paragraph 110* which prescribes qualitative collateral management requirements to ensure that bank's collateral management policies control, monitor and report:

i. The risk to which margin agreements exposes them (such as the volatility and liquidity of the securities exchanged as collateral).
ii. The concentration risk to particular types of collateral.
iii. The reuse of collateral (both cash and non-cash) including the potential liquidity shortfalls resulting from the reuse of collateral received from counterparties (refer to Basel III BIS document page 51). The financial crisis revealed that there was insufficient ability to track collateral that was being reused. Consequently, when the collateral was called upon on default, it could not timeously be recovered. This increased the risk of counterparty default and ultimately increased systemic risk. As a result, Basel has focused their attention around the controls surrounding collateral reuse.
iv. The surrender of rights on collateral posted to counterparties.

3.4 The use of CCPs

In line with meeting the G20 mandate, Regulators globally are faced with a difficult conundrum as consideration is given to the merits of:

- Establishing a local CCP;
- Giving recognition to foreign CCPs; or
- Allowing a combination of both.

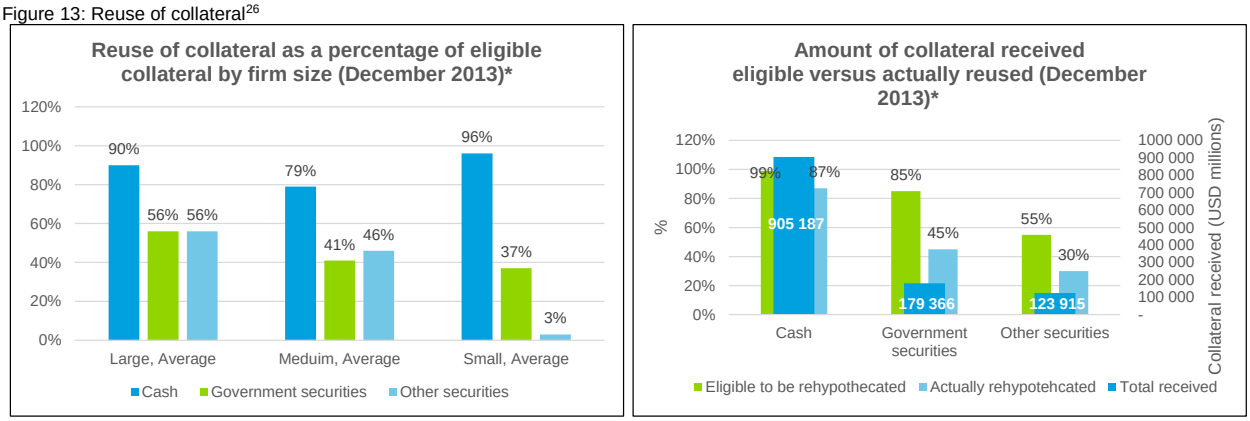
Basel III provides further incentives to clear OTC derivatives through CCPs by offering significantly reduced capital requirements as well as the exclusion of a CVA capital charge.

However, while the recognition of a foreign CCP may appear to be the most simplistic answer, considerations need to be given to the increased systemic risk that may arise should world markets rely on a limited number of CCPs. Furthermore, the focus to centrally clear OTC derivatives has the potential to increase liquidity risk, as the increased margining requirements may place additional strain on cash and other HQLAs which are predominantly placed as collateral. The use of a global platform would facilitate the movements of foreign assets to be used as collateral and thus may soften the impact of the cash strain.

3.5 Potential re-hypothecation of collateral

Greater demand for collateral could lead to the need for re-hypothecation of collateral. Re-hypothecation or re-use of collateral impacts the liquidity management process as it becomes more difficult for entities to recall their collateral promptly from their counterparties. This is inherent in the process as counterparties would often have to call back collateral from their own counterparties, complicating the entire process and increasing systemic risk. The figure below illustrates the current reuse of collateral in the global OTC derivatives market.

Figure 13: Reuse of collateral[26]



** ISDA Margin Survey 2014*

The necessity for a bank to be able to track their collateral and ensure that the posting or recall of collateral happens in a timely manner was highlighted during the financial crisis. However, the current finalisation of rules for *"Margin requirements for non-centrally cleared derivatives*" published by the Basel Committee on Banking supervision in September 2013, may impede this as stricter rules are implemented to ensure that such collateral is only reused once for non-centrally cleared trades. Market players have suggested that such a requirement would increase the costs of funding the transaction and thus have raised their concern that implementation is not practical. Market participants will need to wait and see whether such concerns are addressed and if these margining requirements will still prevail in the future.

3.6 A move to a centralised collateral desk and a drive towards collateral optimisation

With the increased importance of collateral, we have seen several global entities move towards establishing a centralised collateral desk in order to ensure that collateral is optimally used throughout the entity.

