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Derivatives Collateral Management: Entering the Industrial Age?

Prepared for:

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EXECUTIVE SUMMARY

Derivatives Collateral Management: Entering the Industrial Age?, commissioned by Euroclear and the Depository Trust & Clearing Corporation's (DTCC) joint venture GlobalCollateral and produced by Aite Group, is the second in a series of two papers that examine the recent developments in derivatives collateral management activities. Based on interviews with respondents from 34 firms, it highlights internal and external developments for firms active in derivatives markets across the globe.

Key takeaways from the study include the following:

- A third of buy-side respondent firms are concerned about the potentially negative impact of Basel III on the cost and availability of collateral and clearing services.
- The market's approach to clearing non-mandated over-the-counter derivatives in the United States diverges—some firms believe there are netting and offset benefits to clearing these instruments, whereas others feel the cost of clearing outweighs these benefits.
- All sell-side respondent firms have at least some front-office involvement in collateral management, either in terms of contribution to budget or strategic input, often directly related to optimization. The buy-side tends to have far less front-office engagement in collateral management, with more than half of respondents indicating that there is no input at all from their portfolio management team. The function remains operations-focused and located in the middle or back office.
- The primary challenge for sell-side firms is the ability to move collateral around the globe to meet collateral requirements or calls in specific countries. The labor-intensive nature of the collateral management process is the biggest challenge for buy-side respondent firms due to the lack of internal and external automation.
- Many respondent firms would most like to see centralized services to support collateral mobility and margin message communication.
- Buy-side firms would consider outsourcing either part or all of the collateral management function, depending on the growth in their use of derivatives instruments.
- Collateral transformation services, through the triparty repo and securities lending markets, will become increasingly important as more jurisdictions implement derivatives regulations.
- European buy-side firms are likely to enter into at least two clearing broker relationships, much like their American counterparts. The collateral segregation models on offer in Europe will play a big role in determining their business partners in the region.

INTRODUCTION

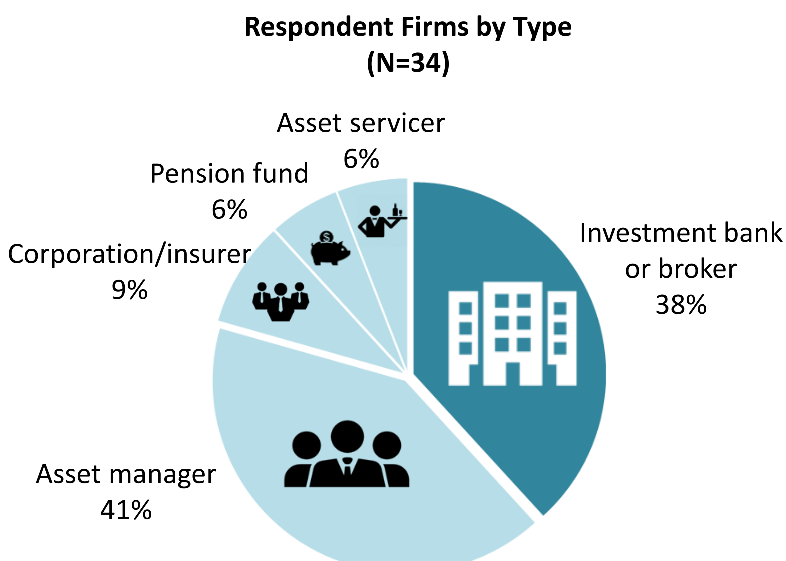
Global OTC derivatives market structure change stemming from the September 2009 Group of 20 (G-20) agreement has significantly altered the collateral management landscape over the last couple of years. Beginning with the clearing implementation of the Dodd-Frank Act in 2013 and the subsequent rollout of similar reforms in Europe and Asia, firms have been forced to re-evaluate their support of derivatives margining activities and the collateral life cycle overall. The buy-side has been a little slower to respond to regulatory change, but all market participants active in the global derivatives markets have witnessed a shift to clearing and an increased prioritization of the margining and collateral management function as a whole.

This study, which is the second in a series of two, examines the current challenges firms face in managing collateral in an environment dominated by legacy technology and siloed workarounds, highlighting areas of particular pain across the enterprise and how firms are tackling these challenges today and planning for tomorrow. It also examines common challenges in moving collateral across the globe and manual inefficiencies in collateral messaging.

METHODOLOGY

This white paper is based on Aite Group interviews conducted with leading market participants representing banks, asset managers, corporates, broker-dealers, and pension funds that have knowledge of collateral and liquidity management and are active in the derivatives markets. During Q1, Q2, and Q3 2015, Aite Group interviewed 34 firms (Figure 1) to capture their views on collateral management and market dynamics, with the majority hailing from an investment bank, brokerage firm, or asset manager.

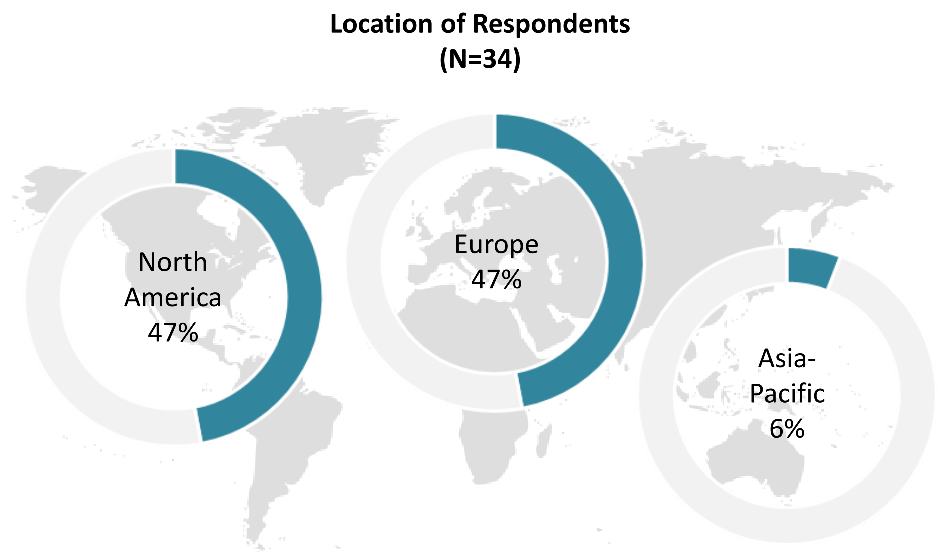
Figure 1: Type of Respondent Firms



Source: Aite Group's interviews with 34 firms, 2015

The majority of respondent firms are based in Europe and North America (Figure 2), with a minority in the Asia-Pacific region. Of the European firms, 37% of respondents are based in the United Kingdom versus 63% in Continental Europe, reflective of the high percentage of derivatives business that takes place in London.

Figure 2: Geographic Location of Respondent Firms



Source: Aite Group's interviews with 34 firms, 2015

Given the size and structure of the research sample, the data provide a directional indication of conditions in the market.

GLOBAL REGULATORY DEVELOPMENTS

There can be no doubt that the global reform agenda has changed the dynamics underlying the derivatives collateral life cycle. The majority of the national regulators in the G-20 jurisdictions have made progress in implementing reforms targeted at the OTC derivatives markets that were agreed back in 2009. The ninth Financial Stability Board (FSB) report[1] indicates that three-quarters of its member countries have at least partially implemented reforms, though some of these are currently under review because they are in conflict with each other. One of the most notable cross-border discrepancies is between the United States and Europe around the treatment of risk and margin mechanics for central counterparty clearinghouses (CCPs), which has been the subject of debate throughout the first half of 2015.

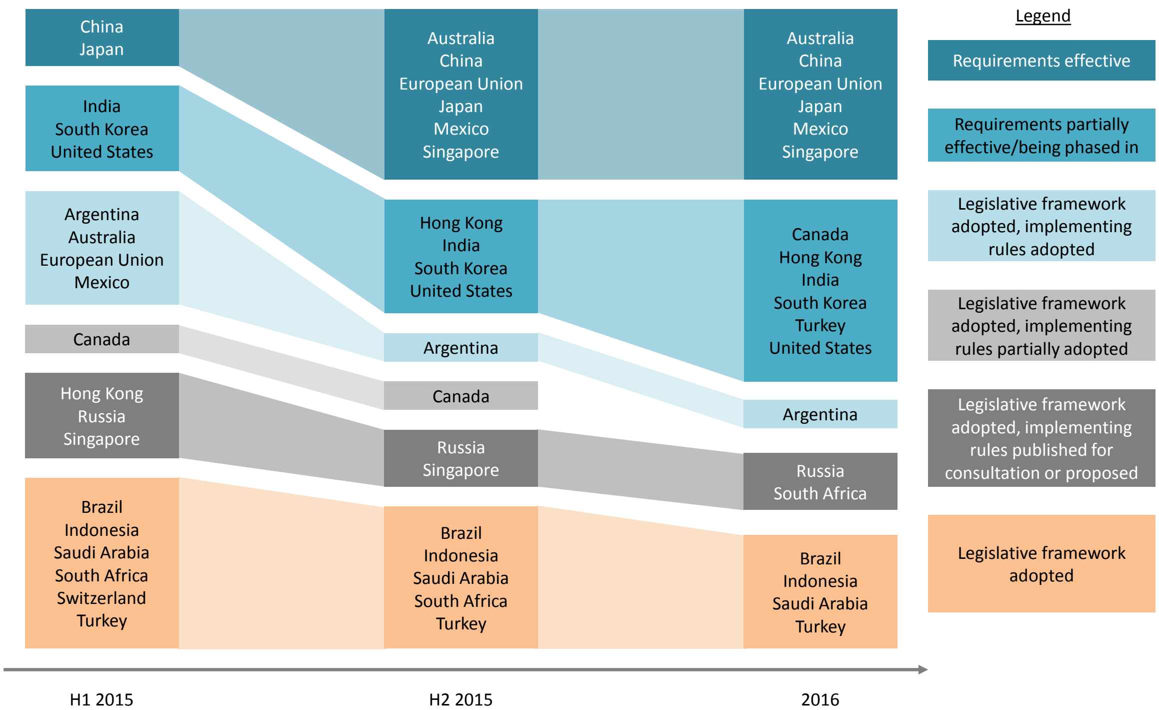
Figure 3 shows the FSB member nations' progress in implementing regulations related to OTC derivatives clearing based on the FSB's July 2015 progress update. At the end of June 2015, seven jurisdictions were actively assessing their markets against criteria to determine if certain products should be required to be centrally cleared, and five jurisdictions had central clearing requirements in effect for one or more specific product types. The United States has undoubtedly been the global front-runner in terms of regulatory change in the OTC derivatives markets, from the passing of Dodd-Frank in 2010 to the U.S. Commodity Futures Trading Commission's (CFTC's) and the U.S. Securities and Exchange Commission's (SEC's) subsequent drafting of clearing rules in 2011 and implementation beginning in 2013.

European regulatory reform has been somewhat slower in terms of implementation due to numerous delays to mandatory OTC derivatives clearing requirements. The European Market Infrastructure Regulation (EMIR) is currently in a state of flux as the European Securities and Markets Authority (ESMA) is reviewing the technical standards for clearing and trade reporting before mandated clearing is due to come into force in 2016. Major markets in the Asia-Pacific region, such as Japan and Australia, have already moved forward with reforms, and Hong Kong, Mexico, and South Africa expect to move forward with relevant rule-making to mandate clearing this year; Russia expects to have at least some of its framework in force before the end of 2016.

The U.S., Asian, and European regulatory communities are also in the process of implementing margin requirements for uncleared OTC derivatives, which are based on guidelines produced in September 2013 by the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO). Internationally agreed phase-in periods for these guidelines were recently delayed due to ongoing debate about the details of variation margin requirements; hence, the phase-in is now expected to begin in September 2016.

1. "OTC Derivatives Market Reforms: Ninth Progress Report on Implementation," FSB, July 2015.

