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Collateral 2018

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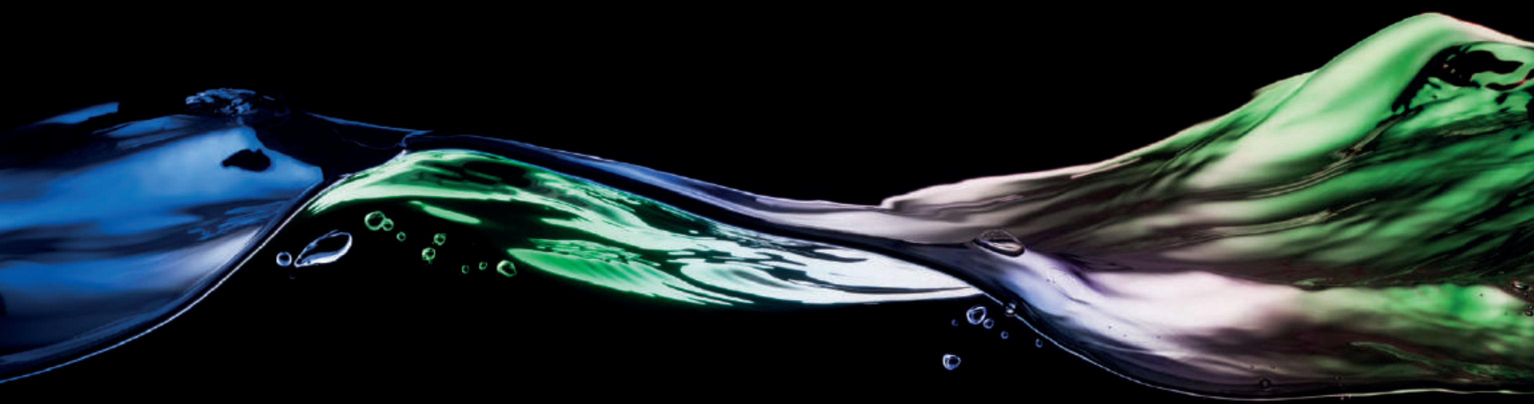

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Ask and you shall receive

As the regulatory gods continue to mould the global collateral landscape to their liking, the way forward remains treacherous for the securities financing industry—but innovation and an ability to adapt may yet prove to be its salvation.

Ever-increasing demands for ritual sacrifices in the form of margin calls and other liquidity buffers is testing the faith of both buy- and sell-side participants, with liquidity squeezes becoming most pronounced and painful during quarter ends. In response, technology providers, vendors and trading platforms are mobilising to offer technical and logistical relief.

In the SLT Collateral Annual, BNY Mellon reviews the results of its survey of buy-side participants, whose “unique and challenging funding circumstances” are pushing them toward more innovative means of doing business.

Pirum Systems, meanwhile, points out that these new means of doing business show that the market “can swiftly adapt to change when necessity dictates”. One such adaptation is the ‘all-to-all’ platform, which aims to give buy-side clients direct access to financing markets, according to Euronext.

These features and more are available to read in the SLT Collateral Annual. As ever, if you have any feedback, don’t hesitate to get in touch via editor@securitieslendingtimes.com.

Mark Dugdale
Group Editor
Securities Lending Times

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Context, not cash, is king

Decisions about collateral risk-taking need to be made in the context of a robust collateral management framework, while being conscious of the associated capital and liquidity implications, as ICMA's David Hiscock tells Drew Nicol

In March 2017, ICMA outlined the severity of the problems in the EU repo market due to a shortage of HQLA collateral. How has the situation evolved in recent months?

The International Capital Market Association (ICMA) European Repo and Collateral Council's (ERCC) short report, Closed for Business, documents the unprecedented price dislocations experienced in the European repo market over the 2016 year-end. This followed increasing concerns raised by market participants related to thinning liquidity and price volatility over previous quarter ends.

A main concern is that the price action and sharp drop in liquidity observed over capital and liquidity reporting dates, and in particular at the end of December, is an indication of a new normal for the European repo market, where demand-supply imbalances for high-quality liquid assets (HQLA) are exacerbated as dealers restrict their repo intermediation services, especially over quarter-end reporting statement dates.

What we have since observed is that subsequent reporting dates have not shown such significant price and liquidity dislocations as those witnessed over year end, when a particular conjunction of several factors occurred, but it must be borne in mind that the stresses being witnessed in the market are still significant compared to earlier time periods.

And, it remains clear that anticipating HQLA demand-supply imbalances over reporting dates, as well as the capacity of repo dealers to intermediate, remains highly unpredictable, and the associated risks for market participants are largely asymmetrical. With regulatory requirements still tightening and central bank purchasing continuing to take collateral out of the market, the pressures, for the time being, continue to build.

One significant instance of the still-building pressure from regulatory reform is the phasing in of new margining requirements, across both centrally cleared and OTC market derivatives transactions and applicable to both buy- and sell-side alike. Satisfaction of the total increased margin requirements requires a material amount of collateral, whether being directly used as margin or being sent out via repo in order to raise the cash for margin payments.

Looking just at one example of the way in which this is playing out, we have figures showing that the initial marin requested, in Q1 2017, for derivatives positions in the major central counterparties is up by €55 billion, some 49 percent, against a year earlier.

The search for HQLA collateral has led some participants to seek out collateral that has previously been locked up in less flexible market structures. Will this improve the market's problems or simply create new ones?

It seems unlikely that any one single solution, either by regulatory or monetary policymakers, will provide a quick fix for the tensions in the market. Rather, it is likely to require a number of measures as well as more rigorous, ongoing analysis of the possible impacts of various policies, in order to ensure the smooth and efficient functioning of the European funding and collateral markets.

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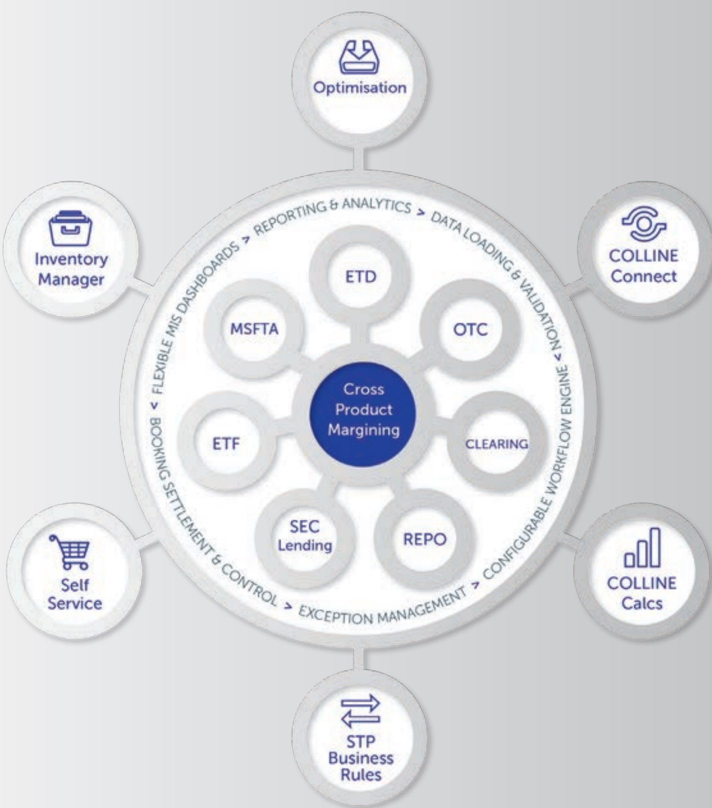

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Innovation is a consistent feature of markets, with the pace of evolution of new ideas inevitably driven to some extent by the degree of the pressures being experienced—as ever, 'necessity is the mother of invention'. This is a positive and natural response that will help to improve things. Nevertheless, it is right to be cautious and to continuously assess where risks exist that could manifest themselves as new problems.

One current example of how banks are seeking to broaden their relationships in order to access more collateral and/or funding, involves exploring the use of collateral pledging. Existing master agreements, such as ICMA's global master repo agreement, are based on title transfer collateral agreements, but there are some counterparties, including significant non-bank entities, that cannot be readily accessed using such agreements, as a consequence of insufficiently robust legal opinions regarding enforceability in certain jurisdictions. The use of pledge agreements offers an alternative way to engage and, under some circumstances, can also give rise to lower capital requirements—thereby alleviating balance sheet constraints.

For Europe specifically, the repo issue relates back to asset purchase programmes of central banks. There have been several hints that these programmes may be under review in the near future. Is it likely the programmes will be wound down soon?

Any decision regarding whether or not to wind down central bank asset purchases lies solely with the central bank and it is not for ICMA to speculate regarding when, or how, this may occur. Nevertheless, it is the case that the purchasing of assets by central banks is one of the factors that have affected repo and collateral markets. So, if, as is widely speculated, there are changes in this regard, it would be helpful.

Yet, if unnecessary market disruption is to be avoided, much care will be needed to smoothly adjust central bank policy, balancing the reduction in cash liquidity that stems from such asset purchases against the collateral market liquidity easing impacts of the wind-down. All the signs are that the central banks are well aware of these concerns and will proceed cautiously over a multi-year period. There are several ways in which they will be able to adapt over time, considering not just the rate of their purchasing, but also the ways in which they handle redemption proceeds as their holdings mature and the interest income being yielded by their portfolio.

Are eurozone central banks doing enough to push the securities they buy back out into the market via securities lending?

The non-centralised and fragmented lending schemes of the European Central Bank (ECB) and the various national central banks have long been cited as problematic, and in most cases, these lending schemes are not viewed as an easily accessible source of bonds. In response, the ECB and Germany's Bundesbank have already gone some way to making their lending programmes more user friendly.

However, many feel that a lot more could be done. In particular, a centrally coordinated programme, using standardised legal agreements, harmonised features (dates, rates, haircuts and rollover capacity), and a broader schedule of collateral (including non-sovereign bonds) would seem to remain an obvious recommendation—indeed, it remains puzzling that equities are not considered as valuable collateral. A further suggestion is ensuring that there is an adequate supply of stock, in particular German and French government bonds, available across both international central securities depositories and auto-borrow facilities, which will also help to provide a floor for borrowing costs.

Should repo participants consider lowering their standards for collateral?

Conceptually, a very wide range of assets could serve as collateral, but for the repo market it is very important that collateral can be accurately valued and readily liquidated, so the focus needs to be on those assets where there are the most liquid underlying markets.

The type of asset that comes closest to fitting the bill, and which is in fact the most commonly-used type of collateral in the European repo market, are bonds issued by creditworthy central governments. ICMA's semi-annual survey of the European repo market estimates government bond collateral to now account for about 85 percent of EU-originated repo collateral.

Yet, it remains important to consider what other high-quality collateral might also be utilised and, in this context, it is interesting to note the consideration being given by certain European officials to the possible issuance of euro-denominated sovereign bond-backed securities (SBBS). These would effectively carry several, but not joint, guarantees by sovereigns in the euro area, with the pool of sovereign assets in the SBBS being weighted (for example, by GDP). SBBS would be designed to promote risk sharing and reduce the inter-dependence between banks and their sovereigns.

It is important that market participants have strong collateral management capabilities, including a clear understanding of the collateral risks they are taking. Each individual market participant's decisions about its collateral risk-taking need to be made in the context of such a robust collateral management framework, while being conscious of the associated capital and liquidity implications, including under stressed market conditions. **SLT**

Conceptually, a very wide range of assets could serve as collateral, but for the repo market it is very important that collateral can be accurately valued and readily liquidated

David Hiscock
Senior director—market practice and regulatory policy
International Capital Market Association

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Robert Akeson, COO (left)
Richard Misiano, Head of global fixed income (centre)
Peter Volino, Head of global equities (right)
Mirae Asset Securities (USA)

Achieving strong momentum

Mirae Asset Securities (USA) is now operational in the securities lending, repo, foreign research distribution, corporate access and agency execution businesses. Its prime brokerage and correspondent clearing businesses are next, as members of the US senior management team explain

How does it feel to be in business?

Peter Volino: Being back in business feels great. The response from our clients has been overwhelmingly positive. Currently, we have 110 repo counterparties and more than 100 securities lending counterparties in various stages of the approval process.

Once OCC membership is finalised, and through the use of its stock loan programme, considerable growth in our securities lending balances are expected.

Also, we just started executing orders off our agency desk. Very shortly, we will be launching prime brokerage and correspondent clearing. Our time-to-market has been what we had expected.

Thankfully, because we are owned by South Korea's leading financial services firm, Mirae Asset Financial Group, we have had access to all resources required to undertake and successfully complete our business launch. For example, we launched with $260 million in total net capital. We also now have 60 employees.

In addition, Mirae Asset Securities (USA) has partnered with FIS on the technology front and uses its Securities360 platform. Securities360 is the first of its kind, fully-integrated solution that automates and streamlines critical tasks, from the front, middle, and back office, into a single platform, and it includes portfolio accounting for our hedge fund clients.

This facilitates operational efficiency and reduces risk—two big competitive advantages for our clients and for us. Lastly, we have chosen BNP Paribas to provide us with global custody services in the Americas, Europe and Asia. This relationship will allow us to meet the global settlement and asset servicing needs of our clients.

Can you tell us more about the Mirae Asset Financial Group and its strategic vision?

Richard Misiano: Mirae Asset Financial Group is South Korea's leading financial services firm and operates in 16 country markets, including South Korea, Australia, Brazil, Canada, China, Colombia, Hong Kong, India, Indonesia, Japan, Mongolia, Singapore, Taiwan, the UK, the US and Vietnam.