As collateral volumes increase, the need for the automation of this process becomes more pertinent in order to reduce operational risk, fulfil collateral reporting requirements and monitor other types of risk that the entity is exposed to. The redefined process will need to facilitate the use and valuation of non-cash collateral, track collateral, calculate and perform margin calls (initial and variation margin) and provide a holistic view of the collateral received and placed. An automated process would assist in streamlining the collateral process, thereby reducing the time taken for collateral management. This could furthermore be enhanced through centralisation of the collateral management function thereby replacing the existing silo approach. A recent Morgan Stanley/Oliver Wyman -*Wholesale and Investment Banking outlook – dated April 2013,* noted a growing need for collateral optimisation services, with an estimated 40 percent of respondents performing collateral optimisation on a piecemeal basis.

The consolidation of activities within the collateral function is expected to reduce the resources and system infrastructure required. The elimination of the duplication of activities within these functions will furthermore lead to a reduction in operational costs.

---

[26] Per the ISDA margin survey 2013, large-sized entities are defined as those with more than 3 000 active agreements, medium-sized entities are defined as those with more than 100 but less than 3 000 active agreements and small- sized entities were those between zero and 100 active agreements.

The Oliver Wyman survey estimated a reduction in collateral management operational costs of between 20-30 percent though optimising the collateral management process. The latter would include the automation of the process and move towards the centralisation of the collateral management function.

In addition operational risk is reduced as the process becomes less manual intensive and is less susceptible to human error. With the anticipated reduction in resources, it envisaged that financial institutions will divert more attention to assessing the cheapest to deliver assets and look to optimise returns on assets currently held on their books. This could be attained through collateral transformation efforts e.g. a basket of securities could be transformed into HQLA using a repo equivalent transaction. However, this may take some time to establish, as most entities are still looking to establish a clear understanding of their collateral management needs and approaches. This was highlighted at the January 2014 Clearstream Summit Poll[27] which showed that 61 percent of financial institutions still have a long way to go to establish a collateral management strategy.

3.7 Creation of liquid assets

As the greater demand for collateral becomes apparent, assets that were previously disregarded for collateral as a result of their liquidity may be considered eligible as non-cash collateral becomes an option to address this demand. The increased use of non-cash collateral assets and the ability to track these assets may stimulate trade and develop a secondary market for these assets. In addition, the formulation of standardised eligibility baskets may assist in converting assets into eligible collateral through the application of haircuts.

3.8 Introduction of a Committed Liquidity Facility (CLF)

The Basel Committee in January 2013 estimated a current shortfall, against a 100 percent LCR requirement for South African banks, to be about R140 billion (SARB G6/2013). SARB had identified this shortfall during the first half of 2012 and approved the provision of a CLF available to banks to help meet their LCR. The CLF may be used to substitute level 2[28] assets in meeting the LCR. The use of this facility may not make up more than 40 percent of the bank's full HQLA requirement. Banks electing to make use of the CLF shall be required to pay a commitment fee to the SARB even if they do not draw on these funds. The proposed fees are as follows:

Table 3: Committed liquidity facility - proposed fee

CLF as a percentage of required HQLA	Proposed fee per tranche (bps per year)	Weighted average fee (bps per year)
<10%	15	15
10-20%	25	20
20-30%	35	25
30-40% (max of 40%)	45	30

Source: SARB – G6 of 2013

The assets received as collateral for the CLF should provide adequate risk protection to the SARB. Some of the acceptable collateral includes:

- Listed debt securities with a minimum credit rating of A- on a domestic rating scale.
- Equities listed on the Johannesburg Stock Exchange's (JSE) main exchange and included in the Top 40 Index.
- Notes on self-securitised pools of high-quality residential mortgage loans.
- Commercial mortgages.
- Loans other than mortgages.

[27] *As per www.iss-mag.com*

[28] *Level 1 assets generally include cash, central bank reserves and certain marketable securities backed by sovereigns. Level 2 are comprised of Level 2A and Level 2B assets. Level 2A assets include certain government securities, covered bonds and corporate debt securities. Level 2B assets include lower rated corporate bonds, residential mortgage backed securities and equities that meet certain conditions.*