Figure 3: An Overview of Derivatives Regulation Implementation Across the Globe

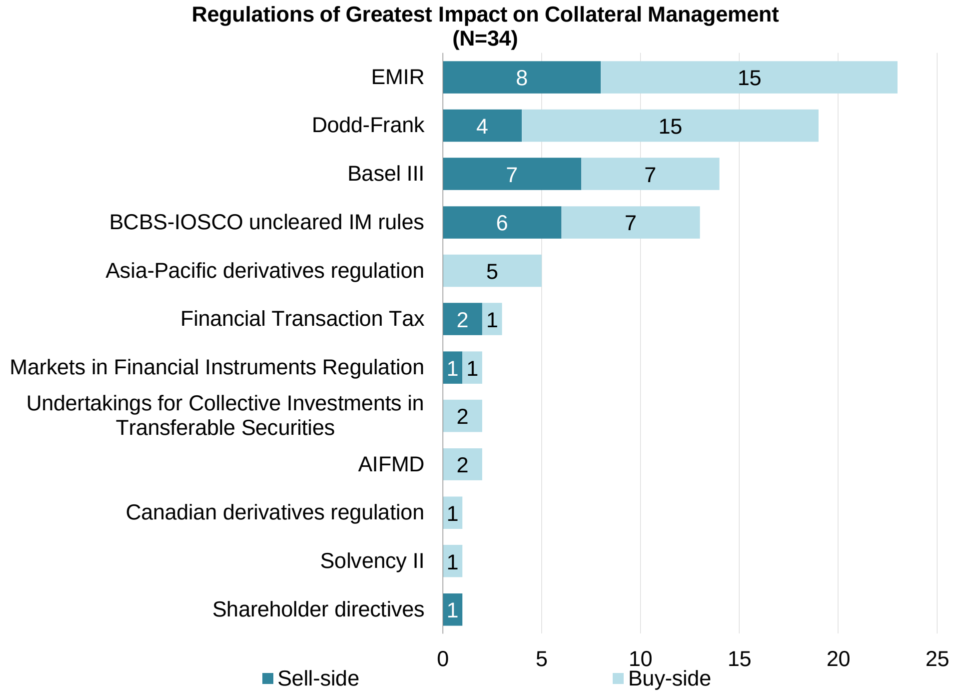


Source: Aite Group, FSB

Figure 4 shows that although direct regulations that impact the derivatives markets are considered to have the greatest impact on respondents' operations, a number of regulations that have an indirect impact on these markets are also of concern. Basel III, for example, features so highly on the list because of its potential impact in creating a shortage of high-quality liquid assets (HQLA) in the market for sell-side firms. The requirement to hold HQLA on the balance sheet means that these firms will have fewer available assets to pledge as collateral and the shortage will, in turn, cause the cost of pledging these assets to go up. As noted by a brokerage firm respondent, the liquidity coverage ratio (LCR) is particularly challenging because it requires firms to take into account potential increases in market volatility that may impact the quality of collateral or potential future exposure of derivative positions. LCR therefore requires that these firms apply larger collateral haircuts or additional collateral, which can "hurt" a firm's balance sheet if these are misapplied, according to the broker.

The buy-side, on the other hand, is concerned about the impact of the new capital framework on the cost of services provided by their brokers. Smaller asset managers are also concerned that brokers may be less willing to do business with them as a result of the higher costs of doing business overall. A Tier-2 asset manager respondent indicates that the implementation of Basel III is governing banks' economic approaches to capital, which has resulted in changes in their client charges for repo and clearing activities. The identification of unprofitable business lines and client relationships has become more active within the sell-side community overall.

Figure 4: Regulations of Impact on Derivatives Operations and Collateral Management

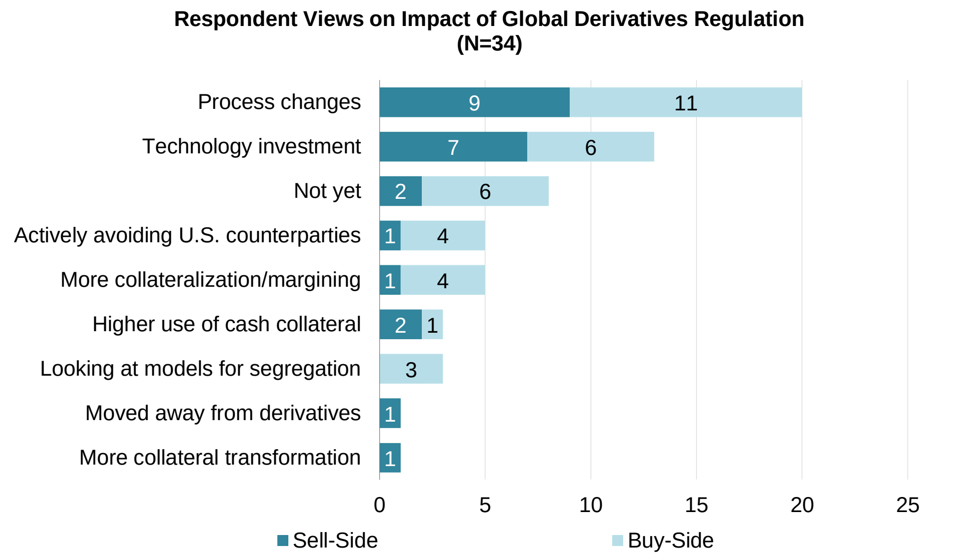


Source: Aite Group's interviews with 34 firms, 2015

Regulatory implementation thus far has been of greatest impact to firms' operations and technology teams because of the high level of process and technology system changes related to moving OTC derivatives onto a CCP and reporting these trades to a trade repository (Figure 5). More than half of firms have been focused on adapting to significant process changes, though less than half have made significant technology investments, which likely reflects the high level of manual processes that dominate the sector. Just under a third of buy-side firms feel they have yet to be significantly impacted by derivatives regulations, but many are concerned that EMIR will more heavily impact them than will Dodd-Frank because of EMIR's wider scope.

Only one sell-side respondent firm has decided to reduce its derivatives activities as a result of regulation, but this number may change in future as more jurisdictions implement mandatory clearing and the cost of capital for trading these instruments increases. The legal, operational, and connectivity costs in multiple jurisdictions may make derivatives support less attractive to some firms.

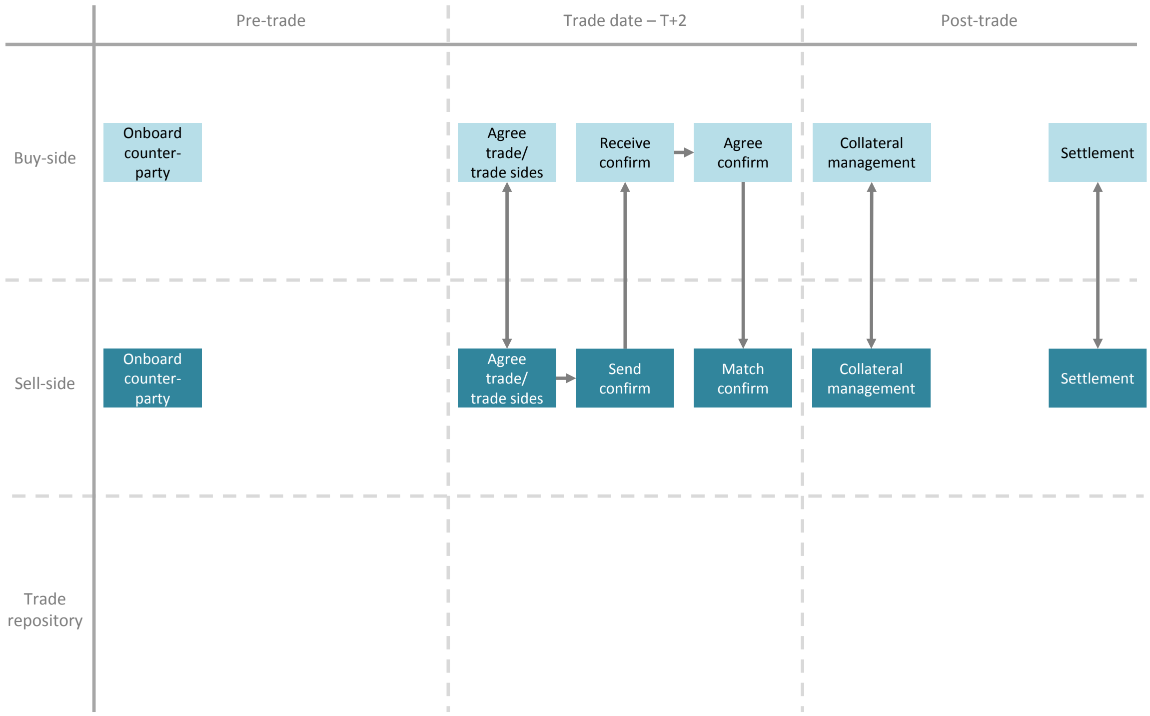
Figure 5: Respondent Views on Impact of Global Derivatives Regulation



Source: Aite Group's interviews with 34 firms, 2015

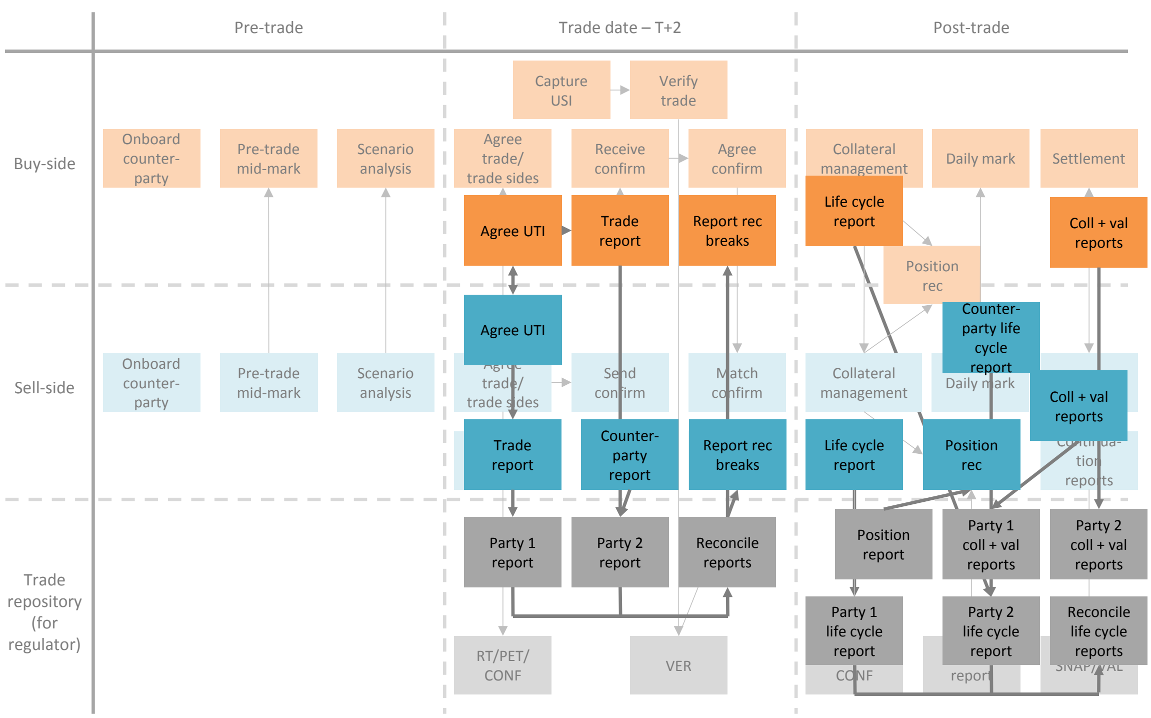
Figure 6 and Figure 7 show why process changes are such as an issue for firms active in the U.S. and European OTC derivatives markets. The diagrams illustrate the move from a relatively linear and simple bilateral flow of information (Figure 6) to supporting a highly complex chain of processes and communications with counterparties and new market infrastructures, such as CCPs and trade repositories (Figure 7). Firms have been compelled to redesign their workflows and add in extra levels of data reconciliation, and adapt to the requirement to generate new data items, such as the unique transaction identifier (UTI) as mandated for EMIR trade reporting. The buy-side reporting requirements in Figure 7 refer specifically to EMIR's dual-reporting model.

Figure 6: Derivatives Trade Life Cycle Process Changes Before Dodd-Frank and EMIR



Source: Aite Group

Figure 7: Derivatives Trade Life Cycle Process Changes After Dodd-Frank and EMIR



Source: Aite Group

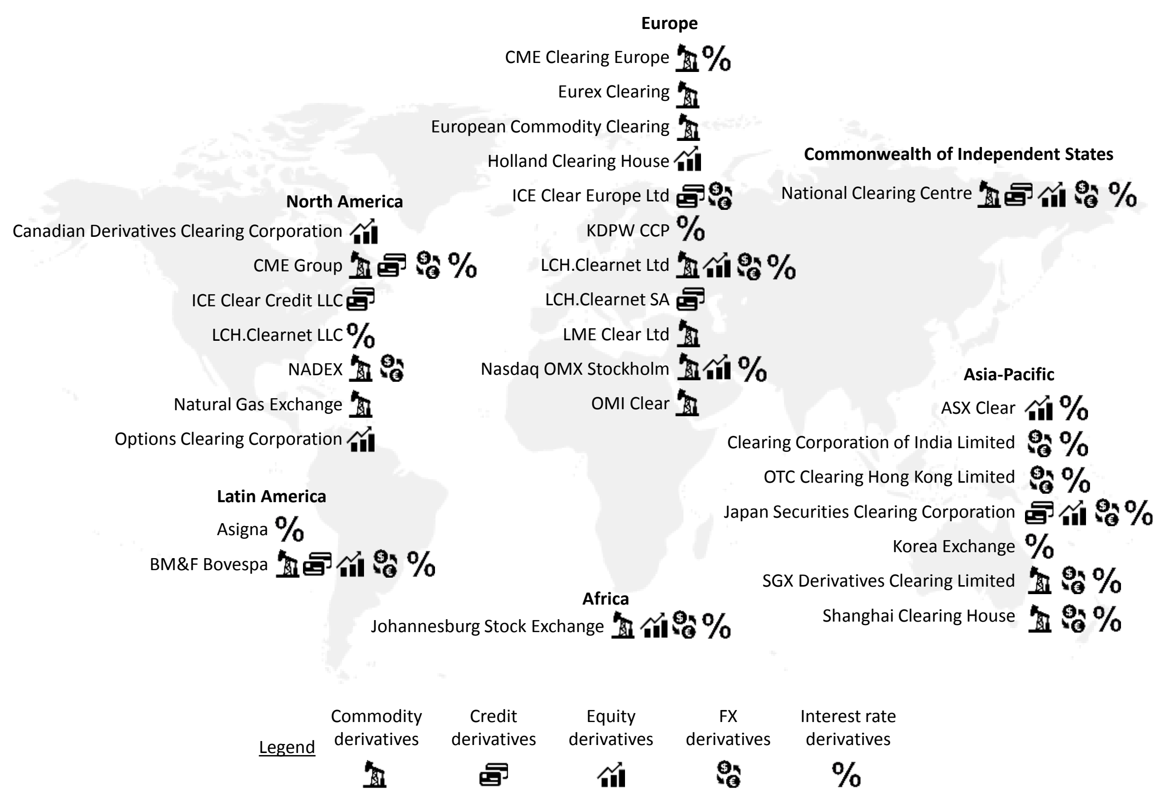
AN OVERVIEW OF CLEARED OTC DERIVATIVES

In the majority of jurisdictions, at least one CCP is authorized to clear at least some interest rate derivatives, although overall availability of CCPs for other asset classes is more limited. The interest rate swap (IRS) market is one of the largest in terms of OTC derivatives overall; hence, the increase in these instruments' clearing volume has the largest impact on the markets overall. At a global level, the use of CCPs to clear OTC derivatives continues to grow, particularly across interest rate and credit derivatives asset classes. Though the U.S. market has introduced mandatory clearing, most other jurisdictions have not, and it is expected that Europe will not be mandating this move for buy-side firms until April 2016, which will give these firms a six-month window for implementation.

