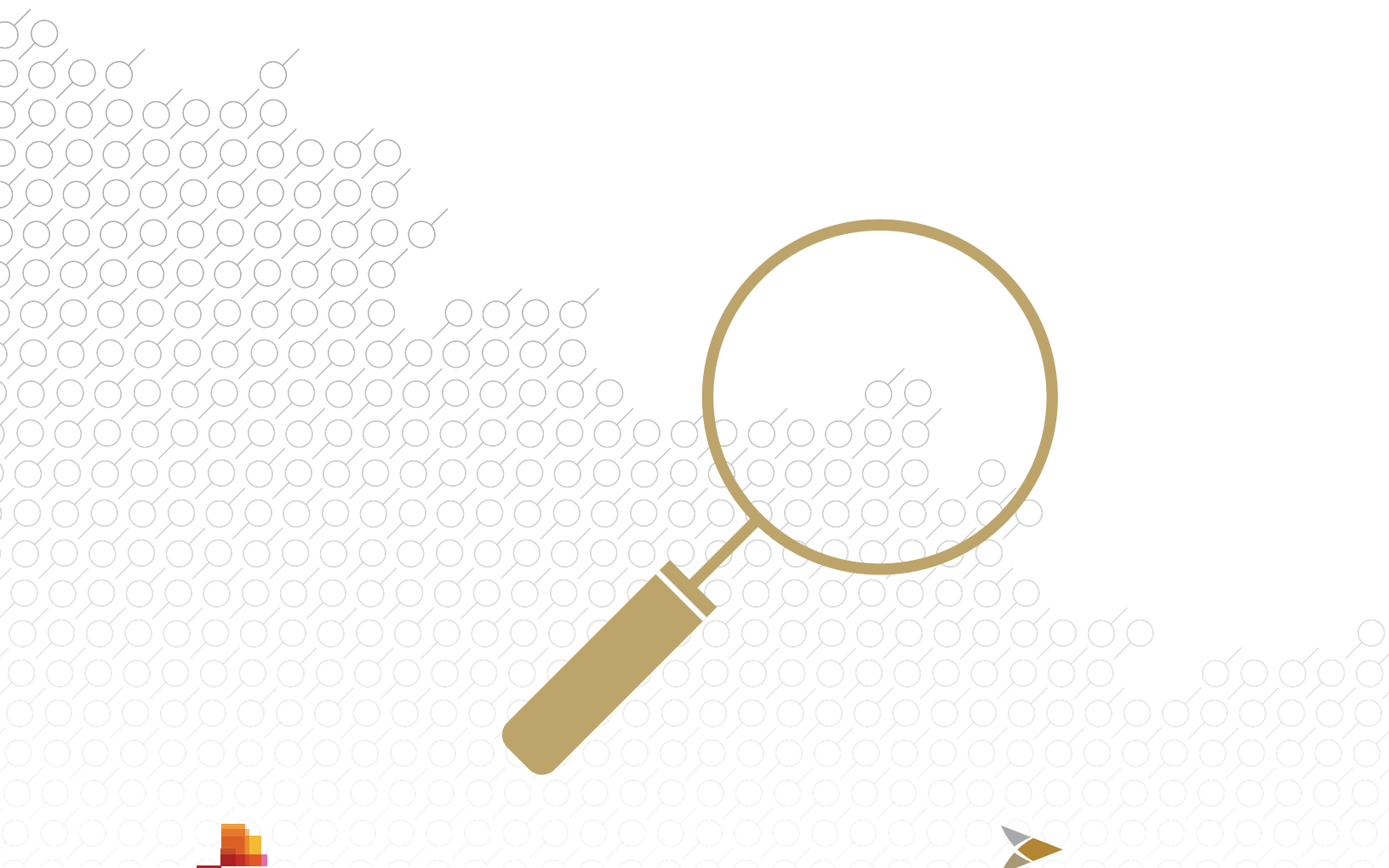


Collateral: The New Performance Driver

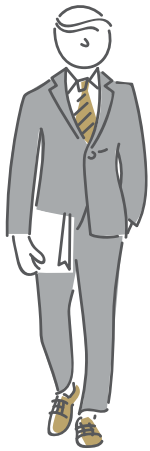
THE BUY-SIDE'S HUNT FOR FUNDING AND LIQUIDITY



Introducing Our Cast of Characters

15% of us with more than \$1 trillion under management expect to face challenges sourcing short-term liquidity.

Our concern over finding cash for non-cleared margin requirements means we are open to participating on peer-to-peer platforms.



THE ASSET MANAGER

I pursue mid- to long-term investments in publicly traded and synthetic products, as well as strategies that mirror specific indices.

THE INSURER

I pursue longer-term investment strategies, with corporate debt forming a significant portion of my portfolio.

THE PENSION FUND MANAGER

I primarily use liability-driven investment strategies, which entail matching liabilities with long-dated stable assets.

Survey Facts

140 Interviews

120 Participants

\$12 Trillion in AUM

79% of us plan on consolidating existing dealer relationships to secure future access to liquidity and funding.



THE BANKER

I provide liquidity to the market, but enhanced capital requirements and liquidity regulations are constraining the level of funding I can extend to the buy-side.



THE HEDGE FUND MANAGER

I use various investment strategies, such as directional global macro and long/short strategies, among others.

Six Months

Three Regions

“

There are people putting the same liquidity in multiple places. If you take it from one place, it will dry up in the other. I don't think there's going to be that much exclusive liquidity.

*Head of Money Markets & Foreign Exchange,
large UK-based Asset Manager*

1

Executive Summary

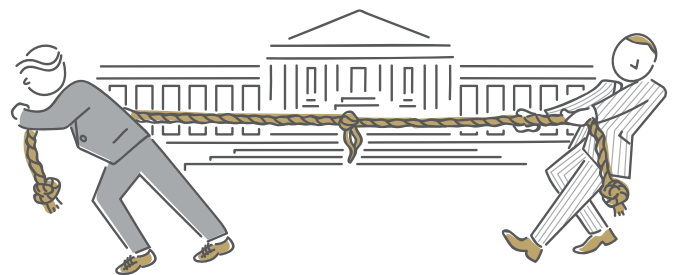
In 2017, the global buy-side community faces considerable liquidity and funding pressures, stemming from market and regulatory reforms that are causing disruption. As a result, access to high-quality collateral, funding and liquidity is not only a pressing concern but has emerged as the essential new performance driver for the buy-side.

This disruption is the result of two opposing forces. Stringent regulatory requirements are forcing market participants to seek collateral — generally of high quality — in order to secure trading exposures. At the same time, the sell-side — or dealer-sponsored financial plumbing used to supply liquidity and collateral to the market — is experiencing challenges due to Basel III capital and liquidity constraints.

A major concern among multiple buy-side firms is that the next market-stress event will occur not because of a lack of collateral in the financial system but rather due to the *inaccessibility* of this collateral.¹ This scenario is forcing firms to reevaluate their collateralized trading portfolios, recalibrate asset allocation strategies and in some cases review the investment products offered to end clients.

This paper presents the findings from BNY Mellon–PwC outreach to senior buy-side executives from over 120 global firms conducted during the first quarter of 2017. It provides insights on demand-supply imbalances that are being experienced by buy-side firms and the possible solutions they are exploring in response to fears that ready access to liquidity and high-quality collateral may become scarce in the years ahead.

The picture that emerged from these discussions was one of a buy-side community both grappling to adjust to its new collateralized trading obligations as well as striving to secure access to sustainable sources of funding and liquidity.



¹ Collateral can be inaccessible due to decreasing velocity of collateral, which indicates how much, on average, a single dollar of collateral is reused over a period of time. This is analogous to the concept of “velocity of money.”

2

Tensions Rise as Market Forces Collide

The clear picture that emerges from the outreach is that of a market dislocation resulting from two opposing forces. Buy-side regulations are requiring end users to hold more collateral, but at the same time, banking regulations are constricting dealer liquidity and their ability to offer collateral optimization services to clients that increasingly need them.

Regulatory Impact

Over 90% of participants noted a direct impact on their collateral obligations due to regulations such as OTC uncleared margin requirements.² Both the demand for high-quality collateral and the frequency of margin calls have increased for almost all participants.

How are you impacted by Uncleared Margin regulation?