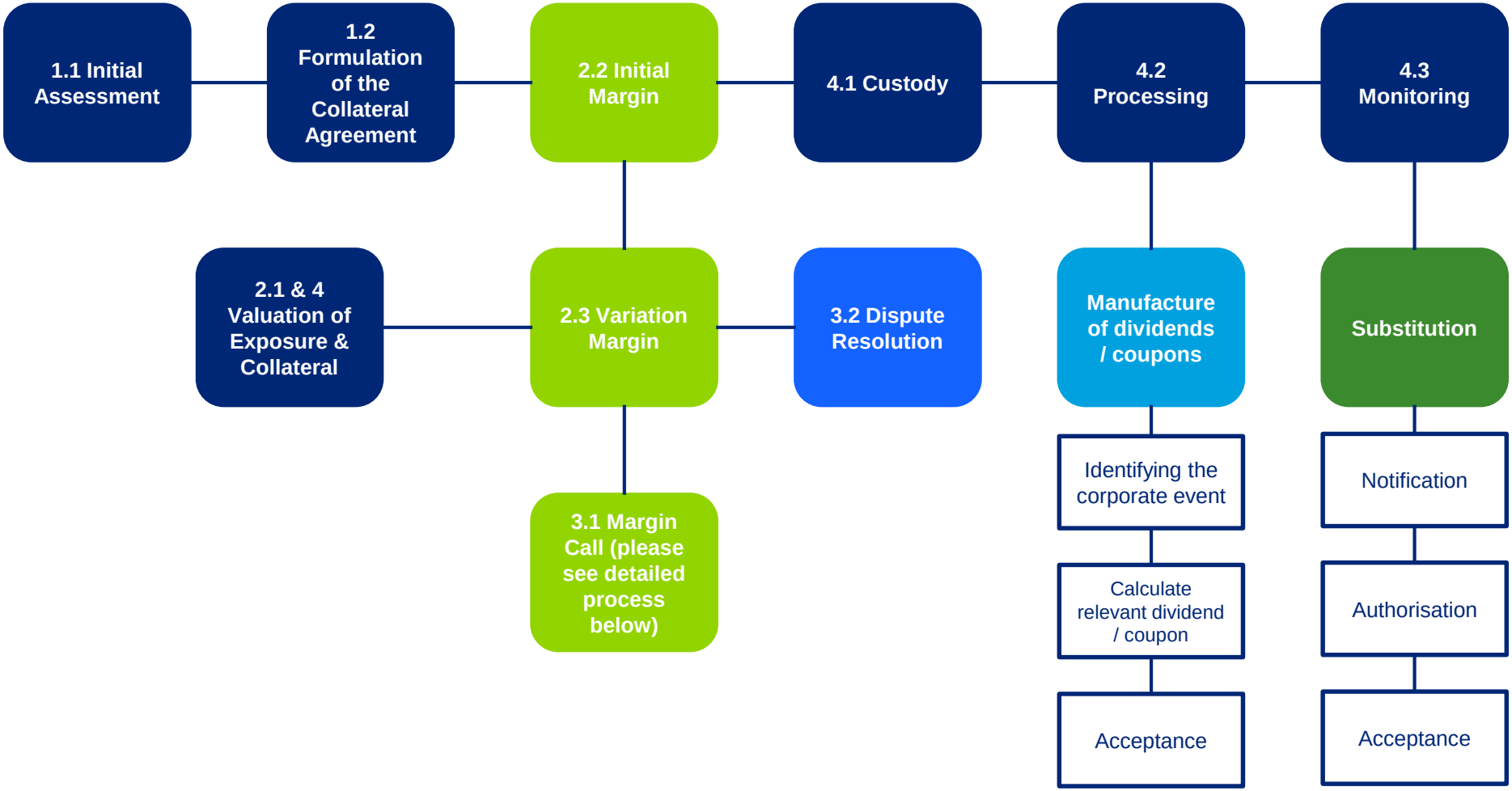
4. Strate Solution

In order to address the key regulatory changes and their anticipated impact on the future state of the market, one needs to have an understanding of the features and limitations of the Strate solution. An objective assessment is needed to determine whether the Strate solution meets these requirements as well as whether any identified limitations can be addressed.

Certain steps within the current collateral process would be addressed by the Strate solution. For ease of reference we have included the current collateral process, with references as to where we anticipate the Strate solution is able to assist in meeting some of these anticipated requirements. It is important to understand that the Strate service is complementary to any internal collateral automation/bilateral solution which a bank/entity may have and aims to provide an outsourced collateral service including:

- Automatic allocation and selection, substitution, withdrawal and valuation of collateral;
- Market-wide optimisation; and
- Standardisation across the market (back-end and timelines) and across exposure types.

Figure 14: The current collateral process:



4.1 Strate solution features

4.1.1 Facilitation of non-cash collateral (Point 1.2, Point 3.1)

The Strate solution facilitates the receipt of cash and non-cash collateral, where non-cash collateral typically refers to dematerialised equity, debt securities, bonds and money market instruments. The integration of the Strate solution with their custodian services allows non-cash collateral to be easily recorded as a pledge or transferred between counterparties, under cession, on a real time basis.

The complexities of managing non-cash collateral are reduced through the automated monitoring of sufficient eligible collateral against financial exposures via the solution's algorithms. This is achieved through the use of both standardised and customised eligibility criteria including haircuts, asset ratings and asset preferences and regular intra-day collateral management processes (valuations, eligibility changes, etc.).

The Strate solution's eventual interconnectivity with key players in the South African market could result in the creation of a central infrastructure solution as opposed to a fragmented bi-lateral collateral management software solution. Such an infrastructure could have the ability to stimulate demand and create liquidity for assets previously disregarded due to the manually intensive process of managing such collateral. In addition, the time spent dealing with counterparties has the potential to be reduced as each counterpart would be on the same platform with the same legal structures in place with the Strate solution. Pre-defined eligibility criteria and increased trading activity via the creation of a secondary market may result in such assets no longer being disregarded. This could allow banks to utilise assets, previously considered to be "lazy" assets, while addressing the potential increase in demand for collateral.

