Collateral Management:

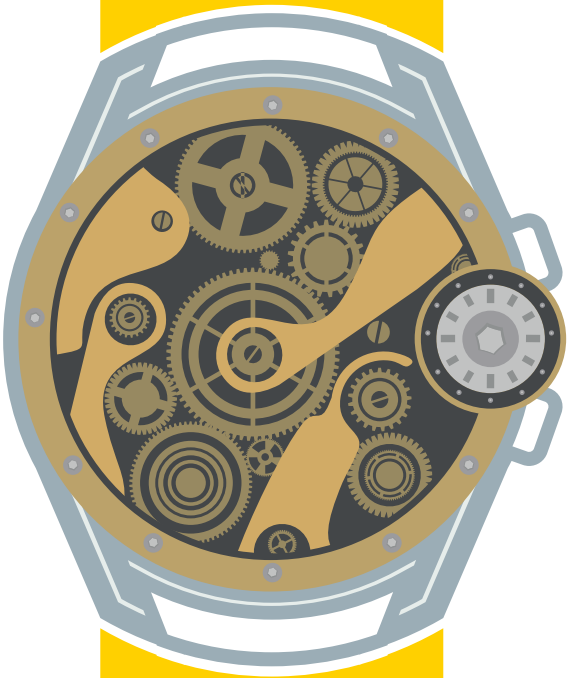
A Review of Market Issues

October 2015

THE FIELD EFFECT

BNY MELLON

Contents:



Executive Summary

This background paper (Paper), co-written by The Field Effect and BNY Mellon, is the first in a series of papers which will focus on the wide-ranging collateral management market issues and opportunities currently facing financial market participants. We (The Field Effect and BNY Mellon) believe the series to be essential reading for asset managers, pension funds, insurance companies, banks and broker-dealers, as it will translate complex regulatory and market structure changes into straightforward operational imperatives.

It is widely acknowledged that ongoing changes to collateral supply and demand dynamics are challenging even the most sophisticated and experienced organisations, with many firms (both financial intermediaries and asset owners) struggling to grasp the full implications and potential opportunities of the new landscape. The reformation and restructuring of the financial markets in the aftermath of the global financial crisis has had a profound effect on how collateral is used and managed. Nevertheless, it is worth emphasising one key point: we believe these events can ultimately have a positive impact on firms that use collateral to support their funding or investing strategies.

This Paper examines the development of collateral management and identifies the key issues of the current collateral landscape, including the anticipated difficulties in accessing supply. Subsequent papers in this series will focus on complex regulatory challenges and innovative solutions. By looking at the current fragmented collateral landscape and the response of infrastructure and service providers, we tackle key issues, such as:

- Is the much heralded shortfall of collateral in the global market still a possibility?
- What changes can firms make to existing account structures, systems and services?
- How are third party service providers helping market participants to manage collateral effectively?
- What does the future hold for collateral management?

At a summary level, key issues can be identified as:

- Compliance with new regulations governing cleared and non-cleared Over-The-Counter (OTC) derivatives;
- For the buy-side, choosing partners who can help with complex requirements for margining and collateral mobilisation;
- For banks, meeting complex interlocking collateral, liquidity, and capital regulations, whilst offering clients collateral services at a viable price point; and
- The ability of custodians to provide clients with a cost-effective collateral management service with integrated tri-party collateral management capability.

We are witnessing a realisation that now is the time for significant change. This task should not be underestimated and many firms may not fully appreciate the challenges they face, nor recognise the opportunities available in the market. We believe collateral management will evolve from being primarily a process of managing assets for margin purposes, to a position where much greater consideration is required to manage assets from a collateral value, cost and balance sheet perspective.

As the sophistication of collateral services evolves, we will see increasing levels of innovation from service providers who truly understand their clients' needs and have the vision to develop services to support them. A critical part of the collateral challenge will be for firms to select the service elements they require and identify the service provider that can most effectively meet their needs in the long term.

SECTION 1:
The New Collateral Challenge

Collateral management has become a sophisticated discipline with financial institutions often making collateral management a dedicated role. A presumed abundance of liquidity and leverage in the period prior to 2008 meant collateral management processes were often fragmented, imprecise and imperfect in practice. The events of the global financial crisis exposed some products and institutions in financial markets as severely under-collateralised, while other financial markets dried up due to a sudden absence of either trust or collateral. The regulatory response to the crisis has increased the activities and transactions for which collateral is required, as well as leading to demand for higher quality collateral. As a result, collateral management has become a much more urgent, business-critical concern for a much wider range of institutions active in the global securities and derivatives markets, encompassing banks, brokers, investment managers, hedge funds, pension funds, insurance firms and other asset owners. To a lesser extent, multinational corporations will also be drawn further into the collateral world, both due to their use of OTC derivatives and as providers of cash via the repo markets, where they will look to balance yield with security, taking secured exposure over unsecured Bank deposits.

This section examines the practice of collateral management before, during and since the financial crisis, highlighting the key requirements for effective collateral management in an emerging post-crisis environment in which demand could well outstrip supply.

Pre-crisis Collateral Management

The importance of collateral management has had an inverse relationship with the availability of unsecured credit. When credit is plentiful, the need to supply collateral diminishes, but when market crises reduce the supply of unsecured credit, increased demands for collateral spur innovation.