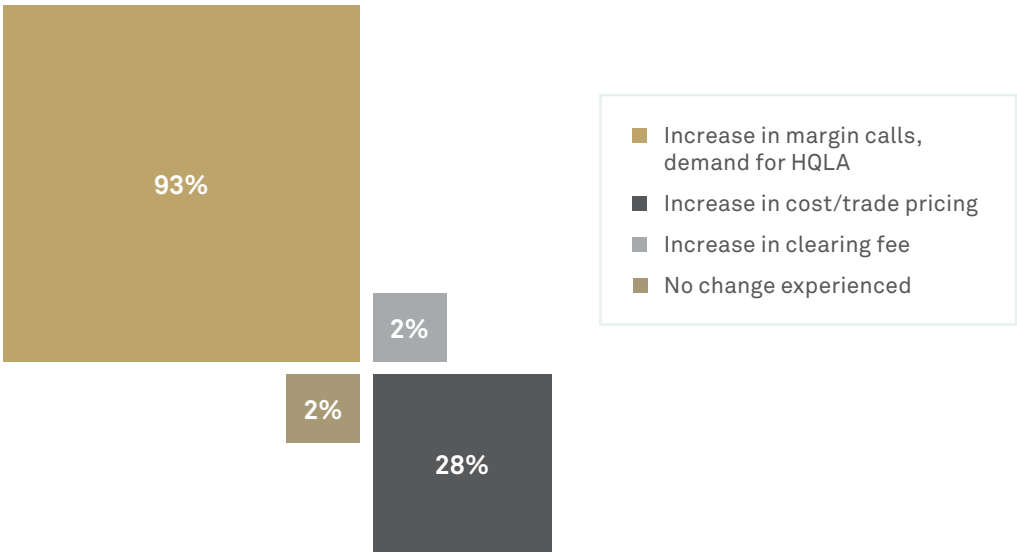


Figure 1: Regulatory Impact (OTC Derivatives)

²Standards for margin requirements for non-centrally cleared derivatives as agreed by the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO).



Impact of Dealer Constraints

Dealer balance sheet constraints are reducing short-term liquidity and limiting access to transformation trades. This impact is especially pronounced on Tier II and Tier III³ asset managers, with nearly 30% of these participants highlighting concerns.

Do you expect to face challenges sourcing short-term liquidity/financing?

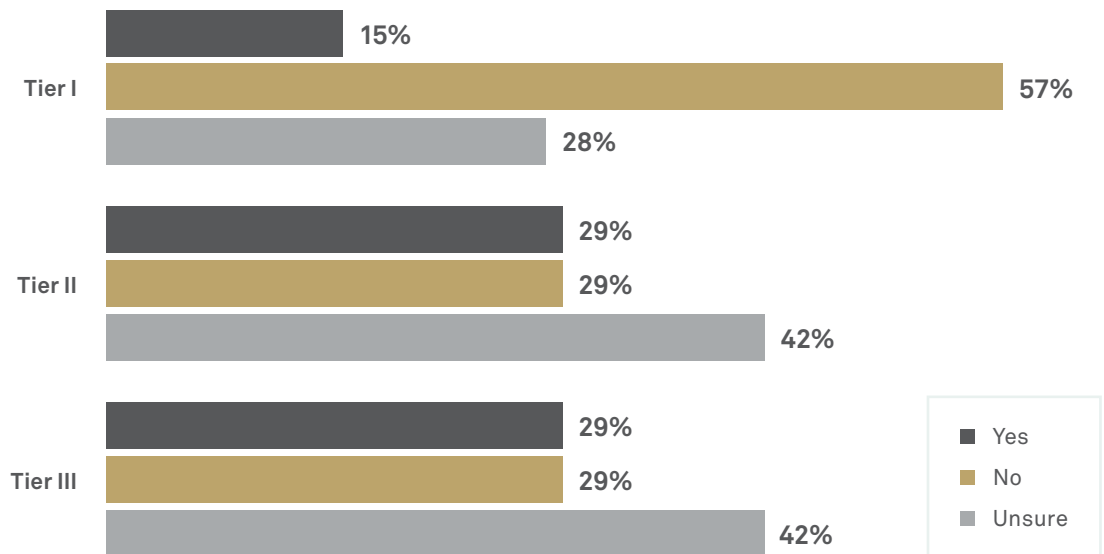


Figure 2: Dealer Balance Sheet Constraints (Asset Managers)

³Tier I, II, III designations are detailed in the Survey Methodology section.

Seeking Additional Liquidity

The outreach focused on how these pressures are impacting different types of buy-side entities. The constraints being experienced by asset managers, hedge funds, insurance companies and pension funds differ markedly — especially between the largest Tier I firms and the smaller Tier II and Tier III entities.

ASSET MANAGERS

Over 80% are engaged in discussions to identify liquidity backstops to dealer balance sheets. Asset managers generally view these backstops as an opportunity to mitigate market procyclicality.

What are your liquidity/funding preferences?

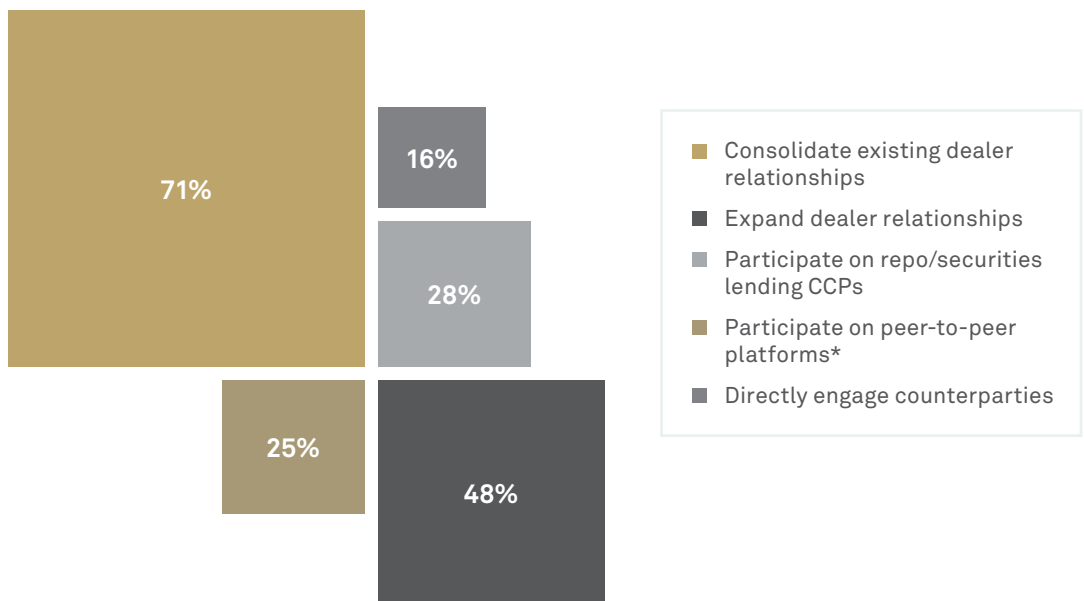


Figure 3: Liquidity/Funding Preferences (Asset Managers)

*As per anecdotal evidence provided by asset managers, the number of firms preferring to participate on peer-to-peer (P2P) platforms would likely be higher if credit intermediation is offered by P2P platforms.

“

71% of asset managers are counting on consolidating their existing dealer relationships to maintain access to liquidity. 48% also intend to expand the number of relationships they have with bank counterparties.





HEDGE FUNDS

Over 70% prefer traditional prime brokerage models and are seeking to further consolidate existing relationships; these firms are willing to pay a premium in order to secure balance sheet access.

Hedge funds have experienced an increase in their cost of funding. These increases range from 35 to 150 basis points, based on the size of the fund, the trade flow routed through their prime broker and the investment strategy being pursued.

How do you plan to engage with your dealers?