As of 31 December 2016, the group's asset management business had approximately $300 billion of assets under management. Its various broker-dealer subsidiaries and affiliates have approximately $5.8 billion in capital. So we have significant and increasing global market breadth and depth.

Strategically, Mirae Asset Securities (USA) is an extension of the formidable asset management and brokerage franchise created by the parent. For example, the parent is now considering ways to enter the asset allocation business in the US with hedge funds and investment advisers. The plan is that these assets can be custodised at Mirae Asset Securities (USA), which will enhance the information flow to, and comfort level of, non-US investors.

What are the possible benefits to Mirae Asset Securities (USA) from the activities of the parent?

Robert Akeson: We see the benefits comprising the following. First, as earlier noted, we have begun operations with a significant permanent capital base. This reality, combined with the fact that we do not roll up to a bank holding company, gives us tremendous added balance sheet 'runway' for our repo, securities lending, prime brokerage and correspondent clearing businesses. We will not be hobbled by Basel III and its ratios like other firms. Because of our globally recognised parent, our prime brokerage offering has the feel of a larger firm, but the nimbleness and attentiveness of a boutique.

Secondly, because of our parent, our clients will have access to a very distinctive foreign research product and related corporate access capabilities. We have a written content product covering a broad range of companies in South Korea, Vietnam, Indonesia and Brazil. We also have strategy pieces addressing East Asian market trends and beyond, written out of Seoul headquarters.

Finally, as the firm enters the asset allocation business, additional synergies will emerge with our prime brokerage and financing businesses and their clients.

As you gear up for the launching of your prime brokerage business, what can you tell us about it?

Volino: We are targeting emerging and small hedge fund managers and proprietary traders. These clients have been most adversely affected by Basel III and the US Dodd-Frank Act and the ensuing industry consolidation. We will also be working with introduced prime brokers who support smaller managers.

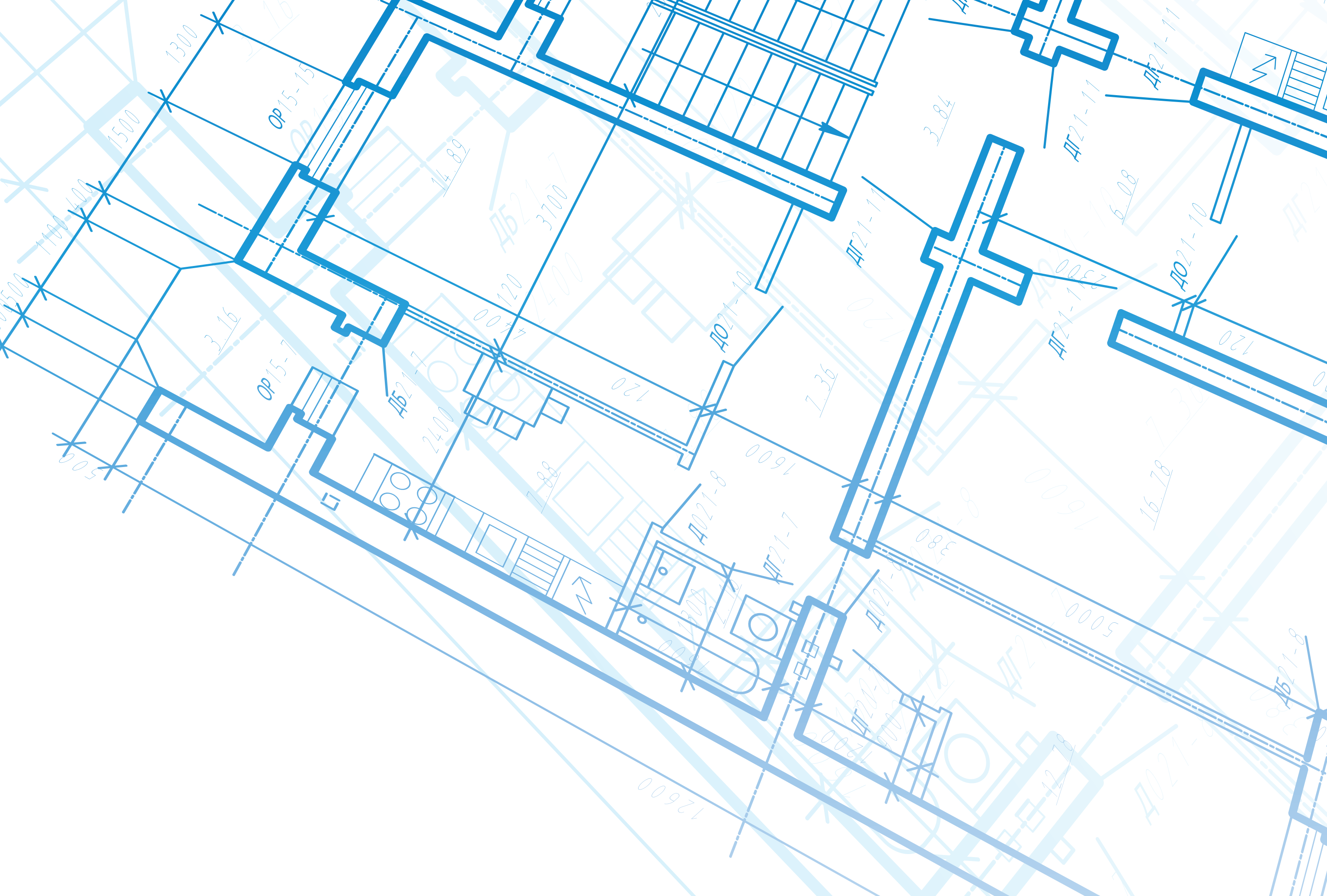
In addition, because of our balance sheet, we have been having conversations with larger funds that are seeking a significant and attentive counterparty for their secondary prime brokerage relationships.

Mirae Asset Securities (USA) offers a fully-integrated prime brokerage platform capable of providing tailored solutions around portfolio reporting and analytics, risk management and trading.

The platform will focus largely on supplying intelligent data to support our client's strategies. Taken as whole or in pieces, this platform will offer hedge fund clients operational efficiencies and risk mitigation tools.

In addition, we will provide hedge funds with a wide range of advisory services to assist them in launching, and operating their businesses, while better preparing to meet their operational due diligence needs. These services span areas including office space, enterprise technology, cyber security, compliance and human resources, and so on.

Recently, we hired industry veteran, Stephen Murphy, to lead our prime brokerage, correspondent clearing and agency execution businesses. Stephen has extensive sell- and buy-side experience with Weiss Multi Strategy Advisors, Neuberger Berman and Merrill Lynch. **SLT**



Holistic collateral architecture: Balancing collateral optimisation and regulatory compliance front to back

In a dynamic marketplace where business needs and regulatory requirements are constantly evolving, a component-based architecture can be an effective approach, according to Bimal Kadikar of Transcend Street Solutions

Financial institutions today are increasingly evaluating how best to manage their collateral needs in the face of dual challenges—how to adapt their business and operational structures to become more efficient and how to respond to and comply with ongoing demands around changing regulatory requirements. These issues resemble a seemingly difficult task, like transferring passengers from one train to another while both trains are in motion. Firms that approach front-office transformation challenges, decoupled from regulatory and compliance challenges, will miss opportunities to solve larger systemic issues in a strategic and integrated fashion. We strongly believe that technology strategy and architecture can play a critical role as firms evolve to meet these challenges.

This article looks at how businesses can strategically address their collateral and liquidity management operations and regulatory needs by adopting a more holistic integration approach that takes into account their organisational complexity, unique business requirements and their compliance mandates. Firms that get this strategy right will establish a competitive advantage and maximise limited budgets by significantly enhancing their front office capabilities, while also meeting regulatory requirements.

Managing business transformations and regulatory challenges simultaneously

Regulations such as the US Dodd-Frank Act, Basel III, the EU Markets in Financial Instruments Directive and the European Market Infrastructure Regulation (EMIR) are demanding significant changes to securities finance and derivatives businesses, which are primary drivers of collateral flow. An organisation's overall portfolio mix dictates the cost of doing business, and having an integrated view of the complete liquidity situation is critical and can't be done in isolation. These regulatory and economic forces are driving firms to integrate their collateral businesses that traditionally operated as silos.

Figure 1

At the same time, new global regulations are mandating that firms implement specific capabilities and requirements that are often quite broad, affecting many aspects of collateral and liquidity management capabilities. Consequently, these requirements are quite onerous to accomplish especially because they need to be implemented at an enterprise level.

What is required for front-office optimisation?

Typically, financial business units were structured and incentivised to take a highly localised approach to addressing the collateral requirements for their specific business lines. This historical constraint was driven by a need for domain expertise and reinforced by budgeting protocols and performance expectations that were more closely aligned with local returns on capital, revenue and income. In the current environment, making decisions within a single function misses the opportunity to achieve broader benefits to drive valuable optimisation across an enterprise. The outlying boxes in Figure 1 illustrate the standard, localised organisations that exist in most firms today, where individual business units make collateral decisions without consideration of their sister businesses' needs.

Firms that move beyond the silo approach and evaluate and prioritise collateral and liquidity requirements in a more integrated fashion across all their collateral management processes are better positioned to ensure the optimal allocation of capital and costs, realise efficiency gains and enhance profitability. Some organisations are doing this by establishing collateral optimisation units that have a mandate to implement technology and organisational changes across multiple businesses on a front-to-back basis. Potential areas that organisations are evaluating include maximising stress liquidity, streamlining operational processing, reducing the balance sheet by retaining high-quality liquid assets (HQLA) and improving the firm's funding profile by reducing liquidity buffers against bad trades for non-liquidity cover ratio (LCR)-compliant transactions.

What is required for regulatory compliance?

While many front-office businesses typically focus on creating optimal technology architecture to improve financial return metrics, there are specific regulatory-focused technology enhancements that additionally need to be implemented. In most cases, these regulatory requirements are implemented by compliance and/or operations areas, potentially away from the front office functions. This is a big challenge as these requirements are at the firm level and most firms don't have a coordinated collateral architecture in the front. In particular, recovery and resolution planning (RRP) requirements, qualified financial contract (QFC) specifications and Securities Financing Transactions Regulation reporting are a few examples that have pressing deadlines in the near future.

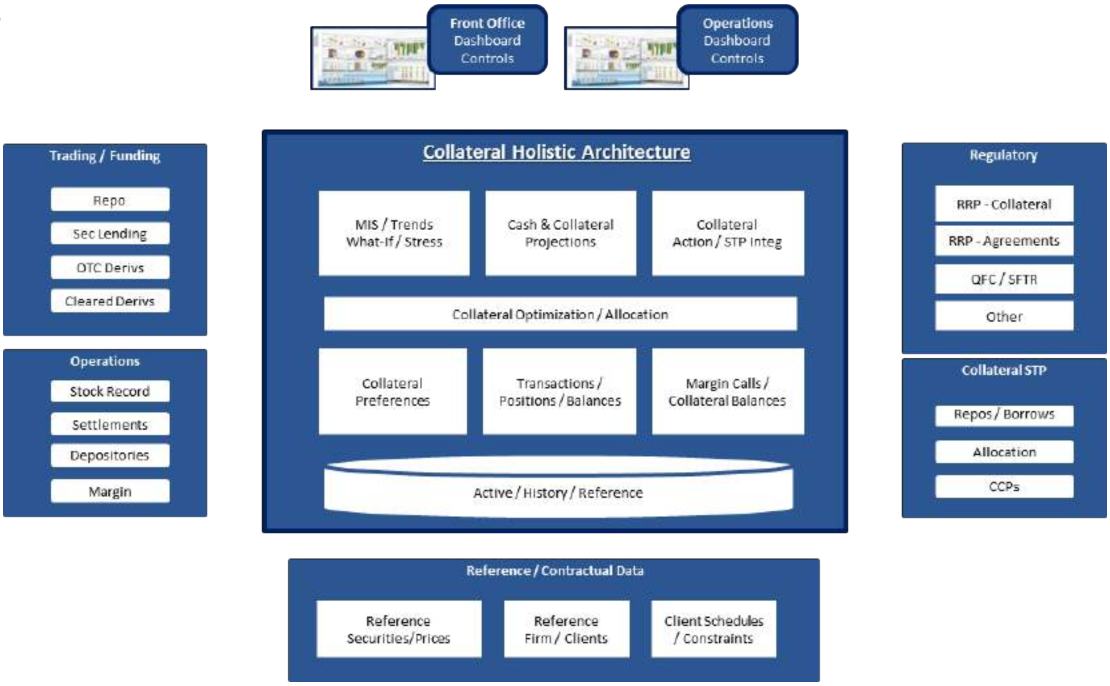
These regulations are creating significant demands on large institutions' business and technology architecture, including the need to:

- Track and report on firm and counterparty collateral by jurisdiction
- Track sources and uses of collateral at a security level across legal entities
- Conduct scenario-planning to simulate market stresses, such as a ratings downgrade or other environmental changes, that estimate impact on collateral and liquidity position in stress scenarios on a periodic basis
- Deliver daily information on their collateral and liquidity positions. Specific QFC reports will cover position-level, counterparty-level exposures, legal agreements and detailed collateral information
- Report on all securities financing transactions

To fully meet these compliance deadlines within the next 12 to 24 months, most firms do not have the luxury of adopting a strategic approach to reengineer their business and technology architecture and have been forced to take tactical steps to ensure compliance. However, it is likely that achieving compliance in a short timeframe will create huge business and operational overhead costs, as one-off solutions may not be tightly integrated and may require additional manual work and reconciliations over time. The ongoing need for changes to front-office business processes will have an impact on compliance solutions, potentially causing firms to significantly increase the operational overhead of supporting these businesses.

