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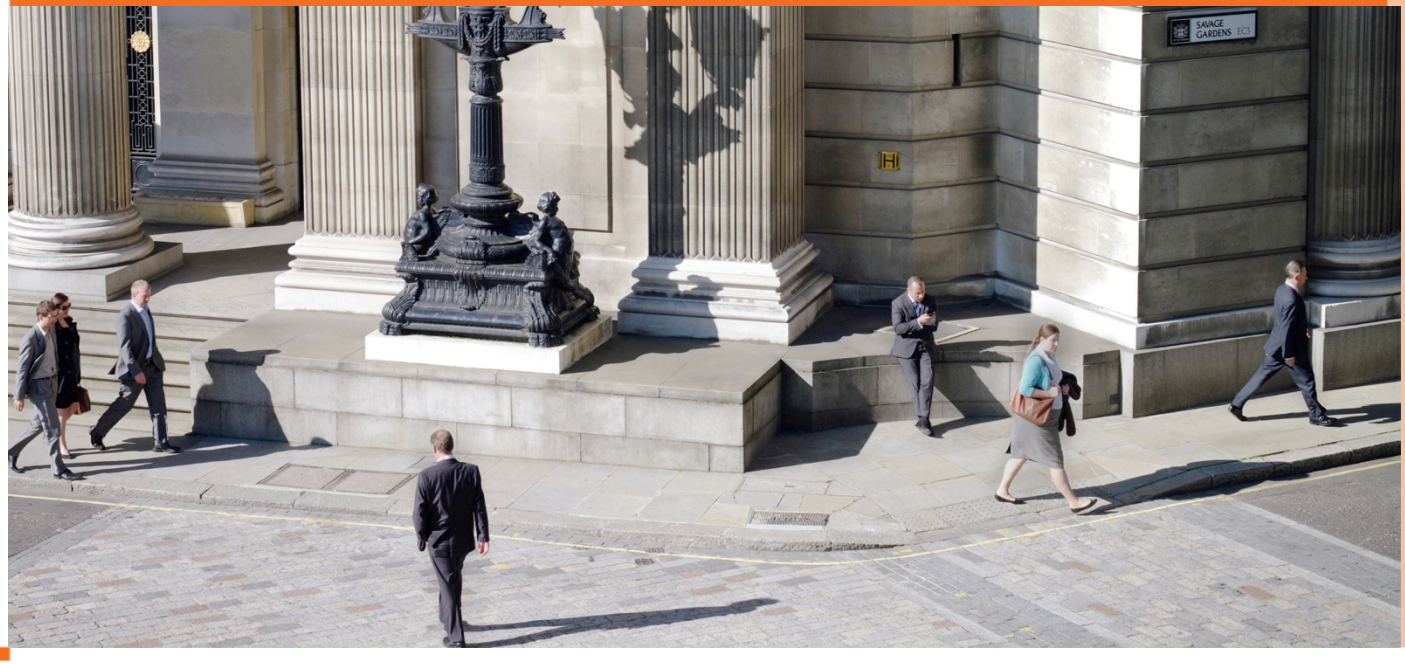
When trading, financial firms must apply greater focus on collateral. How can they make the most of their resources?

Not a game of chance:
The case for stronger collateral management



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Executive summary

C-Level executives in an increasingly interconnected financial services industry will focus on collateral as proactive management of these assets reduces risk, increases liquidity, and improves regulatory capital.

Collateralized trading is on the rise.

Over the next several years, the shift to central clearing and more stringent bilateral trading rules is expected to increase margin call volume exponentially.

While cash collateral is still king for bilateral over-the-counter (OTC) derivatives variation margin, market participants are likely to increasingly post securities for mandatory initial margin requirements. Meanwhile, a slew of new regulations require firms to hold and post high-grade collateral.

Growing demand for a limited supply of high-grade collateral will likely increase its cost.

The result will be more pressure on managers to achieve clear, tangible return on investment from collateral use. To do so, they may need to realign their organizational structures to focus more on collateral optimization.

Increased margin activity and collateral demand will likewise require higher levels of automation. The financial services industry is expected to invest more than $53 billion in technology and infrastructure to address clearing and collateralization inefficiencies in the short to medium term.[1]

However, to get the most value from their investment—as well as maximize liquidity, minimize risk, and achieve regulatory compliance—financial institutions need to take the right approach.

We believe that organizations need a comprehensive, robust, operationally integrated, and technologically advanced solution for enterprise-wide collateral management. Implementing such a solution may be crucial to keeping an organization competitive—particularly if it is part of a proactive approach to managing risk, regulation, and capital.[2]

1 Celent, "Maximizing Collateral Advantage: A Survey of Buy Side Business and Operational Strategies," May 2013.

2 Proactive management of risk, regulation, and capital is arguably the most important of the six priorities we cite in our report, "Capital Markets 2020," for firms looking to stay in the forefront over the next five years. PwC, "Capital Markets 2020: Will it change for good?" www.pwc.com.

Point of view

78.3%

of collateral is cash

Cash is still king, but market participants are likely to post more non-cash collateral as interest rates increase.[1]

$130 bn+

incremental trading collateral

Estimates show that firms may need between $130bn and $450bn in additional collateral to meet higher initial margin requirements for trading interest rate and credit default swaps. [2]

$53 bn

technology investments

The financial services industry is expected to invest over $53bn in technology and infrastructure to address inefficiencies in the clearing and collateralization environment. [3]

1000%

Increase in margin calls

Stronger collateral requirements could increase margin call activity by as much as 1000%, adding to risk and impacting firms' operational capacity. [4]

$2-$4 t

additional collateral

New banking safety rules that require firms to hold a greater proportion of cash and easy-to-liquidate investments will create a demand for $2-$4 trillion additional collateral. [5]

Collateralized trading by the numbers

1 International Swaps and Derivatives Association (ISDA), "Margin Survey," June 2013.

2 Bank of England, "OTC Derivatives Reform and Collateral Demand Impact", October 2012.

3 Celent, "Maximizing Collateral Advantage: A Survey of Buy Side Business and Operational Strategies," May 2013.

4 Depository Trust & Clearing Corporation, "Trends, Risks and Opportunities in Collateral Management," January 2014.

5 International Monetary Fund, "The Changing Collateral Space," January 2013.

New rules and new demands are challenging players in new ways. It's a new game for collateral management—and finding the right approach to deal with these challenges and opportunities is now a make-or-break proposition.

Global regulation is increasing the demand for collateral, changing supply dynamics and ultimately making collateral the lingua franca of capital markets.

While cash still constitutes roughly 75% of the total collateral value underpinning un-cleared over-the-counter (OTC) derivative transactions, this can change.[1] Regulatory mandates (Basel III, global financial regulators, and WGMR, the Working Group on Margin Requirements) will both increase the demand for high-quality collateral for centrally cleared, bilateral derivatives trading, as well as leverage ratios.

Meanwhile, margin call volume is expected to rise many times over—by some estimates, as much as 1,000%—which will test the operational capacity of many firms and their ability to manage collateral efficiently. [2]

Collateral can no longer be an afterthought when trading, as more stringent demands increase costs and, therefore, require a real-time understanding of collateral implications prior to execution.

The number of collateral delivery channels is growing, and with it the need to assess and manage delivery strategically and efficiently. Financial institutions are implementing more advanced trade analytics to identify optimal trading venues, with collateral as a critical component of the analysis.

In our view, the forces driving this change transcend organizational silos, underscoring the need for enterprise-wide solutions that provide a common, cross-product view of collateral and are integrated across functions.

What is collateral management and why does it matter?