Although the plan to implement and utilize a global liquidity hub[29] is still in its infancy stages, its introduction would further enhance the liquidity of local securities and debt instruments as it would provide foreign corporations with access to South African assets.

4.1.2 Tracking of collateral (Point 4.3)

The importance of the entity having the ability to track its collateral placed was highlighted during the financial crisis. Globally, a large portion of collateral is re-used (please refer to figure 13). It is important, as well as a Basel requirement, that entities have the ability to track the collateral, should it be re-used, in order to reduce systemic risk The Strate solution's central custody of collateral ensures that no collateral placed/received can leave the solution, unless sold by the placer of the collateral, given adequate substitution has taken place. Thus, a simple recall process is initiated whereby even re-used collateral can be returned along the initial re-use chain. The Strate solution automates this entire function without any intervention from clients/users.

---

[29] *The global liquidity hub forms part of the Liquidity Alliance. The Liquidity Alliance was established in January 2013 with the aim of providing a platform for Central Securities Depositories (CSDs) to collaborate on collateral management. It gives members an opportunity to exchange information, identify common needs and extend global collateral solutions while encouraging the development of informed research. The Alliance was formed in response to the growing need for collateral due to the regulatory overhaul following the financial crisis. There are fears that there might not be enough collateral around the globe to cover all evolving exposures, especially as various studies revealed that most financial institutions suffer from collateral fragmentation and have no internal overview of their collateral pools. CSDs and other market infrastructures are particularly well placed to address the global collateral shortage by optimising the usage of collateral pools on a short time-to-market basis. Liquidity Hub GO is the collateral management solution of choice of the Liquidity Alliance members, as it enables the collateral to stay in their domestic markets as well as to facilitate foreign exposures covered by domestic collateral and domestic exposures using foreign collateral. With Strate as part of the Liquidity Alliance, each Strate Collateral client will have the opportunity to benefit from the resulting initiatives of the Liquidity Alliance for cross-border collateralisation in addition to the domestic collateralisation being undertaken in the domestic South African market.*

In instances where collateral is pledged, such items are marked at the CSD, in line with the Financial Markets Act, and cannot be re-used.

4.1.3 Substitution of collateral (Points 3.1)

The use of standardised market pricing for valuation of non-cash collateral as well as pre-matched eligibility criteria for the collateral to be received, enables a great deal of straight through processing as well as less disputes on the value of the underlying collateral. These criteria may be satisfied by a number of different instruments. Thus, in cases where the collateral giver requires the instruments placed to be returned, the solution's algorithms automatically returns the collateral required only once an eligible substitute has been placed. This automated process reduces the manual process of finding substitutions and ensures real time delivery of the required collateral placed. In addition, the solution ensures that cash is returned should eligible non-cash collateral become available in source accounts (trading accounts) held by Strate.

4.1.4 Accounting for dividends and coupons (Point 4.2)

In instances where listed securities or debt instruments are placed as collateral, repo'd out or used in a securities lending transaction, the ownership of the security transfers to the counterparty. Dependant on the terms of the transaction, the coupon payment/dividend income earned largely remains for the benefit of the security giver. Thus, in order to compensate the giver for the lost income, the receiver of these assets is required to manufacture the required coupon or dividend.

This process is often performed manually and requires both parties to agree on the manufactured amounts. This process may include multiple custodians and have dividend withholding tax implications. To eliminate this manually intensive process, the solution's algorithms ensure that these instruments given are returned to ensure that the relevant income falls within the security givers hands and thus no manufacturing of income is required. Given the current use of cash as collateral, the full operational burden has not yet been felt and will only be known as collateral users migrate from the use of cash to non-cash collateral.

4.1.5 A common pricing file (Point 2.1, Point 4)

A standardised price for the market (equities, bonds and money markets) ensures that the value of collateral is agreed by both counterparties, reducing any potential disputes when processing margin calls.

4.1.6 A risk management tool (Point 3.1, Monitoring of risks)

While the solution focuses on a collateral management solution, it also helps an entity manage their risks. The following risks can be monitored by way of the solution:

