A balancing act
The collateral challenge for capital markets firms
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Foreword – SA Market

Given the regulatory changes been driven by the Group of 20 (G20), the increased market volatility and the structural holding of assets within the South African (SA) market, we anticipate a change to the status quo in collateral management within the SA financial sector.

Deloitte has undertaken extensive research in both the local and global markets focusing on the changing regulatory environment within the derivatives, securities lending and borrowing (SLB) and repo markets. In 2014/15 we investigated the impact that some of these changes could have on collateral management within the SA market and in 2015/16 a risk-based project relating to the SLB market was undertaken.

The use of collateral is a common risk-mitigation technique used to reduce credit risk and serves as a means of stabilising the financial system. Any entity that has an exposure to another counterparty should consider holding some form of collateral to mitigate the underlying credit risk inherent in the transaction. The lower the credit risk, the lower the capital required to be held in regulated financial sectors.

Responding to the financial crisis, a large number of regulations have been promulgated, with particular focus on the derivative markets. However, in an effort to address risks to the financial markets, regulators have increased their focus on evolving regulations that address risk arising from other areas of the market. These areas include SLB and repo transactions falling within “shadow banking”. The Financial Markets Act regulations, under the recently promulgated Financial Sector Regulation Act (Twin Peaks Act), is the primary regulation set to address these risks through amongst other, the establishment of a framework for Central Counterparties and the requirements set for Trade Repositories. In addition to these efforts, a draft Code of Conduct was published by the Financial Services Board for parties to Securities Financing Transactions (SFT) in the SA Securities Markets stemming from regulation such as the Securities Finance Transaction Regulation (SFTR) promulgated in Europe.

Several of these regulations directly or indirectly focus on collateral management activities. The consequence is that collateral management should no longer be viewed as the routine back-office task it once was before the financial crisis. The increased focus on capital and liquidity optimisation within balance sheets is fast resulting in financial sector entities increasing their strategic focus on collateral across their markets.
Executive summary

Forthcoming regulatory requirements to hold and exchange collateral in derivatives markets will increase demand for eligible assets. At the same time they will impose further restrictions on the use and availability of the existing collateral inventory. Firms will face an unprecedented collateral challenge and will need to optimise their collateral management processes in order to increase efficiency in managing and sourcing collateral. This paper sets out emerging best practices for capital markets participants in managing their collateral, including principles of ‘good’ collateral management, and a number of advanced techniques to maximise collateral management efficiency and thus reduce costs.

Principles of collateral management
The most fundamental principle of managing collateral is having transparency of collateral needs and inventory across the firm. One way to achieve this is to manage collateral centrally through a Central Collateral Management Function (CCMF) which generates a single view of all assets and liabilities and offers the ability to use and deploy inventory across business lines.

A number of regulatory requirements, notably margin requirements for non-cleared derivatives and the prudential framework for liquidity, will place competing demands on high-quality assets, prompting firms to optimise their collateral management processes. Increased efficiency will result in cost savings. We found that a 1% increase in collateral efficiency could result in approximately $1.2m additional revenue per billion units of collateral for an investment bank with a collateral surplus. For a retail bank with a collateral deficit, the same increase in efficiency could result in approximately $1.09m in cost reductions for the same units of collateral.

We argue there is no single optimal target operating model for collateral management and individual firms need to decide whether to outsource or keep in-house the whole or part of their collateral management processes, depending on the size of their derivatives portfolio and business model. There is also an increasing industry trend for market participants to move parts of their internal collateral management function to market utilities which aim to centralise and standardise many of the common services (such as collateral valuation and negotiation) required for collateral management.
The CCMF should be supported by appropriate systems and controls and have an integrated IT infrastructure to offer a real-time view of collateral. A clear collateral policy should also be in place to articulate the sourcing of collateral, the make-up of the collateral pool, the parameters of the segregation requirements, and the circumstances under which collateral can be re-used. Revisiting existing documentation regarding the exchange of initial margin (IM) and variation margin (VM), and putting in place transparent transfer pricing agreements should be additional considerations for firms as they implement the new requirements.

Advanced strategies
Maximum collateral efficiency can be achieved through the deployment of a number of advanced techniques. Some of these techniques such as matched book dealing and internalisation of trading activities are aimed at utilising existing collateral more efficiently, while others such as portfolio margining and collateral upgrades can be deployed by firms to reduce demand for collateral.

Firms should also think strategically when they consider the methodology they will deploy to calculate IM. Developing, for instance, their own internal models – instead of using the regulations’ standardised approach – will provide firms with greater flexibility in their calculations. A large number of firms will also be incentivised to opt for the Standard Initial Margin Model (SIMM) developed by the International Swaps and Derivatives Association (ISDA), because of the benefits it offers (such as significant savings compared to the standard schedules).

Market participants should assess carefully their clearing strategies alongside their central counterparty (CCP) relationships. They have to consider which clearing strategy – being clearing members of a CCP, direct clients of a clearing member, or establishing indirect clearing arrangements – is both available to them and best suits their needs. Finally, having fewer CCP relationships maximises multilateral netting benefits (although increasing overall exposure to each CCP, with attendant capital and large exposures considerations) and centrally clearing trades is the approach regulators look to incentivise, as against entering into non-centrally-cleared transactions.

We argue there is no single optimal target operating model for collateral management and individual firms need to decide whether to outsource or keep in-house the whole or part of their collateral management processes, depending on the size of their derivatives portfolio and business model.
The collateral challenge

Since 2008 there has been an explosion in the number of references to ‘collateral’ by policy makers, regulators and market participants. We do not believe the focus on collateral has reached its peak. Although collateral has been used to mitigate counterparty credit risk for decades, the financial crisis heightened uncertainty around counterparty risk, and has led to secured lending and borrowing becoming the norm for both short- and long-term funding. The use of collateral has risen dramatically, and it is now one of the industry’s main risk mitigation tools.