As can be seen from the table below, collateral is widely used to support transactions in a range of wholesale financial markets. Market-specific documentation, solutions and associated practices have developed over decades, often influenced by market practitioner groups, regulators and others. The processes employed to move collateral (securities or cash) are broadly similar, with cash cleared via a cash correspondent bank and securities via a custodian/international central securities depository (ICSD). Occasionally, when commercially advantageous, cooperation across markets has occurred, e.g. the inclusion of a securities lending annex within the global master repurchase agreement (GMRA).

Similar types of collateral are used across different markets, with similar eligibility criteria applied. Cash and high-grade government bonds, for example, have traditionally been identified as the most desirable collateral, while equity has grown in use due to its underlying market liquidity.

Product Area	Description (i.e. How is the collateral used?)	Legal agreement required	Collateral Management related regulations
Repo (Repurchase agreement)	Collateral in the form of bonds or equity is delivered to secure cash placements	GMRA (MRA in the US)	FSB framework to standardise repo haircuts is yet to be fully implemented
Securities Lending	Cash or other collateral is delivered to secure a loaned security	Global Master Securities Lending Agreement (GMSLA)	FSB framework on shadow banking requirements is yet to be fully implemented
OTC Derivatives (cleared)	Collateral in response to margin process is exchanged between trading entity and central counterparties (CCP). Includes Initial Margin (IM) and Variation Margin (VM)	CCP product specific operational legal agreement	Dodd-Frank Act/ European Regulation on OTC Derivatives (EMIR)
OTC Derivatives (uncleared)	Collateral is moved between trading counterparties. Currently this is limited to VM but requirements for movement of IM are being introduced	ISDA Credit Support Annex (CSA) to the Master Service Agreement (MSA)	Basel Committee on Banking Supervision (BCBS)/International Organisation of Securities Commissions (IOSCO)/national implementation in numerous jurisdictions
Exchange Traded Derivatives (ETD)	Collateral is delivered to / from the relevant CCP to reflect trade	Exchange-specific documents	Dodd-Frank Act/ European Regulation on OTC Derivatives (EMIR)
Cross Product Margining	Legally enforceable netting arrangements across various collateral products	MSA	Complex legal and operational requirements (requiring client specific solutions)

With many institutions using collateral in a wide range of markets (others include letters of credit, collateralised debt obligations, committed repo facilities), some utilise master collateral agreements to facilitate the netting of margin obligations between two legal entities across different collateral products. The common provisions used in these agreements and other legal documents governing use of collateral in specific markets are listed in the boxed item.

Acceptable collateral: Usually, predefined contractual rules between parties are set to govern the eligibility criteria applied to collateral, e.g. above a given minimum rating or a below a given maturity. The broadest definition of collateral includes any asset that is acceptable to both parties to support a specific transaction, e.g. repos in a securities financing transaction, is easily priced, and where title can be transferred. As well as bonds and equities, collateral assets can also include commodities such as gold and silver. The key differentiator is between 'acceptable' and 'not acceptable' collateral. Acceptable collateral usually takes the form of cash and investment grade securities.

Close out and termination clauses: Transacting parties need to agree under what circumstances a trade is terminated and the rules (timing, payment procedures etc.) and the role of collateral in the event of a close out.

Margin: A margin is often applied to the amount of collateral required to collateralise transactions so as to provide a collateral receiver with a small buffer of 'value' that compensates for the price volatility of the collateral. For example, if collateral is volatile (e.g. long dated, low quality security) then a higher margin would be required than that required for a short dated government bond with a low price volatility.

The term Margin is also sometimes used in relation to the broader term of 'collateral', being the full amount required to cover an exposure. Hence the term 'margin call' requiring the exchange of assets (margin) to cover an obligation from one party to the other.

Frequency of margin calls: The value of the collateral may change over time; in order to ensure this change is limited the frequency of margin calls is pre-agreed.

Haircut: A haircut is often applied to discount the true value of acceptable collateral. This allows a small buffer of 'value' to be held by the collateral receiver to compensate for price volatility. For example, if collateral is volatile (e.g. long dated, low quality security) then a higher haircut would be required than that required for a short dated government bond with a low price volatility.

Reuse/Rehypothecation rules: The collateral receiver may wish to reuse the collateral received, for example, to transfer the collateral to a third party. It should be noted that the ability to reuse is restricted by regulation in certain circumstances.

Threshold levels: The value shortfall above which collateral is required. The term minimum threshold amount (MTA) is referenced in the case of additional margin being required, and is the value of collateral shortfall required for a margin call to be valid. This is in place to prevent uneconomically small margin calls being made.

Valuation: The method in which the trade economics and collateral are marked to market for trade and collateral valuation purposes. This is typically done using the previous business day's closing prices.

How the Crisis Changed Collateral Management

Inadequate access to collateral as unsecured credit diminished was a factor in the collapse of individual institutions. Importantly, the crisis revealed the shortcomings of banks' collateral management arrangements, while subsequent reforms underlined the need for a more coordinated, holistic approach, not just by banks but by all market participants.

The events of 2008 highlighted a lack of transparency: Some market participants were found wanting in the area of risk management. Many financial institutions were actively using collateral to support OTC and exchange-traded derivatives, securities lending and repo market activity, operating in separate business silos. Risk monitoring was often controlled across the individual business areas within a firm and then aggregated at a macro level.