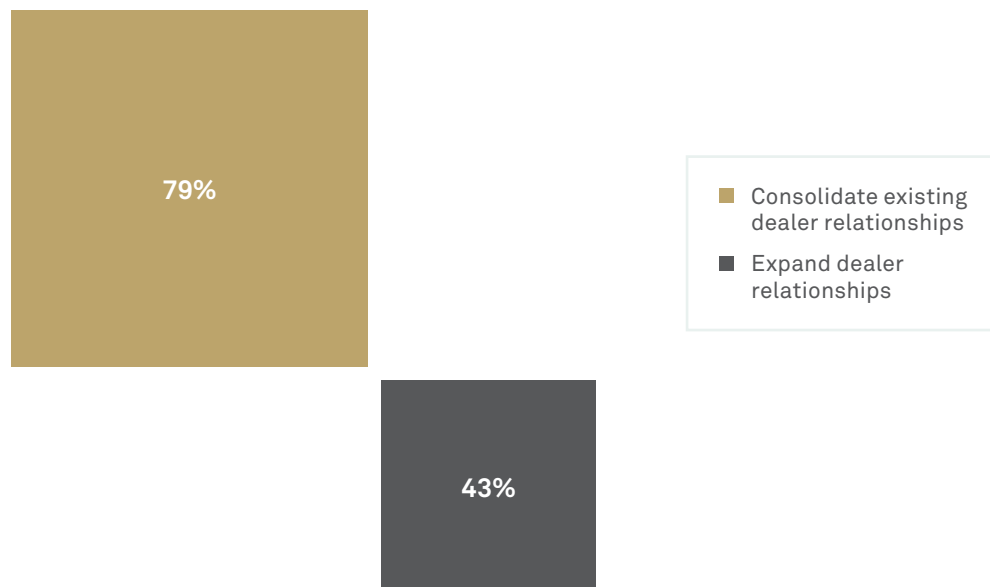


Figure 4: Dealer Engagement Preferences (Hedge Funds)

INSURANCE AND PENSION FUNDS

These indicated a willingness to use new sources of liquidity; however, over 90% of these firms listed credit indemnification, maturity intermediation and operational support as critical considerations.

What are your considerations while evaluating liquidity/funding channels?

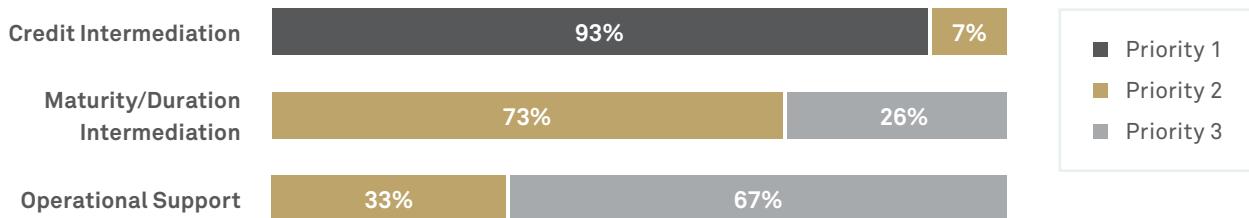
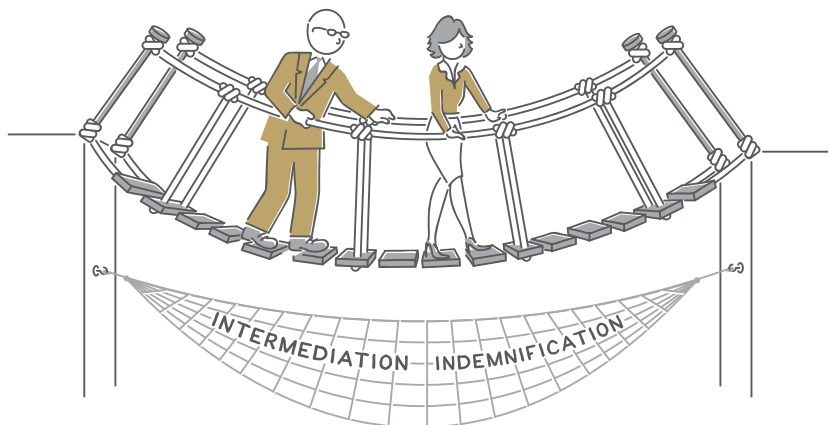


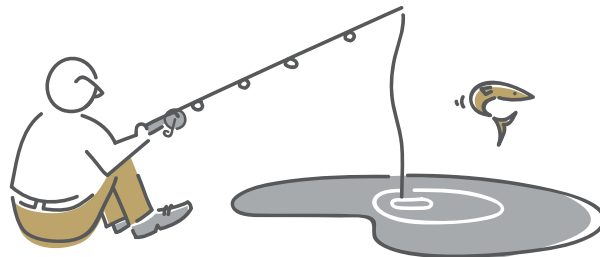
Figure 5: Top 3 Considerations (by rank) for Liquidity/Funding (Insurance, Pension Funds)



Liquidity Options

In light of these mounting pressures, buy-side firms are already exploring alternative sources of liquidity that they can utilize in the event that their existing funding relationships come under stress.

- Buy-side respondents identified four main avenues of liquidity that they intend to pursue after existing funding and collateral sources are exhausted:
 - **Expand existing dealer relationships**
 - **Engage non-dealer counterparties**
 - **Participate in clearing models**
 - **Participate on peer-to-peer platforms**
- Larger and well-resourced buy-side institutions have implemented, or are in the process of implementing, sophisticated collateral management initiatives. These include:
 - **Treating collateral as an asset class**, including appointing a head of collateral management and a dedicated collateral team
 - **Generating yield on collateral** by reusing assets through securities lending and repo markets
 - **Utilizing collateral transformation** services to convert securities into eligible collateral assets
 - **Developing internalization services** to allow asset manager sub-funds and insurance company groups to trade collateral assets with each other at arm's length internally without sourcing external liquidity



3

Collateral Impact Intensifies

Collateralized products perform a vital role by enabling firms to mitigate earnings and cash flow risk through OTC derivatives, providing an avenue to access and invest liquidity through repo markets and supporting the pursuit of alpha through securities lending transactions. The outreach found that the adoption of collateralized products or the total exposure against such products was dependent on several factors, including trading portfolio size (AUM), investment solutions offered to customers, lines of business and corporate structures.

While buy-side motivation to transact remains unchanged, the forces of regulatory change are introducing significant complications to end user collateralization behavior.





Buy-side Outreach Participant Profile				
	Asset Managers	Hedge Funds	Insurance Companies	Pension Funds
Investment Profile 	<p>Active managers pursue mid-to long-term investments that are made in publicly traded and synthetic products. Active managers may be managing portfolios for hundreds of distinct asset owners/entities.</p> <p>Passive managers pursue strategies to mirror a specific index. Such firms invest significantly in money market funds.</p>	<p>Hedge funds use various strategies (e.g., global investment strategy, directional global macro strategy, long/short, etc.). Hedge fund business is predominantly transacted through prime brokers where prime brokers support margin financing, securities borrowing, etc.</p>	<p>Insurance companies pursue longer-term investments. Corporate debt forms a significant portion of the insurance company portfolio. In the US, insurance companies are seeking to increase asset allocation to commercial mortgage loans and build closer connections with Federal Home Loan Banks (FHLBs).</p>	<p>Pension funds primarily use liability-driven investment strategies, which entail matching liabilities with long-dated stable assets (nonvolatile assets).</p>
	Generally high cash % in the overall holdings		Generally low cash % in the overall holdings	
Cash Provider /Securities Provider 	<p>Invest cash deposits in short-term instruments</p> <p>Loan securities to source cash/high-quality collateral</p>	<p>Invest cash deposits in short-term instruments</p> <p>Implement short strategy, borrow securities to cover shorts</p>	<p>Borrow cash/high-quality collateral (from parent company), FHLBs (US only, or from dealers)</p> <p>Loan securities to source cash/high-quality collateral</p>	<p>Borrow cash/high-quality collateral</p> <p>Loan securities to source cash/high-quality collateral</p>
Collateralized Trading Motivations 	<p>OTC Derivatives Hedging interest rate, currency risk, synthetic exposure</p> <p>Repo Markets Invest surplus cash</p> <p>Securities Lending Yield generation (activity depends on asset owner preference)</p>	<p>OTC Derivatives Exposure to products/markets, hedging risks</p> <p>Repo Markets Invest surplus cash, leverage</p> <p>Securities Lending Fund inventory, supporting investment strategy, borrow securities to cover short sales</p>	<p>OTC Derivatives Hedging interest rate, deposit, duration, currency risk</p> <p>Repo Markets Source high-quality collateral</p> <p>Securities Lending Yield enhancement</p>	<p>OTC Derivatives Hedging interest rate, deposit, duration, currency risk</p> <p>Repo Markets Source high-quality collateral</p> <p>Securities Lending Yield enhancement</p>
Use of Service Providers 	<p>Triparty Moderate use (mostly in US)</p> <p>Agent Lender Moderate use</p> <p>Outsourcers Moderate use</p>	<p>Triparty Low use (using prime brokers)</p> <p>Agent Lender Low use (using prime brokers)</p> <p>Outsourcers High use of fund administrators</p>	<p>Triparty Low use</p> <p>Agent Lender High use</p> <p>Outsourcers Low use (due to "control" issues)</p>	<p>Triparty Low use (currently evaluating but low existing adoption)</p> <p>Agent Lender High use</p> <p>Outsourcers Low use (due to "control" issues)</p>