i. Concentration risk: The solution provides a holistic view, on a daily basis, of all the instruments held by entity and placed into the Strate solution. The automated solution is parameter driven and ensures that that the predetermined limits are not breached. This allows management to have a clear picture of all listed securities held and identifies where the concentration in certain assets falls outside the entity's desired risk limits.
ii. Assessment of eligible collateral: Utilising the solution's algorithms, pre-defined criteria are checked intraday, ensuring that the features of the collateral received, are consistent with those initially agreed upon i.e. asset ratings/preferences etc.
iii. Identifying wrong way risk: As non-cash collateral presents its own challenges, the monitoring of wrong way risk becomes particularly important. Since the solution performs a valuation of the collateral on a daily basis, any collateral trends in relation to the underlying exposure are easily identified.
iv. Reduction in settlement risk: All collateral is held within the solution. Any required transfer of collateral is pledged or transferred real time, thus reducing the period of exposure as a result of being under-collateralised. Given the current conversion in the settlement time of listed equity instruments from A T+5 to a T+3 settlement cycle, the solution would automatically assist in meeting these revised conventions. The same benefit could be applied to bonds should settlement cycles be reduced. Furthermore, the solution caters for an automated recall of the instruments on the date committed to the Central Securities Depository, ensuring that the required instruments are available when needed. In addition, the real time delivery of cash collateral would also reduce such settlement risk in instances where cash collateral is

used. All undisputed exposures are collateralised immediately by the solution, however the disputed amount will still need to be investigated by the bank outside of the Strate solution as currently done.

4.1.7 Mechanism to identify the true substance of the trade

Currently the transfer of listed equity securities attracts a tax (Capital Gains Tax – CGT and Securities Transfer Tax - STT) charge, whereas debt securities attract CGT. These taxes are levied by the South African Revenue Services (SARS) as the transfer of these securities is considered to constitute a sale of the instrument. The use of the solution would create mechanism that would allow SARS to identify whether the transfer of the listed instrument is merely as a result of a collateral transaction or whether it constitutes an outright sale of the instrument.

4.1.8 Automated margin calls (initial and variation) (Point 2.2, Point 2.3, Point 3.1)

The solution performs intraday eligibility checks and daily valuation of collateral. Thus, once the exposures of the relevant deals have been loaded, an automated margin call would be performed where necessary, notifying the relevant parties. As all parties would form part of the solution, the collateral would transfer freely between the counterparties' accounts without any manual input required. The automated margin call feature would also reduce instances where over collateralisation may occur, thus optimising the levels of collateral maintained.

4.1.9 Detailed breakdown of collateral transferred (Point 3.1)

On a daily basis, the solution would provide a breakdown of all margin calls made on a deal by deal basis. Thus, any dispute that may have occurred can be identified at an individual trade level as opposed to the portfolio of trades. This identification would assist in shortening the time required to resolve disputes.

4.1.10 Standardisation across the market

The adoption of the Strate solution would provide a centralised infrastructure and have the potential to further enhance the standardisation of the market, standardising:

- The use of an electronic messaging platform;
- Pricing files to determine the value of collateral;
- Operating windows e.g. settlement of collateral timeframes; and
- Defined collateral baskets meeting defined eligibility criteria's.

4.1.11 Collateral optimisation

The Strate solution will facilitate the use and valuation of non-cash collateral, track collateral and automatically book and select the "cheapest to deliver" collateral. Furthermore, the solution automates the margin call process and provides a holistic view of the collateral received and placed. Through the solution's centralised infrastructure, it provides a market wide view of the entity's collateral inventory as well as its location and the associated contracts' eligibility criteria. This is a key differentiator when compared to stand alone bi-lateral software solutions (which can only 'see' contracts with direct counterparts, not indirect ones), as such solutions cannot provide such a holistic view. Utilising existing software solutions to duplicate the benefit of market-wide optimisation would be at a significant cost to the market and would still require a central infrastructure between all counterparts in order to see all transactions, contracts and inventory.

4.2 Further considerations:

i. The Strate solution requires users to upload their calculated exposures in order to determine the appropriate margin call. Current software used to quantify these exposures may also have embedded collateral management features. Although it is not expected that these features would meet all of those offered by the Strate solution, it may result in a duplication of costs. Furthermore the use of different software and methodologies to collate and calculate these exposures may give rise to margin call disputes. However, this would not be different to the current process followed. An in depth cost vs. benefit analysis would need to be performed to quantify the internal cost of implementation of the Strate solution as well as the direct and indirect costs of using and maintaining the system vs. the incremental benefits it will bring.

ii. The benefits offered by the system will be unique to each entity using it.

iii. Presently the transfer of securities and debt instruments are treated as an outright sale by the South African Revenue Services (SARS) and thus attract CGT for fixed income and equities and STT for equities. This deters the use of the non-cash collateral as each transfer incurs a tax cost. .

iv. A key benefit of the Strate solution is its anticipated integration with the key market players, thus serving as a centralised infrastructure as opposed to a fragmented bi-lateral collateral management solution. However, until key market players subscribe to these services, such a benefit may not fully be realised.

v. The receipt of non-cash collateral requires the receiver to raise funding for the underlying derivatives. Should the entity be able to repo the security and raise the relevant cash, no additional funding is required. However, given the expected increase in demand for cash, one needs to consider the appetite of market participants to lend out such cash, and thus the ability to raise funding off the received asset.

vi. The concept of cheapest to deliver collateral needs to be considered in context of the counterparties eligibility criteria and hence appetite to accept the collateral as it is anticipated that these counterparties will have similar optimisation rules in their collateral processes.

vii. The use of non-cash collateral gives rise to a number of valuation complexities, in particular the Funding Value Adjustments (FVA). Although relatively new, the market is still familiarising itself with this concept and may take some time understanding its application to non-cash collateral. In the short term, this may limit the market's utilisation of non-cash collateral.

viii. While the introduction of the global liquidity hub may present some benefits, its success is dependent on the willingness of foreign entities to accept South African originated assets against these exposures. However, the use of foreign asset holdings to collateralise foreign exposures may present itself as a benefit.