In SA, National Treasury released the third draft of the Ministerial Regulations (referred to hereafter as “SA Regulations”) made in terms of the Financial Markets Act (FMA), on the 21st of July 2016. The SA Regulations are necessary to advance SA’s commitment to the G20 obligations to implement regulatory and legislative reforms to make financial markets safer and to regulate the OTC derivatives markets. The SA Regulations are aligned to the relevant international standards, including the Principles for Financial Market Infrastructures, (published by the Committee on Payments and Market Infrastructure and the Technical Committee of the International Organization of Securities Commissions) developed to achieve the public policy objectives of reducing systemic risk, increasing transparency and financial stability, and enhancing the integrity of financial markets. The Financial Services Board published a press release on 8 August 2017 relating to the draft Margin Requirements for Non-Centrally Cleared OTC Derivative Transactions (referred to hereafter as “SA margin requirements”) that forms part of reforms to address systemic risk associated with OTC derivative instruments.

Currently banks adopting the internal model method to calculate counterparty credit exposures related to margin requirements for non-centrally cleared derivative instruments may apply any form of model (simulation model or analytical model) if the model meets certain requirements, one of which is that where the counterparty is subject to a margining agreement the model should capture future movements in the value of the collateral. As per the draft SA margin requirements issued by the FSB, margin requirements for non-centrally cleared derivatives in SA would have been phased in from 1 January 2018 for both initial margin (IM) and variation margin (VM). On 21 August 2017 the Financial Sector Regulation Act (FSR Act) referred to as Twin Peaks was signed into law. The Commencement Notice was subsequently published and the Financial Sector Conduct Authority (FSCA) and Prudential Authority (PA) where established on 01 April 2018. Seen that these authorities are now established we expect, amongst other, the final margin rules to be published by the FSCA during the course of 2018, with the phasing in to start toward the end of 2018 or the beginning of 2019.

When the central clearing obligation and margining requirements come into full force for OTC derivatives in SA it is likely to generate a further increase in the demand for cash, as CCPs require predominantly cash collateral to be posted. It should be noted that the SA margin requirements makes provision for the use of various assets as eligible collateral (cash and non-cash assets), although all the non-cash assets (apart from Gold) will only be specified in writing by the registrar at a later point in time (if at all). The bilateral posting of cash collateral for marging purposes will result in more cash being placed with CCPs and between counterparties to OTC transactions (pending the approval from the registrar to use non-cash collateral), and thus an overall reduction in the level of cash held by entities.
Regulatory pressures affecting collateral

The use of collateral as a counterparty credit risk mitigation tool is long-standing and very well-established. However, following widespread concerns about counterparty creditworthiness, starting in 2007/2008, the need to secure positions became even more pertinent.

The response from policymakers has, cumulatively, amounted to a fundamental overhaul of the use of collateral in the regulatory framework. Following their implementation, some of the measures imposed by policymakers will result in increased demand for collateral, while others will place restrictions on the use and availability of existing collateral (although the aggregate impact and challenges of these changes has not yet emerged).

While, for good reasons, margin requirements for non-centrally cleared OTC derivatives have grabbed the headlines, they form only one part of the new regulatory framework for collateral. Other requirements, such as restrictions on re-use of collateral, the interplay of collateral with liquidity requirements or reporting of the use of collateral are less well known and are more difficult to assess in terms of their impact.

Changes to regulation will have, or will likely have, the following aggregate effects:

- Substantially increasing the requirements or incentives to exchange collateral
- Increasing the demand for eligible high-quality liquid assets (HQLA)
- Reducing the ability of firms to re-use collateral received
- Increasing requirements to disclose information on, inter alia, collateral use, collateral held and posted, the make-up of collateral pools, and how and when collateral is re-hypothecated

Table 1 provides an overview of some of the areas in the regulatory framework resulting in increased demand for collateral and how the requirements fit together. Table 2 presents some of the requirements placing restrictions on the holding of collateral and Table 3 summarises the requirements around the reporting of collateral.
Table 1. Overview of regulations affecting the demand for collateral

| Margin for non-centrally cleared derivatives | CRD IV/CRR favour centrally cleared positions over non-centrally cleared positions. Combined with the typically lower margin requirements of CCPS (compared to the margin requirements for non-cleared trades) this will result in the market seeking to clear as many trades as possible. |
| Margin for centrally cleared derivatives | The Basel III liquid asset requirement for the banking sector considers different forms of collateral in order to meet the liquidity requirements that continues to be phased in until 2019. Although the South African market has somewhat adapted to meet these new requirements, the expectation is that the impact will only be fully understood in 2019, when these requirements are fully implemented. |
| Haircuts on collateral | Under the revised Capital Requirements Directive (CRD IV) and CRR, secured positions attract lower-risk weights, resulting in lower capital requirements. This is likely to incentivize firms to secure positions in order to reduce the capital they must hold, although they should weigh the collateral funding costs against the relief in capital charges. |
| Liquidity requirements | Under the current and “Proposed amended Regulations” of the South African Reserve Bank’s (SARB) Regulations relating to Banks, secured positions have a reduced capital requirement since the collateral being held results in a reduction in the exposure at default (EAD). The EAD is calculated by taking into account the replacement cost (RC) and potential future exposure (PFE) of a transaction, and collateral in the form of liquid assets to be isolated into a separate pool, or under the operational control of a central liquidity function able to monetise the asset without conflicts. |
| Secured positions under the prudential framework | Under the current and “Proposed amended Regulations” of the “SA Specific developments” of the SARB’s Regulations relating to Banks, secured positions have a reduced capital requirement since the collateral being held results in a reduction in the exposure at default (EAD). The EAD is calculated by taking into account the replacement cost (RC) and potential future exposure (PFE) of a transaction, and collateral in the form of liquid assets to be isolated into a separate pool, or under the operational control of a central liquidity function able to monetise the asset without conflicts. |
| Favourable risk weights for centrally cleared derivatives | Counterparties might be incentivised to secure positions so they fall outside the bail-in requirements under the Bank Recovery and Resolution Directive (BRRD). SA does not currently have any “bail-in” provisions. We expect the SA Special Resolution Bill to be released by the SARB during 2018. |
| Incentives to secure positions so they fall outside the bail-in provisions | Under the European Commission’s recent proposal for a CCP Recovery and Resolution framework, during the resolution process and subject to the resolution authority’s discretion, clearing members may be required to increase their contributions to the CCP’s default fund and may receive reduced payments in relation to VM calls. |
| CCP Recovery and Resolution planning | The FSB published Draft Guidelines on Recovery Plans for Market Infrastructures during February 2018. In terms of the Principles for Financial Market Infrastructures set out by IOSCO, exchanges are not included in the definition of financial market infrastructure, but the SA guidelines include exchanges and makes provision for the guidelines to be adhered to by external market infrastructures as well. |
| CCP Default Fund Contributions | The size of the default fund contributions to CCPS can be substantial, especially in the case where direct clearing membership is sought after. From a global CCP, SA market participants would have to assess their clearing strategies based on the SA clearing mandate and their entity’s specific requirements, taking into account FX exposures and cost implications. |