Figure 6: Collateralized Trading by Buy-side

4

Regulatory Disruption to Collateral and Funding

Uncleared margin rules, Basel III, European Market Infrastructure Regulation (EMIR),⁴ Markets in Financial Instruments Directive II (MiFID II)⁵ and Securities Financing Transaction Regulation (SFTR),⁶ are among the reforms that are realigning the existing market structure and creating challenges for the buy-side. The outreach found that implementation of uncleared margin rules for OTC derivatives and EMIR central clearing challenged buy-side firms by contributing to a significantly heightened demand for high-quality collateral. In parallel, Basel III liquidity and leverage ratios⁷ were cited as the leading cause of the breakdown in the repo markets that perform the vital role of liquidity and collateral transmission.

These changes have resulted in the emergence of high-quality collateral as a special asset class that holds monetary as well as regulatory value. The subsequent section discusses changes from the perspectives of four buy-side segments.⁸

Asset Managers: Preserving Cash

Active asset managers indicated that they rarely deploy their cash holdings as collateral. This is because cash balances are generally held to support investor redemptions and implement leveraged investing strategies. It is especially true for asset managers that manage beneficial owner assets.

Asset managers seek to invest their cash holdings through four main avenues:

- Reverse repo transactions with dealers
- Investments in money market funds
- Investments in liquidity services provided by banks
- Custodians and bank deposits

However, Basel III ratios are forcing dealers to pursue balance sheet reduction initiatives before reporting periods (e.g., month and quarter-ends for European banks). Unsurprisingly, these dealer constraints have resulted in a significant reduction in opportunities to conduct reverse repo transactions with dealers or invest cash in bank deposits.

⁴Body of European legislation for the regulation of over-the-counter derivatives. EMIR regulations include requirements for reporting of derivative contracts and implementation of risk management standards. The objective of the legislation is to reduce systemic counterparty and operational risk.

⁵European Union regulation that requires financial institutions to shift from organized trading of financial instruments to multilateral, regulated trading platforms. The regulation aims to make financial markets in Europe more resilient and transparent.

⁶Regulation introduced by the European Commission with the goal to increase transparency in securities financing markets. The regulation requires financial institutions to report securities financing transactions (including repurchase agreements, securities lending activities and sell/buyback transactions) to an approved European Union trade repository.

What challenges do you face in investing your cash balances on a short-term basis?

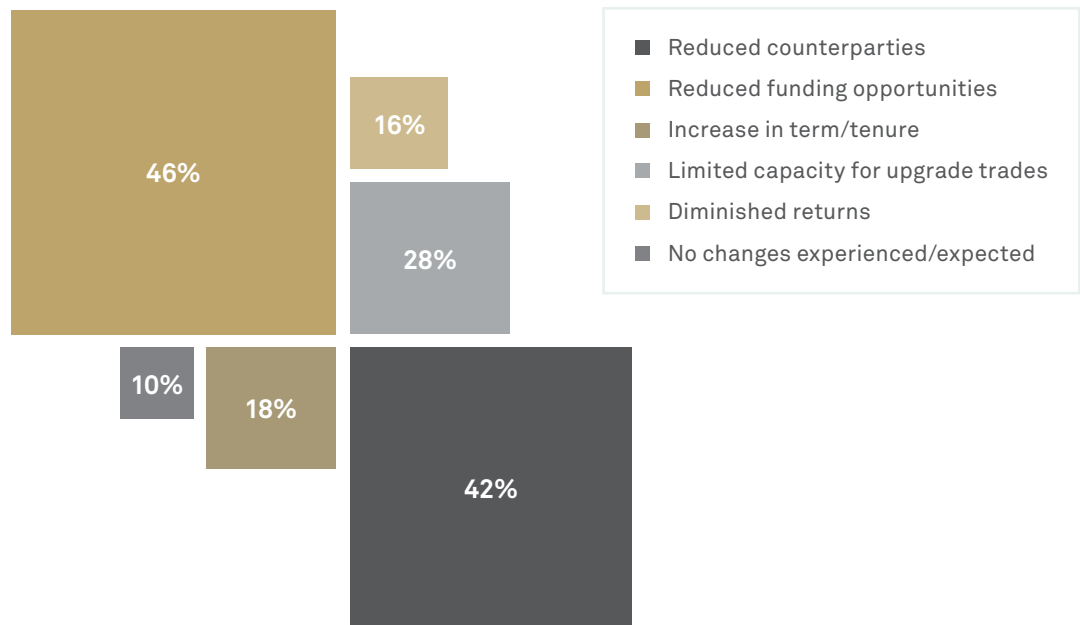


Figure 7: Short-Term Cash Investment Challenges

A majority of the asset managers indicated their preference to post securities as collateral, even when this option incurred significant haircuts. This reflects a preference to protect cash holdings for investment purposes.

Firms that sought to post high-quality collateral or cash by accessing it through the repo markets highlighted the same dealer issues that existed when attempting to place surplus liquidity. A few of these firms also provided examples of temporary spikes in the pricing of sourcing liquidity from dealers. In other words, dealer changes impacted both cash and collateral providers. It was observed that the impact of dealer constraints was more pronounced on Tier II and Tier III firms.

Asset managers also highlighted operational challenges resulting from uncleared margin regulation for OTC derivatives. While most Tier I firms viewed these challenges as temporary and mostly related to the repapering of trading agreements, Tier II and Tier III firms mentioned operational issues with frequently exchanging collateral, supporting processes such as interest computation on cash margin and settling in a compressed time frame.

⁷ Basel III liquidity and leverage ratios include:

- Liquidity Coverage Ratio (LCR) refers to highly liquid assets held by financial institutions to meet short-term obligations.
- Supplementary Leverage Ratio (SLR), also known as Tier I Leverage Ratio, refers to the relationship between a banking organization's core capital and its total assets.
- Net Stable Funding Ratio (NSFR) compares the amount of a firm's available stable funding to its required stable funding to measure how the firm's asset base is funded.

⁸ It should be noted that impacts mentioned in the paper are an aggregation of the overall responses from the buy-side firms engaged. As such, it is to be expected that there may be outlier firms to which these impacts could be different.

Hedge Funds: Funding Costs Increasing

Hedge funds typically hold large amounts of unencumbered cash. Similar to asset managers, hedge funds seek to protect their cash holdings in order to deploy these assets in pursuit of leverage and alpha.

Hedge funds indicated that they invest their cash holdings through three main avenues:

- Deposits and/or reverse repo transactions with prime brokers
- Investments in money market funds (also encouraged by prime brokers as money market funds can be used as collateral)
- Investments in liquidity services provided by banks and custodians

While most hedge funds indicated that they had not yet faced challenges in placing cash with prime brokers, there was uncertainty regarding continued prime broker support during periods of market stress. This sense of uncertainty was most prevalent among the Tier II and Tier III funds.

On the topic of asset financing, hedge funds mentioned that they have experienced an increase in the cost of funding due to dealer balance sheet constraints. There were examples provided of increases in the 35 to 150 basis point range. Such funding cost increases were predicated on the fund size, which in turn translated into prime broker flow and profitability and the type of asset being financed. The cost of funding was also dependent on the investing strategies that were being adopted. Hedge funds employing directional investing strategies that require dealer balance sheet support were anticipating a steeper increase in cost of funding versus their peers using long/short or market-neutral strategies.

When discussing the sourcing of high-quality collateral, hedge funds indicated that they did not have any significant impact from a sourcing/funding perspective due to a preference for collateralizing trading obligations with securities held on portfolio, even when these incurred steep haircuts.