Whether lending or trading, collateral has historically been exchanged to mitigate counterparty risk. However, as regulatory mandates have intensified and efforts to improve liquidity and manage risk have deepened, collateral management has assumed greater prominence in organizations on both sides of the street.

Ultimately, collateral management focuses on developing the processes and supporting technologies to ensure that the assets used to meet regulation and manage risk also promote liquidity and maximize return on investment.

1 International Swaps and Derivatives Association (ISDA), "Margin Survey," June 2013.

2 Depository Trust & Clearing Corporation, "Trends, Risks and Opportunities in Collateral Management," January 2014.

A deluge of changes—mandatory trade clearing, stricter capital requirements, and prescriptive bilateral margin rules, among others—have amplified the role of collateral management in capital markets.

New regulations aim to make markets more transparent, resilient, and less reliant on central bank funding, while imposing changes unprecedented in scope. Regulatory changes have affected many different securities markets (see Figure 1):

- **Introduction of central counterparties (CCPs)**—Dodd-Frank in the United States, as well as its European and Asian equivalents, require central clearing of many OTC derivatives; voluntary clearing of repo and securities lending transactions is also gaining traction.
- **Higher capital requirements**—Basel III and other new regulations have raised risk weightings for un-cleared and/or un-collateralized trades.
- **New margin requirements**—For both bilateral and cleared trades, new requirements are leading to an increased focus on internal allocation of collateral across a firm's business activities.

Mandatory initial and variation margin requirements fundamentally change every aspect of margin processing, including documentation, calculation, dispute resolution, segregation, operations, and technology. As a result, collateralized trading has become more expensive and operationally complex.

Figure 1: Impact of regulatory drivers on various types of collateralized products.

Regulatory requirement: Themes	OTC swaps	Repurchase agreements	Securities lending	Foreign exchange	Listed derivatives
Central clearing	Very high	High	High	Medium	Very high
Increased capital requirements	Very high	Very high	Very high	High	High
Multilateral trade execution	Very high	High	High	High	High
Portfolio reconciliation	Very high				
Reporting	Very high	Medium	High	Medium	Medium
Financial transaction tax		Very high	Very high	Medium	
Bankruptcy/liquidation mitigation	Medium	Medium			

Degree of impact: Very high → High → Medium → Low

Optimizing collateral use has implications for liquidity management across a firm and can help improve risk management in many areas, as well.

The inextricable linkage between liquidity and collateral means that firms need to manage risk while also maximizing liquidity (see Figure 2).

Leading firms are:

- Creating an enterprise-wide collateral inventory across product silos.
- Prioritizing the use of idle assets over cash and cash-like collateral.
- Matching sources and uses of liquidity by linking returns on assets with cost of funding.
- Factoring in regulatory limits on rehypothecation of collateral assets, which can shorten collateral chains and reduce liquidity.
- Providing greater visibility into common collateral pools across the organization.

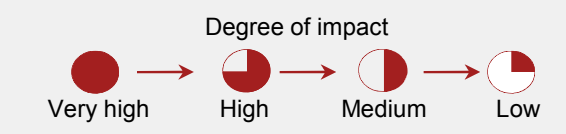
Heightened expectations for management of credit, operational, and settlement risks—from regulators, shareholders, and the public—are also driving firms to improve collateral management.

Leading firms are:

- Standardizing collateral management practices across legal, credit, sales, middle, and back offices. This can include automation of collateral operations to support more real-time, aggregated reporting—a step that also enables more proactive management of counterparty, credit, and operational risk.
- Implementing advanced risk and credit frameworks for credit-value adjustment (CVA), which capture volatility in derivative counterparty risk.
- Protecting collateral assets through improved tracking and segregation of collateral use, which improves trade portability.
- Standardizing trade agreement documents to support transactions with CCPs, clearing brokers, and market utilities.
- Gaining a better understanding of enterprise risk through improved stress-test simulation and master-agreement management.

Figure 2: Impact of liquidity and risk management on various types of collateralized products.

	Themes	OTC swaps	Repurchase agreements	Securities lending	Foreign exchanges	Listed derivatives
Liquidity management	Demand for high-grade collateral	●	●	◑	◑	◔
	Tri-party infrastructure reform		●			
Risk management	Documentation revolution	●	◑			
	Collateral protection/portability	●				◔
	Market transparency	●	●	●	◔	◔



Different types of financial institutions face different trading and operational challenges—but without collaborative collateral solutions, they are likely to share the consequences of failure.

The difficulties of managing collateral are not specific to a single firm; they cut across the entire financial services industry. To succeed, firms must work together to create a cohesive process that accounts for all pieces of the collateral ecosystem.

Sell side	At **sell-side** firms, Basel III, Dodd-Frank, EMIR, and the Volker rule have forced a re-examination—and in some cases, dislocation—of core businesses. Collateral, clearing, and liquidity are converging, requiring integrated, global operating models and technology. At the same time, revenues are declining and regulation is making operations more complex, triggering a drive for organizational efficiencies. As a result, sell-side firms are seeking to optimize trade processes, increase operational efficiency, reduce costs, and develop a holistic view of counterparties across products and geographies.
Buy side	Many **buy-side** firms see a direct or indirect impact from trade clearing and/or bilateral OTC swap margining rules, resulting in fundamental changes in operations. Rising margin calls and compliance requirements demand automated solutions, whether developed in-house or outsourced. As a result, leading buy-side firms are working to realize cross-product margining opportunities, develop analytics to drive margin efficiencies, and move their manual, spreadsheet-based tools to a more automated and compliant collateral management infrastructure.
Custody banks	**Custody banks** look to sell enhanced custody and liquidity services over the full trade lifecycle to both the buy-side and the sell-side. These organizations must determine how to provide seamless delivery, so that their customers will prefer these services over in-house management of increasingly complex collateral operations. As a result, leading custody banks are working on improving the client experience, providing solutions that are truly global and cross product, and implementing more efficient middle- and back-office collateral management and liquidity solutions.
Clearing members	**Clearing members** face a dramatic rise in clearing costs due to new capital and collateral requirements, transforming clearing and forcing a re-evaluation of the business itself. The exit of some providers from the business can lead to unintended risk concentration, as well as issues with porting of positions and assets to surviving providers in the event of a default. Operational burdens are also increasing, including near-real-time trade acceptance, collateral segregation, and more robust compliance. As a result, leading clearing firms are working to bundle clearing with other offerings to strengthen their profitability and ensure viability. The changing business model is exacerbating the increased operational complexity and required investment in technology brought on by financial regulations.

Creative solutions that employ collaborative alliances will address the regulatory, risk, and liquidity demands of today and tomorrow.

Market utilities include central counterparties and trade data repositories, as well as providers of trade compression, portfolio reconciliation, electronic messaging, collateral settlement, dispute management, and collateral outsourcing. This diverse group is central to market function, as participants seek liquidity benefits and operational efficiency.

Industry participants expect collateral management utilities and other shared services to emerge that will address core functions, such as calculation of initial and variation margin, dispute management, master document management, and collateral tracking, reporting, and optimization. In fact, a number of such utilities are in the planning stages, not least because impending implementation of the WGMR bilateral margining rules spur the need for a shared industry solution.

A shared market infrastructure can speed regulatory compliance and promote operational and capital efficiencies by using standard methods to connect with vendors and reducing operational risk via automation.

However, these utilities face many challenges, including competition among market infrastructure providers, delays in regulatory approval, and the need to integrate with internal and external offerings. In addition, utilities must work to seamlessly connect and exchange real-time data with diverse participants in the trade lifecycle and collateral chain.