Regulators and the industry are concerned about a CCP as a point of systemic risk, and much has been made of introducing a minimum baseline for default fund contributions and best practices around margining within the CCP community. Margin requirements have been particularly contentious within the industry, as there is some debate that commercial considerations could compel CCPs to participate in a "race to the bottom" on margin acceptability. Regulators argue that by accepting a wider range of collateral and asking for a lower contribution to their default fund, CCPs can attract more flow (and therefore revenue) but also increase their risk profile. There has also been discussion about the need for CCPs to contribute their own funds for default protection as well as receive those from clearing members.

Figure 8 shows the current OTC derivatives asset class coverage of the CCPs in each main global region. Given the high share of OTC derivatives business that is accounted for by the United States and the United Kingdom and the fact that clearing is a volume-based business, there is likely to be significant consolidation of local CCPs in other markets in the next few years. Fewer CCPs means greater netting benefits for brokers and cost reduction for end clients, though some regulators are concerned about concentration risk in market monopoly situations.

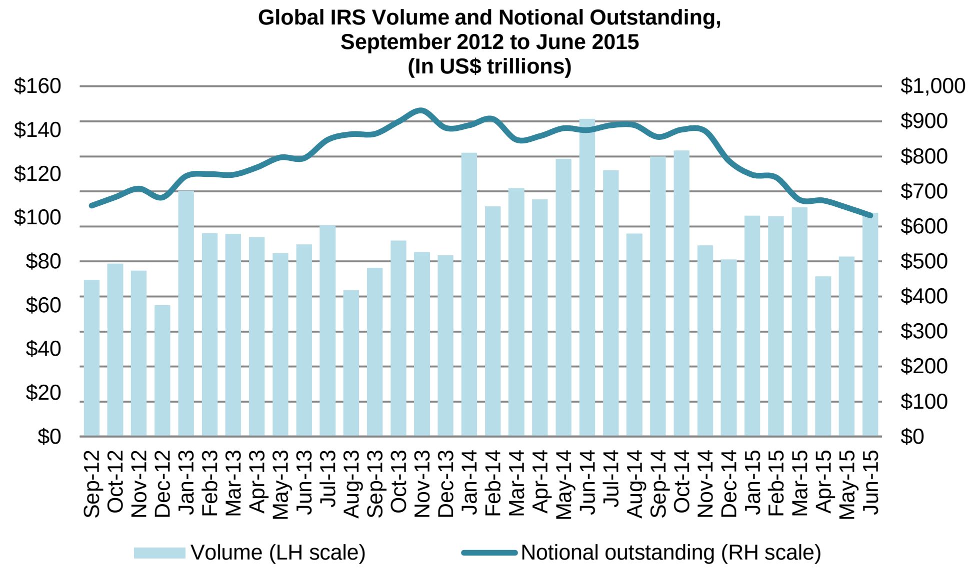
Figure 8: Location of CCPs Across the Globe



Source: Aite Group, CCPs

Figure 9 shows the volume of IRS clearing across three major CCPs—LCH.Clearnet, CME Group, and Japan Securities Clearing Corporation—since September 2012. Volume has fluctuated over the period, but client clearing has increased overall and, measured as a function of monthly trades registered, client clearing volume on LCH.Clearnet reached around 330,000 in June 2015. This represents the highest level on record; it is nearly double the volume cleared on the CCP the previous year and a 33% volume increase since April. This indicates that despite the lack of a mandate to clear in regions such as Europe and Asia, buy-side firms have opted to clear their derivatives for reasons such as reduced counterparty risk and greater efficiency. In the United States, the International Swaps and Derivatives Association (ISDA) indicates that 76.5% of average daily notional interest rate derivatives volume was cleared over the whole of 2014, compared with 57.9% in Q1 2013, before clearing requirements came into force.

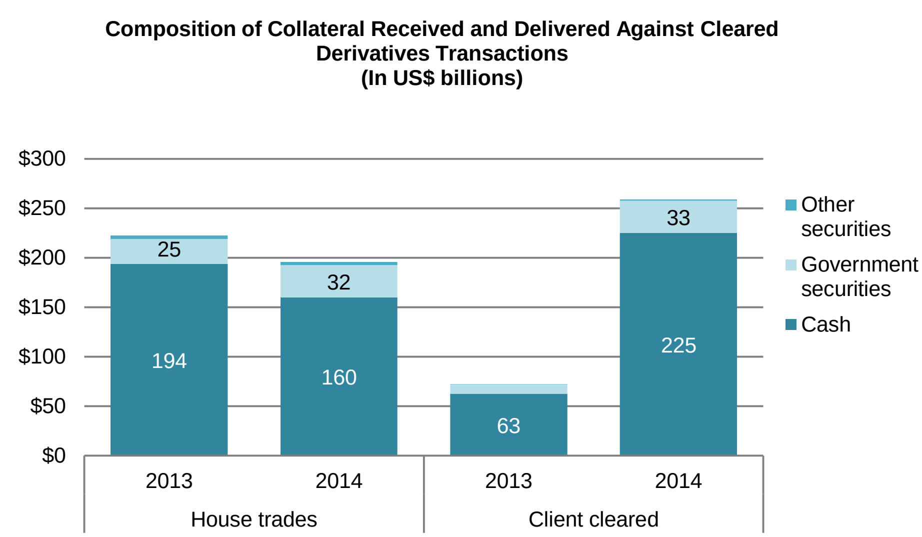
Figure 9: Global Interest Rate Derivatives Clearing Volume



Source: Aite Group, LCH.Clearnet, CME Group, and Japan Securities Clearing Corporation

Figure 10 shows that total reported collateral for cleared derivatives transactions, including both house- and client-cleared trades, rose 54%, from US$295 billion to US$455 billion between 2013 and 2014. Total collateral related to client clearing more than quadrupled between 2013 and 2014, increasing by 262.5%, and all collateral types contributed to this rise, though cash remains the highest percentage overall. There has, however, been a year-on-year decrease in the clearing of house trades, which likely reflects the lower trading volume overall.

Figure 10: Collateral Types for Cleared Derivatives

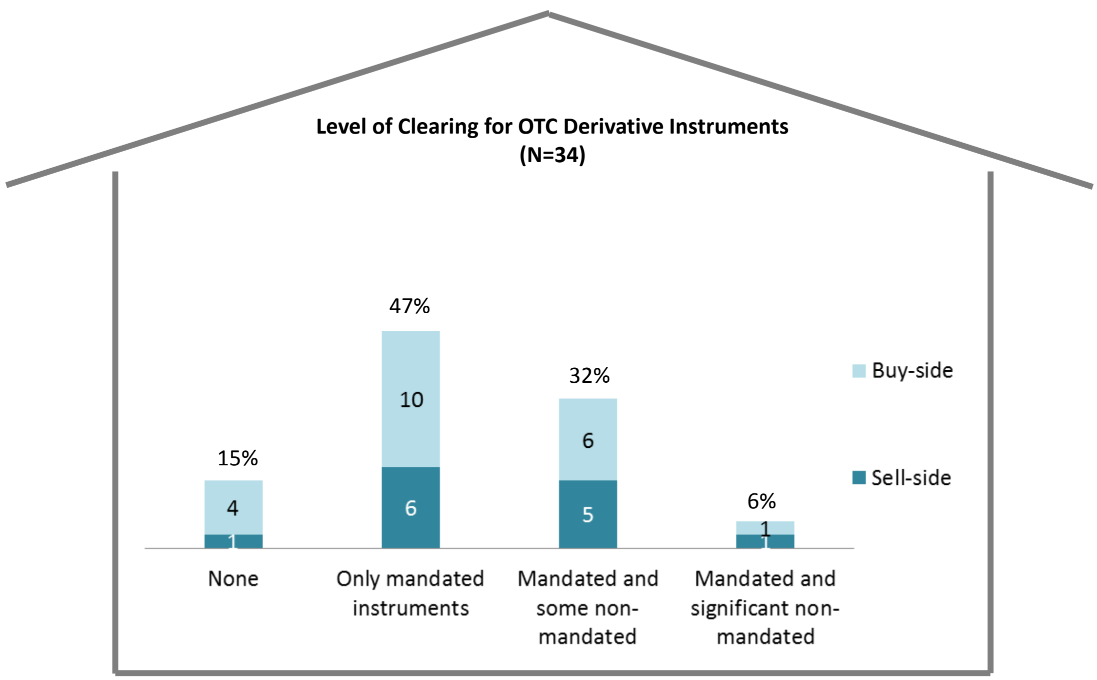


Source: ISDA Margin Survey 2015

At the firm level, 38% of respondent firms have seen an increase in clearing activities and have chosen to clear instruments that have been not been mandated (Figure 11), but the majority have focused primarily on mandatory clearing. While there is liquidity in the bilateral space and the higher margin requirements for uncleared products have yet to come into force, there is no compelling reason for smaller buy-side firms to adapt their processes ahead of the mandate. In fact, many asset managers in the United States opted to wait until the deadline to begin clearing because of the perceived cost and effort required versus the lack of significant benefit.

Only two respondent firms indicate they have opted to clear a significant percentage of instruments that are not mandatory to clear, whereas the rest are clearing only some of those instruments. The benefits cited by those clearing non-mandatory instruments include netting and offset opportunities, which reduces the amount of collateral that must be posted at a CCP. A Tier-1 asset manager respondent that currently clears more than 70% of its non-mandatory instruments indicates that the firm's decision was based on its major institutional clients' perception of clearing these instruments as compliance and risk friendly.

Figure 11: Respondent Views on Shift to Clearing Derivatives



Source: Aite Group's interviews with 34 firms, 2015

MARGINING AND THE UNCLEARED REALM

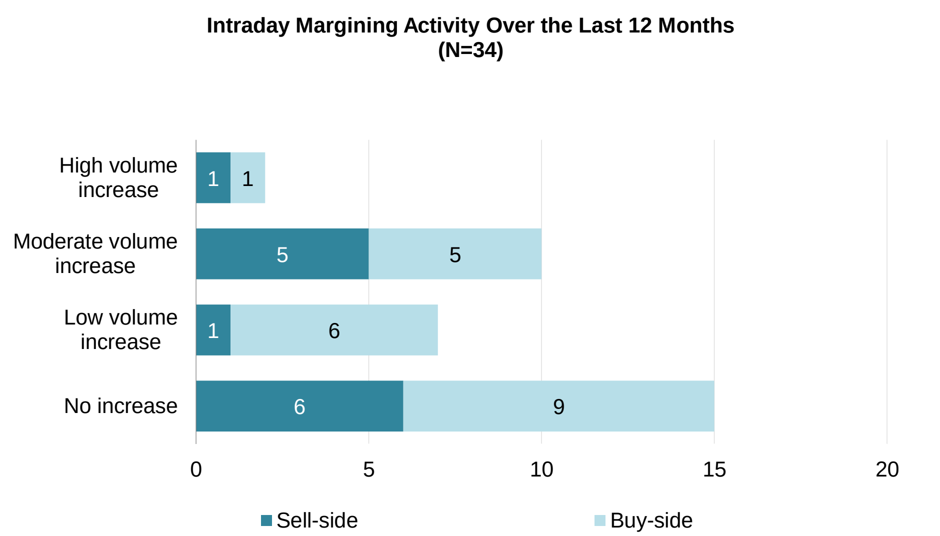
The move to a CCP increases the frequency with which firms must pledge collateral, moving from a monthly or weekly cycle to a more intraday environment, and increases fees overall, as firms must take into account processing charges and default fund contributions. It also adds the requirement to post initial margin, whereas accounts previously only had to post a daily mark-to-market collateral (variation margin). Clearing brokers and CCPs need systems capable of running

margin calculations and providing margin statements simultaneously for the high number of clients involved in some block trades. Segregation requirements for the holding of collateral at the CCP also decrease collateral velocity, limiting the type of collateral that is freely available to use elsewhere. External drivers for the increase in margining activity include the following:

- The segregation of margin into discrete processes for variation margin and initial margin for cleared OTC derivatives
- The regulatory requirement to post initial margin for bilaterally traded OTC derivatives (when the related national rules on uncleared margining come into force)
- The reduction in thresholds and minimum transfer amounts for variation margin especially, which will mean any change in valuation could trigger daily margin calls
- The change in credit support annex (CSA) arrangements to currency-based standard CSAs—CSAs now match the currency of the collateral with the currency of the underlying trade
- The requirement to post collateral at different CCPs due to the fragmented clearing landscape

Just more than half of respondents have witnessed an increase in intraday margining activity over the last 12 months (Figure 12), indicating that although there may have been an uptick in 2013 due to the implementation of mandatory clearing under Dodd-Frank, this increase has not continued over the succeeding years. Those respondents that have witnessed an increase indicate that this growth is related to the volatility in the markets or a business decision to increase derivatives activities rather than regulatory drivers.

