Tri-party Circular

J.P. Morgan Tri-party Program Update

May 2022

J.P.Morgan

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Introduction

Welcome to our Tri-party Circular, which for European based clients also coincides with our first in person collateral and financing conference in two years (we will have replays available for those further afield). As travel and meeting restrictions ease, the J.P. Morgan team has been thrilled to meet with many of you in person again. In this issue, we share some hugely exciting developments, and we look forward to our continued partnership as we work with you on your collateral and financing needs.

BENJAMIN CHALLICE
Managing Director
Global Head of Trading Services, J.P. Morgan

Collateral optimization is a tri-party feature that requires continual investment to stay in tune with client's advancing optimization requirements. In the upcoming article, Michele Filippini, takes us through the benefits of the new Optimizer recently released into Collateral Central, which provides, greater optionality, granularity and performance improvements. For clients developing dealer directed optimization allocations, we were also pleased to announce recently that we are now connected to Pirum's Collateral Connect to help mutual clients streamline their workflow.

On page 4 Paul Pirie provides an update on several developments with digital assets, in particular with regards to the launch of our Tokenized Collateral Network and details of the inaugural trading activity, tokenizing Money Market Funds. The potential is truly industry changing and opportunities equally as broad. We have a huge amount going in a fast moving area and I would encourage you to contact us if you would like to learn more.

Other areas of focus in this publication, include an update on the expansion of our Tokyo team and local service offering, recent product developments for Repo transactions and the potential halo effects of more buy side firms becoming collateral providers.

The team and I look forward to meeting as many of you as possible at our annual conference in London on May 26th and at the upcoming industry conferences.

Best wishes and keep safe,
Ben Challice

Optimization – Faster, Smarter, Sharper

As our client priorities continue to evolve, the ability to optimize collateral held both within and external to the J.P. Morgan Tri-party network continues to be a focus for our investment and mobilization agenda.

MICHELE FILIPPINI
Executive Director
Product Manager

ARTICLE ONE

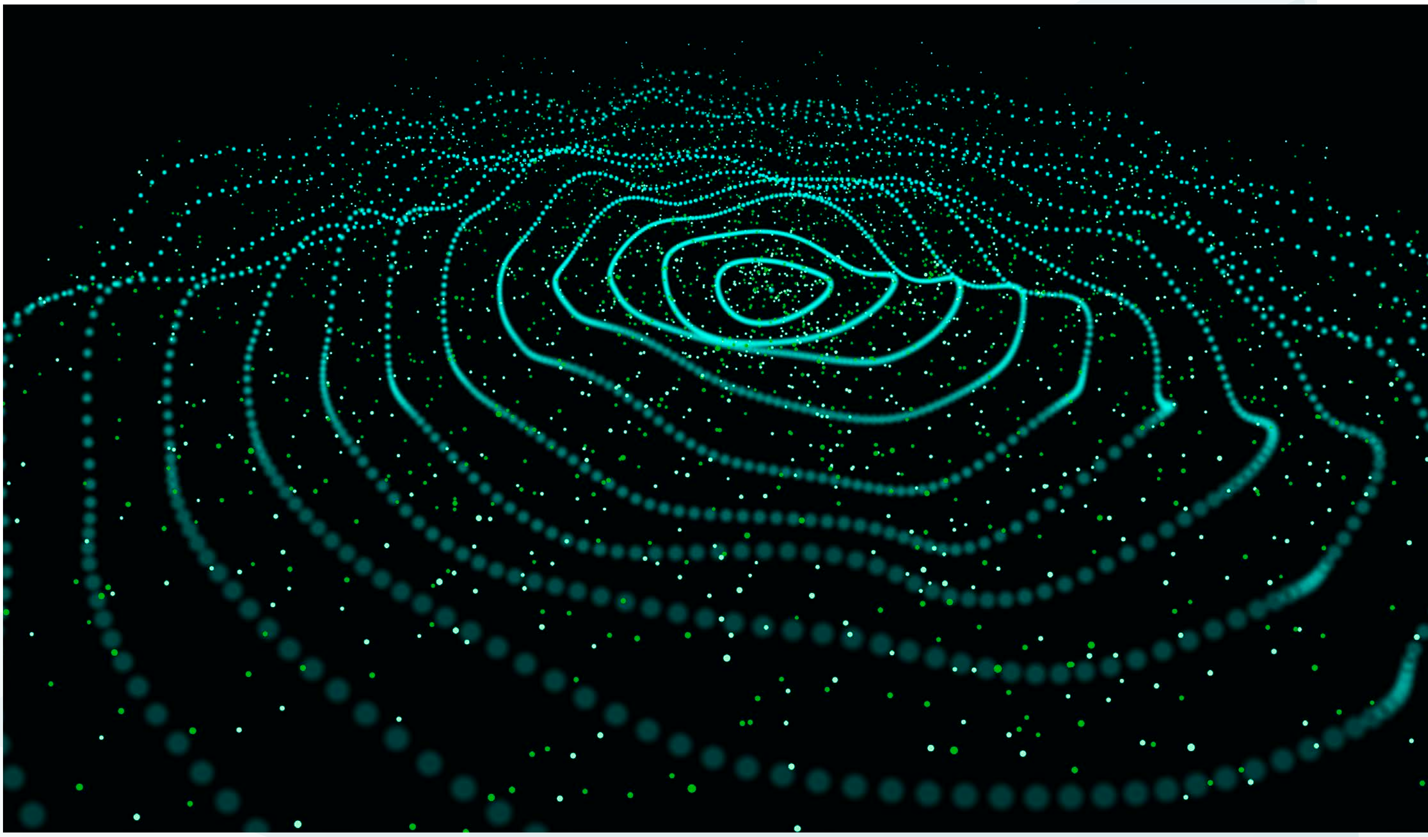
As part of our continuous enhancements to the Collateral Central platform a rebuild of our optimizer was recently released. The new optimizer will allow clients who have selected this functionality, or those who have not yet implemented their own proprietary optimization capability, to increase the granularity of their collateral allocation at J.P. Morgan, as well as leverage the simulation tool to look across their entire inventory pool.