Industry groups such as ISDA, the Securities Industry and Financial Markets Association (SIFMA), and the Futures Industry Association (FIA) are focused on shaping and clarifying regulation while leading and coordinating the industry response. The challenges for these organizations include anticipating and interpreting regulatory changes; developing unified, industry-wide responses that satisfy diverse participants with different needs; and educating regulators about possible unintended consequences of their actions.

As is the case with other market participants, the accelerating pace of regulatory change is an issue for industry groups, which must facilitate leading practice recommendations to meet new requirements while working with participants and regulators to assess and implement new rules.

Product vendors offer enterprise solutions that provide an alternative to outsourcing and proprietary approaches. They are popular with large sell-side firms as well as many buy-side participants, but also face an increasingly competitive field and must invest in research and development to keep pace with client needs and regulatory changes.

Vendors face additional issues, such as developing modular solutions that cross product lines yet can still be used as point solutions; creating simple, repeatable migration processes that enable clients to deploy rapidly; and allowing clients to customize solutions while still ensuring that they can accept new releases readily.

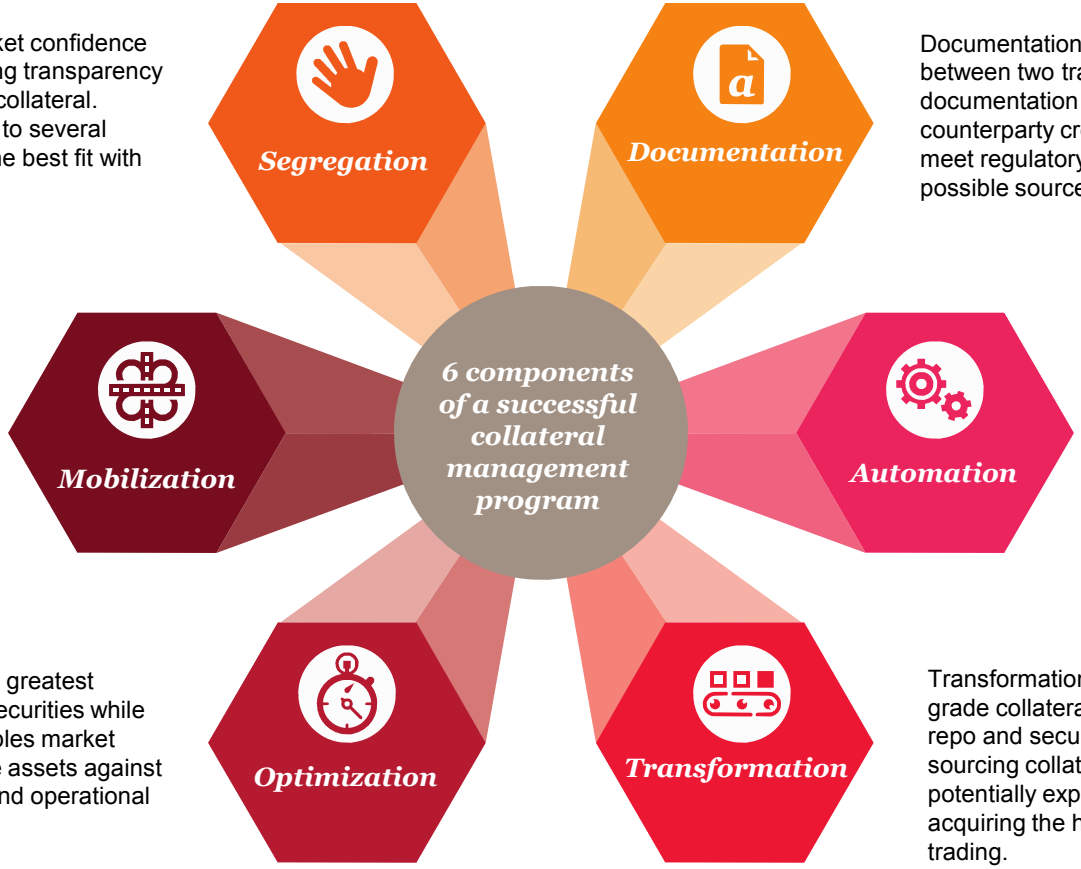
We've created a comprehensive collateral management framework based on the practices of leading firms from both sides of the street. We call this approach the "five 'tions' plus one."

To improve regulatory compliance, liquidity, and risk management, organizations need a comprehensive collateral management framework.

Although each area is important in its own right, the interrelation between them is critical to achieving a holistic solution. Our approach outlines the critical components of a successful collateral management program.

Asset segregation supports market confidence by protecting assets and providing transparency into the use and re-use of client collateral. Market participants have access to several segregation models to support the best fit with the desired risk profile.

Documentation formalizes the terms of a contract between two transacting parties. Previously, documentation focused primarily on mitigating counterparty credit risk; now, it is required to meet regulatory mandates while also providing a possible source of latent liquidity.



Mobilization entails identifying, sourcing, optimizing, transforming, and deploying collateral across different organizational divisions and locations. A natural companion to optimization, it enables collateral movement to the right place at the right time.

Automation is key to efficient market participation and achieving regulatory compliance. Institutions should consider achieving a greater degree of automation by implementing straight-through processing (STP) workflows and electronic messaging.

Optimization involves raising the greatest amount of cash from available securities while minimizing funding costs. It enables market participants to efficiently allocate assets against regulatory, liquidity, risk, legal, and operational constraints.

Transformation entails the exchange of lower-grade collateral for higher-grade collateral through repo and securities lending markets. When sourcing collateral for OTC trades, it could be a potentially expensive but effective avenue for acquiring the high-grade collateral needed for trading.

Our approach can yield a number of regulatory, liquidity, and risk benefits across a range of areas.

The five "tions" plus one	Regulatory, liquidity, and risk benefits
Documentation	• A prerequisite for accessing central clearing, electronic execution platforms, bilateral OTC swaps trading, and TBA margining, documentation enables asset segregation protection through Account Control Agreements. • Reduces counterparty credit risk through documentation of default protocols, provides a consistent view of risk to inform trading decisions, and promotes asset portability in case of credit events. • Reduces collateral optionality by promoting trade valuation consistency, and mobilizes collateral globally by establishing relationships and documenting agreements with market utilities that support broader market access.
Automation	• Enables collateral inventory aggregation, optimization, mobilization, and segregation. • Provides efficient management of trade files, margin calls, substitutions, settlement status monitoring, fails, position reconciliation, and disputes. • Allows market participants to improve efficiency, reduce operational risks, and redeploy staff to focus on higher value activities.
Transformation	• Provides an avenue for acquiring the high-grade collateral needed for trading. • Mitigates potential collateral crunch (along with cross-product margining, broader collateral eligibility, and compression).
Optimization	• Reduces the need for transformation. • Exploits latent liquidity. • Enables repositioning of collateral operations from a cost center to a revenue generator. • Allows market participants to allocate assets efficiently against regulatory, liquidity, risk, legal, and operational constraints.
Mobilization	• Improves liquidity, manages cost, mitigates risk, and satisfies greater collateral demand. • Overcomes collateral depository fragmentation, enables improved optimization, and increases funding opportunities. • Provides increased settlement transparency and certainty, reduces fails, and improves collateral access across borders.
Segregation	• Reduces risk from counterparty default or fraud/misuse, and facilitates porting of assets and positions after a default.

With clearly articulated goals, stakeholder buy-in, and a phased implementation roadmap, organizations can transform their collateral management programs. They must be prepared, however, to address a number of challenges.