Regulatory Response

The events of 2008 triggered the most far-reaching regulatory overhaul of the wholesale financial markets in modern times. Primarily aimed at ensuring banks are better able to absorb shocks and reducing the risk of future bail-outs, the reforms had profound implications for collateral users and providers. The regulatory response to the crisis has been globally coordinated by the Financial Stability Board (FSB) and Basel Committee on Banking Supervision (BCBS), but locally implemented, and encompasses a wide range of measures. Reforms have impacted institutions and markets according to different timetables and in many cases are yet to be finalised. As such, rather than simply being upgraded to comply with new rules, collateral management capabilities must be adapted to enable firms to operate effectively in the new post-crisis regulatory environment. The regulations will be examined in detail in subsequent papers, but notable reforms impacting the collateral world are:

LCR/NSFR – Part of the BCBS package of reform measures (Basel III), the liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) have been developed to achieve separate but complementary objectives. They represent two dimensions of a bank's liquidity profile, designed to monitor, strengthen and promote global consistency in liquidity risk supervision and require reporting to both home and host supervisors:

- The LCR is intended to promote short-term resilience of a bank's liquidity risk profile by helping to ensure that the bank has sufficient minimum stock of unencumbered high quality liquid assets (HQLA) to survive a significant stress scenario lasting for one month.
- The NSFR requires banks to maintain a stable funding profile in relation to the composition of their assets and off-balance sheet activities. The NSFR is intended to limit overreliance on short-term wholesale funding, encourage better assessment of funding risks, and promote longer-term funding stability.

Shadow Banking Rules – As part of its efforts to strengthen oversight and minimise risk in the shadow banking sector, the FSB has called for mandatory haircuts to be applied to non-centrally cleared securities financing transactions (e.g., repo and stock loan transactions), in which financing against collateral other than government securities is provided to non-banks.

EMIR – Part of Europe's response to the Group of 20's (G-20s) call for reduced counterparty risk and increased transparency in the OTC derivatives market, the European Market Infrastructure Regulation (EMIR) has already introduced reporting requirements and mandates clearing of liquid swaps on CCPs, starting 2016. This requires both buy- and sell-side users of derivatives to post IM and VM at CCPs, typically in the form of HQLAs such as AAA-rated government bonds.

MiFID II –The second Markets in Financial Instruments Directive (MiFID II) creates a new category of trading venue – the organised trading facility (OTF) – on which derivatives can be traded. It also requires that all trading of derivatives that are eligible for clearing and that are sufficiently liquid take place on regulated trading venues (regulated markets, multilateral trading facilities (MTFs) or organised trading facilities (OTFs). MiFID II obligations will take effect in 2017. In the US, all these new measures and structures were established by a single piece of legislation, the Dodd-Frank Act.

Non-cleared Derivatives – For OTC derivatives instruments that are not centrally cleared, the BCBS-IOSCO framework requires further steps to the taken between parties that are either not performed or seen as optional today:

- The regular calculation of trade level exposure and the resulting exchange of VM between bilateral counterparts
- Exchange of two-way IM (requiring amendments within the ISDA CSA)
- Establishment of policies, procedures and controls for minimising or avoiding disputes by reconciling portfolios, risk sensitivities, risk factors and margin calls with counterparties;

National implementation of these rules may have additional requirements. For example, the forthcoming U.S. rules likely will require IM to be held at independent third-party custodians.

Adjusting to the New Collateral Challenges

The changes to the collateral market wrought by regulatory change present a compliance challenge in more than the traditional sense. In addition to compliance with regulatory requirements, firms should take a broader, strategic approach to deliver on their ultimate long-term commercial goals.

At this stage there are many 'known unknowns' which any strategy will have to accommodate, but there is enough evidence about the supply and demand of collateral in the post-crisis environment for firms to appreciate that the cost of collateral will need to be identified and factored into many more transactions. While some sell-side firms may be looking to coordinate existing collateral management capabilities more effectively, many buy-side firms will be implementing policies and processes for the first time. Both face a vast array of interconnected collateral challenges, which collectively demand a thorough re-examination of operational procedures.

Should the Market Expect a Collateral Shortfall?

Since the crisis, much attention has been paid to whether there are enough collateral assets to shore up the new market framework. We believe regulation is increasing demand for collateral in three key ways:

- The continued move from unsecured to secured funding driven by the new risk evaluation models, capital treatment, and deleveraging;
- Basel III [Capital Requirements Regulations (CRR/CRD IV)] liquidity requirements; and
- Mandatory central clearing of certain OTC derivatives (e.g. under US Dodd-Frank Act and EMIR) and Basel Committee/IOSCO requirements on un-cleared OTC derivative trades.

Other factors impacting collateral availability including reduced levels of re-use/ rehypothecation; fragmented collateral pools held at different CCPs; and the need to retain HQLAs for regulatory buffer purposes. Some estimates indicate market collateral demand of up to US$4 trillion by 2019, approximately double today's figures. However, there remains the possibility of spikes in collateral demand being multiples of this number during times of high market volatility e.g. during market disruption.

On the other hand, it is worth considering the increased issuance of assets eligible as collateral. There has been a significant increase in the issuance of HQLAs, with an additional US$10 trillion of AAA/AA government securities issued between 2007 and 2011. This number increases to US$11.3 trillion when short-term government securities, corporate bonds rated single A or better, and US securitised bonds are taken into account.