As indicated earlier, the earlier SA margin requirements are only likely to be phased in toward the end of 2018 or the beginning of 2019. Based on the draft notice published by the Financial Services Board these requirements are similar to those prescribed by international standards i.e. BCBS and International Organization of Securities Commissions (IOSCO) document published regarding margin requirements for non-centrally cleared derivatives in March 2015. Based on the SA margin requirements, covered entities (includes counterparty and provider where both are OTC derivative providers) must use either the standardised margin schedule (which is in line with international standards prescribed by BCBS), or make use of a quantitative portfolio margin model which includes some prescribed parameters.
An area where there is less clarity is the impact on asset encumbrance resulting from the increased use of secured positions. Increased asset encumbrance reduces the pool of assets available to subordinated unsecured creditors in insolvency. As the proportion of encumbered to unencumbered assets increases, the risk to unsecured creditors, including depositors, also increases. A lack of transparency on asset encumbrance means identifying this risk and pricing unsecured positions are difficult. Recent changes to the bank prudential regime have reduced the risk of failure of a firm, but incentives in regulation to increase collateral may leave unsecured creditors open to greater losses in the event of a firm’s failure. Moreover, if a bank does fail and is subject to bail-in, secured creditors will be exempt from the bail-in process, meaning that more of the burden will fall on unsecured creditors.

Furthermore, additional measures are yet to be finalised and implemented, such as the Financial Stability Board proposals to introduce haircut floors for non-centrally cleared SFTs, or measures which may come out of the Financial Stability Board work programme on CCP resilience, recovery and resolution.

Increased asset encumbrance reduces the pool of assets available to subordinated unsecured creditors in insolvency. As the proportion of encumbered to unencumbered assets increases, the risk to unsecured creditors, including depositors, increases.
Alongside the multiple regulatory initiatives around collateral, there is divergence in the derivatives rules among jurisdictions, in particular between the EU and the US frameworks (as outlined in Table 4), which could result in fragmentation in derivatives markets and pose additional challenges for firms regarding collateral management. Although this had begun to change with the adoption of the first equivalence decision by the European Commission on the US regime for CCPs, in the EU the implementation of margin requirements for non-cleared derivatives was delayed until February 2017. This put the EU out of step with countries such as the US and Japan, both of which started implementing the requirements in September 2016, in line with the previously agreed international timeline. Although this delay has been a relief for EU firms, as it has allowed them more time to implement the rules, it has caused confusion to EU and non-EU firms that have been counterparties to the same trade and could put US firms at a competitive disadvantage compared to EU firms.

Despite the increased amount of regulation around collateral, there are still a number of legal impediments relating to its enforceability, which are causing uncertainty for market participants and could undermine the regulatory objectives. For instance, differences between national property and insolvency laws across jurisdictions can give rise to uncertainty as to who owns a security in the event of a default, and whose rights take precedence in the event of insolvency. Furthermore, different approaches around the treatment of netting in different jurisdictions create uncertainty in relation to netting enforceability in the event of insolvency.

To further elaborate on this example a Global Master Securities Lending Agreement (GMSLA) has the potential for reducing counterparty exposure on outstanding transactions through the use of close-out netting provisions. If one party becomes insolvent or otherwise defaults on its obligations, close-out netting provisions permit the non-defaulting party to accelerate and terminate all outstanding transactions and net the loans’ MTM values so that a single sum will be owed by, or owed to, the non-defaulting party. In SA pre-insolvency close-out netting is governed by the GMSLA agreement, but the post-insolvency close-out netting is governed by Section 35B of the Insolvency Act, 1936 (No. 24 of 1936). Close-out netting is relied on as a key risk management tool by market participants. The extent to which netting reduces counterparty credit exposures depends on the size and nature of securities lending activity. These and other considerations need to be taken into account across different jurisdictions.

In addition to the above, the combination of legislation per the Insolvency Act and the current draft SA margin requirements’ rules could result in initial margin not being able to be readily used in the event of a counterparty’s default. This can lead to counterparties breaching the requirements under the draft margin requirements, and perhaps result in foreign entities being cautious to transact in OTCs with SA financial institutions.

The SA Regulations categorises OTC derivative providers (ODPs) as “regulated persons that conduct regulated activity in relation to OTC derivatives (that is market participants that originate, issue, sell, or make a market in OTC derivatives as regular business)”, (National Treasury, 2016). This was established to provide the scope of coverage of the proposed regulatory framework. In February 2018 the Financial Services Board released the final Criteria for Authorisation as an ODP. Seen that the FMA regulations are now in force the authorisation process for ODPs can commence, and applications should be submitted within 6 moths from the date of publication of the FMA regulations. In addition to this, the FSCA in April 2018 released a draft Conduct Standard for Authorised ODPs that all ODPs need to adhere to such as financial soundness and fit and proper requirements, to help mitigate the risk of potential losses to clients and other financial market participants.