Challenge	Potential ways to address challenges
Operating model Moving collateral from a back-office to a front-office function can require significant operating model changes, including integrating collateralized trading desks with treasury, legal, and credit functions.	• Understand how each function uses collateral and how common assets will be used in the future, considering competing demands from the front office, treasury management, and risk management. • Determine if creating a centralized collateral function is the best approach to address cross-organizational collateral needs. • Define and implement a stakeholder-approved, cross-functional, and global operating model that is flexible enough to meet changing organizational and regulatory demand.
Technology A technology approach that supports the operating model can be difficult to deliver at a cost that is commensurate with revenue.	• Gain control of agreement management, inventory management, and potentially optimization, including scenario and stress-test analysis. • Assess time-to-market constraints, such as regulatory deadlines, since these largely determine whether a firm builds its own system or uses a vendor, outsourced, and/or utility solution. • Determine if an enterprise collateral management solution is appropriate. Some business heads might prefer “best-of-breed” solutions that are more targeted to their specific needs.
Data management Developing an enterprise view of assets, in real time and available to all functions of an organization, will require improved data management.	• Create a data architecture that revises or eliminates legacy batch-driven processes to enable real-time management of the asset inventory. • Develop a data “middle layer” that sources data from relevant systems while providing real-time data instead of a central data repository. • Craft solutions to achieve efficient straight-through processing while synchronizing data to permit all users to see the same “version of the truth.”
Return on investment Getting bottom-line benefits from a collateral management program may mean transforming the function from a cost center to a profit center.	• Employ utilities to both defray unilateral costs and shift the regulatory compliance, operations, and technology support burdens to the provider. • Maintain accurate and consistent data to allow market participants to realize greater yield from each asset, lower the cost of borrowing, and cut back on over-collateralization—while using liquid assets to their fullest potential. • Rather than cut headcount, redeploy staff from manual, repetitive tasks to value-add endeavors such as monitoring riskier bilateral trading counterparties.

Those who leave collateral management to chance will not only miss the opportunity to gain a competitive edge by unlocking liquidity—they risk being unable to participate in capital markets because they cannot meet the heightened expectations of regulators and the marketplace.

Like blacksmithing at the advent of the automobile, it is irrelevant how, or how well, the function is performed today because it is changing in fundamental ways.

In our view, given the current regulatory, liquidity, and risk management burdens that financial services institutions face, widespread changes are needed. Ultimately, the consequences of not embracing and getting ahead of these changes will be significant:

- Diminished ability to participate in market activities—if an institution cannot meet the margin requirements of a central counterparty, then it cannot trade.
- Unacceptable exposures to counterparty credit risk.
- Inability to meet regulatory liquidity ratios, leading to fines, reputational damage, and reduced access to credit markets.
- Increased time in settling trades and meeting margin calls.
- Reduced capacity to identify and mobilize eligible collateral effectively.
- Diminished ability to unlock latent liquidity.
- Increased operational costs, due to operational and technology efficiencies.
- Reliance on expensive, unsecured funding.

The prospect of continued regulatory changes in the coming years underscores the urgency of taking action—and of taking the right combination of actions to meet the collateral management challenge.

Competitive intelligence

Our observations of industry practices.

While some firms have invested in collateral management solutions, additional work is needed to thoroughly address regulatory, liquidity, and risk management issues.

	Ad hoc	Competent	Mature
Documentation	• Appropriate master documentation covers most trades and is readily accessible when needed. • Essential (but not all) terms in the master agreements match those contained in collateral management systems. • Most documentation processes are manual, including negotiation and input of terms, but with controls such as "four-eye checks."	• All master agreement terms are digitized, electronically searchable, and preferably, held in a central repository. • All master agreement terms match those contained in collateral management systems. • All documentation processes are automated, including workflows to negotiate agreements with counterparties.	• Industry standard master agreements (such as ISDA) that minimize optionality cover all trades. • Firm uses trade data repositories, electronic messaging, and other shared market utilities to aid document management. • Automated documentation methods maintain "one version of the truth" among the legal, sales, operational, front-office, credit, and risk management functions.
Automation	• A single daily batch exchange of critical data serves the treasury, trading, credit, risk, and settlement functions. • Business lines and systems do not easily share data. • Staff levels that are incompatible with operational needs increase risk and cost (such as large offshore teams handling dispute resolution).	• Intra-day exchanges of critical data serve the treasury, trading, credit, risk, and settlement functions. • Systems issue margin calls without practitioner intervention. • Firm redeploys staff from low-value manual tasks to value-add functions.	• Real-time exchange of critical data serves treasury, trading, credit, risk, and settlement functions. • Straight-through processing of workflows extends across the internal collateral management lifecycle. • Straight-through processing of workflows extends to external counterparties, service providers, and utilities.
Transformation	• Collateral management lacks internalization so inventory is not well known or utilized, resulting in expensive external transformation trades. • Firm lacks pre-trade analytics that would help determine collateral demand proactively.	• Operating model facilitates communication between lines of business to determine best use of shared collateral resources. • Systems provide a common view of collateral inventory, as well as limited optimization functionality.	• Collateral management achieves internalization, allowing identification and deployment of internal assets (otherwise hidden in business-line silos) before considering outside funding sources.

While some firms have invested in collateral management solutions, additional work is needed to thoroughly address regulatory, liquidity, and risk management issues (continued).