This can lead to a rather unfortunate outcome, in that costs for collateral businesses can significantly increase, despite hard work to drive cost and capital efficiencies.

Figure 2



A better approach: Holistic architecture

Firms that choose to tackle these operational and regulatory challenges head-on and invest to create and establish an integrated collateral architecture across business lines will have a significant competitive advantage. In a dynamic marketplace where business needs and regulatory requirements are constantly evolving, a component-based architecture can be an effective approach. As seen in Figure 2, this allows seemingly complex processes to be managed through careful consideration of the distinct business and technology architecture elements of each stakeholder to achieve the appropriate balance for their strategy in an effective manner.

Here are some important drivers to consider in your planning:

- Real-time inventory management capabilities across business lines that can be leveraged by both the front and back office. This is a critical component of the strategic architecture, with the key requirement of knowing firm, counterparty and client collateral by jurisdiction
- A QFC trade repository that is integrated across all secured financing transactions as well as derivatives trades that can be linked with positions, margin calls and collateral postings
- Harmonised collateral schedules/legal agreements repository
- Enabling collateral traceability across legal entities with the ability to produce sources and uses of collateral will ensure regulatory compliance, as well as the ability to implement appropriate transfer pricing rules to drive business incentives in the right places
- Utilising optimisation algorithms with targeted analytics can maximise a variety of different business opportunities and most importantly recommend actions through seamless operational straight-through processing.

This transition can be difficult for firms as it will need to cut across business and functional silos and it can have significant people and organisational hurdles, along with technology challenges. One key point is that these changes don’t need to happen all at the same time and firms can prioritise the approach in a phased manner in line with their pain points and priorities, as long as leadership is behind the vision of the holistic architecture.

Many firms have started this journey and those who can make demonstrable progress in this evolution will have a significant competitive advantage in the new era. **SLT**

These changes don’t need to happen all at the same time and firms can prioritise the approach in a phased manner

Bimal Kadikar
CEO
Transcend Street Solutions

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Going mobile

Dennis Mullany offers his thoughts on the future of ‘all-to-all’ collateral transformation platforms, including the new Euronext Collateral Services

At Euronext, we are constantly taking feedback from trading members on matters specific to their customer experience when using our products, and also on generic market issues that may concern them. It has not been a surprise to hear that compliance with new global regulations is a recurring theme, and in my opinion those issues fall into two categories.

The cost of complying with new regulations and reliance on traditional sources of liquidity

Regulations such as the US Dodd-Frank Act and the European Market Infrastructure Regulation have, for many buy-side clients, introduced margin requirements for both cleared and uncleared business for the first time. Traditionally, those clients would to a large extent rely on banks to provide, within their range of services, the ability to transform assets and provide collateralised cash lending, which would enable them to support their day-to-day operations. However, just as those services are becoming increasingly important to clients dealing with their new regulatory requirements, new banking regulations are having a negative impact on the ability of banks to provide them without incurring onerous costs.

To understand the conflict between the impact of banking regulations and the regulatory requirements of banks’ clients, we need to consider the assets that banks are required to hold as capital, and that clients (generally through clearing brokers) are required to provide as collateral. In order to meet their regulatory requirements, banks must set aside capital to absorb possible losses resulting from client defaults or market stress situations. In the past, those capital requirements were measured as a calculated value. Under Basel III, however, criteria have been set for the types of assets that can be used to prove capital adequacy. As a result, banks are compelled, firstly, to calculate the capital cost of doing

business, but also to ensure that they maintain a high percentage of their own holdings in high-quality liquid assets (HQLA).

Those HQLA are also the type of collateral that is widely accepted by brokers and central counterparties (CCPs) to cover margin requirements, and which buy-side clients are in some instances reliant on banks to source, if they do not hold those assets in their portfolio. The impact of that reliance can be seen through increased costs and reduced availability of choice.

As an example, for banks that provide transformation services (for example, taking low-grade securities in return for the HQLA that their clients require), the provision of that service increases their capital requirement and, depending on the quality of the assets involved, can affect the ratio of HQLA they hold against lower grade assets. The costs associated with the bank's increased capital requirement are passed to the client and in many cases the possible reduction in HQLA may discourage the bank from facilitating the transformation at all.

In addition to the transformation of one non-cash asset for another, banks have traditionally also provided liquidity services to their clients through access to repo markets. This service is vital to clients such as pension funds, which hold the majority of their assets in non-cash investments but are now required for parts of their business to settle daily profit and loss (variation margin) in cash. In this example, as with non-cash transformations, the capital costs attracted by the banks are passed on to the underlying client. We have also seen some banks withdraw from segments of the repo market, further reducing the financing options open to buy-side clients.

It is clear that banks sitting as intermediaries between clients that require HQLA and other clients that wish to use those assets to generate cash flow are attracting two sets of associated regulatory costs, which are ultimately borne by their underlying clients.

In response to the issue of intermediary costs, a number of 'all-to-all' platforms have been launched in the last two years with the aim of giving buy-side clients direct access to financing markets. At Euronext, we feel that this is an important development, not because the services that banks provide in financial markets will no longer be required, but because clients need to have other options during market turmoil or when a bank's appetite for providing that particular service diminishes.

Mobilisation of a wider set of assets for financing purposes

Along with the issue of increased regulatory costs, we have also heard increasing calls from our trading members and from industry groups to mobilise and encourage the acceptance of a wider range of assets for collateral purposes.

Securities financing markets were developed to support fixed income products through global repo trading. For government debt and, to a lesser extent, other debt instruments, the trading markets and settlement systems are well established, and although access to those markets through intermediaries can be an issue, the value of collateralised loans traded through repo markets in Europe runs into multiple trillions of euro.

However, the use of assets as collateral such as exchange-traded funds (ETFs), in which volumes in Europe have been increasing steadily over the last decade, is relatively low. There are a number of reasons for this, including the complex classification process for a product with such a diverse range of fund structures and asset classes. Also, historically, it has been difficult to systematically see through to the underlying components of some ETFs for risk purposes, which has restricted trading volumes and in turn makes them difficult to use for financing purposes.

At Euronext, we are working with ETF traders, fund issuers and market data providers to develop solutions to these issues such as standardised baskets of funds with market standard reference data. The expectation is that over a period of time this standardisation will increase acceptability across CCP and broker collateral eligibility lists, which will lead to increased liquidity in financing markets.

In the commodities markets, where financing is well established, we have seen a trend towards the creation of electronic warrants to represent the underlying assets. This was initially intended to introduce efficiencies for the settlement of physically settled futures contracts through the elimination of a paper and physical movement based process. As the range of commodities represented by electronic warrants has grown, those same efficiencies have been introduced into the process for arranging collateralised loans, provided that the necessary legal protections are in place and a liquid market exists.

As financing using electronic warrants continues to grow, we believe that the creation of an electronic marketplace open to all holders of commodities and financing banks will contribute to an increase in liquidity, and eliminate outdated settlement and financing practices.

Euronext's solution: Euronext Collateral Services

In early 2017, Euronext announced the launch of Euronext Collateral Services, with implementation in stages throughout the year. The service comprises two complementary components, Euronext Inventory Management (EIM) and Euronext Collateral Exchange (ECX), designed to operate as an integrated service.

EIM is a registrar system that is linked to external storage facilities such as wheat and corn silos in order to represent Euronext-listed commodities as electronic warrants. The platform enables the holder of the warrants to pledge or transfer title securely via an online user interface, providing visibility to parties supporting the commodities' physical settlement process or transacting financing trades.

The introduction of EIM as the preferred delivery process for Euronext commodities futures contracts introduces efficiencies and risk mitigation for clearers, physical traders and storage facilities. In addition, through the link to Euronext Collateral Exchange, the underlying assets are available for the first time on an electronic financing platform.

ECX is an all-to-all electronic collateral marketplace supporting the transformation of assets across fixed income, equities, ETFs and commodities. Along with the commodities for which warrants are created on EIM, ECX supports commodities such as precious metals not listed on Euronext, and warrants created on other platforms. The platform supports request-for-quote trading with a credit matrix enabling participants to control the potential counterparties that receive their quote requests.

The onboarding process for Euronext Collateral Services is simple. Both EIM and ECX are web-based platforms with no software or hardware requirements for participants to access the service, with standard legal documentation.

I would say that, at a time when traditional ways of doing things are being challenged for both regulatory reasons and in the search for more efficient processes, flexible solutions that provide transparent access to liquidity are key.

At Euronext, we have created an all-to-all solution for collateral transformation with focus on a range of assets and with the aim of unlocking and supporting previously untapped pools of liquidity alongside more mainstream financing markets. **SLT**

> The expectation is that over a period of time this standardisation will increase acceptability across CCP and broker collateral eligibility lists, which will lead to increased liquidity in financing markets
>
> **Dennis Mullany**
> Head of collateral services
> Euronext


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Capital punishment: Collateral takes a hit

The need to streamline the process of exposure management is only increasing, as James Cherry of Pirum Systems explains

Collateral management remains a centre-stage issue in 2017, with the market stuck in a regulatory tug of war. Punitive regulatory requirements increase demand for collateral, pulling participants in one direction. The European Markets Infrastructure Regulation (EMIR) and the US Dodd-Frank Act are massive consumers of high-quality liquid assets (HQLA).

The International Swaps and Derivatives Association estimates that encumbered collateral in support of non-centrally cleared activity alone will reach approximately $800 billion by 2020, and some estimates go to $1.7 trillion. Again, the Financial Stability Board's (FSB) proposed introduction of mandatory haircut floors for repo and securities lending will further drive demand. However, limitations on supply—Basel III's liquidity coverage and net stable funding ratios (LCR and NSFR)—pull just as hard in the opposite direction. The LCR and NSFR constrain bank assets. This has implications for the repo market, which has seen a shift away from overnight and short-term funding to longer-term arrangements (90 and 120 day maturities).

The historical pressures of month-, quarter- and year-end have become exacerbated, with liquidity restricted. December 2016 is perhaps the most striking recent example of these pressures,.The weighted average rate for German tomorrow-next general collateral traded on BrokerTec was close to -8 percent, hitting lows of -9 percent on 29 December. French general collateral also averaged around -8 percent. Such was the dislocation according to the European Repo and Collateral Council's year-end report, that "dealers quickly began to scour the screens for offers in specials that were cheaper than the prevailing general collateral rates, while banks that traditionally could only take German collateral as HQLA quickly relaxed their policy in favour of other core sovereign credits". Further proof that the market can swiftly adapt to change when necessity dictates.

Balance sheet provision is becoming increasingly complex for the sell side, forcing some banks to shy away from offering short-term deposits and repo to a segment of their customer franchise. This creates an interesting dynamic in the market. As a result, institutions are encouraged to look at expanding their liquidity provider relationships and more importantly engage with non-dealer counterparts (corporate treasurers, asset managers and clearinghouses).

To assist in the provision of supply, a number of electronic execution venues are evolving in this space, to which Pirum has established connections providing post-trade lifecycle and automated collateral management. This straight-through processing connectivity will help to bring liquidity to the platforms and allow participants that have less developed back-office infrastructures to lower the implementation burden and realise the benefits of the trading platform. Similarly, Pirum's CCP Gateway enables bilaterally traded business to be novated to a central counterparty (CCP). With the Capital Requirements Directive (CRD) IV and the Capital Requirements Regulation (CRR) both favouring centrally cleared positions, Pirum's service allows customers to gain those efficiencies in capital costs that a CCP offers.

Transparency and connectivity are becoming paramount in the decision-making process. Pirum's position, at the heart of securities finance markets, allows our clients to leverage the connectivity that we continue to build for no additional cost.

Automation of exposure and collateral management

As the industry adapts to changes that increase the complexity of collateral requirements, and the costs associated with managing collateral, more than ever there is a need for automation. Many firms are adopting enterprise collateral management (ECM) functions. The role of ECM is to centralise a firm's approach to counterparty risk management, collateral trading and funding, across multiple products.

ECM is a complicated, data-intensive goal to achieve and demands high levels of straight-through processing. It requires the engagement and collaboration of not only multiple product silos but also the front, middle and back offices. ECM requires significant investment in both time and resources and is a further reflection of financial institutions recognising the advantage that efficient collateral management can provide. Deloitte reported in a recent study that a 1 percent increase in collateral efficiency could result in approximately $1.2 million additional revenue per billion units of collateral for an investment bank with a collateral surplus ($1.09 million cost reduction for an institution with a collateral deficit).

Where exposures are captured in static time slices, the identification and resolution of breaks leading to collateral disputes is a manually intensive process. This has several impacts on cost and efficiency. Firstly, human error, the curse of fat-finger miscommunication of an exposure, can result in the wrong amount of collateral being allocated to an account. Overcollateralisation has obvious implications in additional consumption of capital and credit, but also in terms of the requirement to source additional collateral and the opportunity loss with regards to misallocated assets. Secondly, manual processes are time consuming. Exposure figures agreed later in the day afford those responsible for sourcing and allocating collateral less time, reducing their ability to ensure the most cost-effective collateral is utilised. Time associated with the overall process also has a correlation with the ability to scale a business. Additional accounts require additional resource.

Pirum's Exposure Management service automatically calculates client exposures in near real time across securities lending and repo trades, on a single dashboard for effective management oversight of the entire process. In addition, Pirum's Loan Release and Pre-Pay automation services, which work in harmony with the Exposure Management product, automatically release loans for lenders after ensuring that they are fully collateralised. For firms looking to balance their activities within the context of constrained financial resources, it simply does not make sense to tie up capital in a non-productive manner, especially when technology and automation now exists to prevent the occurrence.