Table 4. A summary of some of the differences between the EU and US rules in relation to margin requirements for non-cleared derivatives. This is not an exhaustive list

<table>
<thead>
<tr>
<th>Scope</th>
<th>Intra-group transactions</th>
<th>Concentration limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physically-settled FX swaps and forwards are subject to VM but not IM.</td>
<td>Intra-group exemption applies if certain conditions are met, for both IM and VM.</td>
<td>Rules include concentration limits.</td>
</tr>
<tr>
<td>Physically-settled FX swaps and forwards are not subject to regulatory margin requirements.</td>
<td></td>
<td>Rules do not include concentration limits.</td>
</tr>
<tr>
<td><strong>Prudential regulators:</strong> A swap entity is not required to post IM to an affiliated counterparty but IM must be collected from an affiliate that is a financial entity with material swaps exposure. No exemption for VM.</td>
<td><strong>CFTC:</strong> A covered swap entity is generally not required to collect IM from an affiliate entity. No exemption for VM.</td>
<td>The SA Regulations include concentration limits.</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>At this stage all OTC derivatives excluding physical-settled foreign exchange (FX) forwards and swaps are excluded from the exchange of IM but not from the exchange of VM under the SA margin requirements.</td>
<td>Intra-group exemption applies for covered entities in the same group, if some requirements are met (e.g. aggregate outstanding gross notional is smaller than R1 billion for all OTC derivatives transactions between entities at close of business on each day, appropriate risk management procedures are followed). The registrar, if deemed necessary can still require IM and VM to be exchanged between two covered entities within the same group.</td>
<td></td>
</tr>
</tbody>
</table>
Despite the increased amount of regulation around collateral, there are still a number of legal impediments relating to its enforceability, which are causing uncertainty for market participants and could undermine the regulatory objectives.
Collateral efficiency

A recent Bank of England study estimated that the total demand for high-quality collateral currently stands at around $1.6 trillion. Although it is safe to conclude that the amount of collateral assets in circulation has increased in the past few years, estimates of its size vary widely, from $500 billion to $4 trillion.

It is important to understand that at any point in time, a firm has little or no influence on the amount of available collateral in the market (essentially it is a price taker). The amount of collateral that a firm needs for its trading activities (the demand for collateral) is mainly driven by its mix of assets, its business model, the economic cycle, the average maturity of its trades and its funding strategies. In the short term, these variables are broadly stable. However, a firm can exert a much greater influence on its need for collateral by altering its collateral efficiency ratio.

Collateral efficiency captures a firm’s ability to move the available collateral through its business units quickly and effectively. It deserves significant attention, as it can have a profound effect on a firm’s revenue stream and cost structure. The role of enterprise-wide collateral management, collateral trading and collateral optimisation (which we discuss in the following sections) is to increase this ratio to the greatest extent possible.

We have estimated that a 1% increase in collateral efficiency could result in approximately $1.2 million additional revenue per one billion units of collateral for an investment bank (IB) with a collateral surplus. Applying the same methodology to a retail bank with a collateral deficit could result in approximately $1.09 million in cost reduction for the same units of collateral. The tables below summarise our findings under both normal and stressed market conditions.

Table 5. Additional revenue or reduced cost arising from a 1% increase in collateral efficiency under normal market conditions (per 1 billion units of collateral)

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Additional Revenue/Reduced Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Investment Bank with collateral surplus</td>
<td>$1.20</td>
</tr>
<tr>
<td>Medium-sized Retail Bank with collateral surplus</td>
<td>£0.12</td>
</tr>
<tr>
<td>Medium-sized Retail Bank with collateral deficit</td>
<td>$1.09</td>
</tr>
</tbody>
</table>

Table 6. Additional revenue or reduced cost arising from a 1% increase in collateral efficiency under stressed market conditions (per 1 billion units of collateral)

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Additional Revenue/Reduced Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Investment Bank with collateral surplus</td>
<td>$3.50</td>
</tr>
<tr>
<td>Medium-sized Retail Bank with collateral surplus</td>
<td>£0.30</td>
</tr>
<tr>
<td>Medium-sized Retail Bank with collateral deficit</td>
<td>$1.71</td>
</tr>
</tbody>
</table>

These levels of savings are sufficiently significant to suggest that simply ensuring base-level regulatory requirements are met is sub-optimal; sophisticated collateral management has become a business-critical discipline for some firms. The following sections present emerging best practices for firms in managing their collateral efficiently and thus reducing costs.
Cost of trading

It was estimated that a total additional annual cost of EUR 15.5bn will result from the OTC derivatives market. Made up of EUR 2.5bn for trades subject to clearing and EUR 13bn for trades not subject to mandatory clearing.

Centrally Cleared Trades – additional cost per EUR 1 million notional

Non-Centrally Cleared Trades – additional cost per EUR 1 million notional

Costs not considered in the estimates above: VM, costs of model development and approval, costs for liquidity management and collateral optimisation.

Table 7. Methodology for calculation

Methodology

We used an economic approach to calculate the collateral cost/benefit.

A number of market indicators can be used as a proxy for funding cost and the difference between collateralised trade/financing and non-collateralised trade/financing. We used a combination of the generalised collateral (GC) rate, banks' CDS spreads, and the spread between LIBOR-OIS curves for this analysis.

To calculate the collateral cost/benefit, the first step is to calculate the bank’s required collateral need for one year.

In our analysis we estimated banks’ three-month collateral usage (using data from publicly available information on banks’ balance sheets and trading portfolios) and then annualised our figures.

We defined the marginal available collateral as the increase in a bank’s available collateral which would result from increasing the efficiency of the collateral by 1%.

After estimating a bank’s collateral surplus or deficit we used the appropriate funding curve to determine the cost/benefit to the banks. Our main assumption here is that the banks use collateral swap, repo and GC and bond markets for providing collateral to the market or sourcing from it.