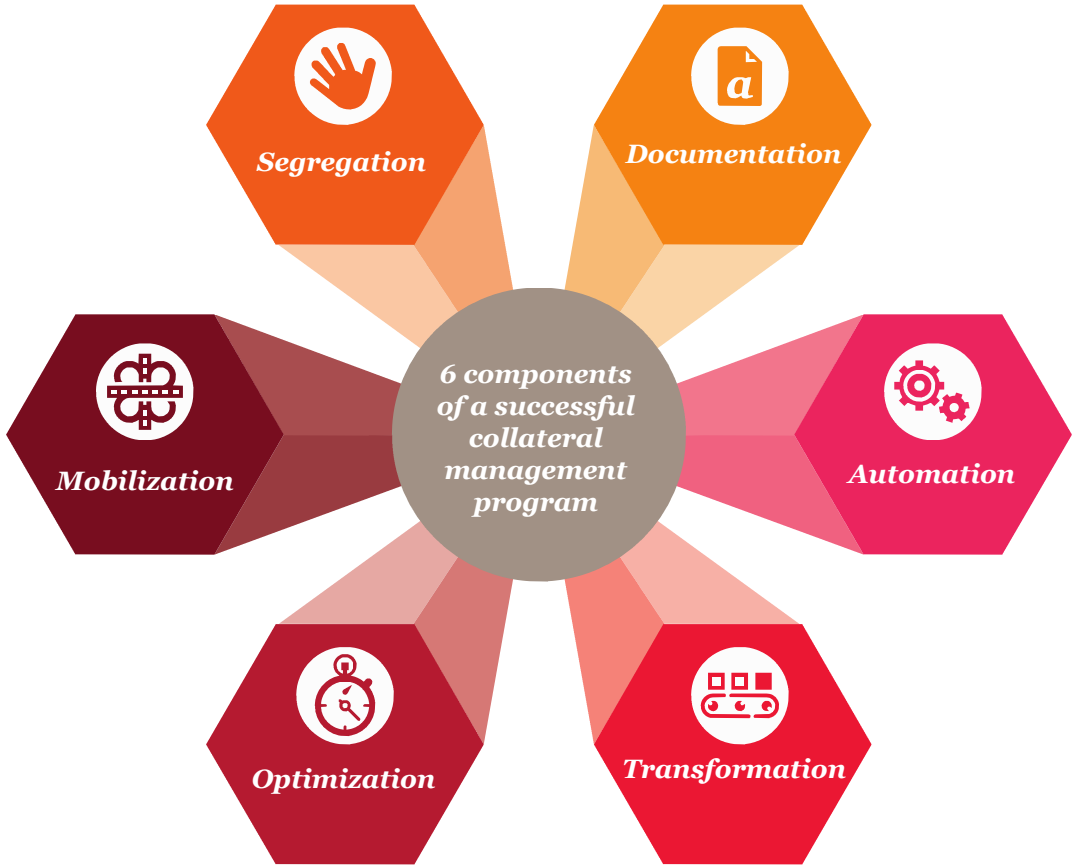
	Ad hoc	Competent	Mature
Optimization	• Firm uses a manual, spreadsheet-based approach for ranking collateral inventory using a static firm profile for risk appetite and economic outlook. • Methods focus on cheapest-to-deliver collateral. • Individual product trading desks have limited view into cross-organizational collateral holdings and available assets.	• Firm takes an algorithmic approach to collateral ranking based on predetermined factors, such as cost, liquidity, and market volumes. • Methods differentiate collateral by ranking, haircut, and location (including costs of moving). • Systems provide a cross-functional, enterprise-wide view of collateral across all asset classes, business lines, and repositories.	• Specialized collateral trading/CVA desks manage the firm's supply and demand. • Collateral management realizes the greatest possible yield from each asset, minimizes the cost of borrowing, eliminates over-collateralization, and ensures that all potential liquidity is put to work. • Firm considers optimization beyond collateral, including cross-product margining, funding, financing/funds-transfer-pricing, liquidity, portfolio, and balance sheet.
Mobilization	• Firm sources collateral from a local pool of collateral and has limited capacity to locate and transport collateral cross-border. • Back office uses manual rather than electronic methods for collateral agreement, instruction, and settlement. • Back office tracks and reports collateral holdings manually in batches.	• Systems permit a view of global collateral data across business lines/global repositories to optimally match collateral assets to collateral requirements. • Automated systems track settled and failed collateral movements, resulting in improved forecasting of funding needs.	• Systems seamlessly connect with shared market utilities to transform matches and calculated margin calls to settlement instructions; send pledges, transfers, or bilateral instructions to custodians; receive and record settlement instructions; and report consolidated collateral activities and positions across locations and jurisdictions.
Segregation	• Back office manually tracks segregated collateral held at custodians, central counterparties (CCPs), and dealers. • Systems cannot always differentiate between encumbered and unencumbered collateral. • Legal and operational difficulties prevent the firm from using segregation protection for bilateral over-the-counter (OTC) swaps.	• Systems permit automated substitution of segregated collateral. • Collateral management facilitates monitoring of complex portfolios, including support for eligibility, concentration limits, and haircuts.	• Firm achieves operational, legal, and technical ability to support various segregation models. • Systems automatically track collateral held by custodians, CCPs, and dealers and its rehypothecation. • Firm selects an optimal segregation model based on cost, risk, and jurisdictional factors.

A framework for response

Our recommended approach to the issue.

Institutions need a comprehensive collateral management solution that will help them maintain regulatory compliance while maximizing liquidity and minimizing risk.

To maximize value from finite collateral resources, organizations must take a holistic view. We believe that an effective collateral management program should include six critical components: documentation, automation, transformation, optimization, mobilization, and segregation. This approach—the five "tions" plus one—can help firms build an operationally integrated and technologically advanced enterprise-wide solution that delivers the regulatory, liquidity, and risk benefits they want.



Documentation

Ensure that documentation meets leading practice standards to achieve regulatory compliance, minimize counterparty credit risk, and inform trading decisions.

Proper documentation is essential to protecting all participants in collateralized trading. Regulators require it for both cleared and un-cleared trades—which now fall under new bilateral margining rules that can call for independent collateral segregation. Meanwhile, central counterparties (CCPs) have their own documentation requirements, as do other market utilities (including trade data repositories and providers of trade compression, portfolio reconciliation, electronic messaging, collateral settlement, dispute management, and collateral management outsourcing).

Start by gaining an overall picture of where you now stand and how you ultimately want your documentation practices to work.

Key steps	Recommendations
Understand current state	• Identify what agreements are in use (Global Master Repurchase Agreements, ISDA master agreements, Securities Lending Agreements) and how stakeholders from different functions (legal, credit, sales, operations) use them. • Determine where and how documents are stored, how different users and systems get the same "version of the truth," and how agreements are negotiated, finalized, and updated between stakeholders.
Determine future state	• Establish the degree of automation and centralization required to support existing agreements. • Leverage emerging industry utilities to negotiate and store contract terms. • Explore automated workflow and agreement management storage tools. • Determine how to simultaneously manage multiple credit support annexes (cash-only variation margin, cash-only initial margin, securities only variation/initial margin, SCSA/SCSA2).

Getting documentation right

We believe that firms should use boilerplate agreements whenever possible to simplify operations and ease negotiation. This is particularly important in bilateral derivatives trading, where such common industry templates as the ISDA standard credit support annexes (SCSA and SCSA2) do much to remove optionality by using overnight indexed swaps (OIS) that discount and align collateral and trading currencies. Whether or not a firm uses these templates, it should ensure that trading relationship master documentation:

- Includes all material terms governing the trading relationship with counterparties.
- Provides legal certainty for non-centrally cleared derivatives transactions.
- Covers the lifecycle of bilateral over-the-counter (OTC) derivatives from daily margin processing, dispute management, and asset segregation.
- Captures the trading relationship in a "non-writable" and "non-erasable" digital form, so it cannot be altered without consent

It is also important for a firm to gain an overall picture of both where it now stands and where it wants to go with its documentation.

Automation

Implement straight-through processing to improve operational efficiency and risk management.

Automation is critical to transforming a firm's collateral management function, streamlining front-to-back workflow while supporting an effective operating model. Implementing straight-through processing across the collateral management lifecycle leads to operational efficiencies, enhanced liquidity, and improved risk management, while re-allocating back-office staff to higher value activities.

However, we believe that before automating, a firm must first establish a cohesive operating model that allows for easy sharing of enterprise collateral assets. Automating internal collateral management processes can prove to be difficult, and it is also a challenge to design, build, and test the complex interfaces needed to connect internal systems to the market. To do so, it is important for a firm to prioritize automation initiatives that support profitable market participation.

Key steps	Recommendations
Assess current state	• Document and analyze end-to-end workflows. • Assess automation opportunities.
Develop and maintain target state	• Develop a target-state solution that details the desired workflow. • Prioritize automation opportunities. • Align implementation plans with other internal transformation efforts. • Conduct periodic reviews to ensure new initiatives are consistent with the target state.
Leverage industry standards and infrastructure	• Accelerate integration efforts and minimize translation costs by using standards such as the Financial Products Markup Language and the Clearing Connectivity Standard. • Use shared industry utilities and off-the-shelf vendor packages wherever possible; concentrate on a robust framework for integrating these solutions with both internal and external systems upstream and downstream.