Non-cash collateral

There are continued reports from hedge funds around the increased cost of funding from their prime brokers. Many asset managers report less inclination to use their long-cash balances as collateral in support of derivatives activity. Instead, many of the larger, more sophisticated buy-side firms are seeking to protect cash holdings, and more generally treating collateral as an asset class that generates yield through repo and securities lending activities.

Levels of non-cash collateral are on the rise as dealers continue to reposition and deleverage their balance sheets. Current estimates place the split at approximately 60/40, up from 45/55 only a year ago. There is a general shift in inventory with many institutions replacing equity collateral in favour of government bonds. The International Securities Lending Association 2016 market survey noted government securities as a proportion of total non-cash collateral increasing from 38 percent on 31 December 2015 to 48 percent on 30 June 2016.

The pendulum could swing the other way in the US, with proposed changes to Rule 15c3-3, which would allow collateral providers to more directly finance their equity inventories. Capital constraints stemming from the leverage ratio could be mitigated through equity-for-equity trading. With the US market historically so focused on cash collateral, Pirum's suite of automation services is perfectly placed to enable our customers to make the transition to non-cash.

The broadening of collateral profile changes amplifies the demand for triparty collateral agents, which are now well established as the boilerplate method of managing collateral for securities finance and initial margin requirements for non-cleared derivatives. However, managing these agents and their various intricacies can be time consuming. Pirum's RQV service can add significant value here, enabling users to ensure full and timely collateralisation, allowing them to focus instead on revenue-generating activities.

In fact, Pirum's service gives users a holistic view of their collateral management activities across both triparty and bilateral obligations. Users have access to fully automated intra-day position updates, close-of-business market prices and foreign exchange rates via near real-time feeds. Using this information, Pirum can calculate the required collateral value at the triparty account level for each side of the exposure, displaying the results on its secure, intuitive web portal. Pirum's proven reconciliation platform then analyses any differences and determines the root cause of any dispute, leading to a rapid resolution.

Legal framework

Another noted trend of 2017 is the growing preference by many for pledge collateral arrangements. Within such a structure, the collateral giver retains property rights with respect to the secured assets, so the assets do not normally form part of the insolvent estate of the secured party. As a result, the collateral provider does not have an exposure at default (EAD) against the recipient if the value of assets transferred exceeds that of its secured liabilities, as would otherwise be the case when a haircut is applied, for example. With supervisors requiring institutions to hold additional capital against their exposures, security interest structures can be viewed as a tool to reduce this regulatory burden.

Following the collapse of Lehman Brothers, lessons have also been learnt with regards to over collateralisation. In the case of the Lehman bankruptcy, claims for the return of excess collateral were treated as general unsecured claims on the debtor's estate, and given the same priority as general creditors. In many cases, this meant institutions that had over collateralised Lehman got back less collateral than they had posted.

Tax issues are less likely to arise with a pledge of collateral, with a reduction in the associated operational burden of dealing with taxable and other income events. A pledge also offers a reduction in other regulatory issues such as disclosure requirements.

However, under a pledge the recipient does not take full ownership of the collateral, and as such cannot generally deal with the assets freely (rehypothecation is often prohibited). A reduction in the 'velocity of collateral' may be viewed in a positive light from a financial stability perspective, as it reduces leverage. However, the tug of war dynamic or Newton's third law can again be seen at play. The velocity of collateral is akin and intrinsically linked to the concept of the velocity of money. A reduction in velocity is a reduction in the lubrication of the financial markets as a whole. In short, a reduction in collateral velocity has a negative impact on money supply in the real economy.

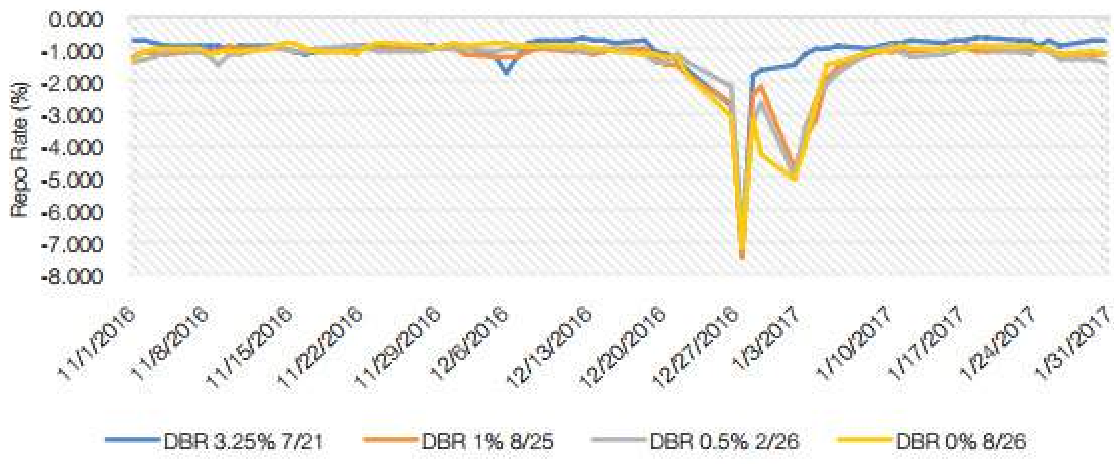
Cost of indemnification

Basel III also affects the way in which firms capitalise their borrower default indemnification. Indemnification is typically demanded and provided as a standard to beneficial owners. However, the practice in turn limits the breadth of collateral the parties are able to accept, which therefore affects the overall economics of the arrangement. This is driving discussions between agent lenders and beneficial owners about how they collateralise loans and the ways in which revenue generated is apportioned.

Balances can grow or shrink based on collateral preference. If beneficial owners are able to accept a broader range of collateral types, equities for example, they increase their attractiveness to borrowers, maintain their on-loan balances and grow revenue. Historically, beneficial owners were considered broadly equal. In the new world, the determination is increasingly multi-dimensional based upon risk weighting, geography, collateral appetite, client type and a plethora of other factors.

Cost and resource management are now a factor at every juncture of the trade lifecycle, hence the blurring of lines between front and back office, pre- and post-trade. Unsurprisingly, there is a continuing trend for firms seeking to 'do more with less'. Our customers are increasingly looking to automate, reducing manual intervention at every possible point. In days gone by, an institution may have had the resource and inclination to build internally, but increasingly regulatory drag, flatlining

Figure 1: German special market. Source: BrokerTec, ICMA-ERCC

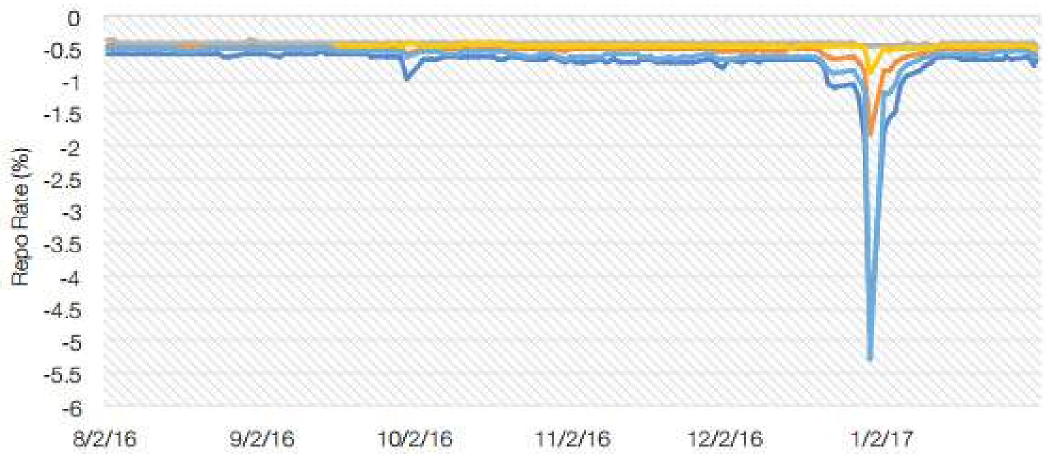


revenue, squeezed margins and shrinking financial resources, together with the increased costs of supporting legacy infrastructure, mean the market is looking to service providers to resolve non-differentiating problems via technology.

The ability for exposures to be compared and agreed automatically on a real-time basis, with exceptions automatically highlighted to both parties, is a key factor in reducing the time a firm spends simply trying to figure out its collateral requirements. This allows them to focus on utilising inventory in the most efficient manner possible in terms of both cost of capital, and cost to source.

The trend towards automation is already well developed in the market and when you add in the increased scrutiny that transaction reporting under the Securities Financing Transactions Regulation tables, the need to streamline the process of exposure management only increases. Firms that automate the way they manage exposures are better placed to deal with the demands of the new regulatory landscape. **SLT**

Figure 2: Euro general collateral rates. Source: Bloomberg, ICMA-ERCC



> Firms that automate the way they manage exposures are better placed to deal with the demands of the new regulatory landscape

James Cherry
Business development manager
Pirum Systems

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Buy-side funding pressures turning collateral into new performance driver

Many buy-side firms are struggling to find assets to meet new collateral requirements as banks stockpile cash and securities. How tight is the liquidity situation? BNY Mellon sets out to discover the answer

Rumours of diminished liquidity in global capital markets began to surface approximately four years ago. They first emerged in the corporate bond market with anecdotal reports that during episodes of market stress, liquidity in the secondary market for corporate debt rapidly deteriorates.

These reports attracted the attention of the US Treasury and the Federal Reserve, both of which have conducted studies to determine the extent of liquidity challenges in these markets.

Funding stresses among US buy-side participants first appeared in 2015 as some clearing clients began to report huge increases in their OTC clearing fees from their clearing banks. These increases were so large that they effectively drove some hedge funds out of the cleared OTC derivatives market altogether in a process that the industry has come to euphemistically refer to as 'offboarding'.

Both of these episodes share the same underlying cause: strongly improved bank capital and liquidity standards enacted under Basel III are mandating that dealers hold markedly more cash to meet bolstered capital requirements and highly-liquid securities to comply with new liquidity ratios.

To these already challenging circumstances, new requirements for market participants to post margin against bilateral OTC derivatives trades are being introduced between 2016 and 2020. This means a market already grappling with a funding strain is going to experience a substantial increase in demand for additional liquidity in the years to come.

How is the buy side responding?

In light of the diminishing liquidity situation, BNY Mellon set out in the first quarter of the year to ascertain the situation on the ground today for buy-side firms. The result of this work is a research study entitled, Collateral: The New Performance Driver.

We partnered with PwC to conduct an extensive, global research study into these issues, in the hopes of better understanding the dynamics

at play, examining the liquidity solutions the market has developed in response and trying to align BNY Mellon's own service offering to help address some of the problems the study uncovered.

Over the course of three months, we conducted more than 140 interviews with senior executives at 121 buy-side institutions across the world. The picture that emerged during these discussions was of a buy-side facing unique and challenging funding circumstances. One common concern shared by all respondents was the impact that the introduction of forthcoming non-cleared margin rules will play in exacerbating their liquidity stresses.

Beyond this common anxiety, the concerns of each of the four buy-side cohorts that participated in the study were as varied as the entities themselves. Below we highlight some of the major differences we observed among the respondents:

Asset managers: Generally the best-positioned of the entities in the study, asset managers maintain relatively high cash holdings, meaning many have the assets on hand to meet their new margin requirements. Nonetheless, 29 percent of smaller second- and third-tier asset managers reported concerns about constrained dealer balance sheets, according to the study's findings. Only 15 percent of first-tier asset managers share this concern.

Insurance companies: Insurers generally hold little cash but carry large inventories of corporate debt. These bonds—though high in quality—are generally ineligible to be posted as initial margin.

This means that insurers require access to bank collateral transformation services that can convert portions of their corporate credit holdings into government bonds or cash.

Pension funds: Of all the participants in the study, pension companies hold the smallest volumes of cash—in some cases it makes up just 1 or 2 percent of their holdings. This makes pension funds strongly reliant on their existing dealer relationships for funding. Pension funds might also need to realign their product mix in light of the new non-cleared collateral requirements and pivot away from liability-driven investment strategies in order to hold higher cash balances to meet margin obligations.

Hedge funds: Hedge funds hold lots of cash, though these balances are typically invested for alpha generation rather than to meet margin requirements. Nonetheless, hedge funds are very much dependent on their prime brokers for many of their trading needs, including margin financing and securities lending, as well as typical leverage and liquidity services. This reliance on their prime broker partners may mean hedge funds have little flexibility to explore some of the liquidity services the market is developing.

What solutions has the market developed?

One of our key goals for the study was to get a concrete sense of the solutions in the market that could potentially alleviate the liquidity challenges arising as a result of the non-cleared margin rules and other regulatory initiatives.

From these discussions, four preferred solutions emerged as most attractive to financial end users. Each of them comes with a caveat, however, likely meaning that no single solution will be sufficient to address the liquidity shortfall:

Consolidate and expand dealer relationships: By far the most popular option among the study respondents, many buy-side participants would like to simply consolidate their existing bank relationships while others are looking to expand the number of dealer counterparties they transact with.

The thinking for those looking to consolidate is that by passing more trade flow through one or two dealers, clients will be rewarded with either superior service relative to peers or preferential treatment in gaining access to bank balance sheets. Those looking to expand the number of relationships they maintain with dealers are doing so in order to diversify their risk and expand their access to the market.

This solution represents a delicate balancing act. For many entities, consolidating their number of dealer counterparties down to just one or two may leave them too concentrated and too reliant on liquidity provided by just those two banks. Conversely, diversifying among too many dealers will likely mean that buy-side entities spread their trade flow too thinly and dilute volumes across bank partners to the extent that they're unable to route sufficient flow to secure the preferential treatment accorded to more frequent clients.