Figure 12: Respondent Views on Increase in Margining

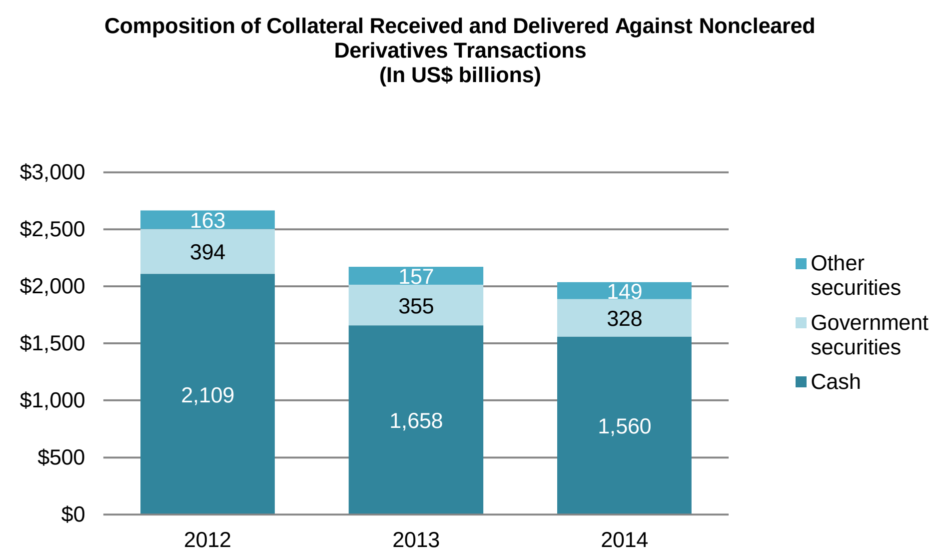


Source: Aite Group's interviews with 34 firms, 2015

The move to currency-based CSA arrangements across the globe is expected to be one of the biggest drivers of increased margining activity, and it will also result in increased interest charges due to currency-conversion requirements. The cost of funding for collateral will also increase, and firms will be expected to optimize collateral assets rather than merely post cash. Similarly, the number of disputes over margining activities could also increase, which could increase these activities' risk profile.

Clearing activities for OTC derivatives have increased overall, so it is no surprise that bilateral arrangements have correspondingly decreased since 2012 (Figure 13). The amount of collateral received against noncleared derivatives increased slightly (4.4%) overall, according to ISDA figures, but the amount of collateral delivered rose substantially, growing by 28.6% between year-end 2013 and year-end 2014. The collateral received was driven by a 6.7% increase in cash, which represented 76.6% of the total.

Figure 13: Types of Collateral in Use for Noncleared Derivatives



Source: ISDA Margin Survey 2015

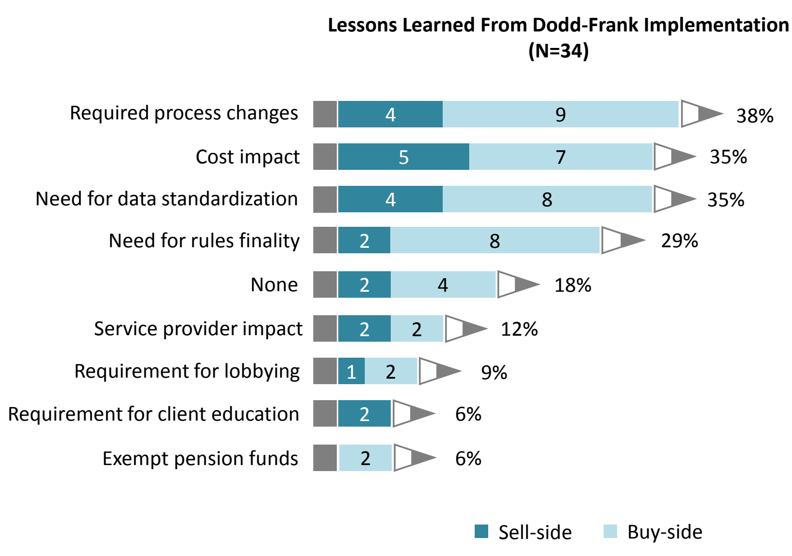
LESSONS LEARNED FROM THE U.S. EXPERIENCE

The SEC has been tasked with regulating security-based swaps, those with a single underlying security or reference entity, or an underlying narrow-based security index, and the CFTC is focused on the rest of the swaps market. The CFTC rules specify that central clearing is required for most market participants' standardized OTC derivatives contracts, though there are exemptions for specific market participants, such as commercial end users that use swaps to hedge interest rate risk. The nonexempt participants in these markets must register with the SEC or CFTC and are then classified in terms of their book size as either a swap dealer or a major swap participant. Thus far, 104 swaps dealers have registered with the CFTC.

Initially, only the simplest IRS and CDS products have been subject to mandatory central clearing; hence, IRSs with optionality, dual currencies, or conditional notional amounts are currently excluded. The CFTC has indicated, however, that it plans to add to the derivatives classes that must be cleared in future; to do so, it will include more CDSs and IRSs and add other OTC swaps, such as energy swaps and equity index swaps. ISDA estimates that approximately three-quarters of interest rate derivatives and CDS index average daily notional volume is now cleared in the United States.

The implementation of the CFTC requirements in 2013 has taught market participants numerous lessons that could potentially help in implementing derivatives requirements in other jurisdictions (Figure 14). Respondents indicate that they now have a greater understanding of the full cost of compliance and the required process changes related to moving from a bilateral environment to a CCP. Just less than a third of all respondent firms have a greater appreciation of the need for greater data standardization due to the complex nature of derivatives data and the related high cost of reconciliation. A third of the buy-side respondents contend that they should have waited until the rules were finalized before they began their implementation programs. These firms cite the increased cost of reworking processes and technology as regulatory requirements changed as the reason behind this decision. Some firms have avoided the impact of Dodd-Frank altogether either because they do not have presence in the U.S. market or they have actively made the decision to move their operations out of the jurisdiction to avoid incurring the immediate costs of compliance.

Figure 14: Respondent Views on Lessons Learned via Dodd-Frank



Source: Aite Group's interviews with 34 firms, 2015

Though not all firms have been impacted significantly by Dodd-Frank thus far, all respondents indicate that the global derivatives reform agenda of the next 18 to 24 months is anticipated to bring much more significant changes to the collateral management landscape. A Tier-2 asset manager respondent says the network effect of mandatory clearing under EMIR and other

regulatory regimes in countries such as Canada and Australia, the addition of uncleared margining requirements, and the impact of Basel III changes on the sell-side will compel many more buy-side firms to re-examine their processes and technology environments.

SUMMARY: REGULATORY STATE OF PLAY

Collateral managers need to consider the following regulatory developments:

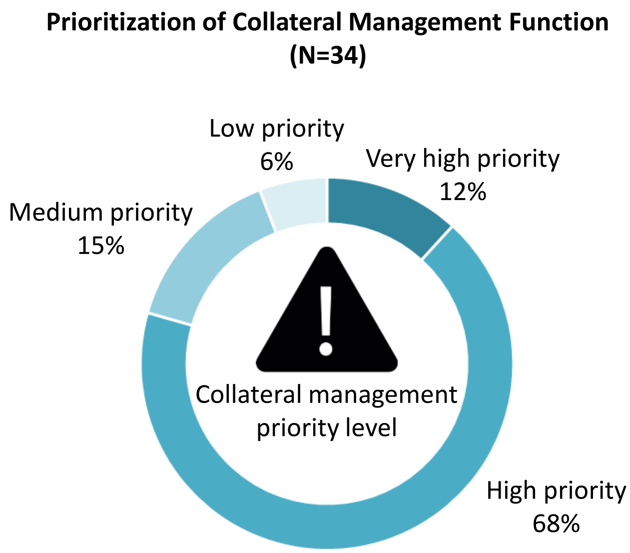
- National regulators are finally making progress implementing OTC derivatives reforms, following on from the United States as the global front-runner—respondents highlight EMIR as the regulation of most concern for collateral managers in the next 24 months.
- A third of buy-side respondent firms are concerned about Basel III's potentially negative impact on the cost and availability of collateral and clearing services.
- There is divergence in the market's approach to clearing non-mandated OTC derivatives in the United States—some firms believe there are netting and offset benefits to clearing these instruments, whereas others feel the cost of clearing outweighs these benefits.
- Post Dodd-Frank, most firms have a greater appreciation of regulation's impact on operational processes, the cost of collateral, and data management and governance practices.

COLLATERAL INDUSTRIALIZATION

There is no doubt that regulatory change is transforming the way firms process derivatives and deal with the management of collateral, which is putting pressure on firms that are heavily reliant on manual processes. For sell-side firms, collateral management support requires the capture and processing of data at every point, from client onboarding in the front office to the back-office settlement of transactions related to collateral activities. The front office is required to capture any client-specific requirements for collateral, including segregation preferences for derivatives clearing. The middle and back office do the heavy lifting, which includes margin management, collateral asset valuation, dispute resolution with counterparties, and, finally, the movement of collateral to fulfill settlement obligations. Information also flows in the opposite direction related to collateral optimization activities, by which information on collateral inventory and obligations is provided to front-office trading teams to more accurately price OTC derivatives trading.

Given the increasingly challenging nature of these tasks, it is no surprise that all but one sell-side respondent firm believes collateral management is a high priority for the business (Figure 15). The buy-side places a little less emphasis on the function overall comparatively, though more than half consider it a high or very high priority to the business. Those that indicate it is a low or medium priority feel that they have not yet been significantly impacted by market infrastructure changes and regulation enough for the business to have increased its focus on the function.

Figure 15: Current Prioritization of Collateral Management



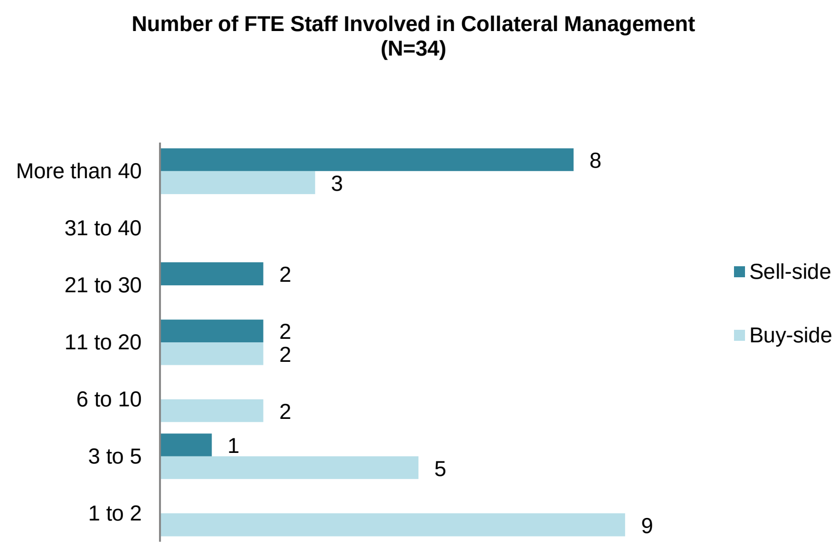
Source: Aite Group's interviews with 34 firms, 2015

The collateral management function continues to be dominated by manual effort, and Figure 16 indicates the high number of full-time equivalent (FTE) staff members at sell-side firms focused on the tasks of managing and optimizing collateral. More than half of the sell-side respondent firms have more than 40 dedicated FTEs, with some employing more than 250 at the top end of

the scale. Given that these firms are often managing client collateral activities as well as their own, these high staff numbers are unlikely to reduce significantly, even if new technology is introduced to automate some aspects of the process. Some firms were unable to give a definitive answer as to the number of FTEs because of the decentralized nature of the process and the involvement of non-dedicated staff members.

Aside from two asset servicers and a very large asset manager, the rest of the buy-side respondents have fewer than 20 FTEs dedicated to the function, reflective of its lower prioritization and smaller scope of operations within the asset management community comparative to sell-side firms. These teams or individuals are focused purely on managing their own firm's collateral assets and are frequently part of the operations function rather than a dedicated collateral management unit. For some buy-side firms, business dynamics rather than regulatory ones underlie the increased prioritization of the function, such as the increased use of liability-driven investments, which requires increased use of collateral assets for long-term liability and interest rate risk hedging.