5. The Bank project

In order to obtain a practical understanding of the features of the Strate solution, our review included the corroboration of the bank. The main project objectives included:

i. Understanding the current related collateral management processes through the development and completion of a questionnaire tailored specifically for the bank
ii. Understanding the sources of potential collateral that exist within the bank that are currently not used in its collateral management processes;
iii. Defining the aspects of both local and global regulatory reforms that could have an impact on collateral management;
iv. Defining the functionality of the Strate supported collateral management solution ("Strate solution"); (and
v. Establishing key thematic observations relating to changes in the underlying collateral management process based on both regulatory requirements and the proposed Strate solution.

5.1 Approach

In order to meet the stated objectives, the following approach was followed:

i. Identified, at a high level, the critical steps in the process that drive the cost of the collateral function. This required an understanding of the following costs:
    a. staff involved
    b. functionality of the actual system/s used
    c. possible 3rd party costs

ii. Obtained an understanding of the various functions of the process when acting as either a principal or agent. These included:
    a. preparation of collateral
    b. placing of collateral
    c. valuing collateral
    d. monitoring of collateral
    e. release of collateral

iii. Obtained an understanding as to what types of collateral are used.

iv. Obtained a detailed understanding of the Strate collateral management solution (as obtained from interactions with Strate)

v. Developed questionnaire
    a. Using the flow diagrams, identify cost factors and formulate questions to assess:
        – Estimated cost of each factor
        – Significance of each factor going forward
        – Plans implemented to reduce such costs and what these plans are.

vi. Completion of the questionnaire
    a. Based on the pilot bank's initial completion of the questionnaire facilitate a workshop with relevant pilot bank staff to review answers to the questionnaire and obtain consensus (revised answers).

vii. Documentation
    a. Based on the answers to the questionnaire, prepare a report that highlights:
        - Then bank's view on the impact of changes to underlying processes;
        - Other forms of collateral that might be eligible in the proposed solution given existing regulatory requirements in the South African market.

We performed this approach over a 6 month period, commencing June 2013. Meetings were held with various stakeholders in the process.

6. Findings

6.1 Funding

In identifying the cost and benefit factors pertaining to the collateral management process, it is necessary to consider the actual cost of the collateral placed and the benefit of the collateral received.

Before one can fully understand these implications, one needs to understand key principles that are inherent in the bank's funding. These principals are discussed in more detail below:

As defined in the respective master agreements, all forms of collateral require some form of interest. Thus the receiver of cash collateral would have to pay the agreed interest rate associated with the currency of cash placed to the placing entity of the cash collateral. ZAR cash collateral usually earns the SAFEX overnight rate

i. In funding a bank's operations, each bank constructs a funding curve that is representative of the cost of funding the bank incurs for different tenors. Simplistically, the banks cost of funding is made up of the following key elements:

Cost of Funding (COF) = Funding rate + Liquids + Risk

The funding rate is bank specific and reflects the rate at which the bank could raise funding in the external market. In South Africa, the current interbank funding rate is depicted by the Swap curve.

Per SARB legislation, each bank is prescribed to hold a minimum amount of reserves and liquid assets with SARB in respect of its deposit base. A negligible amount of interest is earned on these balances, and thus a funding cost is incurred on these deposit balances. As a result, such costs are required to be recouped, and thus a charge is included in the banks COF curve.

In terms of Basel and SARB regulation, banks are required to hold capital on assets to account for the asset specific risk. Thus, the charge of holding this capital is often included in the funding curve.

Using the understanding of these concepts together with the answers received from our questionnaires, one can now try to quantify the cost and benefits of each type of collateral. This has been furthered broken down into placing and receiving collateral.

6.1.1 Placing Collateral

Cash collateral: When placing cash collateral, the desk is required to raise cash either externally or internally. Should the cash be raised internally on an unsecured basis, the COF rate will be used. In return for placing cash collateral, the desk will receive interest (usually at the SAFEX overnight rate) on the cash placed. The SAFEX overnight rate is considered to be the pure risk free rate within the South African market, and thus is lower than the rate that would be charged to raise the funding off a bank's COF curve. As a result, the desk will be charged more interest than what they earned, resulting in a cost and thus an overall cost to the desk. As part of internal transfer pricing procedures these costs or benefits will have to be allocated to the desks responsible for the collateral requirement

A recent Morgan Stanley/Oliver Wyman -*Wholesale and Investment Banking outlook* noted that the current proposal in the OTC derivative reform would materially increase both capital and funding costs. This was illustrated by way of an example of an interest rate swap contract whereby an increase of 1.5 times is expected for centrally cleared trades and 3–5 times increase for trades not centrally cleared. Thus, the cost of overnight cash funding is still expected to increase as the market adapts to changing regulatory requirements.