As such, buy-side firms will have to determine the best course to navigate in their own particular circumstances and strike the right balance between diversified counterparty selection and maintaining meaningful trade flow with select dealer liquidity providers.

Engage non-dealer counterparties: Vast amounts of liquidity could be unlocked if buy-side firms were able to trade directly with other non-bank entities such as corporates and institutional investors.

The problem here is that these new relationships would have to be built from scratch, meaning resource-intensive counterparty credit assessments would have to be undertaken, new documentation negotiated and the new connectivity infrastructure would have to be established to enable trading.

Participate on peer-to-peer platforms: Electronic cash and collateral marketplaces such as BNY Mellon's DBVX allow buy-side participants to access bank liquidity alongside non-dealer liquidity on the same terms, opening up access to the huge universe of assets that exist outside the bank construct without any of the heavy lifting of negotiating bilateral contracts.

In addition, participants on such platforms also benefit from the price transparency of an electronic market, pre-trade anonymity and workflow efficiencies that make it faster, cheaper and easier to connect with supplementary counterparties.

Some buy-side respondents in the study stated that one element that could hold them back from embracing the peer-to-peer model is a requirement to receive credit indemnification from dealers. Platforms including DBVX are developing solutions to address this indemnification requirement.

Participate in clearing models: Central clearing of securities lending and repo trades is slowly progressing at central counterparties (CCPs) such as Fixed Income Clearing Corporation. Clearing offers substantial economic advantages over bilateral trading, including lower capital requirements for dealer counterparties, reduced margin requirements for participants and efficiencies offered by netting offsetting positions.

Despite those advantages, many buy-side firms are still reluctant to engage in central clearing due to an aversion to the many responsibilities of CCP membership, including contributions to the default fund and risk mutualisation with other clearing members.

In conclusion, the ultimate sentiment that emerged from the research study was one of cautious optimism. There is little doubt that the global buy-side community is already experiencing varying degrees of funding strain, and those stresses are likely to increase in the short term as the non-cleared margin requirements become more widespread in the years ahead.

Nonetheless, the market is responding with innovative solutions that can likely alleviate the majority of the funding challenges if used intelligently and in the right combination. **SLT**

> Buy-side firms will have to strike the right balance between diversified counterparty selection and maintaining meaningful trade flow with select dealer liquidity providers

Peter Madigan
Editor-at-large
BNY Mellon Markets

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The way forward to collateral fluidity

SIX Securities Services—through SIX Repo—is developing a new methodology based on the seamless sourcing and pooling of collateral. Head of repo and securities finance, Nerin Demir, explains more

New global regulatory requirements are currently forcing parties in the financial value chain to look differently at how they collateralise their counterparty exposures. Firms will be required to hold a greater proportion of cash and high-quality liquid assets.

SIX Securities Services—through SIX Repo—is developing a new methodology based on the seamless sourcing and pooling of collateral. In close cooperation with industry bodies, clients and regulators, it is committed to raising key challenges in the area of securities finance and developing better ways to deliver innovative, high-quality, state-of-the-art solutions.

Some of these issues raised recently cover the following topics:

The increasing demand for equity repo financing

SIX Repo has increased the number of equity index baskets and added two additional security types, US equities and fixed income (treasuries). The inclusion of US equities will enhance the already broad equity financing portfolio that SIX Securities Services offers, covering the major European indices (SMI, DAX, CAC40, FTSE, MIB and IBEX) while complementing SIX Repo's 'repo on demand' service, enabling the financing of any combination of tailored baskets.

Single access to market liquidity

SIX Repo's collateral management strategy—supported by the Swiss National Bank—builds on its current triparty service and brings a new independent and integrated solution to the market, facilitating improved access to market liquidity and collateral hubs.

The future offering will increasingly relieve the operational burden of the two entities engaged in a trade, by taking on all post-trade processing during the life cycle of the trade, such as the collateral allocation and automatic substitution, as well as settlement and payment.

The future role of distributed ledger technology in collateral management

Distributed ledger technology could eliminate costly and time-consuming collateral settlement moves, and instead track the collateral in a near real-time environment while providing almost instant insight into which collateral position is currently in use or available. This means that real-time collateral management can be plausible without any significant cost increases, providing many benefits to banks' balance sheets. SIX is currently working on two use cases to create new services leveraging distributed ledger technology—one is focusing on the product issuance process while the other is focusing on collateral optimisation capabilities.

About CO:RE

CO:RE (Collateral & Repo) is the real-time securities finance offering powered and operated by SIX Repo. It brings together trading and collateral management capabilities in a fully integrated value chain starting from trading, through settlement, and finally to collateralisation at the central securities depository or custodian level. The need to drive efficiency, reduce risk and control costs has resulted in an efficient collateral management offering for all market players, providing benefits for banks, broker-dealers, insurance firms, commercial banks and asset managers alike.

SIX Securities Services provides a multifaceted electronic trading facility offering single-point access to the over 160 counterparties trading repo contracts across 14 currencies. Central bank money and commercial bank money are both available, as well as access to the Swiss National Bank's primary market for the issuance of money market instruments. Thanks to excellent operations, the accuracy of exposure coverage and the solid legal framework, no haircuts are applied to the available collateral, whereas the range of collateral covers a wide range of currencies and geographical areas. **SLT**


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Smooth as the buy side likes

Martin Seagroatt of Broadridge Financial Solutions analyses the challenges that buy-side firms must overcome in the new collateral management landscape

Buy-side firms face a number of major challenges around the collateral management process.

These challenges include a need to hold or source larger quantities of cash or high-quality collateral for variation margin and initial margin to support cleared and uncleared derivatives activity. This creates a significant drag on alpha for many buy-side institutions in the current low-interest rate environment.

Another challenge is the rise in the volume and frequency of margin calls. This results in an increase in collateral movements to meet more demanding settlement cut-offs for both centrally cleared and bilateral counterparties.

The third is demand from the sell side for beneficial owners to move down the liquidity curve in the collateral they will accept. This is coupled with a preference from the sell side for longer-term financing structures due to regulations such as the Basel III's liquidity coverage ratio (LCR) and potentially the net stable funding ratio (NSFR).

Each of these trends results in a need to re-evaluate existing processes and technology solutions to adapt effectively to this large-scale paradigm shift in the collateral management landscape. In this article, Broadridge will discuss the technology implications of each of these trends.

Increased need to hold or source high quality collateral for derivatives margining

Regulation has resulted in the market pulling in two different directions to some extent. On one side, buy-side firms need to source more collateral of a higher quality than in the past to satisfy these increased obligations. However, holding these asset classes internally creates a major drag on returns. It is therefore more cost effective for the buy side to engage in collateral transformation/upgrade trades with the sell side in the securities lending and repo markets to meet this need.

However, the leverage ratio has resulted in a balance sheet impact on the sell side when offering these trade types. This imbalance between supply and demand has resulted in a rationing of collateral upgrade trades and limited availability, particularly over sell-side balance sheet reporting periods.

The market is now increasingly interested in new electronic peer-to-peer collateral platforms in the securities finance space to take up the slack. This sees, for example, two pension funds trading directly with each other where one is short high-quality liquid assets (HQLA) and the other has excess HQLA.

Of course, sell-side intermediaries provide valuable services for the buy side, including indemnification, maturity transformation and counterparty credit risk intermediation. For these reasons, peer-to-peer appears set to become another channel to tap into market liquidity rather than completely disintermediating the sell side.

This hybrid model sees liquidity sourced via different routes to market depending on cost and availability at a given moment in time. In future developments, technology solutions may play a bigger role in providing analytics that guide decision making around the optimal source of liquidity for buy-side firms.

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Some larger buy-side firms have already begun this transformational journey and an emerging theme is the creation of central collateral funding and liquidity functions to create internal markets for collateral.

Technology has become a key foundation for this new model. Systems such as the Broadridge Securities Finance and Collateral Management (SFCM) solution allow the firm to centralise collateral inventory and exposures across funds and geographical locations.

Collateral managers can then utilise this technology to internally source the lowest cost collateral for margining needs before sourcing more expensive collateral from external providers.

Once collateral has been sourced in an automated way to meet margining needs, the collateral solution can identify any surplus collateral that is trading special or is CCP- or Basel III LCR-eligible and lend/repo it out to the market. In the current low-interest rate environment, this provides significant opportunities to enhance yield.

The key to all of this is the ability to aggregate inventory using technology and then automatically source cheapest-to-deliver collateral at the touch of a button. This can result in significant time savings over more manual methods of sourcing assets.

An integrated solution for securities lending, repo and derivatives collateral management is another cornerstone for this matching process. It allows a clear view of liquidity across siloes and business lines and paves the way for more effective collateral optimisation.

As new platforms arise, the ability to connect collateral systems to market infrastructure will become more important in the future. Connecting to central counterparties (CCPs), clearing brokers/futures commission merchants (FCMs), peer-to-peer platforms and electronic markets, and then combining aggregated market views of collateral supply and demand with the firm's own inventory provides a way to match collateral supply and demand more efficiently and effectively.

Likewise, solutions offering real-time connectivity with triparty agents are becoming essential as use of these services becomes more widespread in response to regulatory mandates around segregated third-party custodian accounts.

A rise in the volume and frequency of margin calls and collateral movements

Regulatory mandates for more frequent margining to more demanding settlement cut-off times create an exponential increase in operational workload. The need to mobilise collateral more quickly also results in a major rise in collateral lifecycle processing, settlement failures, reconciliations and disputes.

Technology solutions that can automate these manually intensive processes are now critical to meeting regulatory requirements with minimal increase in headcount. They also help to mitigate the increase in operational and settlement risk. Solutions such as Broadridge's that offer settlement automation, coupled with clear workflow views to manage settlement failure, offer significant improvements on manual processing or spreadsheets.

This allows collateral managers and operational leads to focus on making strategic decisions around the firm's collateral and liquidity profile, rather than constantly battling day-to-day operational tasks. Integrated margin messaging and reconciliations platforms also provide a way to increase automation of these time consuming activities.

In the future, we may also see the rise of blockhain platforms for mobilising collateral more efficiently. Technology solutions that can plug into this infrastructure will enable buy-side firms to take advantage of the benefits of blockhain, should it become widely used.

A move down the liquidity curve in acceptable collateral and longer term structures

Regulatory demands for the sell side to meet Basel III liquidity coverage ratios have seen borrowers in the securities finance markets offer higher fees for beneficial owners that are prepared to accept lower-quality collateral in exchange for lending HQLA at longer terms.

The ability to manage the eligibility and concentration risk of this collateral using sophisticated technology solutions allows the buy side to increase returns from lending programmes and expand business opportunities in a way that is acceptable to the firm's risk profile. Likewise, systems that can handle evergreen and extendible term structures are now becoming essential components in the changing collateral landscape.

The widespread regulation-driven step change described above is resulting in a need to either outsource collateral management activity or improve existing technology solutions to ensure they are fit for purpose in the new, more dynamic environment.

Strategic collateral management technology solutions such as Broadridge's can provide major benefits in matching collateral supply and demand across the firm, allocating costs, automating manual processes and improving decision making around the collateral lifecycle.

While some regulatory mandates are yet to fully affect the buy side, it is important to take a long-term view of these trends and begin selecting future proof technology systems to position the firm for success. With collateral increasingly becoming a key performance indicator for the buy side, it is important to act now to ensure a smooth transition to the new operating environment. **SLT**

The need to mobilise collateral more quickly results in a major rise in collateral lifecycle processing, settlement failures, reconciliations and disputes

Martin Seagroatt
Marketing director, securities finance and collateral management
Broadridge Financial Solutions

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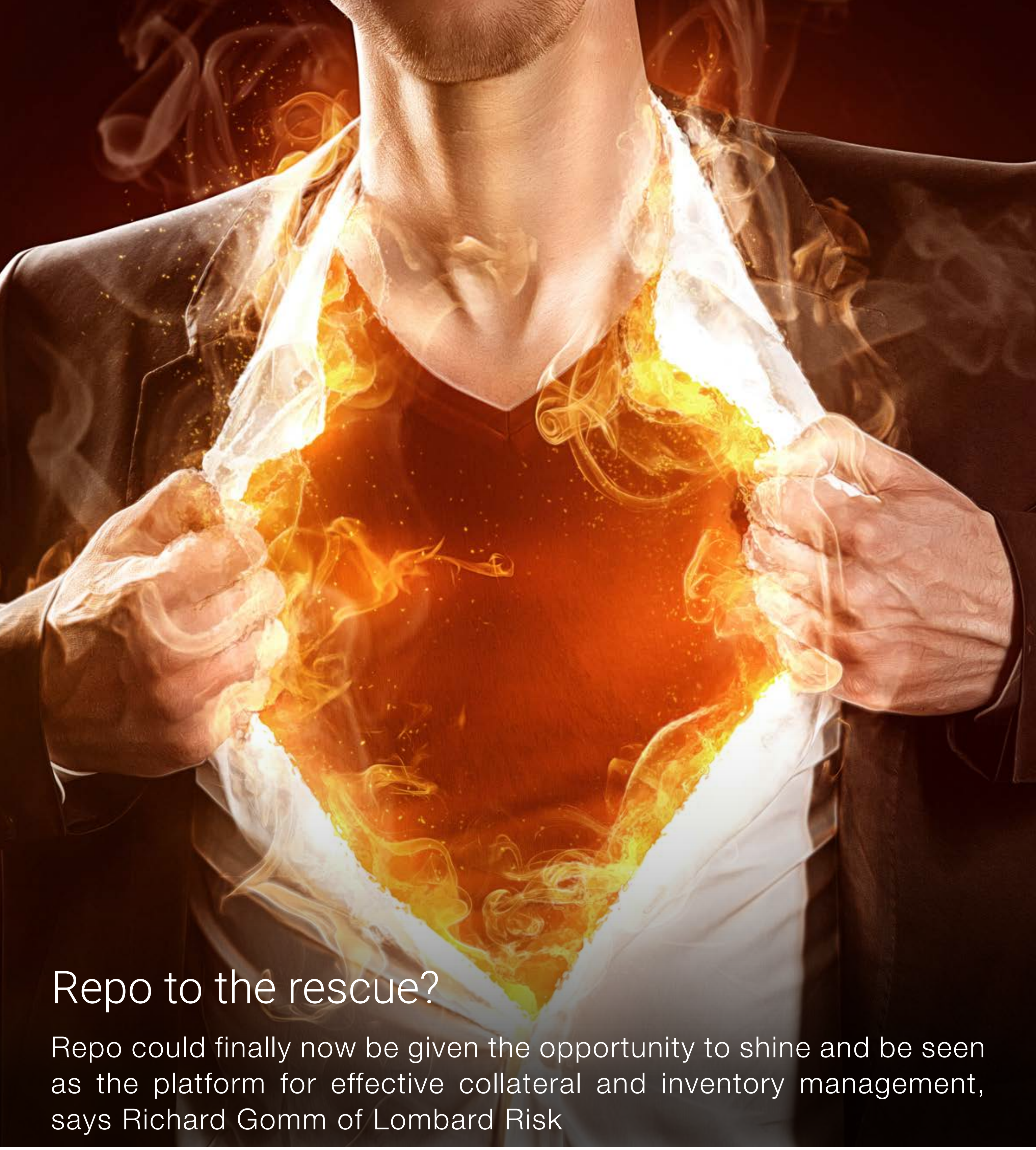

Repo to the rescue?