Figure 16: Number of Staff Dedicated to Collateral Management



Source: Aite Group's interviews with 34 firms, 2015

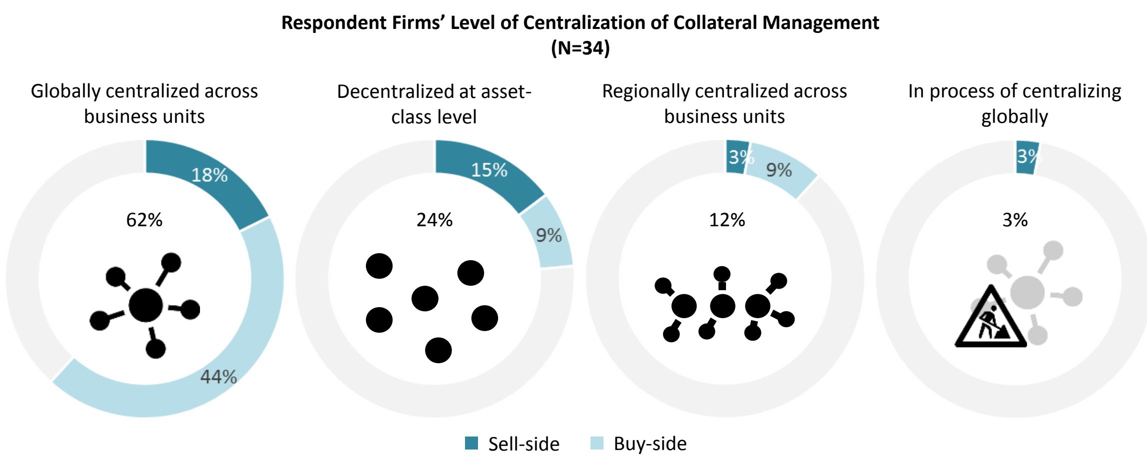
The reliance on manual processes and the expertise of in-house staff also brings its own risks. Not only is there the operational risk of manual error, but the lack of an industry-wide, standardized approach to collateral management, including a common definition for market practices among firms, also means that any new hires must acclimate to new operating environments and processes. Key-person risk is therefore at a high level overall.

The structure of the collateral management function tends to depend on the internal architecture of the financial institution in question; hence, it is often siloed at the asset-class or business-line level. The focus of the function has traditionally been on supporting individual business lines or front-office trading desks, with little thought to aggregating a consolidated firm-wide inventory for collateral; therefore, derivatives collateral management generally sits apart

from fixed income collateral management. The sell-side is especially challenged in this area because of the range of business lines that involve collateral activities, whereas buy-side firms may only require these capabilities to support derivatives activities.

In spite of the legacy siloed approach, the majority of respondents have some degree of global centralization in place at the operational level. This does not mean, however, that they have a single technology platform for managing collateral across their business lines. Some firms are regionally structured to take into account time zone differences, and even those firms that have centralized teams have in-country support for clients and business units at the local level. The benefit of a centralized approach is that firms are better able to track collateral inventory across the enterprise. A Tier-1 asset manager that centralized its function a decade ago indicates that it has since been able to see the location of every collateral asset, including cash in transit, and to centrally manage all margin calls in one place.

Figure 17: Level of Centralization



Source: Aite Group's interviews with 34 firms, 2015

BUY-SIDE VS. SELL-SIDE INTERNAL ENVIRONMENTS

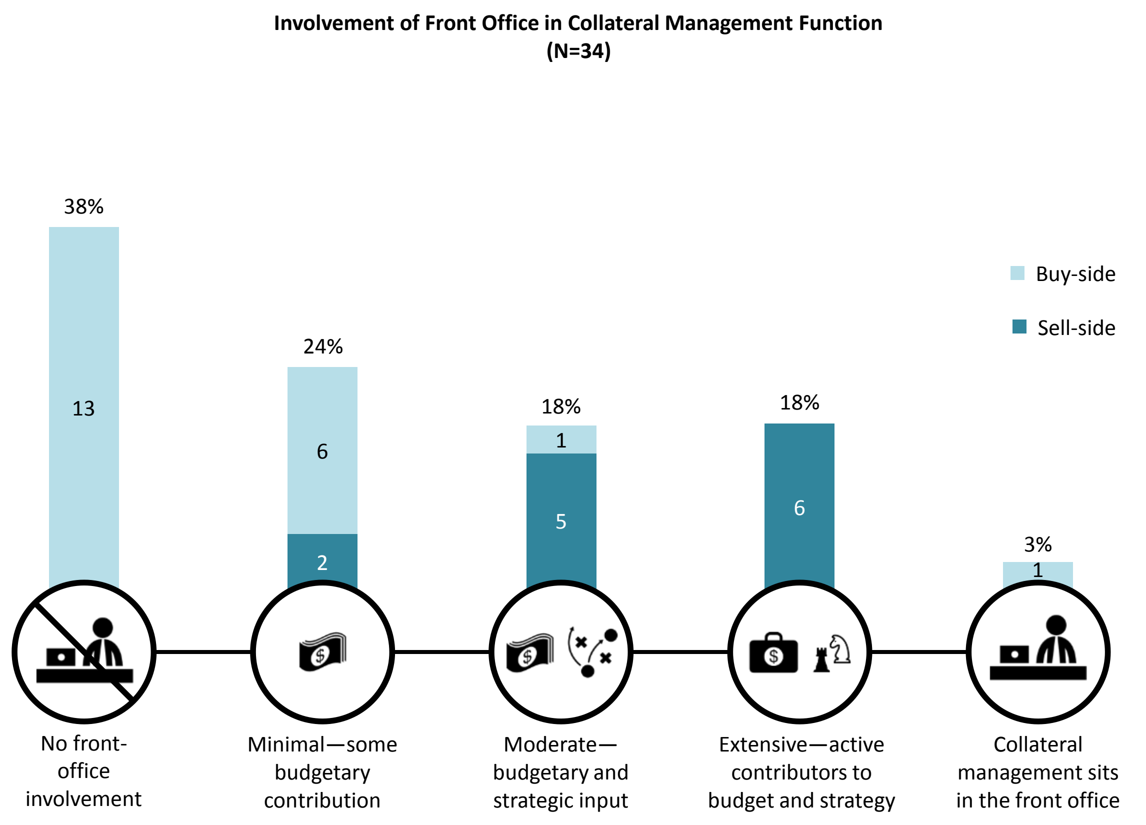
Collateral management has certainly moved onto the sell-side's front-office radar over the last couple of years as firms have recognized the impact that CCP margin requirements have on the price of trades. This trend has been realized in the development of various valuation adjustment methodologies, starting with credit valuation adjustment (CVA), which rose in profile across the industry post Lehman, and, most recently, with funding valuation adjustment (FVA) and debt valuation adjustment (DVA). The Basel III framework is also introducing a CVA risk capital charge that requires financial institutions to set aside regulatory capital to cover CVA risk in addition to counterparty default risk, which is being referred to as K-CVA. Tier-1 investment banks such as JPMorgan, Barclays, and Bank of America have all set up so-called XVA desks to manage all their derivatives valuation adjustments, including DVA, CVA, FVA, and K-CVA.

Figure 18 clearly shows that all sell-side respondent firms have at least some front-office involvement in collateral management, either in terms of contribution to budget or strategic

input, often directly related to optimization. The main benefit of this attention is that while middle- and back-office functions are often perceived as cost centers, functions that directly impact profitability are more likely to receive C-level buy-in for investment. This dynamic has granted the collateral management function more of a business case for technology investment within the sell-side community, spurred on by the activities of these XVA desks.

The buy-side, on the other hand, tends to have far less front-office engagement, with more than half of respondents indicating that there is no input at all from their portfolio management team. The buy-side respondent firms that do receive input from the front office are generally receiving some level of financial contribution toward an enterprise system that encompasses collateral management technology, often in the form of a dedicated module. Portfolio managers' focus in terms of collateral data and strategy is different from that of front-office teams within sell-side firms—rather than focusing on pricing collateral, the intent is to understand its availability and the impact of market changes, such as a sovereign debt crisis or market default.

Figure 18: Front-Office Involvement in Collateral Management Activities



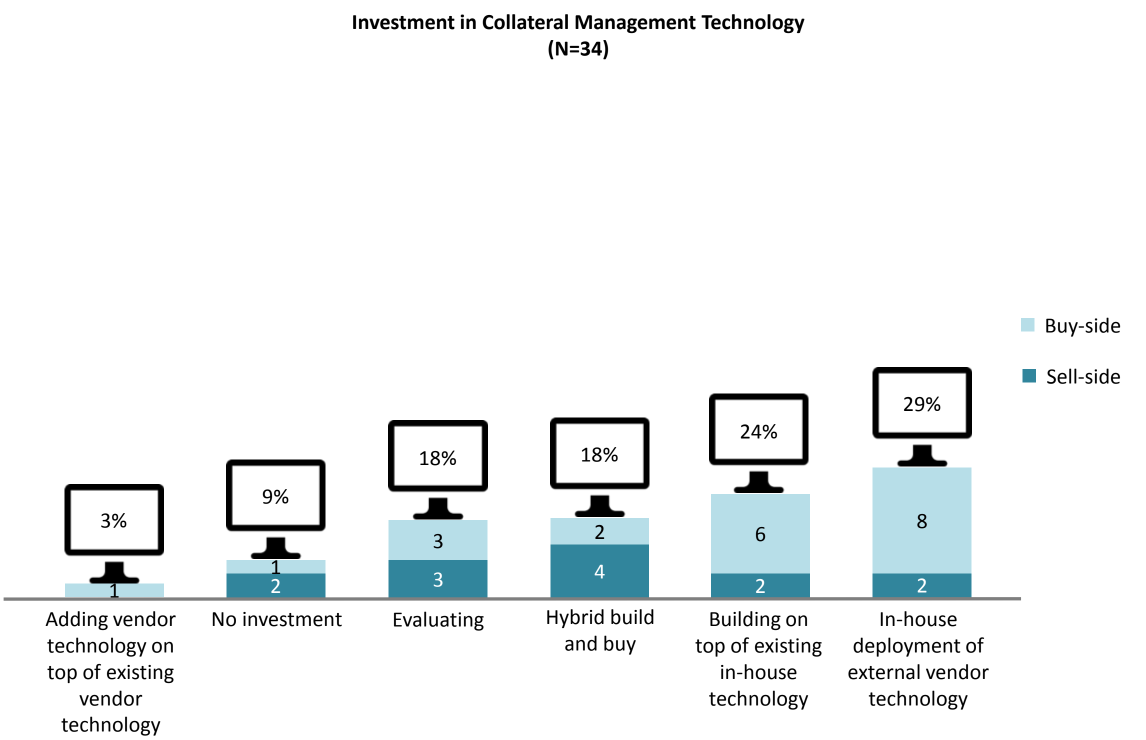
Source: Aite Group's interviews with 34 firms, 2015

In accordance with their operational structures and priorities, sell-side firms are more likely to have built some aspects of their collateral management technology environment rather than work only with vendor solutions. Figure 19 indicates that more than half of respondent sell-side firms have either built their own platforms or have adopted a hybrid, part-build-part-buy

approach. Those firms that have built their own proprietary technology platforms have opted to do so because of the perception that internally built collateral management technology could be better-tailored to the firm's various business requirements than off-the-shelf options.

A third of buy-side firms, on the other hand, have opted to exclusively deploy external vendor technology, citing the expertise of the vendor as the key selling point. Many of these firms moved or are moving from a primarily manual and spreadsheet-based approach to collateral management and therefore do not have the in-house expertise to build a new system from scratch.

Figure 19: Technology Environment for Collateral Management



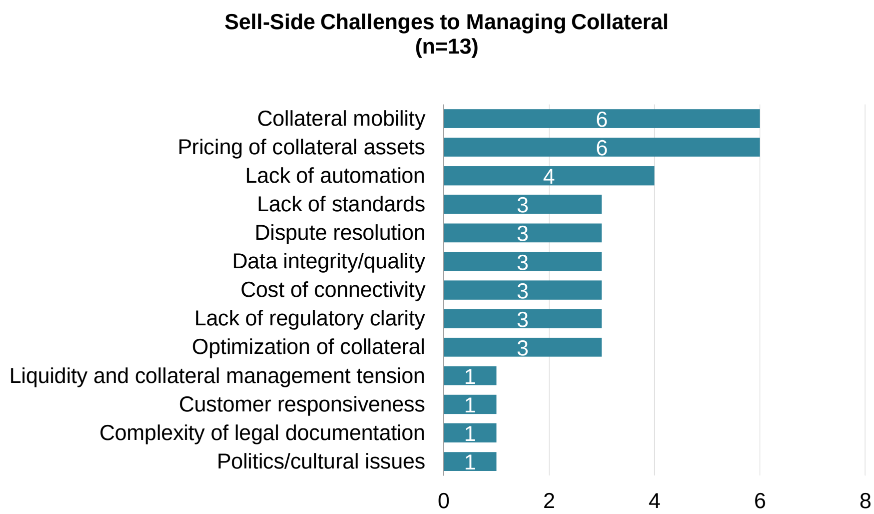
Source: Aite Group's interviews with 34 firms, 2015

The primary challenge for sell-side firms is the ability to move collateral around the globe to meet collateral requirements or calls in specific countries (Figure 20). This is exacerbated not only by the current lack of interoperability between market infrastructures but also by the lack of an internal centralized view of a firm's collateral assets at the enterprise level. Time zones can also prove challenging for firms operating in multiple jurisdictions. If a call arises in a region where collateral is not immediately available because it is outside of operating hours, the firm must wait until the next day to fulfill obligations or source collateral externally at extra cost.