- **Non-cash collateral:** In this assessment, the use of non-cash collateral assumes that the assets used are currently residing on the bank's balance sheet and thus no additional funding cost would be incurred should these assets be used as collateral. As a result there is no incremental cost in funding these assets, accordingly the bank remains funding neutral. However, the transfer of non-cash collateral attracts a tax charge (STT set at 25bps per transfer of securities and CGT estimated to be 18 percent of the capital gain made on bonds or equities). Given that non-cash collateral attracts higher haircuts and requires a larger amount of collateral to be placed to reach the equivalent capital saving attained using cash, a higher effective tax charge may result.

  The choice of collateral can be broken down further between government bonds and listed equities when considering the opportunity cost off using government bonds. In meeting the requirement of the LCR, SARB permits the use of the CLF to meet 40 percent of these requirements. However, the use of the facility would carry a tiered commitment fee (please see table below). Thus, should the bank wish to use government bonds as collateral, it would effectively cost the bank in the region of 15bps to 30bps in commitment fees, assuming that the CLF was used to replace these bonds in meeting the LCR. Furthermore, it should be noted that the CLF can only be used for level two HQLA, and thus it is expected that level one asset (government bonds) would have a significantly greater cost.

Table 4: Committed liquidity facility - proposed fee

CLF as a percentage of required HQLA	Proposed fee per tranche (bps per year)	Weighted average fee (bps per year)
<10%	15	15
10-20%	25	20
20-30%	35	25
30-40% (max of 40%)	45	30

Source: SARB – G6 of 2013

6.1.2 Receiving Collateral

- **Cash collateral:** As cash is considered to be fungible, the cash received is integrated into the bank once received. The desk receiving cash collateral will enjoy a benefit in the form of either receiving interest on the cash invested or an interest cost saving resulting in a reduction in their funding requirements. Typically, it is anticipated that the desk would receive interest at a rate lower than the bank's COF

  The receiving desk would be required to pay interest to the collateral giver (typically at the SAFEX overnight rate). Dependant on the benefit received by the desk, this transaction may give rise to either a net funding benefit or net funding cost. This would have to be allocated correctly as part of a transfer pricing mechanism if the collateral management function is centralised

  Based on the outcomes of our meetings held with the bank Treasury, the receipt of cash collateral is considered more beneficial, as this cash is effectively used to fund the outgoing cash flows originating from the deal and reduce any funding requirements that may arise from the deal. However, given the changing collateral landscape, one needs to be cognisant of the collateral placer's preference as to the type of collateral that they are willing to place in future.

- **Non-cash collateral:** The receipt of non-cash collateral would not provide a funding benefit to the desk, unless the collateral received could be used to raise cash i.e. repo'd. As discussed above, the underlying deal gives rise to cash flows that will require funding. Thus, in order to fund these deals, the desk will be required to raise cash at the COF rate. Thus, the receipt of non-cash collateral would result in a significant differential in cost when compared to the receipt of cash collateral, unless the non-cash collateral can be used to raise funding.

However, bearing the above in mind, the benefit of receiving cash collateral may be eroded with the introduction of a CCP requirement for OTC derivative trades, as margins placed are no longer fungible within the bank, as the CCP holds these margins independently.

6.2 Operational Efficiencies

In order to identify the possible benefits of the Strate solution, a detailed understanding of the current collateral management processes was required. This was obtained through a number of meetings held with various stakeholders in the bank. The operational benefits are considered below:

6.2.1 SBL

It was noted that the current process is manually intensive, from the inception of collateral agreements, to the management of margin calls and deal closure. The introduction of the Strate solution is anticipated to have a number of benefits and cost savings to the current SBL process. Some of these include:

- All collateral is currently managed through an external software solution with manual intervention. It is expected that the use of the Strate solution would replace some of the collateral functionality currently performed by the current software, and eliminate manual entries in the collateral management process, as these bookings will now be automated.

- The use of the Strate solution has the potential largely automate the collateral monitoring process and would significantly simplify the substitution and withdrawals process as this becomes automated. It is worthwhile noting that the bank currently transacts with a limited number of counterparties and a limited number of securities, with the majority of these instruments being pledged. Should the bank move towards an increase in the number of counterparties/securities, it was anticipated by the bank staff that current process would need to be reviewed to ascertain process efficiency and the need for improvement through process re-engineering and /or increase investment in infrastructure technology.

- Given the anticipated increase in the use of non-cash collateral, the bank's management showed appreciation for the potential value that automation could bring to the process. Should this functionality be automated using the Strate solution, it is expected that the existing resources used in this process could be used in more specialised roles focussing on exception management and the formation of a centralised collateral optimisation desk.