Repo could finally now be given the opportunity to shine and be seen as the platform for effective collateral and inventory management, says Richard Gomm of Lombard Risk

Once upon a time, in a regulatory landscape far, far away—may sound like an opening to a fairy tale, but the reality is that the regulatory landscape is now beyond recognition for even the most grizzled and battle-hardened of collateral managers. The Dodd-Frank Act, Basel III, European Market Infrastructure Regulation and other global equivalents have left the collateral pool shuddering at the concept of an unprecedented demand for collateral comprised of high-grade assets and an increase in haircut provisions. While it is noted that increased collateral requirement in the market means greater safeguards against default, conversely the ever-increasing demand for high-grade collateral also has an inherent destabilising market factor.

Buy-side institutions have limited access to large inventories of high-grade collateral, which gives rise to the phenomenon known as 'collateral scarcity'. The current economic climate, coupled with stressed market conditions, only exasperate this notion, which, in the collateral world,

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Its subsidiary, Daewoo Securities (America) Inc., is planning to enter the Prime Brokerage, Global Securities Lending, Repo, Delta One Trading, and Correspondent Clearing businesses in the US.

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means higher margin call volumes, an increase in the number of margin disputes and adverse operational capacity implications.

Since the 2008 financial crisis, regulators have made huge strides towards stabilising the global financial system via regulatory reform. This has essentially created a tornado of regulations, consuming all forms of high-grade collateral in the market, leaving a trail of fewer and fewer smaller institutions and buy-side firms in its wake as a direct result of the new and all-encompassing collateral requirements. Additionally, liquidity ratios and capital requirements are coming under increasing pressure from regulators—all of which are fuelling the whirlwind—and ultimately creating a perfect storm.

Global financial institutions are striving to manage risks and collateral requirements as efficiently and intelligently as possible. Now more than ever, there is a distinct need to reduce the fragmentation of global collateral pools. As more and more firms are finding it too expensive to manage collateral on a cross-border basis, secured financing is now seen as one of the most effective techniques in meeting the new-found demand and squeeze on collateral pools.

Secured financing is a critical contributor to the efficient functioning of global capital markets. The securities financing business is gathering momentum and repo agreements have been established as the flagship securitised finance product, with more and more firms becoming savvy to its importance to the entire industry. Repos are the most widely and commonly used securities financing transactions and are fast becoming the foundation of capital market liquidity.

For those of us who remember the 'good old days', repo agreements, in conjunction with collateral management in general, were somewhat viewed as a back-office function domiciled within operations—an afterthought in many ways. However, the lowly repo transaction is now viewed as an integral component of the banking industry, aiding liquidity and effective inventory management. Repo transactions are fundamental to the provision of an untapped global inventory of high-grade collateral to smaller institutions and buy-side clients, while simultaneously providing sell-side intuitions with further profitable business and revenue streams.

With this in mind, a significant byproduct of regulatory reform is concentrated around the repo market and the anticipation of an unprecedented spike in repo trading volumes. However, gone is the era when efficient and effective credit risk management of repos could take place with the use of a notepad and an abacus. The increasing market demand for these transactions brings with it additional complexity and operational challenges in supporting them. As a result, financial technology companies and their solutions have moved to the forefront of a previously antiquated collateral management space.

Improving efficiency in repo collateral management is, as always, proving a challenging task. One of the biggest obstacles envisaged by institutions pertains to IT complexity in the form of product silos, multiple systems and data touch points and a lack of technical integration. Significant initiatives in this space include the move towards single-platform, cross-product margin systems and electronic messaging. Many of the repo processes in place today have not been historically dynamic in approach. Process automation, calculation and pricing flexibility are areas of concern given the anticipation of greatly stressed repo trading volumes on the horizon.

Control should be at the forefront of any efficient repo collateral management process and ultimately be automatically embedded into technology workflows. The support and validation of collateral eligibilities, concentration limits and sufficiency checks are often manual and exposed to a great deal of operational risk in the repo space. Therefore, the introduction of any margin system should provide a safeguard to operational risk by preventing the booking of ineligible collateral and, where possible, assisting in the identification of the most optimal collateral postings. Repo margining would benefit greatly from dynamic exposure calculation and real-time integration to upstream and downstream data sources. There is now a real need for automated statements and reconciliations that would ultimately reduce the need for external solution provisions by third parties.

Firms need to be gifted the technological flexibility to support the wide variety of margin methodologies employed globally without manual intervention, and the ability to re-run calculations on an 'any-time' basis, especially in market stress scenarios. The growing need to forecast exposures and simulate 'what-if' scenarios is key to enabling and maximising an efficient management of collateral inventory. This can further be achieved by breaking down product silos—providing a holistic, cross-product view of risk to optimise firm-wide collateral inventories. Competitive advantages such as these are not only proving to be critical to the success of any institution, but to the financial industry as a whole.

In conclusion, since the collapse of Lehman Brothers, the use of repo agreements has experienced a cultural revolution. Long gone are the market perceptions that repo collateral management is the poor cousin of its OTC counterpart. No longer is repo, or collateral management in general, lurking in the shadows of the more en-vogue front-office machine.

Under the ever-changing regulatory landscape, post-trade operations are becoming key drivers of profit. Access to high-quality collateral positions via repo transactions, coupled with a competitive edge gained from technological efficiencies, is vital to market liquidity and the elimination or easing of the collateral scarcity phenomenon. Is the historically undesirable repo of the collateral and trading world now at the very forefront of market stabilisation? From its humble beginnings, repo could finally now be given the opportunity to shine, and be seen as the platform for effective collateral and inventory management. **SLT**

Repo transactions are fundamental to the provision of an untapped global inventory of high-grade collateral to smaller institutions and buy-side clients

Richard Gomm
Collateral management consultant
Lombard Risk

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Top of your game: What the modern collateral manager can learn from elite cycling

To optimise collateral management, you should be clear on the objectives, question everything, and make sure you have the right team in place, says Ted Allen of FIS Global

I'm typing out these words on a glorious summer's day surrounded by the high French Alps. My bicycle is cleaned, oiled and ready to roll. Looming above me is one of cycling's iconic climbs that's feared, respected and adored by both professionals and weekend warriors, like me.

Others will argue, but for me the toughest challenge in professional sport is the Tour de France. Three weeks and more than 3,000 kilometers of unrelenting effort where only the strongest, most strategic and best organised teams have a chance of delivering the winner's yellow jersey.

Something remarkable has happened to that race over the last few years. A brand new team with no road cycling heritage was formed with the stated aim of delivering a British winner of the tour within five years. The old hands cried hubris, but Team Sky achieved that goal not in five years but in two. To prove that was no fluke, Team Sky then went on to win five of the last six tours. While others try to close the gap, they continue to dominate the podium.

This unprecedented performance came in the face of changing regulations, internal challenges and fierce competition. They did it with a relentless, laser focus on what it takes to win that one race, by embracing changes in the regulations and by questioning everything that others had done in the past. They initiated a culture of marginal gains, finding improvements in every aspect of preparation, training, organisation, race strategy and equipment. The team director, Dave Brailsford, described marginal gains as: "The 1 percent margin for improvement in everything you do." Every marginal gain, however small, contributes to the overall chance of success. As I get ready to pull on my kit, clip in and start my (un-Sky-like) slow slog to the summit of the mountain above me, my mind is drawn to the parallels for the modern collateral manager.

Global regulations have fundamentally transformed collateral management. Collateral now touches every aspect of capital markets activity, pre- and post-trade, across all asset classes and, whether your focus is trading, risk management or operations, this transformation creates opportunities as well as challenges.

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* Source: The Banker Database (as of 30th November 2016).

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Regulations and expanding market infrastructure require a fundamental reassessment of how collateral is managed, but just like Team Sky, elite capital markets firms are using marginal gains to turn those threats into opportunities.

Collateral management has become the key area of focus and change for firms across the buy side and the sell side. Let's take a look at the top three opportunities for marginal gains for elite collateral managers today.

The regulations governing central clearing of derivatives, margin rules for uncleared trades, FINRA 4210, Securities Financing Transactions Regulation and others create a set of challenges for the collateral market. Firms have to invest to address the core challenges of:

- How do I become compliant with all these regulations across different regions and different asset classes?
- How do I deal with the complexity that comes from different workflows, different calculations and different types of collateral?
- How do I handle the volume increases of all these new regulations?

Tactical solutions have got some firms over the hump of compliance, but just like getting to the finish line is not enough if you're not winning a bike race, just being compliant by throwing bodies at the problem or putting in workarounds is not enough. Now is the time for the leaders to look for marginal gains in collateral operations infrastructure and processes to make the transition from the tactical to the strategic.

Customers of FIS Apex Collateral benefit from the full support for regulatory compliance across asset classes. Apex Collateral's lean operations module automates the complexity and enables the collateral operations team to optimise its performance. It delivers straight-through processing for enterprise collateral operations. Collateral calls can be calculated, communicated, agreed and settled in a fully hands-free environment where every step can be automated. So, the operations team concentrates its efforts on exception management only. Apex Collateral's automated environment for regulatory compliance and lean operations empowers you to concentrate your talent where it adds value. The productivity gains drive the investment.

The collateral marketplace has transformed from an operationally intensive, entirely bilateral model dominated by emails and phone calls to a much more interconnected ecosystem. Collateral managers now interact with triparty agents, custodians, central counterparties, futures commission merchants, initial margin calculators, TriOptima for reconciliations, AcadiaSoft for margin call messaging, liquidity hubs, central legal agreement repositories, supplemental security income stores and more. All this offers huge potential for marginal gains in efficiency and control if you can connect your collateral management infrastructure to bring this all together.

Apex Collateral's connectivity server provides real-time, out-of-the-box connectivity for our clients to all the major collateral market utilities. They benefit from this interconnected world, allowing seamless flow of data and full automation of the collateral management lifecycle.

Marginal gains in connectivity provide the means for data to flow smoothly from sources for exposure, market data, risk and static, through your automated collateral workflows and then back and forth with your market counterparties and settlement infrastructure. Real-time, standardised connectors are essential to take advantage of the new collateral landscape.

Successful teams win not only because they have the top talent, but also because they give them the tools and the organisation within which they can excel.

The extra collateral required to support central clearing and the uncleared margin rules has been estimated in the region of $800 billion, according to a Bank of England quantitative impact study, and at several trillion dollars by others. At the same time, banks are grappling with the impact of the regulatory ratios by minimising balance sheet impact and dealing with competition for high-quality liquid assets. We see opportunities to increase the velocity of collateral, to move assets around to maximise the return on inventory.

To succeed on the Tour de France, a cycling team is constantly making decisions about where and when to allocate its resources. If we compare the cycling team members to a pool of collateral, each must be allocated in the way that adds most value to the team, and that allocation will be constantly reassessed and juggled by the team director as the race evolves. At the finish line, if the team does its job correctly, all members will give maximum value to the overall team goal of winning.

Apex Collateral is a fully automated tool that our clients use to gather inventory together in real time and to optimally allocate their assets to trading, capital and collateral requirements. The collateral optimisation desk plays the role of team director, moving those assets around as liquidity, funding and collateral requirements change all the time with an eye on managing the balance sheet. Our clients are able to realise significant basis point savings on the cost of collateral and at the same time automate the allocation of assets and transfer pricing.

So, to wrap up this tour around the tactics that it takes to succeed in the new collateral reality: search for marginal gains in every aspect of your process—front to back—and the technology choices you have made. To optimise collateral management, you should be clear on the objectives, question everything, make sure you have the right team operating the right equipment to give you the platform you need to finish at the front of the peloton. **SLT**

Search for marginal gains in every aspect of your process—front to back—and the technology choices you have made

Ted Allen
Business development, Apex Collateral
FIS Global

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Leading from the front

Clients and senior members of Calypso Technology discuss how its technology helps in a segment characterised by complex requirements

During the Calypso Client Conference in London, senior members of the Calypso product management and customer success management teams discussed how the firm's Collateral Management solution is developing and how to anticipate the evolving needs of clients and the global financial markets. Some of the Calypso clients also shared their views on how the Calypso solution has helped to advance their business.