Pension Funds: Uncleared Margining an Issue

Pension funds indicated that cash balances contribute only 1% to 2% of their overall holdings. This was due to the investment strategy of remaining nearly fully invested. Furthermore, pension fund portfolios generally include a variety of derivatives products that are intended to minimize exposure to funding volatility and manage asset-liability duration mismatches associated with liability-driven investing (LDI).

In light of their small cash holdings, the introduction of uncleared margin regulation for bilateral OTC derivatives and the proposed move in Europe to central clearing were identified as the leading causes of concern, as these regulations required exchanging margin.

Participants indicated that variation margin (VM) posed a greater challenge than posting initial margin (IM) as the latter could be satisfied through posting securities. VM was, however, sought to be posted as cash, and this generally posed a funding challenge for these firms. Participating firms indicated that they executed collateral transformation trades to access high-quality collateral.

Pension funds shared scenarios of how a lack of funding would result in a significant change in asset allocation, with cash balances of up to 6% of the overall holdings required to be held aside. There were further examples of situations where firms may be required to sell holdings to access cash. There are concerns about a lack of funding translating into pressing investment and risk management challenges.

Pension funds in Europe expressed relief over the temporary central clearing exemptions extended to them. However, the same funds also expressed concerns about operational challenges related to exchanging collateral frequently, sometimes even intraday, with central counterparties.

Insurance Companies: Focus on Funding Access

Insurance participants indicated that they held cash balances of nearly 4% to 6% of the overall holdings. The use of collateralized products by insurers was found to be dependent on factors such as portfolio size, line of business and corporate structures.

Insurance firms that had considerable OTC derivatives portfolios stated that their IM obligations were being satisfied through high-quality collateral such as US Treasuries; however, VM was still required to be covered by cash postings. Insurance companies mentioned that while their existing VM funding needs were satisfied by dealers through collateral transformation trades, there were concerns regarding the ability to continue funding such needs, especially in times of market stress. These concerns were more pronounced for European insurance companies, as they do not have access to cost-efficient funding that is afforded by the Federal Home Loan Banks (FHLBs)⁹ to US insurers.

These concerns are forcing insurance companies to review their product mix and develop/offer variable annuity products that can pass interest rate risks directly to customers (instead of attempting to hedge these risks internally). If this situation materializes, it would affect the important risk-sharing services that insurance companies provide to the economy.

What challenges do you face with your OTC derivatives operations?

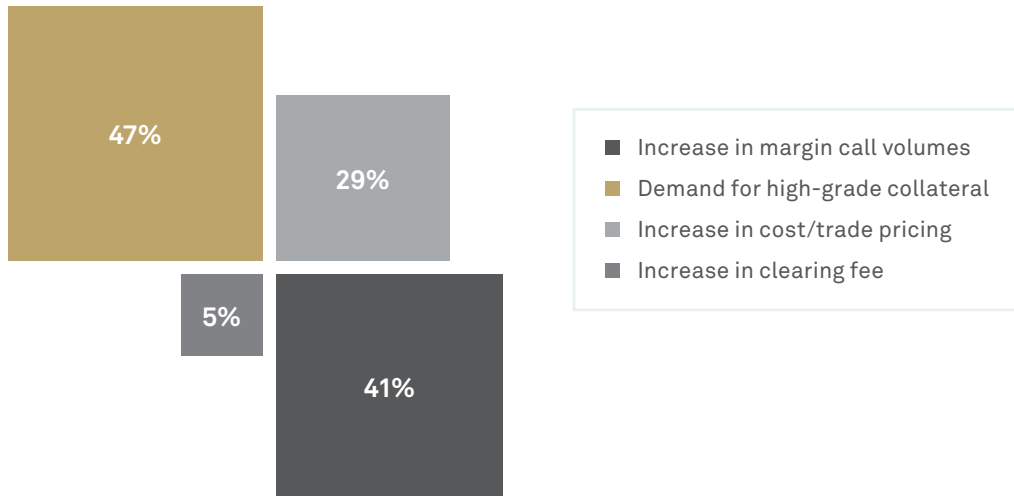


Figure 8: Insurance Company OTC Derivatives Constraints

⁹ Federal Home Loan Banks (FHLBs) provide liquidity by increasing the amount of loanable funds available for affordable housing and community development projects.



When discussing operational imperatives for meeting requirements in regard to the frequency of margin/collateral exchange and ensuring settlement in compressed time frames, most Tier II and Tier III insurance firms nearly unanimously listed challenges in satisfying regulatory mandates associated with both cleared and uncleared OTC derivatives.

Note: Insurance companies manage large amounts of third-party collateral that is related to their insurance business. This type of collateral was not considered in scope for the buy-side outreach.

5

Buy-Side Solutions in the New Paradigm

Structural market changes are forcing buy-side firms to expedite the search for alternative sources that can provide stable support for liquidity, funding and collateral needs, even during times of market stress. While a majority of the firms indicated that they were adopting tactical steps — such as routing consistent flows to dealers in the hopes of receiving timely support — buy-side firms are simultaneously pursuing two additional approaches as potential solutions for liquidity, funding and collateral.

Approach #1: Develop centralized collateral, funding and liquidity function

A majority of the outreach participants indicated that their current operating model for managing collateralized trading involved the management of liquidity, funding and collateral within product silos.

When discussing capabilities to forecast liquidity, funding and collateral requirements, most participants indicated that they were equipped to project liquidity, funding and collateral needs over short time frames. However, only a handful of buy-side firms possessed sophisticated capabilities to estimate the impact of front office/trading decisions on liquidity, funding and collateral requirements.

The outreach found that collateral management was typically set up as a back-office function that could support the valuation and mechanical exchange of collateral. This setup implied that a majority of the firms did not fully understand the liquidity and funding implications and/or have views into depots and counterparties where positions were left overcollateralized.



What are your existing and planned capabilities for a centralized collateral, funding and liquidity function?

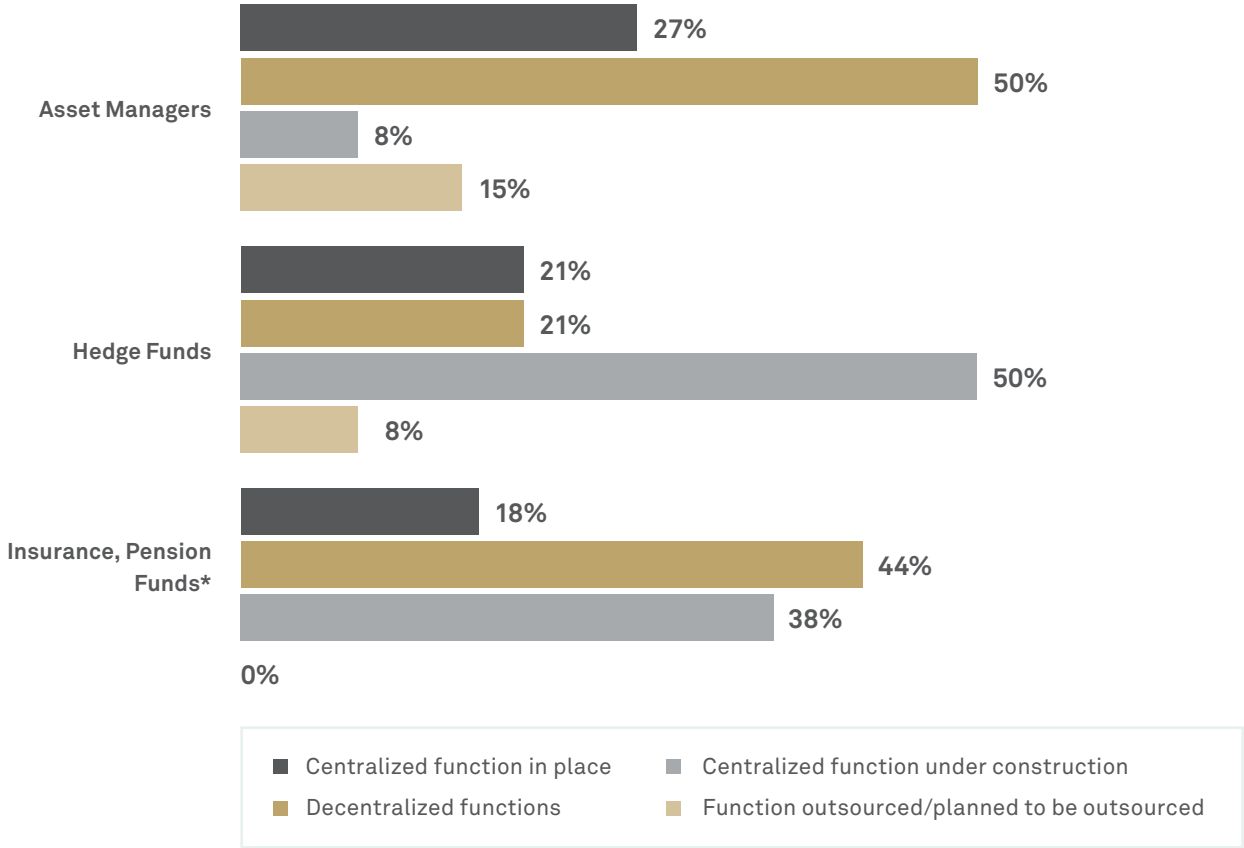


Figure 9: Centralized (Enterprise-Wide) Capabilities (Existing and Planned)

*Insurance company and pension fund responses have been combined to use comparable data sets.