Not only have these firms found that the cost of pledging collateral has increased but they also face difficulties factoring the cost of the collateral into their pricing models, which has become a more frequent process as a result of OTC derivatives moving onto CCPs. The lack of industry-wide standards for collateral messaging and data is also a pain point for three of the 13

respondents due to the operational risk and cost of manual intervention that is required to deal with email-based interactions.

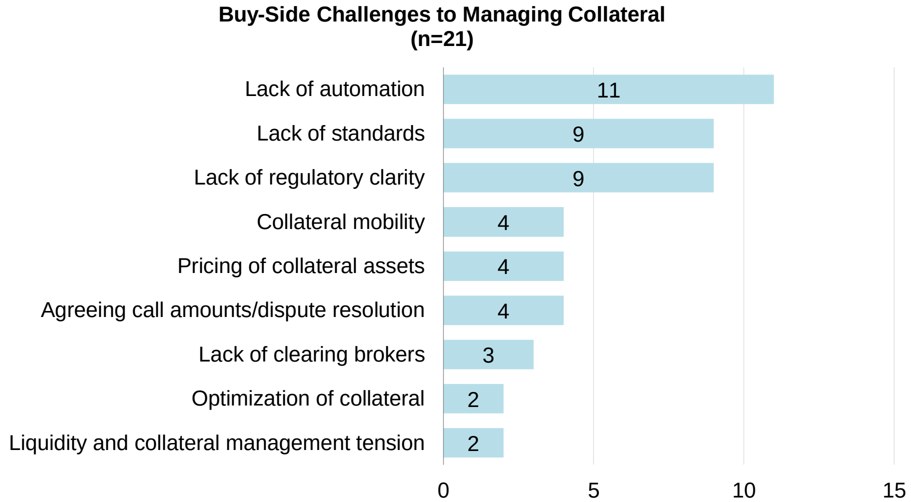
Figure 20: Sell-Side Respondent Challenges



Source: Aite Group's interviews with 34 firms, 2015

The labor-intensive nature of the collateral management process is the biggest challenge for buy-side respondent firms due to the lack of internal and external automation (Figure 21). A Tier-2 asset manager indicates that the firm struggles to respond to calls in a timely manner intraday because it is reliant on staff members rekeying data received from counterparts via email, which is inefficient and risky. This environment also reflects the second most cited challenge—a lack of communication standards for the exchange of information between counterparties. Collateral mobility is further down the priority list than it is for the sell-side because the majority of the buy-side firms are at an earlier stage of maturity in terms of managing collateral assets.

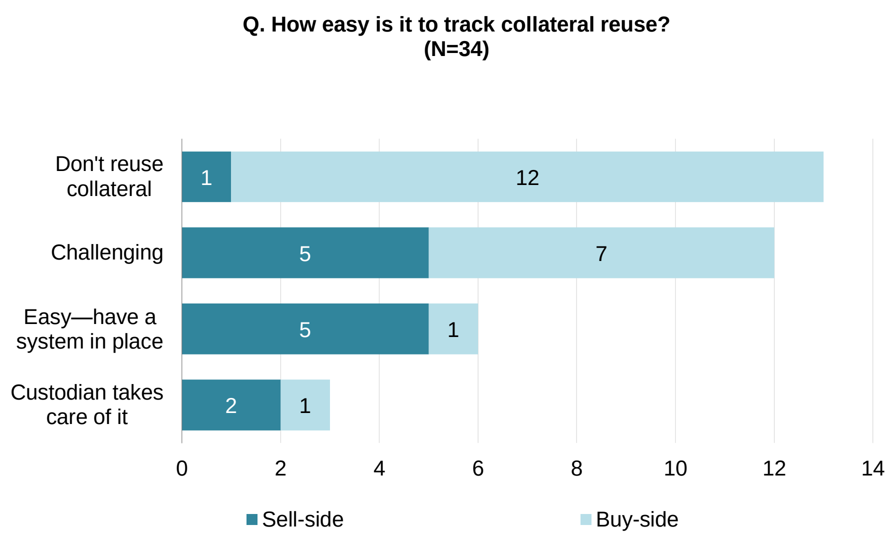
Figure 21: Buy-Side Respondent Challenges



Source: Aite Group's interviews with 34 firms, 2015

Figure 22 indicates that more than half of buy-side firms do not allow the rehypothecation of collateral assets and more than half of sell-side firms find tracking collateral reuse challenging. A Tier-1 brokerage firm respondent says it is very difficult to track rehypothecated assets because they move around frequently between a wide range of different counterparties in the market. The firm also currently has no specific technology in place to assist in the monitoring of collateral reuse.

Figure 22: Respondent Views on Challenges in Rehypothecation



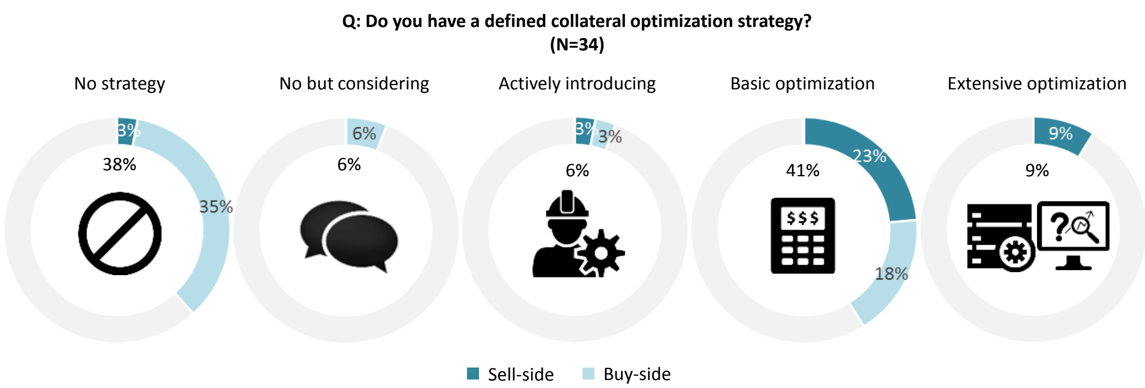
Source: Aite Group's interviews with 34 firms, 2015

COLLATERAL OPTIMIZATION

Collateral optimization means different things to different firms and can also mean different things to an individual working in an operations team versus an individual working in the front office. It most frequently refers to the efficient allocation and use of collateral assets, often based on the concept of cheapest to deliver. From a front-office perspective, this could be based on liquidity risk, funding costs, capital costs, and other economic factors. From an operations perspective, optimization can mean higher levels of automated processes for collateral tracking and delivery.

Unsurprisingly, more than half of buy-side respondents do not have a defined collateral optimization strategy and do not have any immediate plans to introduce one (Figure 23). Only three sell-side respondents describe their strategy as extensive, and more than half have basic capabilities. A respondent from a Tier-1 investment bank with extensive capabilities indicates that his firm looks at the cost of financing for collateral, including the haircut and the impact of using the asset on the firm's liquidity buffer, as part of its optimization strategy. The firm has invested heavily in technology over the last few years to support this process, though there remains some disagreement among internal front-office desks about which optimization algorithms should be used in these calculations and whether they should be consistent across the firm.

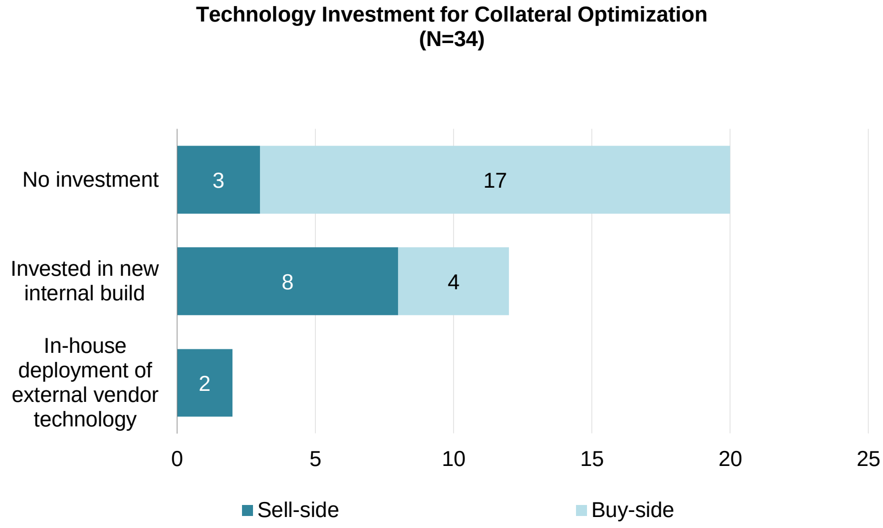
Figure 23: Optimization Strategy



Source: Aite Group's interviews with 34 firms, 2015

Reflective of their lack of strategic focus, the majority of buy-side firms have not invested in any kind of technology to support optimization (Figure 24). The two asset servicer respondents have built in-house technology capabilities to support their clients in optimizing their collateral assets, and two of the large asset managers have built basic capabilities to support the manual process of selecting collateral assets. The sell-side is more advanced in its approach, and two of the investment bank respondents have deployed external technology capabilities to support optimization.

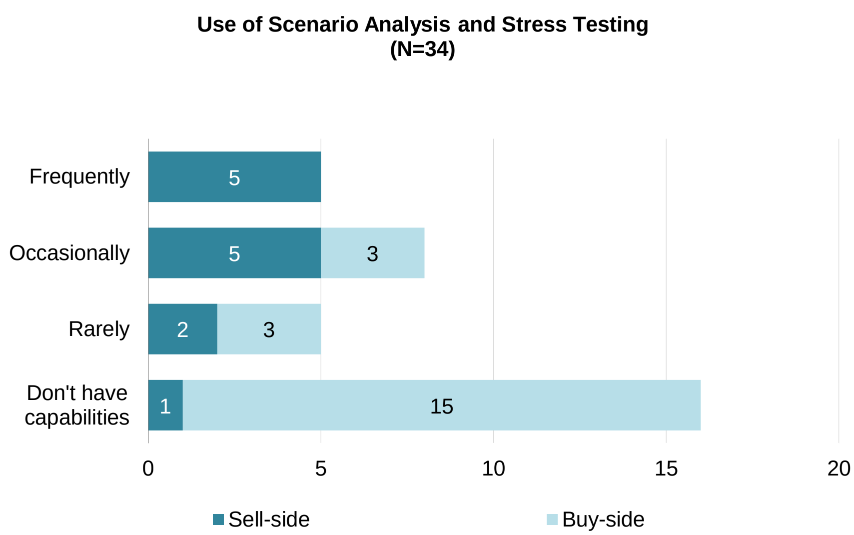
Figure 24: Optimization Technology Capabilities and Investment



Source: Aite Group's interviews with 34 firms, 2015

The majority of buy-side firms also do not have "what if" scenario capabilities in place to model and adjust collateral strategies in the event of a significant market event (Figure 25). Only five sell-side respondent firms run these stress tests on a regular basis, though this number is likely to increase as collateral teams face a shortage of collateral assets. The sell-side will continue to front-run in this area, given the greater pressures these firms face compared to the buy-side in terms of managing liquidity, capital, and collateral under the Basel III framework.

Figure 25: Scenario Analysis Capabilities



Source: Aite Group's interviews with 34 firms, 2015

TRADE REPORTING

The FSB indicates that the majority of jurisdictions have trade repositories available to accept transaction reports for at least one asset class, and six jurisdictions currently have a trade repository authorized to operate in every asset class. It is anticipated that by the end of 2015 several jurisdictions will have expanded the coverage of trade reporting requirements, and by year-end 2016 almost all jurisdictions expect to have reporting requirements in force, covering more than 90% of OTC derivatives transactions.

Trade reporting has been a particular pain point for both buy-side and sell-side firms, with respondents highlighting the EMIR requirements as particularly challenging. The most common complaints relate to the requirement for both sides to be reported under one unique transaction identifier and the inclusion of exchange-traded as well as OTC derivatives for EMIR. Though buy-side firms can delegate responsibility for reporting to their sell-side counterparties or other third parties, many have opted to report directly to trade repositories because the liability for reporting remains with the asset manager. This has meant extra costs for asset managers, with some respondents calling the process a “nightmare” and “significantly operationally challenging.”

SUMMARY: INSIDER VIEWS

The increasingly centralized approach toward collateral management reflects the industrialization of the function. A number of other significant trends are impacting these teams:

- All sell-side respondent firms have at least some front-office involvement in collateral management, either in terms of contribution to budget or strategic input and often directly related to optimization.
- The buy-side tends to have far less front-office engagement in collateral management, with more than half of respondents indicating that there is no input at all from their portfolio management teams. The function remains operations-focused and located in the middle or back office.
- The primary challenge for sell-side firms is the ability to move collateral around the globe to meet collateral requirements or calls in specific countries.
- The labor-intensive nature of the collateral management process is the biggest challenge for buy-side respondent firms due to the lack of internal and external automation.
- More than half of buy-side respondents do not have a defined collateral optimization strategy and do not have any immediate plans to introduce one. Only three sell-side respondents describe their strategy as extensive, and more than half have basic capabilities.