- The shortening of the equities securities settlement convention from T+5 to T+3 is expected to add increased timing constraints in processing collateralised transactions.

- While it was noted that the corporate actions currently did not give rise to a significant number of disputes, it is expected that this may change should there be a move towards non-cash collateral in the future. The Strate solution's treatment of corporate actions on equities will reduce, if not eliminate such disputes thus saving on the potential recruitment of additional resources in the future.

6.2.2 OTC derivatives

In considering the use of the Strate solution in the OTC process, the following was noted:

- At present, most of the CSA agreements are drawn up by the counterparty and remains a manual process. The introduction of the Strate solution would not necessarily give rise to a cost saving, as it is still considered that such resources would be required to complete this process.
- There is a general drive for banks to move towards gold standard CSA's and thus receive cash and place cash as collateral. This is aligned with the global market's future state in which OTC

derivatives move towards being centrally cleared. Furthermore, as noted above, future regulatory reform is expected to increase the number of transactions that are collateralised. The use of the Strate solution will also provide further operational efficiencies, as Strate is connected to each market treasury and SARB (SAMOS) in order to automatically initiate cash payments and recalls in relation to cash collateral.

- A general increase in the number of CSA agreements would generally result in an increased work load for collateral management teams.

- The introduction of standardised eligibility baskets provided by the Strate solution is expected to reduce the negotiation time needed in drawing up the CSA agreements as well as reduce the risks that the bank is susceptible to, as all eligibility criteria are monitored every 15 minutes.
-
- Although there has been a recent drive by ISDA to standardise all CSA agreements, the use of the standardised CSA agreement and eligibility baskets in the local market is initially expected to take some additional time as the market adopts a new format. However, it is anticipated that in the long term the simplified format could lead to a cost saving.

- The Strate solution's electronic messaging platform could result in the replacement of the existing software used.

- Based on management's past experience, it was estimated that disputes occur both as a result of non-delivery or valuation of collateral at least 10 percent of the time. The current settlement convention of bonds and equities received as collateral is t+1. The delay in receiving collateral due to disputes could expose counterparties to settlement risk. The adoption of the Strate solution would result in real time delivery of collateral thus reducing the settlement risk. Furthermore, the agreement of the pricing source for valuing the collateral is agreed at the inception of the CSA agreement, thereby reducing these disputes arising from the determination of the collateral value The other 90 percent of the time disputes arise as a result of different exposure valuations and this will not change with the Strate proposed solution.

6.2.3 Repo

In obtaining an understanding into the current repo process, a number of similarities were found with the SBL process, and thus similar benefits would be achieved. However, some additional benefits noted in response to the questions posed included:

- In managing disputes a manual process is followed whereby the counterparty's trade portfolio has to be reconciled on a trade by trade level in order to identify where the potential dispute arises. The Strate solution provides details of collateral received/posted at a trade level, thus, any dispute will be easily identified to a specific trade, and thus save time in resolving the disputed trade.

- At present, margin calls notifications are generated by outsourced collateral management software, and then are manually emailed to the relevant counterparty. Any collateral movements are manually accounted for in the collateral management software and internal reporting systems. The use of the Strate solution would largely automate the margin call process, notifying the counterparty of the margin call as well as facilitating the movement of the collateral. End of day collateral movement summaries are generated by the Strate solution and can be used to book such movements on a portfolio basis, with the underlying summaries supporting the detail. It is further considered that should there be an integration of the Strate solution into the existing software, further benefits would be achieved.

- On a daily basis, the Operations team reconcile the securities and bonds held to the custody statement received from the Bank's custodian. Although this reconciliation is performed for all of the bank's securities and bonds, it is anticipated that the use of the Strate solution would assist in reconciling the movements relating the collateral due to the integration of the solution with the custodian function.

The manufacture of coupons is current done manually for collateral posted/received. The use of the Strate solution would automate the process and eliminate this manual process.

- The review and receipt of collateral is currently reconciled by back office via a manual process. The introduction of the Strate solution would automate this process, thus significantly reducing the time to perform this reconciliation.

6.2.4 General

- The real time delivery of collateral through the Strate solution will result in a decrease in credit risk, operational risk and provide assistance in meeting the increased and more stringent regulatory reporting requirements. The Strate solution will also aid the monitoring of concentration risk, providing a holistic view of collateral held/placed across the entity. This would allow the bank to monitor concentration risk, per ISIN, per Issue or per counterparty.

- In addition, as the South African market laws and regulations have not yet tested a material counterparty default scenario, the central collateral tracking and control provided by the Strate solution may prove beneficial should a material default occur in the market.

- As the Strate solution collateralises on T+0 as opposed to the current T+1 settlement for non-cash collateral, counterparties will be made more aware of any potential issues to meet a collateral call. Similarly for cash collateral, this will occur between 7.5 and 15 minutes after receiving an exposure. However, should this not take place, the counterparty may be alerted of a potential counterparty credit risk. This could lead to changes in market behaviour in the case of contract default in the future.