To provide a better understanding of the impact and dynamic behaviour of collateral optimisation and the cost/benefit associated with it, we present two sets of numbers. The first looks at cost/benefit analysis by calibrating the bank’s funding curves, repo, GC and LIBOR-OIS curves to the first three months of 2016. In the second approach we adjusted these figures to a stress period.

We made additional adjustments to the average rating of available collateral and increased haircut charges to take into account that, during market turmoil, banks’ pools of collateral will have lower ratings and higher associated haircuts.

For the calculation of the collateral demand and collateral cost/benefit analysis, we relied on a number of third-party data and collateral management systems. Although we believe the inputs to and outputs from these systems to be accurate and in-line with our own expectations, we have not independently validated the accuracy of the data, or the risk and pricing models used to create the results we have calculated.

A recent Bank of England study estimated that the total demand for high-quality collateral currently stands at around $1.6 trillion.
Principles of collateral management

Smashing the silos: moving towards enterprise-wide collateral management and trading systems

Collateral optimisation is a frequently used term that has no precise meaning because there is no one-size-fits-all solution. However, the attractive economic opportunities that proactive collateral management and trading can offer to financial firms have caused firms to change their view on the subject.

Today, rather than considering enterprise-wide collateral management as a purely regulatory exercise, the industry now recognises it as a strategic tool for generating additional revenue, reducing the cost of funding and deploying capital more efficiently across different business units. However, the transition has proved to be challenging. Legacy collateral systems were built for back office operational workflow as management or trade reconciliation tools, and so lack the capabilities to price, optimise and allocate collateral in real-time with Straight-Through Processing (STP) capabilities. Additionally, in many organisations each desk manages its own inventory of collateral, allowing limited interaction with other desks.

We do not believe there is a single Target Operating Model (TOM) that fits all firms’ enterprise-wide collateral management needs. However, there are common elements in every enterprise-wide collateral management solution that each firm needs to consider carefully. As a fundamental starting point, a decision will need to be taken over whether to outsource the function either fully or partially. This may not be straightforward given the multiple collateral utilities that have come to market, as well as the different types of service they offer.

Smaller firms and funds should consider outsourcing collateral management to a third party to reduce their costs and operational burden. Under the tri-party collateral management model, the tri-party agent is responsible for record keeping, accounting, valuation and substitution of collateral, tracking of re-hypothecation, delivery of collateral including margin calls, and maintaining custodial arrangements. On the other hand, firms with large derivative portfolios are likely to benefit from keeping their collateral management in-house and developing advanced strategies to optimise the use of existing collateral and source the necessary additional collateral from the market. These firms could also capitalise on their advanced capabilities and offer outsourcing services to smaller firms.

Other firms that fall between these two options should explore RegTech offerings for basic collateral management needs. Such solutions range from cloud-based services requiring minimal infrastructure to more traditional software packages that provide all the basic functionality needed to run collateral operations. Selecting the best solution in this instance needs careful analysis of both business requirements and also technical considerations around integrating any solution with front-office trading platforms and downstream settlement and risk systems.

The table overleaf presents three different TOM options that firms could adopt, depending on their business and collateral needs. Underpinning these three options, there are increasingly important market infrastructure initiatives that aim to centralise and standardise many of the common services required for collateral management. There is an increased market trend for firms with large derivatives portfolios to move some of their collateral management functions, such as collateral valuation and negotiation, to market utilities using a combination of the optimised and market infrastructure models. The decision about which TOM to choose may well depend on the market infrastructure options a firm wishes to subscribe to, as there is a strong interplay between the different models.

Collateral optimisation is a frequently used term that has no precise meaning because there is no one-size-fits-all solution. However, the attractive economic opportunities that proactive collateral management and trading can offer to financial firms have caused firms to change their view on the subject.
Given the increase in the number of collateralised trades and the move towards the use of a broader portfolio of non-cash collateral seen in the SA market, 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, valuations, frequency of margin calls, etc.). In order to respond to these challenges that give rise to an increase in the operational risks, it is expected that entities will look to automate the collateral management process in order to reduce these risks, monitor collateral and appropriately manage market and credit risks inherent in the process. The establishment of tri-party collateral management solutions across a number of jurisdictions is a favoured means to address some of these challenges. The integration of these solutions with market liquidity hubs, which allow for integration with CCPs existing in those jurisdictions makes this a favourable choice.

Looking further ahead, disruptive technologies such as blockchain are likely to transform securities settlement and associated collateral management. These offer the potential to reduce costs dramatically, simplify processes and remove multiple applications, reconciliations and integration points. The key change will be the introduction of a distributed ledger representing a single, consistent view of collateral through the settlement chain. Firms should position themselves to participate in and benefit from these developments as they evolve.

Looking further ahead, disruptive technologies such as blockchain are likely to transform securities settlement and associated collateral management.

Table 8. Three TOM options for firms

<table>
<thead>
<tr>
<th>Third party model</th>
<th>Simple model</th>
<th>Optimised model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview:</strong></td>
<td><strong>Overview:</strong></td>
<td><strong>Overview:</strong></td>
</tr>
<tr>
<td>outsource collateral management in its entirety to a third party or to a collateral utility.</td>
<td>basic internal collateral management, likely centralised within a business, to meet minimal collateral demands.</td>
<td>centralised global collateral management function with advanced solutions to manage collateral actively. It will also be able to offer outsourcing services for firms using the third party model.</td>
</tr>
<tr>
<td><strong>Who is it suitable for?</strong></td>
<td><strong>Who is it suitable for?</strong></td>
<td><strong>Who is it suitable for?</strong></td>
</tr>
<tr>
<td>Investment managers, large non-financial counterparties.</td>
<td>Large investment managers, retail banks with large derivative and repo portfolios, investment banks with minimal business which requires collateral.</td>
<td>Investment banks with large derivative portfolios.</td>
</tr>
<tr>
<td><strong>Market infrastructure model</strong></td>
<td><strong>Overview:</strong> centralised common services such as bi-lateral workflow and dispute management in an industry utility.</td>
<td>All market participants.</td>
</tr>
</tbody>
</table>
Principles of ‘good’ collateral management

The most fundamental principle of managing collateral is having transparency of both collateral needs and collateral inventory across the firm. It is only when these two elements are achieved that netting opportunities can be maximised and inventory can be utilised across business lines – the beginnings of a CCMF.