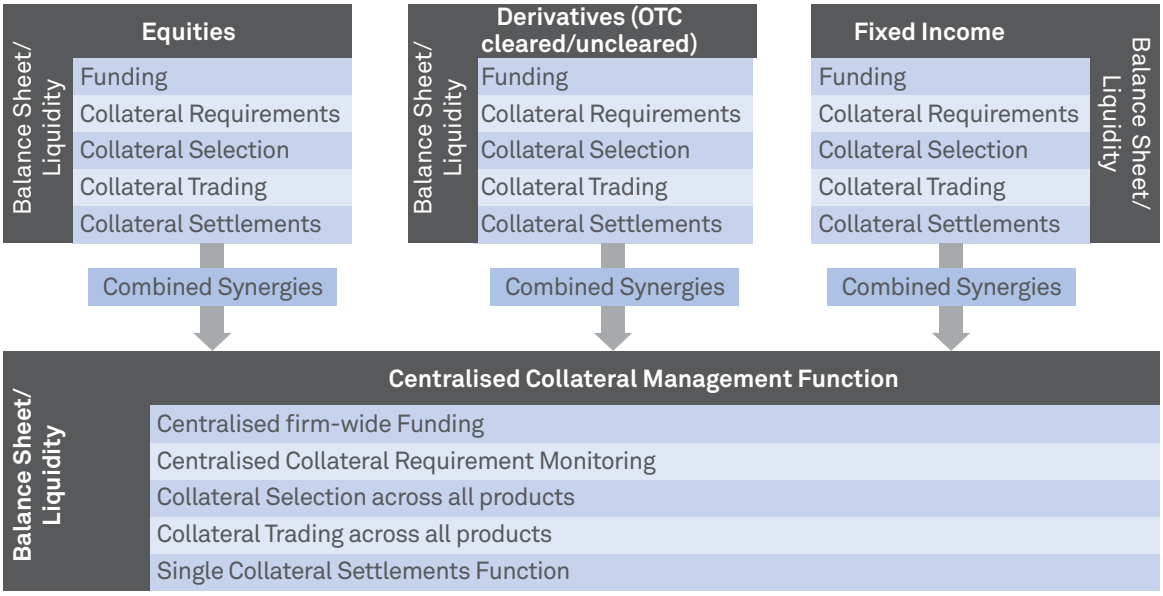
Does this mean that the actual supply of securities for use as eligible collateral significantly outweighs the increase in collateral uses? No. There is a well-recognised difference between the potential supply and actual supply of collateral as not all securities are available for use as collateral. This is due to a variety of factors including the continuation of siloed market infrastructures, different eligibility criteria across markets and jurisdictions, and large central bank holdings. This fine balance between supply and demand factors suggests the collateral challenge will involve both effective sourcing and mobilisation of eligible collateral. It is now often said that there may be enough collateral in the world but it has to be 'the right collateral, in the right place at the right time'.

Practical solutions

Despite the advantages of employing a single integrated collateral solution (e.g. reduced technology overheads, a single collateral pool, streamlined management and operational support), many firms have continued to maintain a siloed approach. We believe, however, that most will adopt a more coordinated, centralised approach as a key part of their efforts to address the collateral challenge, as per the diagram below.

Traditional Collateral Management Silos by Product

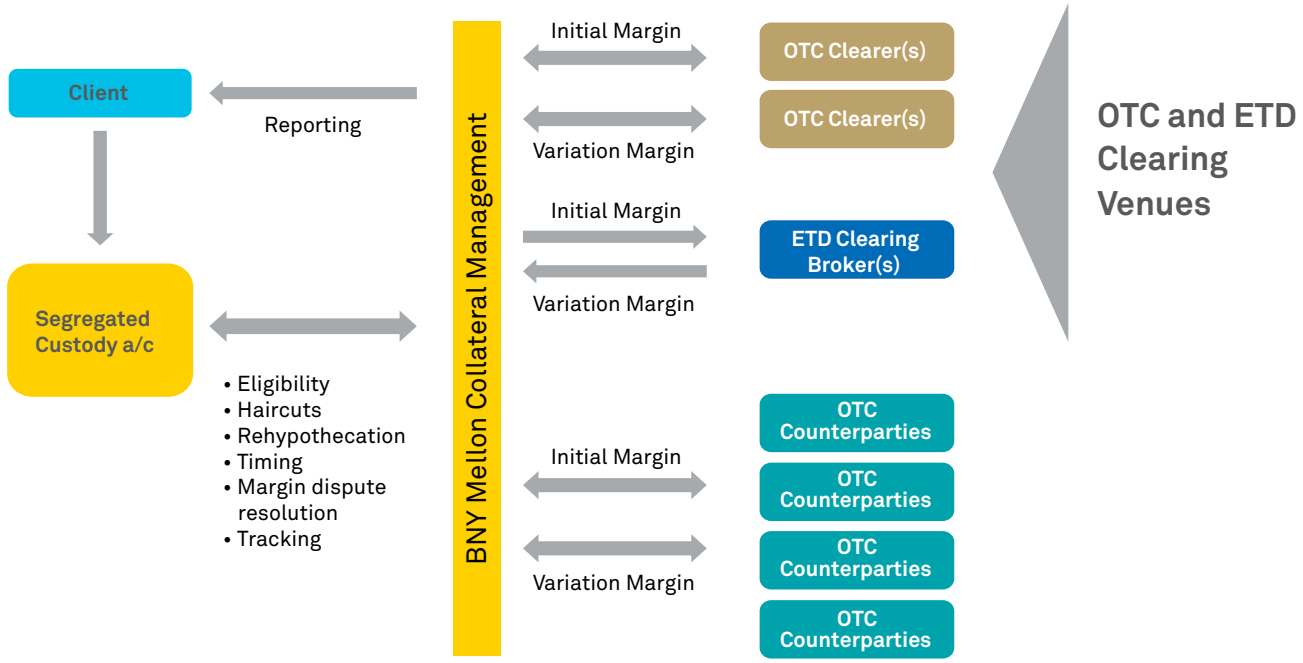
Benefits of single centralised collateral function across equities (securities lending), fixed income (repo) and derivatives products (ETD and OTC)