Calypso Technology offers a cross asset, front-to-back collateral solution. How does it compare with other standalone solutions in the market?

Alan Sheehan, director of product management at Calypso Technology: Purely from a collateral management point of view, I think that the Calypso Collateral Management solution is equal to the 'best of breed' solutions. A key differentiator is the ability to offer a consolidated platform.

Firms are looking to reduce the number of systems in use and to simplify their processes. Infrastructure cost savings are still important but, increasingly, the business is demanding horizontal consolidation of exposures in a single solution. Calypso can address both of these concerns. Calypso displays a holistic view on risk and funding requirements across products and entities, facilitating quick and efficient decision making.

Furthermore, Calypso offers flexible deployment options: a standalone system for collateral, integrated with Calypso post-trade processing (offering the full suite of back-office functionality), or with the Calypso Securities Finance solution. In addition, Calypso provides a 'Collateral as a Cloud' service to further simplify the deployment and reduce costs. Clients can meet their needs for an advanced collateral solution quickly, with the option of expanding the usage in the future to reduce costs and reap the benefits from a consolidated, cross-asset platform for trading, risk management and full back-office processing.

Leveraging Calypso's award-winning post-trade processing functionality allows us to have real-time visibility of the back-office processing, which is particularly important for collateralising the securities lending business.

Our ability to calculate margin requirements for both cleared and uncleared derivatives (using ISDA SIMM), including pre-trade what-if analysis, means that we can address our clients' needs to comply quickly with the recent Initial Margin regulatory requirements. This, coupled with a centralised real-time inventory management view across products and business entities, together with post-trade optimisation, offers powerful tools for transforming the management of collateral.

The Calypso Collateral Management solution is standardised to create a best practice solution at minimal cost to our clients. We offer multi-agreement support (including GMRA, GMSLA, ISDA CSA, and cleared OTC and ETD), as well as out-of-the-box connectivity to utilities and triparty services.

The Calypso workflows support the entire collateral management lifecycle. The central view of inventory enables organisations to optimise the use of their assets to cover exposures. Another reason Calypso stands out from its peers is the dedication to innovation and working in close partnership with our clients.

Can you give examples of Calypso-client partnerships supporting business innovation?

Sheehan: The market has been faced with recent pressures to comply with new regulations and cope with squeezed margins. Many firms have turned to technology to reduce costs and support business innovation. Some agile financial institutions have seized the opportunities the changing regulatory landscape has provided and have looked for a technology partner that can help to transform their business model and seek new revenue opportunities.

Alberta Investment Management Corporation (AIMCo) is one of Canada's largest and most diversified institutional investment managers with more than $90 billion of assets under management. AIMCo selected Calypso Technology as its partner to simplify and consolidate its collateral management across separate portfolios and business units while also introducing a transparent structure for the optimal use of collateral.

Michael Baker, senior vice president of investment operations at AIMCo: Although we were facing the market under a single name, the management of collateral was decentralised and we were relying on multiple platforms and spreadsheets to monitor, calculate, communicate and process collateral for different strategies. This has been simplified with the implementation of Calypso's Collateral Management module.

As the same counterparties were used across our internal entities, we realised that there was a more agile way of optimising the pool of collateral available but this would require a centralised view of inventory. We needed a new, centralised system architecture to provide the exposure and available collateral from each unit to our collateral management group while maintaining and displaying the owners of both.

We had a vision of a consolidated system that could give us a simple and transparent view across all funds, allowing us to optimise the use of collateral, seek new revenue streams and improve profit margins.

We selected the Calypso Collateral Management solution and worked in partnership with Calypso Technology to create a transparent portfolio lookthrough where it would be possible to allocate the exposure back to the eligible pools. In addition, the Calypso system offered the possibility to optimise the allocation of fund assets to external counterparties, including the use of rehypothecated collateral with the ability to track the source and destination of the collateral.

The Calypso system allows us to assign a value to the collateral depending on the various demands from different markets we operate in, and enables us to seek new revenue opportunities. The Calypso solution has provided us with a powerful centralised, real-time inventory management view which truly reflects our business model.

Sheehan: This is an example where we have worked in close partnership with a customer to deliver functionality to support its business transformation. This has been a benefit to AIMCo, Calypso and other clients as enhancements are made to our core Calypso product and shared across our client base.

Corinne Grillet, chief customer officer at Calypso Technology: Take the example of BNP Paribas Securities Services, which has a distinguished track record for providing premier client service and operational excellence.

> The Calypso system offered the possibility to optimise the allocation of fund assets to external counterparties, including the use of rehypothecated collateral

Michael Baker
Senior vice president of investment operations
AIMCo

We are pleased to be trusted to support its end-to-end post-trade processing services with the Calypso integrated front-to-back architecture.

Amor Chebira, COO of market and financing services at BNP Paribas Securities Services: With the Calypso solution, we have been able to consolidate our securities lending and repo activities resulting in significantly improved collateral management capabilities.

How has regulation affected your development of the Calypso software?

Sophie Marnhier-Foy, principal product manager at Calypso Technology: In the past, margin requirements have significantly increased, with the implementation of the Basel Committee on Banking Supervision-International Organization of Securities Commissions margin requirements for non-centrally cleared derivatives, and the expansion of clearing mandates. Once the phased implementation has been completed, most derivative trades will be subject to initial margin, creating substantive costs in terms of collateral requirements.

Calypso Margin not only offers a tool for compliance with the new regulations, but also a solution to optimise the collateral and reduce the total cost of the trade. With Calypso what-if margin simulation, the cheapest trading venue can be selected, based on ISDA SIMM and major CCP OTC margin methodologies. Calypso Margin also offers post-trade margin calculation and decomposition reports, in order to validate and analyse the margin costs.

Sheehan: The BCBS-IOSCO regulation has been a big driver for us to ensure necessary tools were integrated as part of our standard framework. As an ISDA-licensed vendor, Calypso provides the ability to both calculate the initial margin requirement using ISDA SIMM methodology and process the initial margin using the Collateral Management solution, adhering to regulatory concentration limits, eligibility, wrong way risk and segregation.

Our tier-one clients have had to comply with the initial margin requirements since their introduction in September 2016. This should comfort our wider client base, which will be affected by the phased implementation of the initial margin rules, knowing that the system offers full support. In fact, some of our buy-side clients will comply with the initial margin rules earlier than the actual regulatory deadline to benefit economically from preferential pricing offered by their brokers.

As of March 2017, everyone had to comply with variation margin regulation. Calypso clients have been able to advance their business knowing that their system offers full support for both the initial margin and the variation margin regulations.

What is your current focus for developing the Calypso Collateral Management solution and how do you decide the direction?

Sheehan: All our developments are aimed at further enhancing the user experience, making Calypso easier to implement and to reduce the total cost of ownership.

The cloud deployment is an example of this. The Calypso Cloud solution further standardises the system for a quick time-to-market and reduced costs in terms of maintenance, upgrades, implementation, hardware and support. This is an attractive option, especially for our buy-side clients and medium-sized or smaller banks.

Data is a general concern in the industry—how to access it in real time and how to make most use of it. At Calypso, we are constantly working on improving our real-time dashboards and central views of inventory to provide full transparency for easy decision making.

Looking ahead, we are also analysing blockchain technologies, where we have a partnership with the R3 Consortium.

Grillet: We are proud to have a substantial client base and equally pleased to see it being so diverse, ranging from clearinghouses/CCPs, to large investment banks, asset management firms, pension funds and increasingly, hedge funds. In fact, nine CCPs rely on Calypso Technology, clearly demonstrating our leading vendor position in this segment that is characterised by rather complex requirements.

The diverse usage of Calypso demonstrates the depth and breadth of the functionality, as well as our close ties to all market sectors. We need to anticipate and respond to how new regulation is affecting different client segments across the globe.

In terms of our own roadmap, we always take on board feedback from our clients, along with discussions with regulators, as key drivers when choosing our directions for development. With more than 200 customers across our services and more than 55 live on our collateral product alone, we get a lot of useful feedback. We actively promote discussion with our clients, as well as between different customers themselves, through client conferences such as this, and by facilitating smaller user group meetings. **SLT**

> With the Calypso solution, we have been able to consolidate our securities lending and repo activities

Amor Chebira
COO of market and financing services
BNP Paribas Securities Services

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BNP Paribas Securities Services is a multi-asset servicing specialist with 34 offices around the world covering more than 100 markets. As of 30 September 2016, BNP Paribas Securities Services had USD 9.577 trillion in assets under custody, USD 2.174 trillion in assets under administration, 10,381 funds administered and over 9,530 employees.

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- We facilitate the trading and settlement of assets through our broker-dealer, global markets and treasury services activities.
- We hold and service assets for beneficial owners through asset servicing.
- We provide a distribution channel for assets through our Pershing platform
- We can restructure those assets, as in the case of debt restructurings, through corporate trust.
- We support the rapidly expanding collateral management needs of both the buy and sell-sides through our global collateral services business.

With the formation of our Global Collateral Services division, we have brought together four of the businesses that have a central role to play in solving collateralisation challenges—agency and principal securities lending; tri-party securities financing; our Derivatives360 OTC derivatives collateral processing service; and liquidity management—to help buy-side and sell-side firms address their needs around liquidity, efficiency and the segregation and optimisation of collateral.

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The Broadridge Securities Finance and Collateral Management Solution (SFCM) provides an integrated front-to-back office solution for financial institutions of all sizes. The system is a real-time, multi-currency solution for all securities finance trade types. It helps smaller direct lenders through to custodians, brokers and other intermediaries to manage the securities finance process more easily.

The solution supports both agency and principal trading of equities and fixed income securities on a global basis.

Broadridge offers integrated or standalone systems for securities lending, repo, collateral management and collateral optimisation.

Broadridge's solutions help customers to:

- Make more intelligent use of capital, balance sheet and liquidity
- Increase efficiency, reduce costs and free up time for strategic decision making through automation of manual processes and clear views of complex data
- Comply with new regulations with minimal headcount increases
- Improve customer service and expand trading opportunities
- Reduce IT costs by replacing multiple systems with a single global solution

For more information about Broadridge and our proven securities finance and collateral management solutions, please visit www.broadridge.com.

Calypso

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Calypso Technology has 21 offices around the world

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Calypso Technology Inc is a leading provider of cross-asset front-to-back technology for financial markets. Calypso software and cloud services support trading, processing, accounting, risk management and compliance in a uniquely integrated platform, bringing simplicity and cost efficiency to today's business and regulatory imperatives.

The Calypso Collateral Management Solution offers:

- Pre- and post-trade optimisation
- Centralised, real-time inventory
- Optional seamless integration with securities finance
- Cross asset coverage
- Multi-agreement, multi-sector support
- Triparty integration and utility connectivity
- Flexible deployment: standalone, integrated or as a cloud service

With 35,000 users in 68 countries, Calypso addresses the needs of capital markets and investment managers, providing solutions for collateral optimisation, securities lending, clearing, treasury management, and enterprise risk. The firm is consistently granted the most prestigious product and technology awards in the industry.

Calypso is a registered trademark of Calypso Technology Inc in the US, EU and other jurisdictions. Other parties' trademarks or service marks are the property of their respective owners and should be treated as such.

Elixium

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Repo and securities lending are the engine of the financial markets. However regulatory initiatives, designed to improve the robustness of the financial markets, have made many transactions economically unviable. This has led to the normal liquidity channels for collateral markets becoming impaired.

Where does Elixium fit into all this?

Elixium is a global all-to-all electronic trading venue, designed to provide a transparent and unbiased market place for trading collateral. It seeks to address the growing issues around liquidity, which have been affected by ongoing market evolution.

- Regulated as an MTF
- Diverse range of participants including corporate treasurers, CCPs, asset managers,
- hedge funds, banks, government issuers, central banks, insurers, and agencies
- Designed to address the impact of regulation, balance sheet pressures and
- deteriorating levels of liquidity in these markets
- An efficient conduit to raise/invest cash/collateral on a secured basis to manage
- margin and cash-flow
- Uses standardised products (collateral baskets with a range of maturities and
- currencies), standardised processes and documentation
- Offering a range of settlement methods
- Auction, CLOB, RFQ, IOI protocols
- Collateral transformation

ENSO Financial Analytics

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ENSO
A NEX Group business, ENSO operates within NEX Optimisation, which helps clients simplify complexity and optimise resources. We are a fully hosted treasury, cash, counterparty and portfolio finance management solution that caters to hedge funds, asset managers, and other buy-side institutions. Our suite of intuitive, data-driven tools enhances risk and operational transparency and improves transactional efficiency, allowing multi-prime hedge funds and asset managers to centralise their treasury and portfolio finance functions. For more information, go to www.ensofinancial.com or email inquiry@ensofinancial.com.

NEX Optimisation
Leading the transformation of market structure, NEX Optimisation offers a portfolio of cloud-hosted services across the transaction lifecycle. Ranging from pre-execution credit checking to multilateral portfolio compression, our purpose is to simplify our clients' workflow and help them optimise their resources. We are an integrated team of financial markets and pioneering financial technology specialists who operate in all asset classes, geographies and business sectors across the financial markets. For more information, go to www.nex.com or www.nex.com/our-businesses/business-category/optimisation.

We are dedicated to mitigating risk, increasing efficiency, reducing costs and streamlining increasingly complex processes for our clients. We offer the opportunity to optimise both regulatory and financial resources.