CCMF

In assessing the current collateral management process in the Deloitte 2014/15 investigations, it was noted that the OTC derivatives, SLB and repo markets 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 CCMF 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.

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

Controls and governance

The CCMF should be subject to a suitable controls and governance framework so as to ensure validation checks of margin calls and margin calculations. It should also have a reporting line to executive management. Suitable management information should form a key aspect of this controls and governance framework, including the ability to monitor current and impending regulatory compliance. The CCMF should be subject to scenario, resilience and continuity planning as part of a firm’s broader risk management framework (e.g. internal liquidity adequacy assessment process), with a particular focus on preparing for periods of illiquidity and volatility.
**Infrastructure**

The CCMF should have an integrated IT platform that offers a real-time view of collateral, including reporting of collateral demands, netting, valuation and pricing. The platform should also be able to segregate collateral and monitor re-use positions. Ideally, it should not only calculate margin calls, but also monitor open positions and model future collateral needs. It should also have direct connectivity with the necessary external infrastructure such as custodians and CCPs, so as to be able to offer STP.

**Collateral policy**

Firms need to have a clearly articulated collateral policy setting out the following:

- suitable arrangements for the sourcing of collateral
- make-up of a collateral pools
- the parameters of appropriate segregation requirements and preferred methodology
- the appropriate use of pledge or title transfer agreements
- the permissibility of collateral re-hypothecation and lending
- when collateral transformation or collateral upgrades are appropriate
- risk management and stress testing procedures that are in place.

These policies should also consider collateral suitability parameters on a country-by-country basis, as the CCMF should have authority over and oversight of a firm's global collateral needs.

**Collateral sourcing**

Firms should, in particular, develop a short-term strategy for sourcing additional collateral in the event of adverse market conditions. These strategies need to incorporate how collateral can be sourced and used during periods of market volatility, which will likely create a spike in demand. Although the effects of such spikes on collateral needs should be reduced due to requirements that collateral models are not pro-cyclical, an increase in haircuts in periods of stress will still probably occur. In developing their sourcing strategy, firms should take account of these potential increases in haircuts as they will result in the need to post additional collateral against their positions. A further consideration for those UK banks which are subject to ring-fencing requirements is the restrictions the non-ring-fenced bank faces in using the ring-fenced bank's assets as collateral. In essence, the non-ring-fenced bank will be required to source collateral from the ring-fenced bank on the same commercial terms as with any other third party and subject to the relevant large exposures restrictions.

**Documentation**

Most firms will need to revisit their documentation ('repapering') in light of the introduction of margin requirements for non-cleared derivatives. In particular, firms subject to these requirements will have to put in place – if they have not already done so – new documentation for the exchange of IM and VM, increasing the complexity of documentation management. This provides an opportunity to implement standardised rules and procedures which would make firm-wide collateral management easier, rather than dealing with bespoke parameters. Industry bodies are doing much to develop standard industry documentation. Examples are ISDA's production of regulatory-compliant credit support annexes (CSAs) and development of an industry- and regulator-approved IM model. Firms, however, will encounter difficulties in dealing with multiple legal documents, each of which has specific information (e.g. reporting currency or IM threshold) which needs to be taken into account when calculating sensitivities and exposure for counterparty credit risk. Ideally, legal agreements should be integrated into the IT infrastructure. There are some early industry initiatives which aim to introduce utilities that can negotiate and capture CSA terms.
Collateral pricing
Sufficiently transparent transfer pricing agreements need to be put in place between the CCMF and trading desks to recharge the costs of collateral and CCMF services to the desks. Trading desks should have full visibility of the costs of collateral so they can be priced into trades and consequently reflected in the relevant business unit’s costs. Here again ensuring as much automation of this process as possible will reduce errors and the overall administrative burden.

Today, rather than considering enterprise-wide collateral management as a purely regulatory exercise, the industry now recognises it as a strategic tool for generating additional revenue, reducing the cost of funding and deploying capital more efficiently across different business units.

Resolution planning
Putting in place advanced systems and controls will not only increase firms’ collateral management efficiencies but will also help them meet regulators’ expectations around resolution planning arrangements. US regulators – in particular the Federal Reserve Bank and the Federal Deposit Insurance Corporation – have already provided feedback on the resolution planning arrangements of eight systemically important US banks, highlighting that they should ‘possess fully developed capabilities related to managing, identifying, and valuing the collateral that is received from, and posted to, external parties and its affiliates’.

Although the European resolution authorities are not expected to provide such public feedback, we do not expect them to take a fundamentally different approach in their demands of banks. Alongside building ‘resolution robust’ collateral management systems as part of their resolution planning arrangements should also consider gaining a stronger understanding of likely counterparty collateralisation requirements in a resolution scenario, particularly from Financial Market Infrastructures (FMIs) such as CCPs. Doing this will require heightened data capabilities and banks should address this in tandem with ongoing work to enhance data management.

These are the fundamental principles of good collateral management. In addition, there are more sophisticated practices that are deployed by some firms so as to ensure maximum cost reduction and return on inventory. These are presented in the following section.
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Collateral management approaches

**Strategies and initiatives**
Firms, in particular those with large derivatives portfolios, use a number of strategies and initiatives to make sure they are utilising their collateral inventory in the most efficient way possible and also achieve lower levels of collateral required to be posted for their transactions. We analyse some of the most commonly used techniques below.