Firms also need to give careful consideration to the choice of method for the provision of collateral to be used – pledge or title transfer – and the legal arrangements around the chosen method when using a custodian or ICSD. Regulatory requirements may also affect pledge vs title transfer. Pledged collateral allows the collateral provider more control over the management of its assets; only in the event of a collateral provider default can the collateral receiver liquidate the collateral in order to cover any shortfalls. With pledge, the assumption is that fees will be higher because the collateral cannot be re-used. With title transfer, re-use becomes possible under current rules and tri-party collateral platforms, such as BNY Mellon's, provide mechanisms to control the selection, allocation and onward use of the collateral. In this instance, the collateral can be delivered to the broker, but it can only move on within the boundaries of the tri-party agent environment and with the originating collateral provider's permission.

The sheer volume of collateralised transactions means that wherever possible, firms are seeking automated collateral solutions. We are witnessing the emergence of both full service and 'pick and mix' offerings from some service providers, demonstrating both regulatory compliance and an awareness of market needs. Several service providers are well positioned to support some or all of the requirements of firms as they have kept pace with the requirements of the changing regulatory landscape. Firms with a track record of developing collateral solutions, such as BNY Mellon, will use their tri-party collateral management product to provide an automated collateral eligibility and sufficiency check as an integral component of the collateral solution.

Collateral Management Administration Services



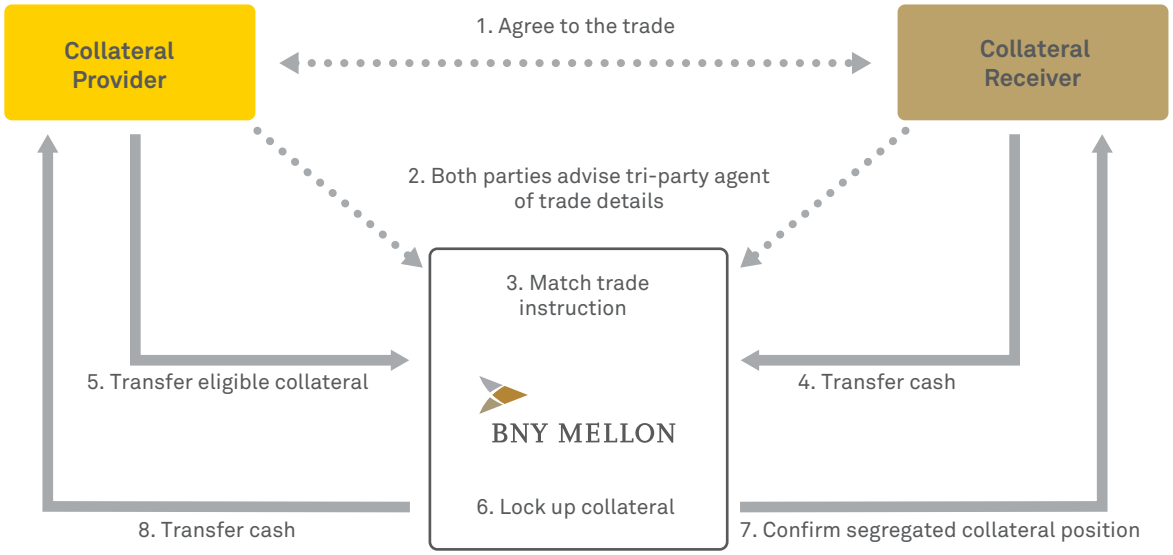
SECTION 2:
Service Provider and Infrastructure Developments

The post-crisis reforms have had a substantial impact on both the users and providers of collateral, as well as on those they rely to manage collateral effectively: service providers (such as custodians) and market infrastructure operators (primarily CSDs and CCPs). Whilst the regulators have generally maintained a commercially neutral stance, allowing the market to define business terms, rates and definition, they have also encouraged competition, notably among CCPs. The evolving regulatory framework has not only changed business and operating models; it has also called into being new structures and facilities. However, the long-term viability of some service providers may come into question as costs, returns and compliance pressures start to bite. In this section, we review the role of service providers and market infrastructure operators in the new collateral environment and some of the challenges they face.

Tri-Party Agents (TPAs)

A tri-party transaction is one in which all post-trade processing, i.e. collateral selection, payment and settlement, custody and management, is outsourced by the transacting parties to a third party, known as a tri-party agent. The TPA acts on behalf of both parties, identifying a sufficient value of eligible collateral and initiating delivery from provider to receiver. Securities selection is normally made in accordance with a pre-agreed algorithm.

Global Tri-Party Transaction Flow



Established in the repo and securities lending markets, the operational advantages of tri-party transactions are being transferred to other markets, specifically the automatic selection and movement of eligible collateral. Once an exposure has been confirmed, the TPA is notified of the instruction fields (i.e. required collateral value, settlement date, eligibility set and counterparty/ CCP) and the movement of collateral will occur.