Transformation

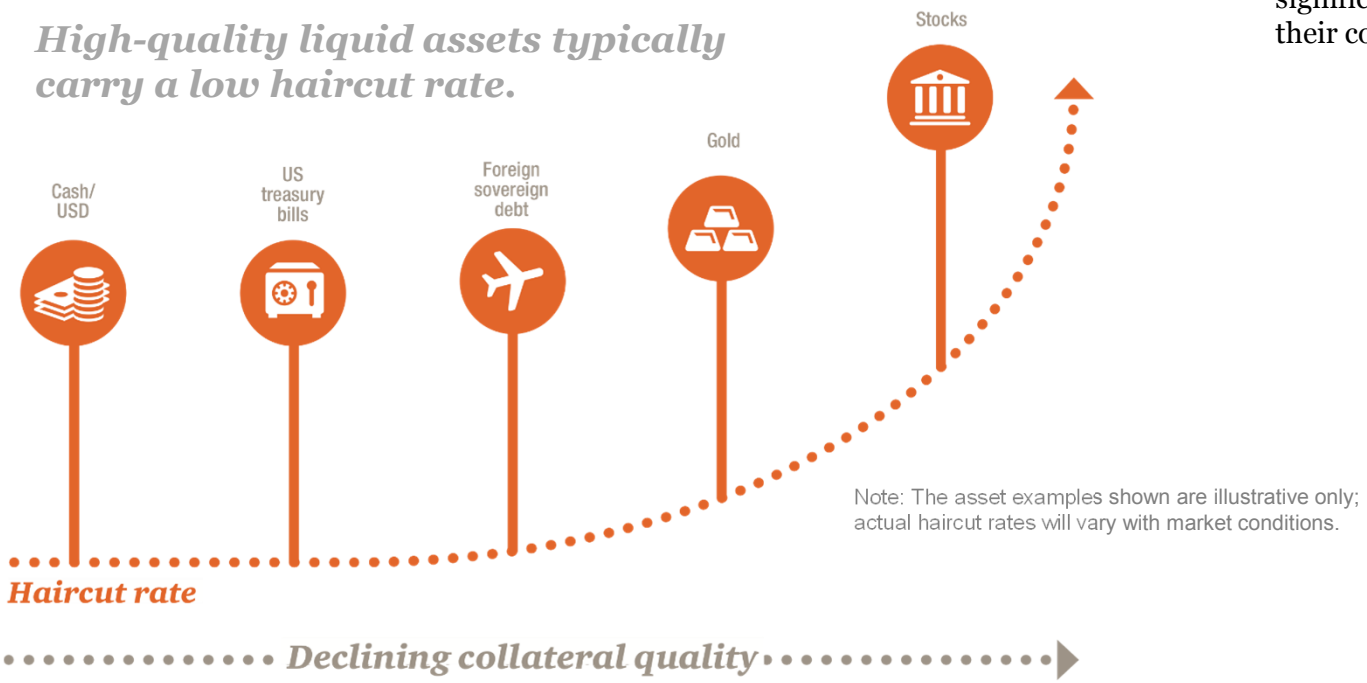
Prepare for an increased demand for high-quality liquid collateral by leveraging collateral transformation.

While the predicted shortage of high-quality liquid collateral has yet to materialize—despite the imposition of central clearing for many derivatives in the US—it may still happen, particularly after a similar European regulatory mandate goes into full effect. The growing impact of liquidity coverage ratios may also intensify demand for high-quality liquid collateral.

Market participants may need to use the securities finance markets for "transformation" trades that turn lower grade securities into high-grade "clearing-eligible" paper. In the meantime, banks are currently doing these trades to acquire securities that will help them meet regulatory requirements for liquidity coverage.

Ultimately, most firms will fall into one of two groups:

- Firms who have a need for high-grade collateral—Firms who expect they may need transformation services in the future should look to partner with providers that offer liquidity in periods of stress.
- Holders of high-grade collateral—The providers will include traditionally collateral-rich participants, such as custody banks. Regulations may result in additional participants, such as hedge funds and cash-rich corporations that are entering the transformation markets to generate additional revenues. These firms should consider how they can support a potentially significant new business model by lending their collateral for higher returns.



Note: The asset examples shown are illustrative only; actual haircut rates will vary with market conditions.

Optimization

Exploit available securities while minimizing borrowing costs.

The collateral optimization process enables efficient allocation of assets in line with regulatory, liquidity, risk, legal, and operational constraints. More sophisticated than basic "cheapest-to-deliver" (CTD) allocation, optimization exploits available securities while minimizing borrowing costs. While CTD is sufficient for some participants, banks and dealers must have the ability to view their holdings and disposition of collateral across all asset classes, business lines, and repositories—including open positions and locations of pledged assets.

We believe that a comprehensive collateral optimization solution should deliver inventory management, collateral tracking, and complex analytics using automation and straight-through processing. It should offer a view of collateral across custodians. It should also link to tri-party collateral providers, central securities depositories (CSDs), and utilities that allow for the tracking, settlement, status of margin calls, and transparency into the settlement lifecycle.

Getting to such a solution requires a complete picture of the firm's current practices and agreement on goals.

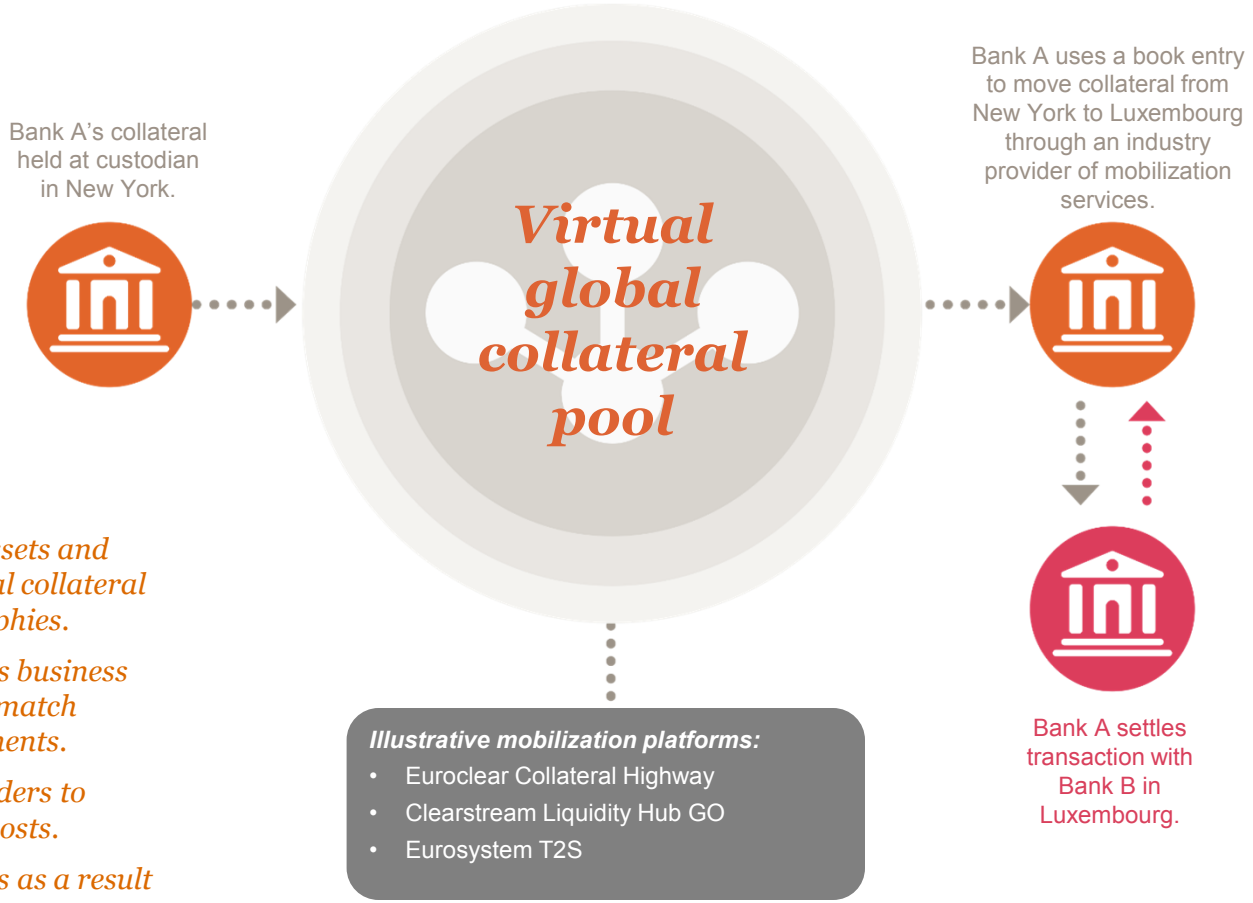
Optimization goals and objectives	
Front office	Gain greater control of collateral selection against trades.
Treasury	Effective collateral use for adhering to capital requirements for collateral, liquidity, and regulatory capital.
Buy side	Minimize demand for high-grade and additional collateral.
End users	Manage higher costs from buying assets in the market solely for collateral purposes and using cash as collateral when it could be used elsewhere.
Service provider	Provide a differentiator to clients to win new business and generate revenues from existing business.