“

Over 60% of buy-side firms plan to move to an integrated model of collateral funding and liquidity that can operate as an ‘internal capital market.’

The sensitivity to costs has resulted in a low appetite for transformational undertakings. However, issues with financial plumbing and the ensuing search for short-term funding and high-quality collateral have forced buy-side firms into action. As a result, over 60% of the buy-side firms mentioned plans to move to an integrated model of collateral, funding and liquidity that can operate as an “internal capital market.”

This function is expected to support internalization of funding, liquidity and collateral through sophisticated balance sheet and cash flow projections, limits management, intraday liquidity management, transfer pricing and collateral management. In addition, such internalization efforts can enable firms to mitigate credit risk concerns and reduce dealer spread. Further, it is expected that this function can also help firms understand the pricing differential available between various pools of liquidity/funding.

As firms engage in this ambitious project to centralize functions, buy-side firms mentioned several critical considerations that should be addressed. These include:

- Development of a business case that includes projections for capital, collateral and FTE savings
- Identification of services and solutions that can support the consolidation of functions without requiring multiyear transformation programs
- Training and development of staff supporting the consolidated function
- Development of reporting structures for the consolidated function

Approach #2: Development of new sources of liquidity

A vast majority of buy-side participants shared plans about identifying avenues of liquidity and high-quality collateral that potentially could be leveraged after traditional sources have been exhausted. These are the four liquidity options that are currently being evaluated by buy-side firms.

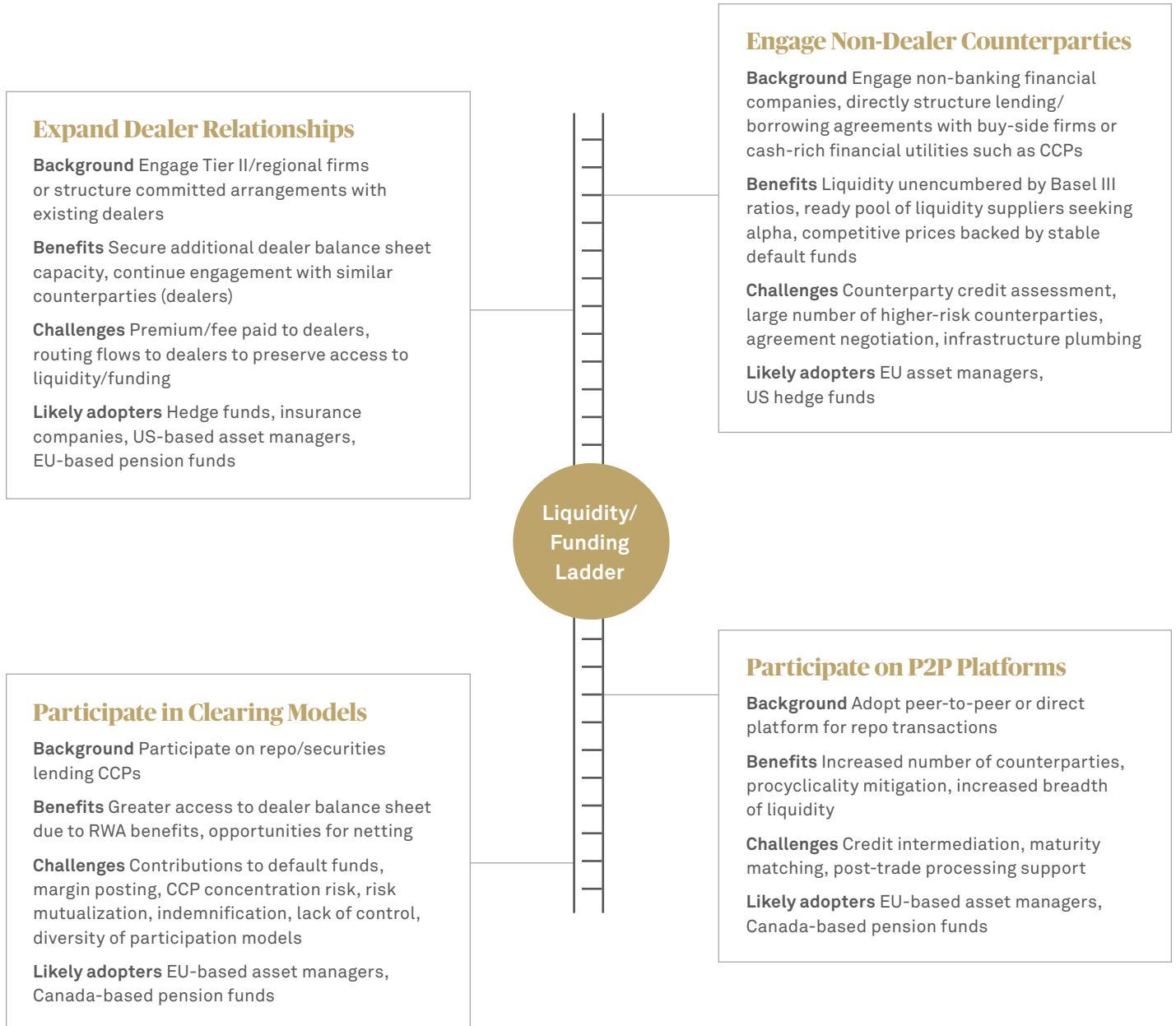


Figure 10: Liquidity Solutions under Consideration by the Buy-side

Source: PwC Analysis

A. Expand bank/dealer relationships Buy-side firms are nearly unanimous in their preference for expanding their existing relationships to additional banks/dealers. This preference is a reflection of the desire to maintain the status quo and leverage existing infrastructure that is being used to manage current banking/dealer relationships. While expanding bank/dealer relationships is a relatively easy step, it is likely to provide only marginal benefits, as this model continues to propagate the challenges that exist with current dealer relationships. Further, expanding the number of bank/dealer relationships will likely require a premium as flows have to be continually routed, even when not required, to these new relationships in order to secure timely access to liquidity. Such an arrangement with banks/dealers may in turn pose challenges due to the introduction of best execution requirements imposed by industry regulators.

How do you plan to manage your relationships with banks/dealers?

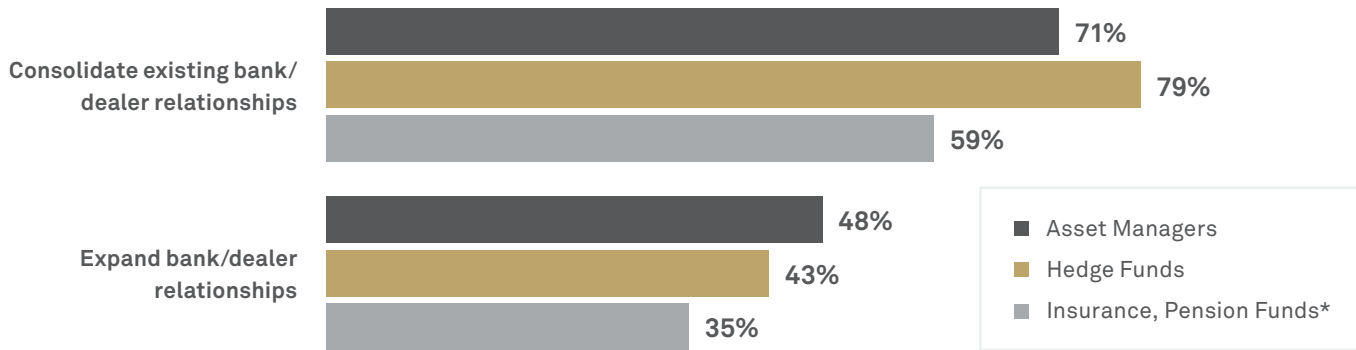


Figure 11: Bank/Dealer Engagement Approach

Unless the volume of flows increases significantly, bifurcation of flows between new and current banks may end up as a zero-sum game. Furthermore, expanding relationships to similar counterparties preserves the potential procyclicality of existing dealer-dominated models. The new banks being engaged are likely to face similar challenges and follow market trends during periods of stress. The familiarity of this model is encouraging firms from all the relevant buy-side segments to emerge as likely adopters of this liquidity channel.