Tri-party collateral management services (TCMS) cover a range of functionalities, such as recalling (substituting) collateral delivered in the event of a pending corporate action, which can be combined to offer tailored collateral optimisation solutions. TPAs can also monitor for the sale of any inventory being used as collateral, in which case the TPA will automatically recall securities, and substitute alternative collateral held within the inventory. TCMS are governed by a tri-party service agreement that sets out the services to be provided to support the underlying bilateral agreements (e.g. GMRA, GMSLA, ISDA CSA/CSD, etc.). The expected growth in collateral movements – in response to increasing margining requirements for derivatives transactions – is likely to prompt market participants to turn to TPAs to support the automation of their collateral selection process, to initiate the securities movement and to carry out post-delivery substitutions.

Tri-party services are typically provided by global custodians or international CSDs. BNY Mellon has been a key tri-party collateral management service provider over many decades and continues to develop its services to support clients' increasingly complex collateral needs. As of end-Q1 2015, the average total global tri-party collateral balances managed by BNY Mellon daily stood at US$2.2 trillion, based on a mixture of repo, securities lending, clearing-related collateral management and OTC derivative exposures.

European and US Tri-Party Repo Markets

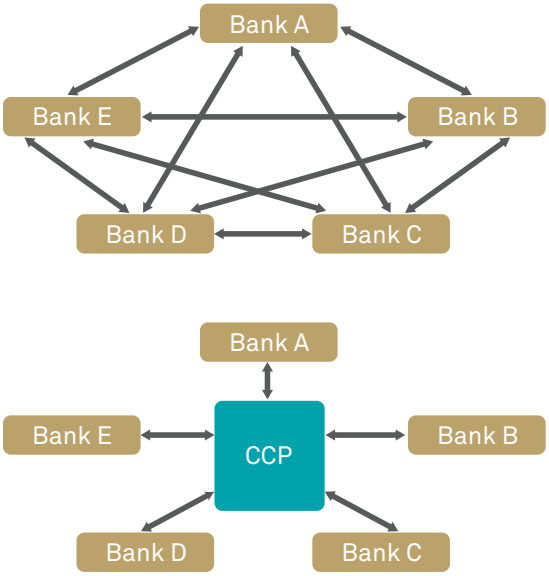
Usage levels of TPAs differs markedly across the US and European repo markets, with TPAs used to settle the vast majority of US$ repos, compared with around 10-12% in Europe. (BNY Mellon manages over $2.2 trillion of collateral by value across a range of Triparty Collateral Management activities in the US, EMEA and APAC regions).

The US Tri-Party Repo Infrastructure Reform Task Force developed and implemented solutions to reduce systemic risk, practically eliminating intraday credit risk and enabling market participants to continue to efficiently and effectively fund their operations. Working with market partners, BNY Mellon has played a major role in the design and implementation of the risk reduction initiatives that have been implemented through a series of operational and technology changes and improvements.

Central Counterparties (CCPs)

CCPs sit between the buyer and seller of a transaction to enable 'multilateral netting' (See figure below), taking on counterparty risk from bilateral counterparts to a trade, but not market risk. To offset the risk that a trading counterparty defaults, the CCP takes collateral in the form of IM and VM from counterparties. Netting reduces the size of exposures at default and also the liquidity demands on traders during stressed market conditions. Losses in excess of collateral provided by the defaulters are mutualised and allocated according to a default waterfall by CCPs, reducing some of the uncertainty that would otherwise arise in the event of a counterparty failure.

A complex 'web' of bilateral exposures is reduced to a simpler network via a CCP



Source: Bank of England: Quarterly Bulletin 2013 Q2

While EMIR requires buy-side firms to deliver collateral to CCPs, many for the first time, to support their OTC derivatives trading positions, post-crisis regulation arguably poses even more profound challenges for CCPs. Not only must they adapt their risk management policies and processes to handle new instruments and a new client base, CCPs must also submit to greater balance sheet scrutiny (under a framework for recovery and resolution outlined by IOSCO and the Committee on Payments and Market Infrastructures). Further, EMIR requires CCPs to offer buy-side clients a range of account options managing cash and securities collateral within net omnibus or individually segregated accounts (ISA's).

From a collateral perspective, there is the potential for further collateral fragmentation as multiple CCPs service the same transaction types competing for the same settlement business, with commercial imperatives influencing that trades are cleared at the CCP demanding the smallest margin or offering the widest range of collateral types. This approach has been widely debated in the market in recent years and is perhaps part of a client's decision making process when combined with the need for liquidity. This is likely to increase the number of locations and processes required to support a firm's collateral activity, with fragmentation also undermining netting opportunities. Evidence illustrated by trade volumes points at cleared derivative trades gravitating towards trade-type specific CCPs.

In an uncertain collateral environment, CCPs are also under pressure to extend their collateral eligibility criteria, but must ensure they can liquidate any collateral in an efficient manner in the event of a default. Moreover, CCPs must offset pressure to offer cross-product margining against their ability to risk manage collateral in a stressed environment and to monitor concentration risk efficiently. Consequences that may result from CCPs' approach to these issues include:

- The focus on risk and the use of collateral may result in a significant reduction in market liquidity;
- The cost of transacting, together with the ongoing support of OTC derivatives trades, may become too expensive, leading to reduced sell-side support;
- Potential growth of swap 'futurisation', i.e. where an enhanced range of swap contracts are made available on exchanges.