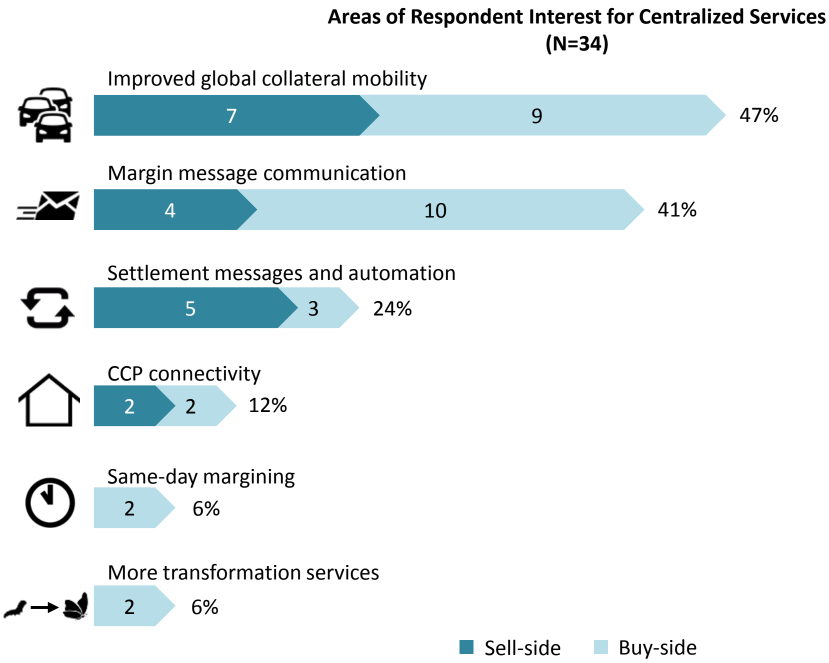
THE EXTERNAL REALM

Reform of the OTC derivatives markets is not only influencing firms' internal approach to collateral management, it is also leading many to consider the services that should be provided externally. For a number of market participants, the investment and effort required to update their collateral management technology environments and current operational workflows is too substantial and too painful to even contemplate. As such, there is appetite in the market for outsourcing and managed services in certain areas.

Respondents would like to see centrally provided solutions for several different elements of the collateral management life cycle, the most commonly cited of which is an offering to facilitate the movement of collateral assets (47%; Figure 26). Using existing infrastructure, many firms struggle to move collateral assets between siloed pools in a timely and efficient manner, resulting in both an increase in cost and operational risk. This problem will be exacerbated as more jurisdictions enforce OTC derivatives regulation and as firms are compelled to manage collateral assets more actively across regions. As such, a number of market participants believe that market infrastructures should provide a platform for the movement of collateral assets, thus reducing the connectivity costs that arise in a decentralized environment.

The challenge a central services provider for collateral management faces is that such a service needs to be not only operationally efficient but also cost-efficient. One Tier-1 asset manager respondent notes that the key to achieving this is to be agnostic about how the service receives data, as firms do not want to be forced to use additional vendor middleware or services. On the other hand, widespread adoption of a messaging platform, such as AcadiaSoft MarginSphere, could increase automation and reduce reliance on the extract, transform, and load capabilities of the central service provider. To this end, 41% of respondents would like to see margin messaging communication handled centrally, particularly as the volume of margin calls increases with the move of more OTC derivatives onto a central clearing model.

Figure 26: Respondent Views on Areas for Centralized Services

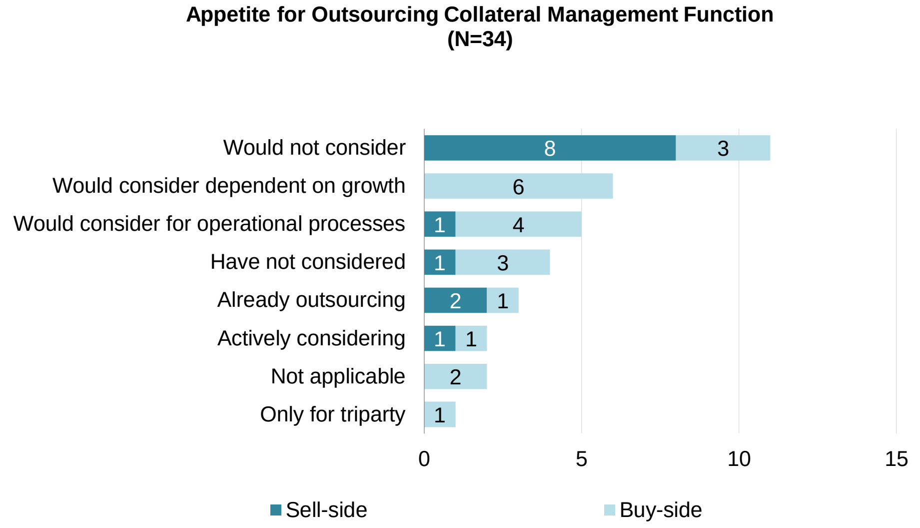


Source: Aite Group's interviews with 34 firms, 2015

While some firms would like to see certain aspects of collateral management handled by central service providers, a number also believe that outsourcing the entire collateral management process is the optimal approach. This is particularly the case for Tier-2 and Tier-3 buy-side firms, several of which acknowledge that the increasing collateral management requirements will necessitate investment in technology and staff. These firms struggle to see past the opportunity cost of this investment and would prefer to focus resources on their core profit-generating activities, such as investment strategy. One Tier-2 asset manager also indicates that outsourcing collateral management to custodians could be more efficient from an operational perspective, particularly if the use of noncash collateral increases, because firms would need real-time access to their collateral inventory.

On the other hand, the majority of sell-side respondents would not consider outsourcing collateral management (Figure 27), which is unsurprising given these firms are more likely to have already made investments in technology and staff. Those that offer collateral services to their clients feel that it can be an area of competitive advantage and therefore prefer to keep operations in-house. Additionally, these firms feel that outsourcing is too much of a concern when it comes to operational risk and control.

Figure 27: Outsourcing Appetite

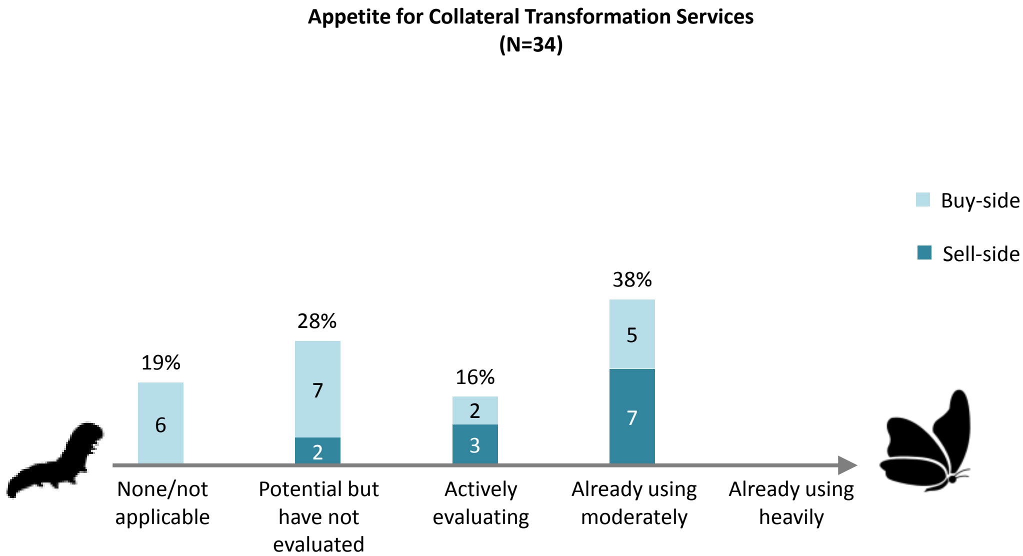


Source: Aite Group's interviews with 34 firms, 2015

Previous Aite Group research found that 70% of firms see collateral transformation as becoming increasingly important[2] due to the implementation of regulatory and market infrastructure changes. This sentiment is reinforced by seven out of 12 sell-side respondents and a further five buy-side respondents that are currently using collateral transformation services moderately (38%; Figure 28). No respondents are heavily using transformation services, although one Tier-1 broker states that it firmly believes collateral transformation will become a significant business overall. Aite Group expects this to occur over the next two years, particularly as central clearing is phased in as part of EMIR and various HQLA are tied up as a result of Basel III's LCR requirements.

2. See Aite Group's report *Collateral Management in Europe: Searching for Central Intelligence*, May 2015.

Figure 28: Transformation Activities



Source: Aite Group's interviews with 34 firms, 2015

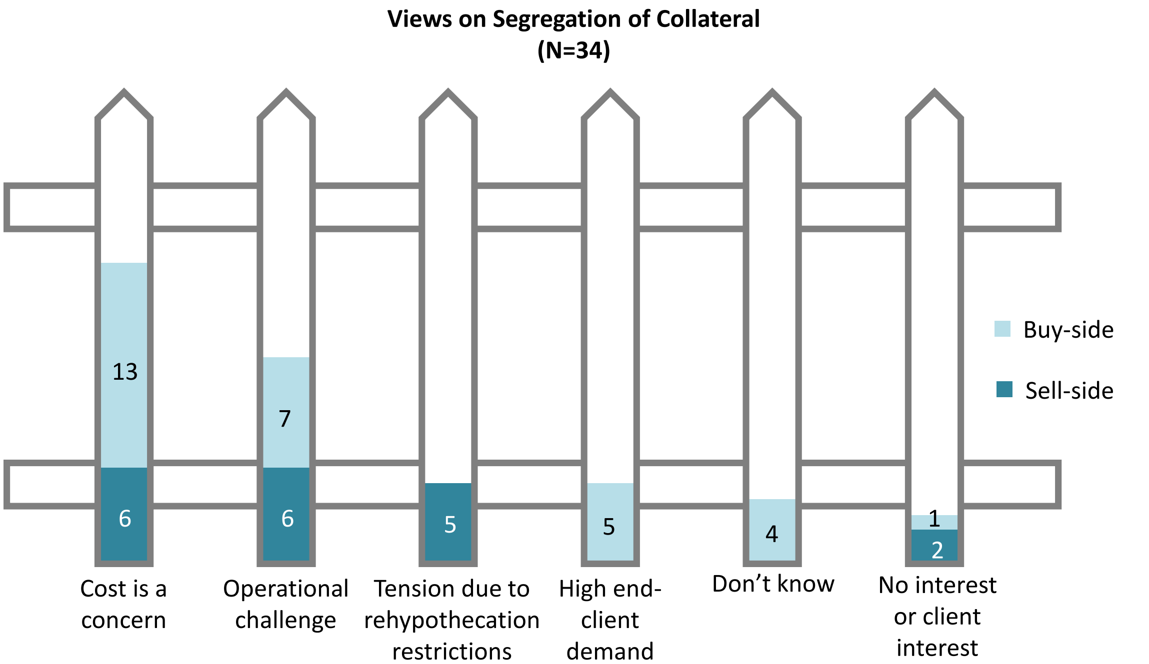
Asset segregation rules intend to ensure that in the event of a clearing member or client default, the other clients will be minimally impacted and be able to move to a backup clearing broker. Although the regulators share this end goal, there are some discrepancies in the rules that have been mandated. In the United States, the CFTC has introduced a single prescribed option for client asset segregation—the legally segregated, operationally comingled model (LSOC). Under this model, a futures commission merchant or clearing broker must segregate client assets from its own assets, but the assets of all its customers can be operationally comingled in one account at a CCP. The LSOC model emerged from a CCP-led working group and was later embraced by the CFTC, but its biggest detractors argue that in the event that a clearing broker defaults, clients are not guaranteed to get back the exact same instruments that they pledge. Even if the value of the returned assets is equal to the collateral assets that were originally pledged, this is still viewed by some as insufficient.

In Europe, on the other hand, EMIR offers a range of options for client asset segregation that clearing brokers can establish depending on client preferences. At a minimum, clearing brokers must support two different models for client asset segregation. At one end of this spectrum is the omnibus account client asset segregation model, where the clearing member arranges with the CCP to separate records and accounts to distinguish the assets and positions of its clients from its own assets and positions. Positions can then be netted within an omnibus account, although not across accounts. This is widely perceived to be the most operationally simple and least expensive segregation model, although it does result in risk mutualization. Some buy-side firms are quite mindful of this risk, especially pension funds.

At the other end of the spectrum is the full segregation of individual client assets, which a number of buy-side firms are keen for their clearing brokers to support. A Tier-1 pension fund, for example, highlights that collateral assets are a part of its investment portfolio, and therefore it requires those exact assets to be returned. The difficulty with this model is that it is the most

costly and operationally complex, and it prevents firms from netting across different client accounts, which results in margining inefficiencies. Figure 29 shows that cost is respondents' biggest concern regarding collateral segregation. Many buy-side respondents fear their service providers will raise charges to take into account the operational burden. For this reason, one buy-side respondent suggested that it might go direct to a CCP, rather than via a clearing broker, if CCPs offered a suitable model for this arrangement.

Figure 29: Views on Collateral Segregation



Source: Aite Group's interviews with 34 firms, 2015

BUY-SIDE RELATIONSHIPS

In Europe, a number of firms have exited the OTC derivatives clearing space because of the high cost of operations and the impending capital regime under Basel III as well as the delays to EMIR that have held back buy-side interest and investment. While buy-side firms do not face the same capital requirements as the sell-side, the costs of CCP connectivity and collateral segregation will likely be passed along the food chain from the agents to the end clients. So what options do buy-side firms have?