*Insurance company and pension fund responses have been combined to use comparable data sets.

B. Trade bilaterally with non-banking institutions The presence of significantly fewer leverage and liquidity constraints — if any — are establishing non-banking institutions as an attractive buy-side counterparty. One such category of non-banking institutions are Central Counterparties (CCPs) that typically hold large cash buffers in their default funds. The availability of these buffers and implicit backing from local governments is positioning CCPs as a suitable counterparty (when allowed by local jurisdiction) for buy-side firms that are seeking to access liquidity at competitive prices.

Even though assessing creditworthiness of counterparties may seem easier when dealing with CCP-type institutions, buy-side firms felt that trading bilaterally with non-banking institutions required significant fixed and variable cost investments. This is due to the fact that direct engagement with non-banking counterparties requires skilled legal and credit staff who could support agreement negotiation and credit assessment. In addition, operations staff and post-trade processing infrastructure was needed to support such engagements. Buy-side firms felt that this was a promising new avenue for liquidity and funding; however, the overlays required to support this step meant that only Tier I firms that possessed sophisticated infrastructure were able to explore this option.

C. Participate in clearing models Participation on repo and securities lending CCPs is another step that is being evaluated by a wide spectrum of buy-side firms. While adoption of this liquidity avenue is still nascent, the outreach revealed that firms were being encouraged by dealers to move to a cleared environment in the hopes of receiving pass-through benefits from dealers. Several buy-side firms are expecting dealers to provide stable, cost-efficient sources of funding through a realization of lower counterparty risk-weighted exposure charges and increased opportunities for netting cleared transactions.

Although participation in clearing models can potentially enable firms to unlock a secure source of liquidity and maintain linkages to traditional dealer models, there were several firms that raised classic concerns associated with CCPs: lack of appetite for posting margin and/or contributing to default funds; fellow customer risk; access to collateral in the event of the member or CCP default; and an unequal playing field due to potential CCP participation by only a specific type of buy-side firm.

“

On a peer-to-peer platform, I would much rather deal with another pension fund than with a bank. From a credit perspective, a pension fund has a better risk profile than a bank.

*Director of Securities Lending and Collateral Management,
midsize Canada-based Pension Fund*



D. Participate on peer-to-peer platforms Liquidity constraints in a variety of products are forcing the buy-side to adopt a prominent role on electronic trading platforms such as those supporting fixed income trading. This evolution in behavior from price takers to liquidity providers or price makers is being extended to the realm of collateralized products such as repo instruments.

Buy-side firms are considering participation on such peer-to-peer platforms as a means of taking direct control over how they source the collateral that they require. End users view these venues as an important avenue to source liquidity/collateral and receive risk diversification through engagement with a greater number of both traditional and nontraditional counterparties such as dealers, other buy-side participants and cash-rich corporates. In addition, peer-to-peer platforms are also expected to support internalization efforts for liquidity and collateral by enabling arm's length transactions between affiliates.

Besides expressing interest in exploring such arrangements, buy-side firms also shared strong demand for receiving support for credit and maturity/duration intermediation. Furthermore, simpler client onboarding and agreement negotiation processes were mentioned as critical prerequisites for joining peer-to-peer platforms. Buy-side firms also indicated a need for receiving post-trade processing and settlement support that can be linked to the electronic platforms being currently evaluated.

6

Leading Collateral Practices for the Buy-Side

The level of sophistication in collateral management among the international buy-side in mid-2017 is as diverse as the financial end user community itself. Nonetheless, a number of leading practices have emerged among sophisticated buy-side institutions.

These include:

- **Treat collateral as an asset class** Appoint a head of collateral for the business — often an investment professional rather than a member of the operations staff — and establish a dedicated collateral management desk. This unit can operate as a centralized collateral management function to develop and implement a cohesive cross-product strategy that optimizes available collateral, funding and liquidity on a firm-wide or business-specific basis. Some asset managers have embedded collateral management directly into their Order Management System.
- **View collateral as a performance driver** Growing numbers of beneficial owners realize the potential to generate significant alpha from both cash margin and securities. These changes are being driven by unexpected costs that can be incurred when inventory is used inefficiently, such as due to slippage. Examples of such inefficiency include the transformation costs of converting ineligible assets into eligible collateral, as well as opportunity costs arising from the wasteful uses of assets. Conversely, efficient collateral management can release assets that can be made available for lending to generate income.
- **Factor collateral value into investment decisions** When comparing assets for investment, many collateral managers consider the ability to reuse assets for margin or lending purposes — given that lending income or transformation costs can affect net performance. While not typically the primary driver behind investment decisions, the utility of a particular security for margin purposes is unquestionably growing in importance.
- **Take advantage of collateral transformation** Pension funds and insurance companies holding substantial inventories of securities are utilizing dealer collateral transformation services. These facilities allow securities that do not qualify as high-quality collateral for regulatory purposes — investment-grade corporate bonds, for example — to be converted into margin that can be pledged to meet clearing requirements and general collateral obligations. Securities selection often includes consideration of assets for reuse of collateral and lending purposes. At a practical level, this entails eligibility screening before investment to verify whether an asset can be used as collateral within the terms of the Credit Support Annexes in place with counterparties.
- **Deploy internalization as a mission-critical strategy** Many asset managers and insurance companies are now exploring the possibility of sourcing liquidity and collateral internally. Transactions between insurance companies within the same corporate group — or among subaccounts within a large asset manager — can allow such entities to secure required collateral assets from each other without utilizing external counterparties.

“

If one of these platforms has significant liquidity, it would be good for us to participate, but ultimately, we will follow the liquidity.

Head of Money Markets and Foreign Exchange, midsize UK-based Asset Manager

Peer-to-peer platforms are emerging as suitable venues on which these internalization trades can take place. Buy-side participants can instruct the matching engine to prioritize internal matches ahead of trades with external counterparties. This allows related parties to trade with each other at an “arm’s length” price and on an independent basis of allocation, improving liquidity management and avoiding spread costs. Regulatory authorities have granted exemptive relief for such “interfund” lending in recent years as the potential liquidity benefits of such arrangements have become apparent.

- **Use leverage as part of liquidity management** In a low-return environment, some hedge funds are using leverage to amplify returns on collateral assets. For example, a fund would buy a bond, repo it and use the proceeds to buy another bond. With higher bond returns than financing costs, the hedge fund enjoys incremental returns.
- **Solve custodian cutoff times and source late-day cash** Cutoffs become an issue for buy-side firms when assets have to be externally delivered between custodians and/or across Central Securities Depositories (CSDs). If settlement takes place within the same custodian, this should not be an issue because book entry transfers can be made at any time. If a buy-side firm is relying upon external delivery, however, late-day cash can be a problem to either place or source. Sophisticated buy-side entities are utilizing peer-to-peer platforms that can directly connect lenders and borrowers. These platforms both facilitate late-day activity for both parties and also allow an efficient allocation of funding.

For the 29% of Tier II and Tier III asset managers revealed in the outreach as expecting to face short-term funding challenges, the adoption of programs like these could make the difference between uninterrupted access to funding and encountering periodic evaporations of liquidity. Buy-side participants should draw lessons from the work taking place at the most advanced collateral managers and think about how some of these programs could be applied within their own institutions.

Anecdotal reports suggest that cash investors in triparty repo markets have fewer than 10 counterparties, on average. In a market increasingly characterized by scarcer liquidity, the need for buy-side firms to widen their counterparty pool and sources of liquidity could not be more urgent.