Euronext

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Pan-European stock exchange Euronext has launched a suite of collateral management services to provide inventory management and a collateral transformation platform supporting commodities, fixed income, ETFs and equities.

Developed in collaboration with industry stakeholders, this service meets increasing participant demands for liquidity and collateral transformation tools, to meet regulatory requirements, and will help customers control costs and improve efficiency.

Euronext Collateral Exchange

- An electronic all-to-all collateral trading platform across asset classes, pairing liquidity providers with liquidity takers
- Price discovery, liquidity, transparency across asset classes
- Intuitive Use Interface (UI)—no additional technology to support or upgrade for existing members

Euronext Inventory Management

- An electronic register providing the ability to pledge or fully transfer title of commodity ownership
- Electronic and secure view of commodities assets
- Developed in partnership with major silos, market participants and trade finance banks

Future phases will include the introduction of risk analytics and additional collateral management functionality. Contact us to see how you can access high-quality collateral through a simple and efficient solution.

FIS

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FIS provides best-of-breed solutions for all aspect of securities finance and collateral management. We help a broad range of participants address all aspects of their securities borrowing and lending, repo, enterprise collateral and optimisation needs.

Whether you are on the supply or demand side of the securities finance business, FIS helps you maintain agile growth and run smarter operations by supporting you in:

- Increasing profitability, improving transparency, and making smarter decisions throughout the global trading day
- Expanding your business through support of a broad range of product types and markets Controlling operational cost and increasing the efficiency of your business
- Managing risk and holding down the cost of collateral/capital usage

FIS's solutions for securities finance allow you to automate your entire operation, including enterprise collateral management, collateral optimisation, order routing, trading, real-time positions management, operations, accounting, settlement, trade analytics and trade automation services. Our solutions are used by more than 140 of the world's leading financial institutions, including the world's 10 largest banks.

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Today's challenging times, now more than ever, demand the most comprehensive and dependable securities finance and balance sheet management tools available. With the ability to provide 'the small company touch', responding to the specific requirements of each individual customer, but with the added security and resources of being backed by parent company Cantor Fitzgerald, Helix Financial Systems continues to be a leading provider of software solutions, hosting and consulting services for the buy- and sell-side communities.

HelixREPO, the original standard bearer for fixed income repo trading, is complemented by our HelixSL, HelixMBS, and HelixALARM modules. Used together or separately, these modules offer global multi-asset solutions for managing every requirement of a modern securities finance and collateral management desk. Solutions offered include, but are not limited to, full lifecycle contract management for both fixed income repo and equity stock loan, US and non-dollar collateral management, counterparty and market risk, P&L and cost of carry reporting, TBA pool allocation management, and regulatory balance sheet and capital cost reporting.

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Collateral management/collateral agency services

Efficiently manage your collateral to address financing, funding and liquidity requirements, with innovative solutions for both collateral providers and receivers. Banks, broker-dealers, asset managers, insurers, central banks and pension funds can optimise their collateral portfolio with sophisticated analytic and eligibility tools and flexible bilateral and triparty solutions. J.P. Morgan's global capabilities, supported locally, help institutions manage collateral around the world or onshore, in order to meet increasingly complex financing and liquidity requirements.

A leading global custodian, J.P. Morgan operates in more than 100 markets and provides a comprehensive suite of settlement, asset servicing, tax, FX, collateral management, securities lending, cash and liquidity products.

Lombard Risk

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Lombard Risk is the leading dedicated global provider of collateral management and regulatory reporting solutions to the financial services industry. Through intelligent automation and optimisation, Lombard Risk's clients are able to improve their approach to risk management, gaining the agility they need for competitive advantage. As well as bringing immediate and urgent solutions to clients' needs, Lombard Risk's global team of experts look beyond today's reporting and collateral management to develop technology solutions that help them adapt as industry challenges evolve.

COLLINE is a web-based solution that supports all of your regulatory and strategic collateral management needs anywhere your business operates, across all time zones. The solution enables firms to move away from managing collateral in business silos. COLLINE supports multiple asset classes on a single platform, thus permitting efficient collateral management, inventory monitoring and proactive management of liquidity and capital charge constraints.

At the heart of the system is a powerful, configurable enterprise inventory manager that interfaces with your existing systems. With this holistic understanding of the underlying assets, the system is then able to:

- Automatically calculate exposure and balance collateral needs
- Manage end-to-end margin call workflows
- Reconcile margin call disputes
- Calculate interest and produce fully configurable client statements
- Provide consolidated information in user-defined dashboards
- Support an array of sophisticated risk and trade analytics

Lombard Risk recently launched AgileCOLLATERAL, a cloud-based collateral management system that offers the functionality of our market-leading COLLINE solution in a modular, light-touch delivery format.

AgileCOLLATERAL is targeted at asset managers, buy-side brokers, pension funds, corporates and investment firms which need the agility to 'turn-on' a collateral-in-a-box solution that is hosted in the cloud and eliminates the need for onsite installation and infrastructure costs. The solution is intuitive—reducing the need for training; modular—adding asset classes as needed, scaling up over time to handle more complexity and volume; and implemented in layers—to control costs to match business needs.

Mirae Asset Securities (USA)

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Mirae Asset Financial Group is South Korea's leading financial services firm and operates in 16 markets: South Korea, Australia, Brazil, Canada, China, Colombia, Hong Kong, India, Indonesia, Japan, Mongolia, Singapore, Taiwan, the UK, the US and Vietnam.

Mirae Asset Securities (USA) Inc. provides prime brokerage, securities lending, repo, correspondent clearing, agency execution, corporate access and foreign research distribution services to the institutional buy-side community. The firm also provides clients with a fully-integrated technology solution that automates and streamlines critical tasks, from the front, middle and back office, into a single platform, which includes portfolio accounting for our hedge fund clients. This facilitates operational efficiency and reduces risk for clients.

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Murex—MX.3 for Collateral Management

For more than 30 years, Murex has provided enterprise-wide, cross-asset financial technology solutions to capital markets players. Its cross-function platform, **MX.3, supports trading, collateral management, treasury, risk and post-trade operations**, enabling clients to better meet regulatory requirements, manage enterprise-wide risk, and control IT costs. With **more than 45,000 daily users in 65 countries**, Murex has clients in many sectors, from banking and asset management to energy and commodities.

MX.3 reinvents active trading of enterprise asset inventory. It provides funding and collateral trading desks with a real-time view of their equity and bond enterprise inventory. The solution includes tri-party repos with agent connectivity, evergreen and extendable, fee and rebate stock loan, as well as synthetic financing across asset classes. Corporate actions can be executed automatically. Compliance and concentration rules, as well as collateral eligibility checks, automatically apply.

MX.3 for Collateral Management offers a single framework for enterprise-wide margining, optimisation, regulatory compliance and collateral trading. The offering features an enterprise inventory manager for cash, security and physical commodity positions—synchronised in real time with positions, market data and settlement events. The analytical optimisation algorithm proposes optimal allocations, substitutions or repo booking against margin or funding requirements and user-defined constraints.

The single platform bridges gaps between silos, decreases cost of ownership and increases efficiencies across the chain. Operational processes are rationalised around a single data source. This avoids unnecessary reconciliations between front, back and risk functions.

This solution centralises collateral processing across entities and business lines for bilateral or cleared OTC, repo or securities lending, and exchange-traded derivatives products. The exception-based workflow manager enables intra-day margining and high STP across the collateral chain, including connectivity with key market infrastructure.

MX.3 for Collateral Management supports the mandatory collateralisation of un-cleared trades, it is compliant with BCBS/IOSCO and regional or local jurisdictions, as well as initial margin methods, including ISDA SIMM.

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OCC is the world's largest equity derivatives clearing organisation and the foundation for secure markets. Founded in 1973, OCC is a low-cost, customer-driven organisation that delivers world-class risk management, clearance and settlement services to 19 exchanges and trading platforms for options, financial futures, security futures and securities lending transactions. It operates under the jurisdiction of the US Securities and Exchange Commission (SEC) and the US Commodity Futures Trading Commission (CFTC). OCC has been designated by the Financial Stability Oversight Council as a Systemically Important Financial Market Utility (SIFMU), which reflects OCC's critical role within the US financial markets infrastructure.

In 2016, OCC cleared 4.17 billion equity derivatives contracts, representing its fifth-highest volume year ever. OCC stock loan activity in 2016 was up 37 percent from the previous year with nearly two million new loan transactions.

Pirum Systems

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Pirum provides a secure, centralised automation and connectivity hub which seamlessly connects market participants with each other, allowing them to electronically verify key transaction details and fully automate the post-trade lifecycle. By combining an in-depth understanding of both the securities finance industry and information technology, Pirum has created a set of highly innovative and flexible services which are tailored to fully support the complexities of the underlying business processes.

Pirum's platform also provides onward connections to other infrastructure service providers. This position, at the heart of the securities financing market, allows Pirum clients to reuse their connection to Pirum to access triparty agents, market data companies, CCPs and trading venues with additional connectivity being added all the time. Financial institutions from around the world have increased processing efficiency, reduced operational risk and improved profitability by using Pirum's services to reduce manual processing.

Pirum's Core Service delivers:

- Contract compare
- Billing compare and billing delivery to your clients

Pirum's Live service delivers:

- Marks automation with STP rates over 99 percent
- Automated triparty RQV processing, with links to BNY Mellon, J.P. Morgan and Euroclear
- Bilateral exposure reconciliation
- CCP gateway
- Automated returns with STP rates over 97 percent
- Automated prepay and cash return compare
- Real-time contract compare and pending compare
- Automated loan release
- Trading venue connectivity
- SFTR reporting

SIX Securities Services

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SIX Securities Services provides a multi-faceted electronic trading facility offering single-point access to the over 160 counterparties trading repo contracts across 14 currencies.

Central bank money and commercial bank money are both available as well as access to the SNB´s primary market for the issuance of money market instruments.

Thanks to excellent operations, the accuracy of exposure coverage and the solid legal framework, no haircuts are applied to the available collateral whereas the range of collateral covers a wide range of currencies and geographical areas.

BUILDING TEAM SPIRIT TOGETHER

SOCIETE GENERALE
Corporate & Investment Banking

Societe Generale Prime Services

www.cib.societegenerale.com

Societe Generale Prime Services, part of the Global Markets division of Societe Generale Corporate & Investment Banking, is the bank's prime brokerage business, offering a unique combination of execution, clearing, custody and financing services. It is truly multi-asset and multi-instrument across listed derivatives, equities (cash/synthetic), FX, fixed income and OTC cleared. As the world's leading derivatives broker, the prime services business offers unrivalled access to 125+ markets and exchange venues; offering both agency or principal execution, and extensive value-added services.

The full service platform offers access to significant securities financing capabilities, extensive capital introduction and best-in-class cross-margin capabilities as well as straight-through processing with an industry-leading post-trade platform aligned with Societe Generale's extensive research product.

At the core of Societe Generale's universal banking business model, the corporate and investment bank is a well-diversified and leading player with nearly 12,000 professionals present in more than 34 countries across Europe, the Americas and the Asia Pacific region.

Standing by its clients across sectors, the corporate and investment bank tailors solutions for them by capitalising on its worldwide expertise in investment banking, global finance, and global markets.

Transcend
Street Solutions

Transcend Street Solutions

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Transcend Street Solutions provides next-generation collateral and liquidity management technology solutions for the fast-changing capital markets industry. Transcend's team has decades of hands-on experience in some of the top tier wall street banks, in the areas of capital markets, trading, funding, prime brokerage, clearing and operations.

The Transcend team boasts a long and successful track record of developing and delivering enterprise-wide strategies and solutions for solving complex business challenges. Team Transcend brings you CoSMOS; an innovative approach and technology that allows you to embrace the challenges of collateral and liquidity management with a modular, agile and scalable technology platform.

About CoSMOS:
The future of collateral and liquidity management
CoSMOS gives you a highly effective means of collating, harmonising, mining, analysing and executing on all dimensions of collateral information across your enterprise, without the need for expensive systems replacements. Key features and modules are:

Agreements Insight: Innovative way to harmonise and analyse collateral terms embedded in various legal agreements. A powerful collateral validation tool to ensure proper allocations in real time.
Real-time Inventory Management: Real-time view of inventory and settlement ladders with projected and actual values across the enterprise.
Collateral Optimisation: Flexible algorithms and workflows to optimally allocate and execute collateral placement across business areas.
Liquidity Analytics: Sophisticated analytics of business metrics and sources and uses of collateral from firm and client perspectives. Transfer pricing to allocate income and expense down to the most atomic level.
Margin Dashboard: Aggregated margin calls and collateral balances across business areas and clients for enhanced transparency.
Regulatory: Address increasing regulatory complexities through integrated data and analytics tuned for SR 14-1, QFC and other rules. Sophisticated stress test module for forecasting liquidity and collateral impacts.

we lead the way

OCC guides its customers safely and securely through a dynamic marketplace with the industry's most innovative risk management, clearing and settlement services. We're always on course.

OCC is the world's largest equity derivatives clearinghouse and a leading innovator in risk management solutions. As a Systemically Important Financial Market Utility, OCC provides market participants with industry leading efficiencies in the clearing and settlement of options and futures transactions. We strive to achieve the highest standards possible in everything that we do in order to promote financial stability and integrity in every market we serve.

OCC

The Foundation for Secure Markets www.theocc.com

FIS' APEX DELIVERS ENTERPRISE WIDE SOLUTIONS

GLOBAL INVENTORY

SECURITIES FINANCE TRADING

MARKET DATA

COLLATERAL MANAGEMENT

CROSS-ASSET OPTIMIZATION

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