Central Securities Depositories (CSDs)

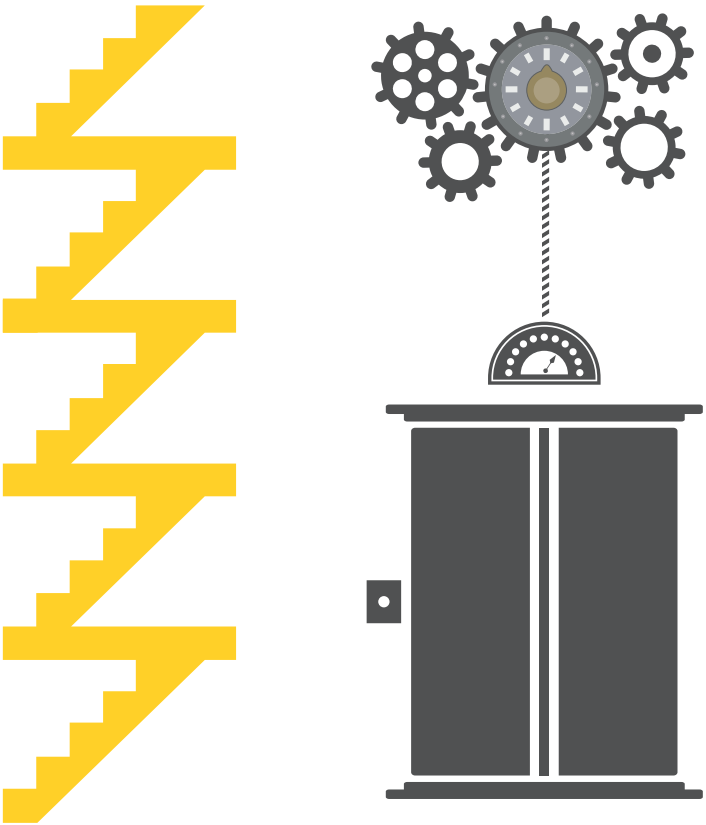
Responsible for registration, safekeeping and settlement of securities, CSDs are systemically important infrastructure components of the securities markets. Many were originally established by or allied to national stock exchanges and as such have operated largely on domestic lines. Two international CSDs settle trades in international securities, e.g. eurobonds, as well as settling trades in domestic securities via a direct or indirect link with the local CSD.

As well as responding to the changes to the demand and supply of collateral described in section one – primarily by making it easier to access and mobilise collateral assets – European CSDs must also adapt to regulatory and market structure change. The Central Securities Depositories Regulation (CSDR) standardises processes and creates possibilities for competition between CSDs.

TARGET2-Securities (T2S)

Established by the European Central Bank, T2S is a new European securities settlement engine which aims to offer centralised delivery-versus-payment settlement in central bank funds across all European securities markets. T2S went live in June 2015 and more than 20 European CSDs have signed up to migrate to the platform in four waves by February 2017. T2S is not a CSD, rather it is a standardised settlement platform with a common set of rules that shall be applied by all the CSDs on the platform.

The objective of T2S is to integrate and harmonise the highly fragmented securities settlement infrastructure in Europe. It aims to reduce the costs of cross-border securities settlement and to increase competition and choice amongst providers of post-trading services in Europe. T2S is likely to result in a single large pool of collateral that is easier to manage in shorter time frames and at a lower cost. The move towards T2S is also likely to precipitate other market developments required to enable the more efficient movement of securities (and therefore collateral) within the European system e.g. the interoperability of tri-party service providers.



Swap Execution Facilities (SEFs) and Organised Trade Facilities (OTFs)

The post-crisis reforms to the OTC derivatives markets which mandated central clearing of liquid instruments – thereby requiring users to post collateral at CCPs – also require many derivatives to migrate to electronic trading platforms from traditional voice-brokered dealing. SEFs, introduced as a requirement of the US Dodd Frank Act, are regulated swap trading venues which provide pre-trade information (bids and offers) and an execution mechanism for swap transactions among eligible participants. SEFs should be viewed as part of regulatory efforts to increase greater transparency in derivatives trading, which are rapidly evolving and causing substantial shifts in the overall swaps market structure.

The OTFs are effectively the European equivalent of the SEF. Together the SEFs and OTFs are designed to bring together buying and selling interests or orders related to financial instruments. OTFs are being introduced as part of the MiFID II and are focused on non-equities such as derivatives and cash bond markets.

Trade Repositories (TRs) and Swap Data Repositories (SDRs)

In all G-20 countries, trade repositories are being established to receive, store and disseminate trade related data. Termed SDRs by the US Dodd-Frank Act, and TRs by EMIR, these electronic platforms may receive swap trade data from a variety of sources such as trading counterparties, derivatives clearing organisations, designated contract markets and trading platforms. The purpose of the repositories is to facilitate market transparency.

SECTION 3:
The Future of Collateral Management

The 2008 financial crisis resulted in a large number of regulatory and market structure changes directly impacting the collateral world. There is a market hierarchy of collateral sophistication, with perhaps a firm's focus on collateral seemingly proportionate to their reliance on collateral for the firm's activities. Certain firms have developed highly sophisticated collateral solutions, for example if they depend on the use of collateral for funding. Other firms may be less reliant on collateral for funding, and as a result have simpler collateral solutions. Our view is that both approaches to capital may have to change.