Key steps	Recommendations
Understand current optimization practices	• Document practices across business silos, including rehypothecation policies as well as sources and uses of collateral.
Quantify benefits	• Consider revenue lost, funding cost, impact on the balance sheet, and return on equity. • Understand the impact of various interest rates, credit ratings, and spreads. • Assess internal transfer pricing policies.
Develop target operating model	• Implement the model incrementally across business/product silos and geographies. • Enable the model using automation.

Mobilization

Source, optimize, transform, and deploy collateral regardless of its location.

Mobilization entails moving a firm's collateral across borders and among repositories, creating a virtual collateral pool across their business lines and geographies. Firms can use services provided by International Central Securities Depositories to use collateral located in one business unit or geography to settle obligations across the globe, in a relatively fast, cost-effective way. Mobilization allows participants to cover exposures where and when needed, improving liquidity and mitigating risk.



Mobilization benefits

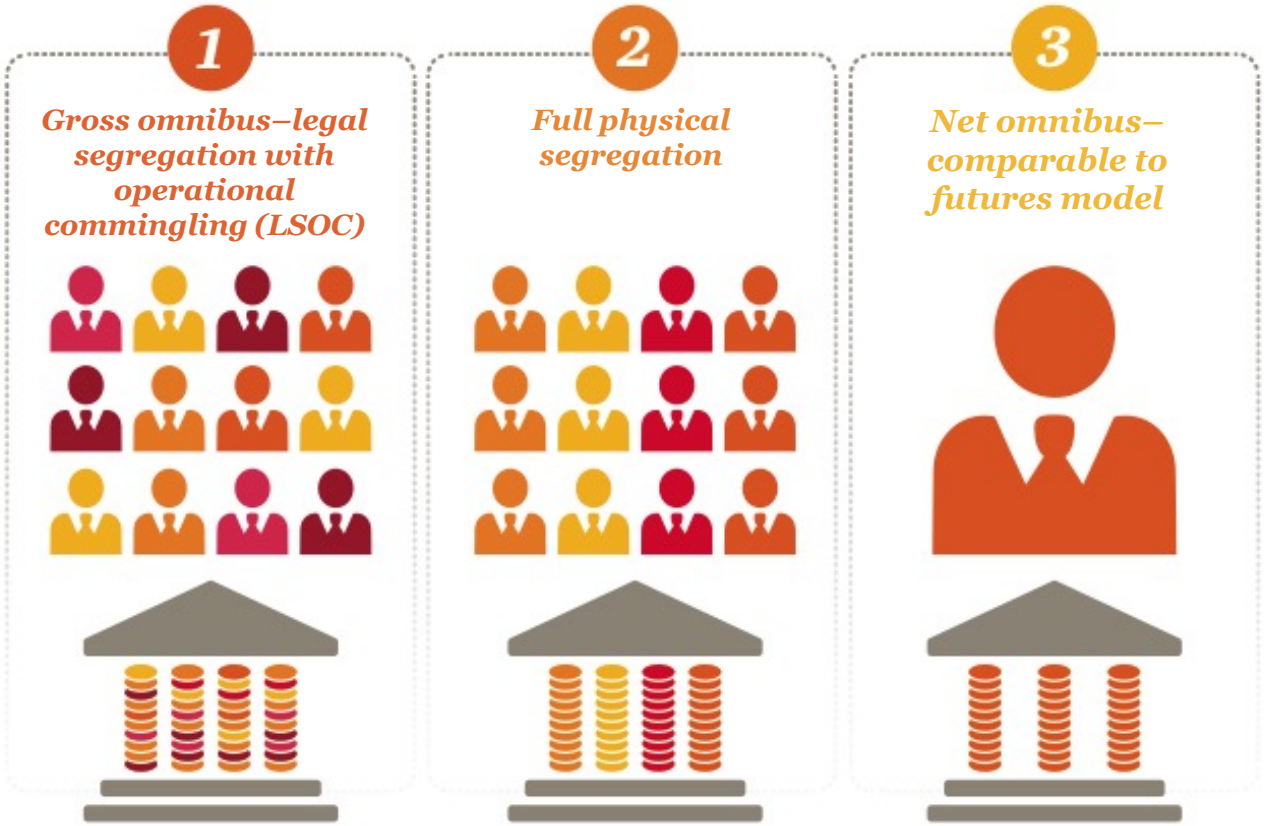
- *Single, holistic view of all collateral assets and obligations by creating a virtual global collateral pool across business lines and geographies.*
- *Real-time global collateral data across business lines/global repositories to optimally match collateral assets to collateral requirements.*
- *Improved collateral access across borders to reduce liquidity needs and financing costs.*
- *Improved forecasting of funding needs as a result of settled/failed collateral movements.*

Segregation

Adopt an asset segregation model that offers the proper level of protection and efficiency.

Demand for collateral segregation services for un-cleared derivatives trades is expected to greatly increase as a result of the WGMR's (Working Group on Margin Requirements) rules, which allow for both mandatory and optional third-party segregation.

For participants, implementing these rules involves establishing custodian accounts, connecting to custodians, and moving collateral, as well as negotiating account control agreements (ACAs) and tri-party control agreements. Firms will also need to actively manage valuation and substitutions of collateral, integrating these functions effectively into the optimization and segregation process.



1. All collateral goes into one pot, but it is attached to individual clients. Collateral of non-defaulting firms should be protected if there is no shortfall following a default. In the case of a shortfall, US bankruptcy law requires recovered amounts to be shared pro rata among all clients.

2. Each client gets its own individual collateral pot, potentially away from the futures commission merchant (FCM). Theoretically, client collateral should be protected in all circumstances—even following a double default of the FCM and another client. In the US, however, physically segregated accounts can be exposed to loss, barring amendment to the bankruptcy rules or defining client collateral so it is not treated as FCM customer property.

3. All collateral goes into one pot, unattached to individual clients. The clearing house can draw from the non-defaulter's collateral before it turns to its own capital or the default contribution of non-defaulting FCMs.

Segregation (continued) Different participants in the market will have different challenges and priorities.

Sell-side: Under proposed margin rules for un-cleared bilateral trades, the industry expects the number of required segregation accounts for initial margin will grow exponentially by 2019—by some estimates, 8,000 new accounts will be required by the end of 2015.[1] Further, each dealer will need to interact with an increasing number of custodians, as each may appoint different custodians to hold their segregated initial margin. Establishing new custodial relationships and building connectivity to each, implementing internal system changes, and implementing STP will pose significant challenges.