**Strategies and initiatives that increase efficiency**

**Matched book dealing**
Firms often refer to a balance sheet where repos finance offsetting reverse repo agreements as a ‘matched book’. In essence, this means a client provides a security as collateral in exchange for cash, and grants the bank the right to reuse this collateral. The firm re-pledges this security to another client to source the cash. As a result, the firm’s balance sheet does not reflect any mismatch between assets and liabilities. The firm earns a margin (the spread between the rate paid to lenders and that charged to borrowers) which compensates the firm for its higher creditworthiness relative to the other parties in the transaction, and any rollover risk.

If the firm is unable to use one customer’s collateral to secure a loan from another customer, it may be forced to borrow on an unsecured basis to source the cash, or use some of its own collateral. In either case these transactions would have higher costs for the firm, and this may change an attractive trade into an uneconomic one from the firm’s point of view.

**Internalisation**
In some cases the firm can source financing for its customers internally, without the need to use the external money markets. Internalisation allows a firm to generate additional income from finding and matching the same security among its own customers. In particular, a firm that provides funds collateralised by client securities can then re-use these securities to finance another client transaction. Through internalisation financial firms can achieve another source of collateral efficiency.

This strategy can present firms with regulatory advantages from a capital and leverage perspective. By eliminating the need to engage in (additional) external repo and securities borrowing transactions, a firm minimises the size of its balance sheet, while being able to deploy existing capital more efficiently. A second advantage arises from the fact that the firm may be able to finance its own positions with client activity. For example, a market-making desk which is long on a security can, under some circumstances, deliver its own inventory to a client that sells short that same security. The firm benefits significantly from this form of internalisation as it earns a fee on the client’s short, and saves on the financing cost of its own inventory for its market-making activities.

**Market infrastructure**
Market participants should scrutinise their clearing strategies alongside their CCP relationships. Having fewer CCP relationships maximises multilateral netting benefits, and clearing trades is overall cheaper than a non-cleared OTC derivative position. Portfolio margining, mentioned below, is an example of how firms can benefit from routing similar transactions to a single CCP. This could, however, give rise to concentration risk. If the CCP becomes distressed, the disruption to the financial markets and the economy would be severe. Under the recent European Commission proposal for a CCP Recovery and Resolution framework, clearing members may be required by the resolution authorities to have their contracts terminated (partially or fully), contribute additional collateral to the CCP’s default fund and receive reduced VM payments. Trading could also be disrupted if trading venues were served by the same CCP.

Firms use a number of strategies and initiatives to make sure they are utilising their collateral inventory in the most efficient way possible and also achieve lower levels of collateral required to be posted for their transactions.
When it comes to clearing strategies, firms have a number of options under EMIR; they can be clearing members of a CCP, direct clients of a clearing member, or establish indirect clearing arrangements. Firms should assess the optimal approach based on their derivatives portfolio and the options available to them. CCPs set stringent requirements for a firm to become a clearing member, including creditworthiness, operational capabilities, minimum trading activity in covered derivatives, contributions to the CCP’s default fund and participation in the default management process. That said, there can be a significant difference between the overall costs of using one CCP over another, particularly due to the differing levels of collateral that are required to be posted to resolution funds, and in some cases a significant divergence in the collateral concentration limits imposed upon those funds. The additional costs and operational burden from becoming a clearing member of a CCP is expected to cause most entities to enter into a relationship with one or more clearing members to clear their transactions.

Based on the Explanatory Memorandum published by National Treasury the preferred CCP solution for the SA market was determined to be the establishment of a local representative office of an international CCP. In accordance with the above, legislative amendments have already been proposed by means of the FSRB for the licensing of foreign CCPs. Most SA market participants/banks are clients of international banks that are clearing members of global CCPs since their interbank transactions are subject to foreign clearing mandates; therefore SA market participants should already meet clearing requirements in order to transact with some international counterparties. This can be realised either through being a direct clearing member or by being an indirect clearing member.

Once the CCP clearing mandate for the SA market is finalised by SA regulators, market participants would have to assess their clearing strategies attentively. Various considerations would need to be made such as default fund requirements and/or default fund requirements per asset class, clearing services and capabilities of the CCP, participation in auctioning procedures, payment of concentration margins, portfolio margining ability, intraday margining requirements, trade-off of being a direct clearing member or becoming a client clearing member through an international bank, and the interoperability of CCPs to reduce concentration risk and increase multi-lateral netting benefits.

### Strategies that affect collateral demand

#### Portfolio margining

Margin can be calculated on a gross basis, where the amount of the margin required is based on each individual position of the portfolio, or on a net basis, where margin is calculated across all positions. Under the latter approach, each position is considered in conjunction with the others in the portfolio. Portfolio margining is the strategy whereby margin is calculated on the basis of a portfolio that consists of derivatives positions which are negatively correlated and thus are offset against each other. This results in lower levels of risk and thus lower required margin. This strategy can be used for both cleared and non-cleared derivative transactions.

A number of CCPs offer portfolio margining solutions to their members in relation to their cleared trades. This strategy can yield positive results when similar instruments are cleared by the same CCP. In Europe, where different asset classes are cleared by different CCPs, the netting benefits deriving from portfolio margining are reduced. The impediments caused by the fragmented clearing market can be addressed through the establishment of interoperability arrangements between CCPs. This would allow members in one CCP to clear trades with members of the interoperable CCP and benefit from multilateral netting. Therefore, market participants should consider which CCPs have such arrangements in place in order to maximise their netting benefits. Market participants that use portfolio margining to calculate their margin for non-cleared transactions could explore ways to broaden the scope of the tool by, for example, using it on a cross-region basis. There are also a number of emerging industry solutions using portfolio margining for both cleared and non-cleared transactions.