Firstly, the buy-side cannot simply forgo the costs of OTC derivatives clearing and exit the market entirely because, for many, OTC derivatives are hedging tools that are fundamental to their investment strategies. To remain active in these markets, buy-side firms can consider a number of approaches. One option is to invest in collateral management technology, which could mean migrating from a spreadsheet-dominated environment to a vendor-provided solution. This may seem like unnecessary expenditure for a function that has had little in the way of technology investment or footprint in the past. It should be noted, however, that in recent years a number

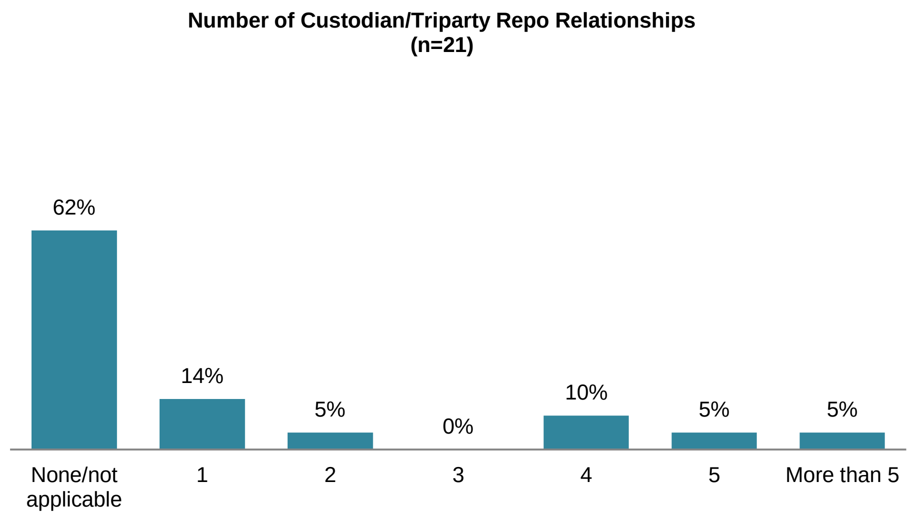
of buy-side-focused products have been developed, with the specific demands of the buy-side in mind. This can also include automating margin communications, removing many of the manual inputs required by a collateral manager.

Cross-product margining is potentially another cost-saving option for the buy-side, as margin is netted across both exchange-traded derivatives and OTC derivatives at a single clearing house. This allows liquidity to be pooled, which means that fewer margin calls are needed and margining efficiencies can be realized. The industry’s main concern about cross-product margining is that CCPs will be undercollateralized in times of market stress, and the exchange-traded and OTC derivatives default funds would be linked, thus giving rise to correlation risk. Buy-side respondents nonetheless express their interest in the service and believe that the costs savings far outweigh the potential risks. A Tier-1 asset manager indicates that the availability of cross-product margining directly impacted its choice of clearing venue.

Widespread adoption of cross-product margining could lead to a reduction in the number of clearing brokers and futures commission merchants that buy-side firms use. Traditionally, exchange-traded and OTC derivatives business lines have operated in silos, with different liquidity pools and different clearing brokers servicing them. The most efficient practice under cross-product margining, however, is to combine those liquidity pools and use just a single clearing broker, although firms may be opposed to this for concentration risk reasons.

A further avenue for buy-side firms to consider when dealing with the collateral difficulties posed by the OTC derivatives market reforms is the triparty repo market. This allows firms to transform collateral assets, which may be necessary for CCP eligibility purposes. At present, however, more than half of buy-side respondents do not have any relationships with triparty agents for repo access, suggesting that there has not been enough of a squeeze on collateral supply for substantial collateral transformation services to be required. It should also be noted that some firms are outsourcing their entire collateral operations to their custodians, in which case the buy-side firm may only have one triparty repo relationship in place (Figure 30). The option to outsource the entire collateral management process may appeal to smaller asset managers that may have existing outsourcing relationships for other operational processes.

Figure 30: Buy-Side Respondent Relationships With Triparty Agents

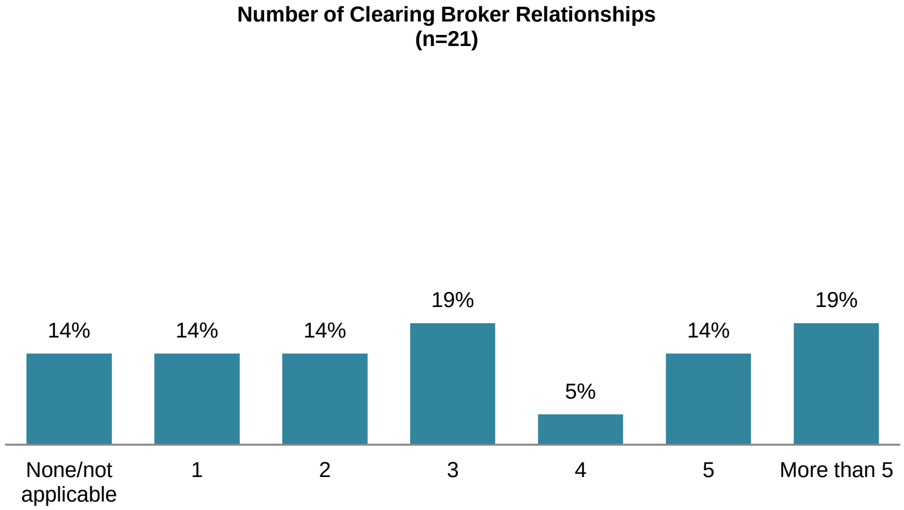


Source: Aite Group's interviews with 34 firms, 2015

The ability and willingness of triparty agents to provide collateral management services to the buy-side may ultimately impact the number of clearing broker relationships held by an asset manager or pension fund. If the risks and costs associated with maintaining one or several clearing broker relationships are deemed to be too high, buy-side firms may disintermediate their sell-side counterparts and connect directly to CCPs. In this case, triparty agents could provide access in a risk-mitigated environment and match up assets on both sides of the custody network. This is, however, an unproven model and would only apply to larger asset managers that have the budget to make the relevant technology investments and CCP default fund contributions.

For the majority of buy-side firms, the investment required to go directly to CCPs is too high, and instead they must connect to CCPs via clearing brokers. In this case, buy-side firms need to consider the fees charged by the clearing broker, the broker's risk model, the likelihood of the clearing broker defaulting, and the collateral segregation models offered. Figure 31 shows that the majority of buy-side respondents have or plan to have at least two clearing broker or futures commission merchant relationships in place, primarily for the purpose of mitigating concentration risk. The selection process for a broker must take into account the broker's potential default and its long-term strategic commitment to clearing the instruments in question.

Figure 31: Buy-Side Respondent Relationships With Clearing Brokers

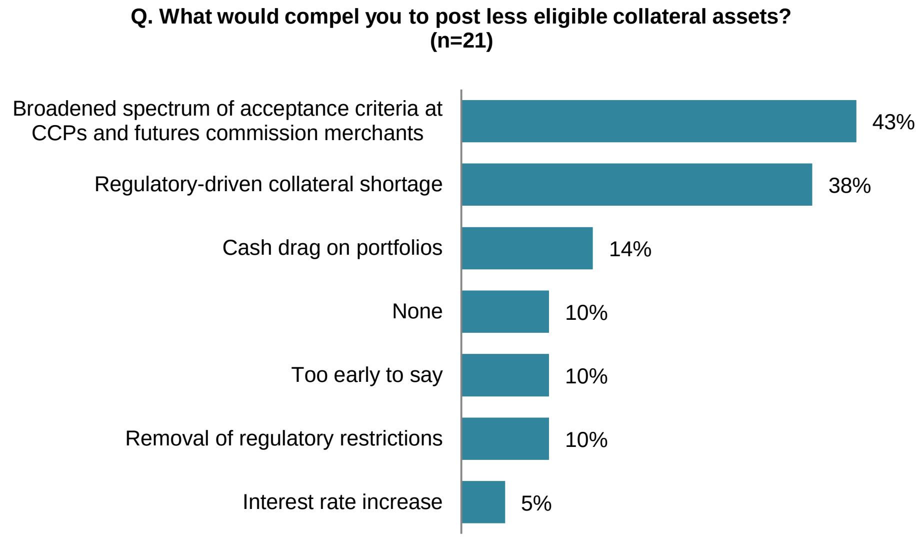


Source: Aite Group's interviews with 34 firms, 2015

While buy-side firms acknowledge the future importance of central services, such as those targeted at improving collateral mobility, their immediate priority appears to be much more internally focused. There is yet to be a sufficient enough squeeze on cash and other types of HQLA to warrant the adoption of these external services in the short term and, as such, firms are also not yet feeling compelled to post less eligible assets as collateral. So what could trigger this move?

At present, the haircut for posting cash or government bonds as collateral at CCPs is generally somewhere between 0% and 10%. For those CCPs that accept less eligible assets, such as gold bullion or corporate bonds, the haircut range is from 15% to 30%, and firms may face haircuts as high as 50% if they wish to post equities as collateral. With such high costs for posting less eligible assets, it is unsurprising that cash is still king. Figure 32 shows that the main driver for buy-side respondents to post less eligible assets as collateral would be if CCPs and clearing brokers increased the range of acceptable assets and decreased the cost of posting those assets. However, a squeeze on HQLA supply by central bank activity, Basel III capital requirements, and continued reform of global OTC derivatives markets could result in firms being forced to post less eligible collateral assets irrespective of CCP haircuts. For this reason, 38% of buy-side respondents say a regulatory-driven collateral shortage would compel them to post less eligible collateral assets in future.

Figure 32: Buy-Side Tipping Points for Posting Less Eligible Assets



Source: Aite Group's interviews with 34 firms, 2015

SUMMARY: THINKING OUTSIDE THE FIRM

There are several opportunities for external service providers in the collateral management space:

- Many respondent firms would most like to see centralized services to support collateral mobility and margin message communication.
- Buy-side firms would consider outsourcing either part or all of the collateral management function, depending on the growth in their use of derivatives instruments.
- Collateral transformation services, through the triparty repo and securities lending markets, will become increasingly important as more jurisdictions implement derivatives regulations.
- European buy-side firms are likely to enter into at least two clearing broker relationships, much like their American counterparts. The collateral segregation models on offer in Europe will play a big role in choosing business partners in the region.
- There is a great deal of buy-side interest in cross-product margining.

CONCLUSION

- **Cross-product margining remains high on the buy-side agenda, but so does collateral account segregation.** Asset managers and pension funds are keen for their brokers and CCPs to offer netting opportunities across similar products to benefit from margin efficiencies. Many of these firms are also, however, concerned about the risks involved in comingled accounts and feel the costs of segregated accounts are potentially too high.
- **Though there are no current signs of a collateral shortage, the next couple of years could see a regulatory-driven squeeze on HQLA.** Collateral mobility concerns will therefore increase, which will spur the adoption of transformation services and optimization efforts. The sell-side will continue to be front-runners in their maturity of approach.
- **Internal industrialization of the collateral management function will progress as firms adopt more centralized approaches.** This will be driven by the need to view a central inventory of collateral at an enterprise level and increased front-office involvement in budgeting and strategy. Technology investments will play a part in this industrialization process.
- **Timeliness of dispute resolution and margin management activities will be important for all market participants as the frequency of calls increases.** The uptick in margining activity resulting from Dodd-Frank will be replicated in other jurisdictions as more regulations are implemented. This could prove a tipping point for a greater number of buy-side firms to invest in technology for margining support.
- **The sell-side will continue to spend more on optimization technology than will the buy-side.** Unsurprisingly, the incentive to invest in technology to support collateral optimization is much stronger for sell-side firms that are offering services to smaller peers or buy-side clients than it is for asset managers. It may be some time, however, before these investments by custodians and investment banks benefit their internal collateral management teams. Multiyear projects take time to pay off.

ABOUT GLOBALCOLLATERAL

DTCC-Euroclear GlobalCollateral Ltd (GlobalCollateral) is a joint venture between DTCC and Euroclear, two of the world's largest post-trade infrastructures.

An open-architecture infrastructure designed to streamline collateral processing globally, GlobalCollateral provides both OTC derivatives and financing solutions that deliver transparency, collateral mobility, efficiency, and security through two powerful utilities:

- **The Margin Transit Utility:** Enabling straight-through processing of margin calls, mitigating systemic risk, and providing improved liquidity and operational risk management

- **The Collateral Management Utility:** Automating collateral management tasks, repositioning inventory seamlessly across settlement locations, making collateral available wherever and whenever it is needed

GlobalCollateral enables the market ecosystem to adapt to the operational challenges brought about by the changing capital markets. It is in constant dialogue with the industry through advisory groups, which have a combined membership of 17 dealers, eight custodians, three CCPs, and more than 30 buy-side firms.

Speak to GlobalCollateral to discover the opportunities its infrastructure offers for improving collateral efficiency while minimizing risk.

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ABOUT AITE GROUP

Aite Group is an independent research and advisory firm focused on business, technology, and regulatory issues and their impact on the financial services industry. With expertise in banking, payments, securities & investments, and insurance, Aite Group's analysts deliver comprehensive, actionable advice to key market participants in financial services. Headquartered in Boston with a presence in Chicago, New York, San Francisco, London, and Milan, Aite Group works with its clients as a partner, advisor, and catalyst, challenging their basic assumptions and ensuring they remain at the forefront of industry trends.

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