The immediate focus for firms will be on the need to adjust their collateral operations and strategies so that they can operate effectively in the evolving post-crisis market environment, which continues to be reshaped by a regulatory calendar that currently extends beyond 2017. Practically, this means firms must be operationally capable of ensuring there is sufficient collateral available, at the right time, in order to meet margining and other requirements. These increased collateral obligations and practices could include:

- A single pool of collateral inventory, i.e. an ability to obtain a full overview of all of the firm's existing collateral, in either an actual or virtual form;
- A centralised autonomous collateral function with the authority to manage the firm's entire collateral obligations; and
- Management information capability that tracks and reports on regulatory compliance and provides a benchmark of the firm's developing collateral capability.

Today, for all firms, there is a recognisable market move away from the traditional decentralised product-focused approach to managing collateral toward a centralised (or enterprise-wide) collateral solution, with an increased focus on both global and cross-border activity. However, many firms continue to struggle to move away from their traditional practices based on asset classes, despite the ultimate benefits that can be achieved from centralisation. As such, it is still too early to honestly claim a victory in this area as efforts are still a 'work in progress'.

Medium and Long-Term Challenges

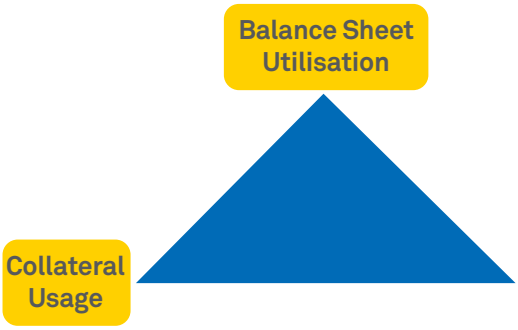
For those firms who are willing to embrace the longer-term collateral challenge, experience illustrates that the 'ultimate' collateral solution can only be achieved by a process of iterative improvements rather than a single event. The ultimate collateral solution for a given collateral / margin requirement will depend on a firm's trading profile, risk management, and the balance of the firm's needs in each of the three areas of cost, collateral utilisation and balance sheet usage. Here, we would highlight a shift in the regulatory climate toward higher and more frequent financial penalties imposed by regulators on both buy- and sell-side firms. In our view, the potential of falling foul of regulatory requirements through under-resourcing collateral programmes needs to be factored into any cost-benefit analysis.

Treasury Triangle

Showing the inter-relationship between Funding Cost, Collateral Usage and Balance Sheet Utilisation

Collateral Optimisation is a balance between the three key drivers:

- Minimising balance sheet usage
- Minimising funding costs
- Minimising use of collateral



Collateral optimisation is a reflection of the circumstances of these three factors prevalent at an individual institution. E.g. Institutions that are not balance sheet constrained are able to focus more on minimising funding cost and collateral usage.

As firms develop their collateral operating capabilities, we believe they will turn to third-party service providers for support, often requiring a fundamental choice between buy or build. There are a wide number of tried and tested market collateral solutions to choose from. However, as some of the early adopters of outsourced solutions can testify, when a firm outsources, only the 'solution' is outsourced, the firm retains ownership of the 'problem'!

We expect service providers to respond to market needs for new and innovative solutions, as we gradually migrate away from a market infrastructure that still remains a legacy of the pre-2008 era – batch processing, daily margining & manual processes – toward real-time digitally-driven capabilities.

One of the larger hurdles to overcome in the quest for improved collateral solutions is in the alignment of asset classes and their post-trade arrangements across multiple custodians or ICSDs. Many firms use multiple custodians to service their different assets due to quality of service, geography, and a desire to avoid concentration risk, but market developments such as 'virtual' inventories and the advent of T2S are facilitating a more consolidated view of collateral. A further recurring theme is that of timeliness and accuracy of data. It is our view that improvements in collateral solutions rely on improved data processing.

A New Era

The development of an effective collateral management solution is a complex combination of market variables, many of which continue to evolve. Over recent years, collateral management has adopted a central role – it is no longer an operational support function as it now often sits as a core capability in most firms alongside compliance and risk.

We believe those firms who fail to master the fundamental strategic collateral questions will find themselves at a considerable disadvantage. Banks may find themselves unable to fund core business lines or meet the needs of clients cost effectively; asset owners and managers may find themselves unable to pursue preferred investment strategies. Whilst there is consensus that the subject area is complex and in flux, it is also clear that considerable prizes are available for those who identify their specific collateral service elements and requirements.

Impact Analysis by Customer Segment

	Financial Institutions	Hedge Funds	Asset Managers	Sovereigns	Corporates	Insurance	Pensions
IORP							
EMIR							
DFA							
Basel III							
Solvency II							
BCBS/IOSCO							
G-SIFI							
MIFID II							
UCITS V (& AIFMD)							
Vickers							
Overall Impact Rating	**18**	**14**	**14**	**5**	**10**	**14**	**9**

Direct Impact (2 points on the Impact Rating)

Indirect Impact (1 point on the Impact Rating)

No Impact (0 points)

As the figure above shows, the collateral challenge has many varied impacts and elements for different market participants. The lack of a hard regulatory deadline makes the collateral challenge no less important. On the contrary, the value of being able to access the right collateral at the right time is one of the defining challenges of the post-crisis era and firms should seek advice and allocate resources accordingly.

In future papers, we will define further how BNY Mellon plans to respond to the changing market requirements for collateral management.

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The Field Effect

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TFE was founded and is led by David Field, an acknowledged expert in clearing and collateral management. With over 20 years financial services consulting experience, David has led many clearing and collateral advisory projects across buy-side, sell-side, CCPs and custodians, spanning strategy, target operating model, and technology. David speaks at numerous industry conferences and is frequently quoted in financial services media.

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