Buy-side: Asset managers must determine which segregation model is appropriate for both cleared and bilateral trades, weighing the benefits of risk mitigation versus operational complexity and cost. As is the case with the sell-side, participants will want to track, value, and substitute collateral seamlessly.

Custody banks: Custodians need to scale up in response to the exponential growth in demand for segregation services. This includes providing STP solutions for both un-cleared and cleared segregation models. Custody banks are likely to see competition from central securities depositories and CCPs.

CCPs: US regulation mandates the LSOC model while Europe offers a variety of models, including "full" segregation, under which a custodian or CSD holds the assets. In the US, CCPs can hold excess margin away from the FCM, but they will also need to work with custodians who offer quad-party segregation models to clients and broker dealers.

Central securities depositories (CSDs): EMIR 47.3, a European financial regulation, mandates that CSDs hold initial margin. While this is not a requirement in the US, a CSD could also offer segregated accounts for both cleared and bilateral trades.

1 "ISDA letter to the ESAs on estimates of numbers of accounts affected by IM segregation requirements, to demonstrate operational challenges," www2.isda.org, August 22, 2014.

Case study: A leading bank takes steps to better deploy cross-organizational collateral and improve operational efficiency.

A G14 bank/broker dealer needed help in identifying opportunities to better integrate a recently formed fixed-income repo and prime finance joint venture. The bank's disjointed processes and technology kept its collateral management function from operating efficiently and effectively:

- The fractured collateral inventory reduced liquidity and forced the bank to use unsecured funding for posted collateral.
- Siloed counterparty views limited the bank's ability to effectively manage concentration limits and credit risk.
- Manual tasks plagued the organization, requiring the bank's employees to spend a significant amount of time reconciling information on spreadsheets, checking data integrity, and performing other transactional activities.
- The fixed-income repo and prime finance functions operated independently, creating friction for clients who interacted across divisional lines.

To address these issues, the bank embarked on a 12-month journey to improve its collateral management across its fixed-income repo and prime finance functions. First, it merged the two functions to meet funding, liquidity, and efficiency goals. This included co-location of the trading, liquidity management, and funding functions of the three groups on the same floor to minimize duplicative activities and leverage existing infrastructure.

Next, the bank aligned operating models and consolidated operations with a view toward creating a common supporting technology platform. This included redeployment of staff to more value-add tasks that helped limit the impact of the consolidation on core businesses. It also implemented tactical modifications to each function's technology platform to provide a common collateral inventory view (eliminating the immediate need for a complex common inventory solution).

Finally, the bank leveraged and reduced custodian accounts, aligning the settlement function and facilitating collateral optimization.

With a relatively modest capital investment, the bank realized measurable results: it had a stable operational and technical infrastructure, as well as a culture of cooperation and success that would support the more strategic changes it needed to truly merge and continuously improve its handling of collateral throughout the organization.

Appendix

Why PwC?

Collateral management transformation is a complex undertaking that requires a trusted partner for success. PwC offers an unparalleled set of capabilities, skills, and experiences to help capital markets participants. We can apply our deep industry experience with buy-side participants, sell-side banks, custody banks, industry utilities, and collateral management solution providers to help you achieve your program objectives.

Capability	Description	Services
Collateral management best practices	• Collaborate with professionals who have proven industry experience in collateral management strategy, operations, and technology.	• Leading practice workflows. • Collateral optimization services. • Tech/operations automation/STP.
Multi-generation plan	• Develop a multi-generation strategy to enable rapid transformation and accelerated value.	• Collateral strategy development. • Target operating model (TOM) development.
Technology solutions	• Utilize our industry proven methodology to unlock rapid and enduring value from leading technology solutions.	• Technology selection and implementation. • Agreement/documentation management solutions.
Risk/regulatory framework	• Address collateral management risks across all products with PwC's tailored and systematic approach for risk management.	• Regulatory compliance solutions. • Risk mitigation and management. • Settlement risk efficiency/reduction.
Disciplined large program execution	• Establish a program management office using an adaptable project management methodology and toolset.	• Program management. • Vendor and service provider tracking.

Appendix—Select qualifications

Project and client	Issues	Approach	Benefits
Collateral operations risk and compliance review—Global investment bank	The bank needed help reviewing governance, risk, and compliance aspects of its collateral management operations across OTC derivatives, prime brokerage, and repo functions. This required the documentation of target-state requirements, as well as the development of tactical and strategic solutions to address functionality gaps.	PwC facilitated several working sessions to: • Assess the client's global treasury credit management operations, including the governance, control environment, measures, limits, analytics and reporting, and the collateral management infrastructure for OTC derivatives, repo, and prime brokerage. • Assess process and control gaps for legal document negotiation, client on-boarding, and margin call processes. • Assess procedures for the processing of interest, dividends, and corporate actions, as well as the independent verification process.	As a result of this project, the client identified numerous gaps in governance, technology, resourcing, and operational processes. PwC's strategic and tactical recommendations enabled the client to implement a prioritized plan that specifically addressed these issues.
Collateral asset protection for cleared OTC derivatives trades—Global custody bank	The custody bank needed help in facilitating the flow of collateral between itself and derivatives users, futures commission merchants (FCMs), and central counterparties (CCPs). It was looking for a target operating model, account structures, operational workflows, and system interfaces, as well as integration of multiple technology platforms, to ease collateral flow and protect all parties in the event of default. It also wanted the target model to comply with multiple regulatory requirements.	PwC facilitated several workshops to develop the target operating model and aid assimilation of the new service within the custody bank. The PwC team helped management: • Develop process flows, document data requirements, and analyze interfaces to design real-time data flows. • Conduct business requirements sessions with external stakeholders, including FCMs and CCPs. • Map regulatory requirements to the proposed segregation offerings (LSOC/ISA).	The bank was able to deploy an industry-leading solution that met an urgent need for its clients. This solution: • Offered participants superior collateral asset protection that facilitated the flow of assets to secured parties. • Integrated this service with other related offerings, leveraging the bank's existing client base. • Achieved operational and technical efficiencies that helped contain costs.
Response to regulatory mandate —Large tri-party repo agent bank	The bank needed assistance in developing a response to the Federal Reserve's Tri-Party Repo Task Force's mandate to explore the possibility of converting this function to a market utility. It required an in-depth analysis of many regulatory recommendations, as well as coordination of priorities across stakeholders from the technology, operations, client management, legal, and compliance functions.	PwC helped develop and manage a cross-functional project management office that analyzed all Task Force recommendations. This included: • Providing capital markets and technical experience to help devise approaches for implementing recommendations. • Assisting stakeholders from technology, operations, client management, legal, and compliance in developing and executing a detailed, risk-prioritized action plan. • Developing an automated dashboard for weekly reporting to internal stakeholders, bank clients, and the Fed.	As a result of the project, the client had a detailed understanding of the requirements to convert the tri-party repo function into a market utility. This understanding incorporated a thorough analysis of multiple internal and external views, including those of the bank's client and the Fed.

www.pwc.com/fsi

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"Not a game of chance: The case for stronger collateral management," PwC FS Viewpoint, May 2015. www.pwc.com/fsi.

About our Financial Services practice

PwC's people come together with one purpose: to build trust in society and solve important problems.

PwC serves multinational financial institutions across banking and capital markets, insurance, asset management, hedge funds, private equity, payments, and financial technology. As a result, PwC has the extensive experience needed to advise on the portfolio of business issues that affect the industry, and we apply that knowledge to our clients' individual circumstances. We help address business issues from client impact to product design, and from go-to-market strategy to human capital, across all dimensions of the organization.

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