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Conclusion

As financial markets continue to adjust to new realities, buy-side firms are faced with a unique set of challenges. Even though most participants continue to struggle with the demand for high-quality collateral, the breakdown in financial plumbing and an increase in market complexity, there is a nearly unanimous view about markets today being significantly safer when compared to the pre-financial-crisis era.

Buy-side Solutions	Asset Manager		Hedge Fund		Pension Fund		Insurance Company	
	US/CA	EU	US/CA	EU	US/CA	EU	US/CA	EU
Trading Solutions Electronic trading solutions can promote market transparency and support "best execution"	●	●						
Credit/duration intermediation	●	●	●	●	●	●	●	●
Market liquidity aggregation services that can enable real-time view into liquidity pools	●	●	●	●	●	●	●	●
Pre- and post-trade optimization solutions to support efficient sourcing and use of collateral	●	●	●	●	●	●	●	●
Liquidity/Funding Solutions Expanded base of cash/liquidity supported through master agreements that simplify client onboarding, agreement negotiation	●	●						
Liquidity management for non-Treasury collateral	●	●	●	●				
Collateral upgrade/transformation services	●	●			●	●	●	●
Workflow Solutions Centralized client and securities reference data		●						
Consolidation layer that can enable an enterprise-wide view of collateral, funding and liquidity	●	●	●	●	●	●	●	●
Support for movement of collateral between custodians	●	●						
Post-trade/settlement solution for P2P platforms and trade clearing	●	●						
Support for back-office processes associated with electronic trading and central clearing	●	●			●			

Figure 12: Solutions Being Requested/Analyzed by Buy-side Respondents

Source: PwC Analysis

- Strongly interested
- Moderately interested

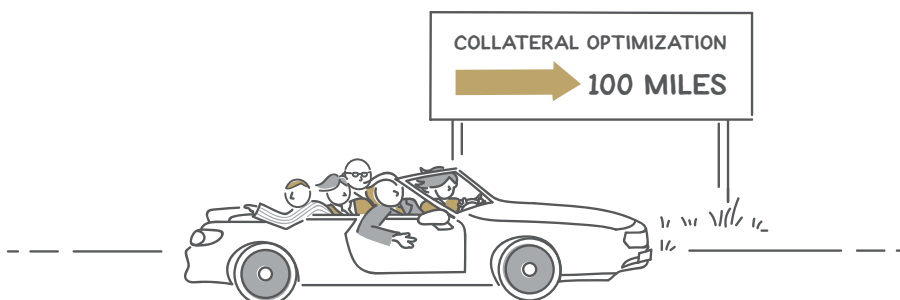
The emergence of collateral as one of the most pressing concerns for the buy-side has resulted in forward-thinking participants viewing it as a new asset class that can drive alpha for firms that are able to expeditiously mobilize and access collateral. These capabilities are expected to aid buy-side objectives by allowing firms to generate additional returns on collateral and improve returns by accessing cash to support investment.

The necessity of addressing anticipated and realized fears of liquidity constraints and collateral crunch is spurring buy-side firms to evaluate a spectrum of solutions that promise to unlock liquidity and collateral. These include:

- **Expanding dealer relationships** — given balance sheet constraints, uncertainty remains over the capacity of bank counterparties to extend additional liquidity to large numbers of new buy-side clients
- **Engaging with non-dealer counterparties** — such as cash-rich market utilities like CCPs, though this involves extensive documentation, credit assessment and infrastructure plumbing
- **Participating in clearing models** — lessens dealer balance sheet constriction through lower RWA treatment and netting benefits, but requires the buy-side to participate in CCP margin posting and perhaps contribute to the default fund
- **Joining peer-to-peer platforms** — allows a much wider universe of counterparties without relying on dealer liquidity, but requires credit intermediation

At the same time, buy-side firms are embarking on a belt-tightening exercise to develop leaner and more efficient processes that can support optimization of collateral, funding and liquidity.

The link between external programs and internal models continues to be a critical missing piece of the puzzle as a large number of buy-side firms are taking a "watch and wait" approach when adopting new solutions. However, inertia can also translate into missed opportunities for the buy-side to shape and adopt holistic solutions that can simplify processes and present a one-stop shop that can support the liquidity and collateral management needs of the end user community.



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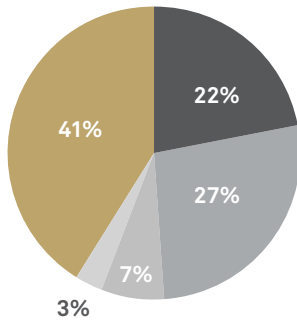
Appendix

Survey Methodology

This report presents the results of a global buy-side outreach that was jointly conducted by BNY Mellon and PwC in Q1 2017. The study was implemented to understand how senior executives, practitioners and industry experts from leading asset managers, hedge funds, insurance companies and pension funds envisage the future of their collateralized trading activities and how their organizations are formulating strategies toward their goals.

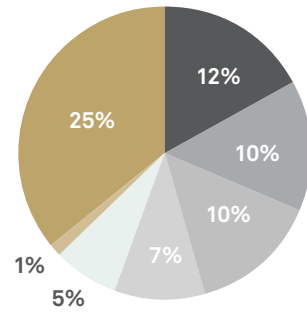
As part of this outreach, over 120 leading buy-side firms of varying sizes whose combined assets under management (AUM) totaled over \$12 trillion were engaged. These included:

- **Asset Managers** (Tier I: Over \$1 trillion AUM; Tier II: Between \$500 billion and \$1 trillion AUM; Tier III: Less than \$500 billion AUM)
- **Hedge Funds** (Tier I: Over \$50 billion AUM; Tier II: Between \$20 billion and \$50 billion AUM, Tier III: Less than \$20 billion AUM)
- **Pension Funds** (Tier I: Over \$100 billion AUM; Tier II: Between \$25 billion and \$100 billion AUM, Tier III: Less than \$25 billion AUM)
- **Insurance Companies** (Tier I: Over \$500 billion AUM; Tier II: Between \$100 billion and \$500 billion AUM; Tier III: Less than \$100 billion AUM)



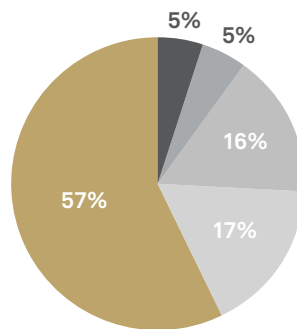
Buy-side segments represented

- Asset Manager
- Hedge Fund
- Insurance
- Pension Fund
- Other



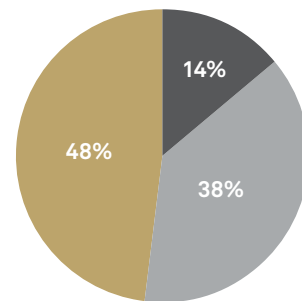
Primary business areas interviewed

- Operations
- Treasury
- Finance
- Trading
- Collateral Management
- Risk Management
- Other



Geography of participant firms

- US
- APAC
- Canada
- EU
- UK



Tier of participant firms

- Tier I
- Tier II
- Tier III

Figure 13: Buy-side Outreach Participant Profile

The study encompassed both qualitative interviews and quantitative surveys across North America, Europe and Asia-Pacific. Roles targeted include senior executives from trading, finance, treasury and collateral management functions.

Senior industry stakeholders participated through telephone and electronic interviews to discuss topics on collateral, funding and liquidity. Over 140 C-suite executives from trading, finance, treasury and collateral management functions contributed their views as part of this study.

The report draws insights based on the changing economics of the buy-side community as a result of regulations such as uncleared margin regulations and the knock-on impact of regulation-imposed dealer balance sheet constraints. Topics covered as part of the survey include market priorities, changes anticipated by the firms, challenges they must overcome and the plans they have for the future.

Overall, this report broadly aims to understand the buy-side imperatives from a collateral, funding and liquidity perspective. In particular, it provides:

- Buy-side motivations for collateralized trading activities
- Direct and indirect impact of regulations
- Buy-side response and challenges
- Industry solutions that can address trading, collateral and liquidity needs

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The following PwC representatives conducted the buy-side interviews and engagement upon which this study is based: Thomas Ciulla (lead engagement partner); Gaurav Joshi and Manan Shah. PwC would also like to acknowledge the contributions of Gail Vennitti (global relationship partner), Bala Annadorai, Abiram Sivasankaran and Margaret McCabe, the efforts of whom were crucial to the development of this white paper.

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