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17 Portfolio margining
18 Different asset classes
19 Interoperability arrangements

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A balancing act | The collateral challenge for capital markets firms
Collateral upgrade
The increase in demand for high quality liquid assets has placed significant pressure on firms in terms of sourcing eligible assets to be posted as collateral. To address this challenge, firms are engaging in collateral upgrades or collateral transformations that allow them to swap a lower quality, hard to pledge, illiquid or even non-acceptable collateral into higher quality collateral such as Treasury bonds. According to the IOSCO, increased demand for highly liquid collateral is expected to drive demand for collateral transformation services.20

Collateral upgrades can be achieved through repo and securities lending transactions. A market participant can lend lower grade securities for cash and then use the cash received to source eligible securities. The tri-party repo market is an example of an industry solution that facilitates the execution of these transactions by delegating some of the operational requirements of a repo trade to a third-party repo agent. The tri-party market is a GC market, meaning that a participant may care more about the asset class of collateral it receives and less about the specific security. The tri-party repo market in the US has accounted for about $1.6 trillion of securities funding, while in Europe around 10% of the 6 trillion euros of contracts in repos and reverse repos are tri-party contracts.21 Finally, collateral can be transformed through central bank lending. These collateralised loans are similar to repo transactions and they allow firms to pledge a wide range of securities with central banks in exchange for cash.

Margin models
In advance of the implementation of margin requirements for non-cleared derivatives, firms should consider the methodology they will deploy to calculate IM. Both the US and EU frameworks give firms an option between a standard schedule specified by the regulators and an alternative model approved by the regulator. The standard schedule is quite conservative and does not provide firms with flexibility in calculating IM. Some firms – in particular those with the most substantial portfolios – will choose to develop their own models. ISDA has estimated that under the standard model the total IM for the market would be $10.2 trillion compared to $1.7 trillion under internal models.22 The models will need to be robust and flexible, and not be subject to pro-cyclical effects. They should also be able to verify IM by replicating the models used by their most significant trading counterparties, monitor open positions, model future collateral needs including scenario analysis and forecasting, and evaluate netting.

ISDA has developed the Standardised Initial Margin Model (SIMM) methodology that would allow firms to calculate IM based on a single industry agreed model. We expect that many firms will choose to utilise this model, as the savings are significant compared to the standard schedules, but without the costs or burden of seeking regulatory approval of a firm’s bespoke model. Using different models rather than standard schedules may result in discrepancies in the amount of margin calculated by two counterparties in the same transaction and thus give rise to disputes on margin calculations. This could result in a significant operational burden, or the risk that some smaller counterparties may not have the capabilities to perform the complex calculations necessary and may choose an alternative counterparty as a result. Another way market participants may limit disputes would be to include contractual clauses on margin calculations. ISDA’s new Standard CSA removes optionality which exists under the current CSA by promoting consistent and transparent valuations.
Conclusion

Competing regulatory pressures for collateral and high quality instruments, such as the new margin regime for non-cleared derivatives, as well as prudential requirements around liquidity, will result in an unprecedented demand for such assets. Although we do not expect a shortage of collateral in the market, the increased demands for, and on, collateral present challenges for firms in terms of managing their existing inventory efficiently as well as sourcing additional collateral. In their attempts to meet upcoming regulatory requirements, firms are now revisiting their collateral efficiency and strategies.

We do not think there is a ‘one size fits all’ solution. Firms should adopt a TOM for collateral based on their business structure and operational needs. Smaller firms could consider outsourcing part or all of their collateral management function, while larger firms may find it more beneficial to manage their collateral in-house. Such firms should consider establishing a centralised function accountable for maximising collateral efficiency that has a single view of collateral supply and demand and is supported by appropriate IT infrastructure, a robust collateral policy, and appropriate controls and governance frameworks.

To maximise collateral efficiency, firms are deploying a number of more sophisticated strategies. Some of these solutions, including matched book dealing and internalisation, ensure that existing inventory is utilised in the most efficient way, while others such as collateral upgrades are used to facilitate the sourcing of high quality assets.

Effective and efficient collateral management can significantly reduce the costs and operational burden imposed by regulatory requirements. Given that the implementation phase for margining of non-cleared transactions has already started in some jurisdictions, including the EU, the pressure for firms to address the collateral challenge is already acute. The methods and approaches set out in this paper provide good practices for firms to review and adopt.

We do not think there is a ‘one size fits all’ solution. Firms should adopt a TOM for collateral based on their business structure and operational needs.
Endnotes

1. Please refer to page 18 on collateral management approaches, for a definition of matched book dealing
2. Deloitte LLP
4. Under sub regulation 17 (Counterparty credit risk exposure and matters related thereto) of section 23 (Credit Risk – Directives and interpretations for completion of monthly return concerning credit risk) of the Banking Regulations.
5. These proposals are not part of the EU regulatory framework although the SFTR provides that the European Commission should submit a report to the European Parliament and to the Council by 13 October 2017 on progress in international efforts to mitigate the risks associated with SFTs, including the recommendations for haircuts on non-centrally cleared SFTs, and on the appropriateness of those recommendations for EU markets.
6. According to the EBA, the main sources of asset encumbrance, i.e. balance sheet liabilities for which collateral was posted by institutions, are repos, covered bonds issued and over-the-counter derivatives. EBA report on asset encumbrance, September 2015.
8. This is a subset of the total eligible collateral and is different from the term ‘collateralised market’.
10. Please refer to the methodology (Table 7).
12. See ISDA’s webpage on the SIMM initiative.
14. Re-use of collateral should be subject to the restrictions set out in SFTR. Collateral can be re-used with the express consent of the providing counterparty, once it has been informed of the inherent risks, and only after the collateral has been transferred to the counterparty’s account.
15. The European Systemic Risk Board’s (ESRB’s) response to ESMA on the temporary exclusion of exchange-traded derivatives from Articles 35 and 36 of MiFIR, February 2016.
17. E.g. holding a long futures position on a 10-year Treasury but is often a hedge against the fixed rate payments due under a 10-year interest rate swap. As interest rates change, the value of each position will move in opposite directions.
19. In the EU, there are a number of interoperable links between CCPs for equities, bond and exchange traded derivatives. ESMA Final Report on possible systemic risk and cost implications of interoperability arrangements, March 2016.
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