Here's how it works:

- Account groupings will be set with a unique Asset Allocation Order (AAO) denoting the clients preferred sequence of top up
- The groupings will have collateral accounts assigned to match underlying optimization preference to a unique AAO ladder
- Accounts within each group will be weighted to achieve a dynamic account sequencing score which will be used to top up efficiently in the client's preferred ordering
- A shortfall coverage process will run at the end of the top up to ensure any margin call is minimized
- The optimization will run on a scheduled or ad hoc basis intraday as required
- Reporting will be available to show success criteria and identify areas for further improvement
- The optimization strategy will also be provided in the simulation environment which will allow clients to introduce additional hypothetical assets or adjust exposure values (RQV) supporting the optimization of their whole collateral book across multiple collateral venues

The introduction of the new optimization strategy leverages a new code base leading to further improvement in end-to-end run times for even the most complex processes.

In addition to the introduction of our new proprietary algorithm, we continue to explore opportunities to expand the use of our target state (dealer-directed) functionality delivered in 2021. Many dealers already connect directly to J.P. Morgan Tri-party, transmitting multiple daily files with their preferred, proprietary collateral allocation. Recently we announced our connectivity to Pirum's Collateral Connect, facilitating a more streamlined workflow for our mutual clients.



J.P. Morgan provides the eligibility extract in a technical format and Pirum provides the rules translation in a normalized form, for the client inventory. This efficiently tests the client's asset universe for potential allocation opportunities (headroom) based on their optimization preferences. An API is also available to transmit the file either directly from the client front office system or via a vendor platform such as Pirum.

J.P. Morgan is in advanced discussions with other vendors providing optimization allocation outputs to be deployed into J.P. Morgan Tri-party, as well as in direct conversation with their clients to further expand the use of target state.

With the introduction of a new optimization strategy through the second quarter, the increased use of target state through link-ups with third-party software providers and a rewrite of the core algorithm planned for the second half of 2022, it continues to be an exciting time in the development of the global Collateral Central platform.

Key Benefits of New Optimizer

- Faster Run Times
- Customizable Collateral Ladders
- Dynamic Account Sequencing
- Reduced Collateral Fragmentation

Tokenized Collateral Network

PAUL PIRIE
Executive Director
Product Manager

ARTICLE TWO

With little fanfare but potentially significant long term impact, J.P. Morgan recently launched an entirely new product under its Trading Services umbrella. In the December Tri-party Circular we hinted that in 2022, we would deliver "some revolutionary products to the market" and not even halfway through the year, we introduce to you:

Tokenized Collateral Network (TCN)

This is a major milestone in our digital strategy and will be a central utility in creating a digital collateral hub for our clients and the market.

In January 2021, we revealed our Collateral Token Agent (CTA) functionality which enabled the tokenization of baskets of assets in tri-party, to facilitate the execution of trades on the J.P. Morgan DLT Repo platform. With the arrival of the TCN, J.P. Morgan's Trading Services business has the infrastructure to potentially tokenize any asset in any market, and transfer that "token" to any collateral receiver.

This is incredibly powerful, and it not only vastly increases potential mobility for traditional collateral securities, but it also opens the door for new asset types or markets to be utilized as collateral.

Although it is integrated, the TCN is not a new tri-party 'add-on', it operates independently of J.P. Morgan's Agency products and services.

What is the TCN?

- TCN is a utility for every actor in any collateral transaction, including Collateral Providers and Receivers, Collateral Agents, vendors (e.g. Acadia), and tri-party agents
- TCN improves all collateral flows – bi-lateral or tri-party, Inter or Intra entity, Variation or Initial Margin
- TCN leverages Smart Contracts to facilitate real-time collateral exchanges either as a pledge or title transfer. This model is supported by independent legal opinions, which confirm that right of ownership is not impacted by the DLT nature of the process
- TCN significantly reduces settlement risk from the market, leaving assets with the client's custodian and tokenizing them in location, before mobilizing as collateral on the blockchain
- TCN creates mobility in less liquid assets, allowing so called "trapped" assets to be financed, reducing the cost of carry and improving investment viability
- TCN allows collateral providers to create a single global pool of collateral which can be mobilized to any counterparty instantaneously, independent of market operating hours
- TCN enables the tokenized collateral to be delivered into standard collateral models such as tri-party, leveraging standard asset reference data

While the applications are potentially endless, the initial focus is on mobilizing the harder to finance assets as collateral and bringing these into the existing collateral flows.

First Trade on the TCN

In close collaboration with key clients and stakeholders, we have successfully tokenized CNAV Money Market Fund (MMF) shares, and executed a title transfer move of those shares between two TCN participants on blockchain. This is an industry first, and demonstrates the power of our Onyx blockchain platform and our team's ability to innovate on behalf of our clients.

MMF shares are an example of a low risk, highly liquid asset that is actually very cumbersome to mobilize as collateral. By tokenizing MMF shares, the TCN has tangibly increased the utility of MMF's for natural investors and provided an alternative to cash for collateral providers.

We are now working with a core group of market participants in Design Partner Groups, to prioritize the most valuable use cases for the TCN, allowing it to evolve and scale up incrementally in the coming months.

This is an exciting time, and if you are interested to know more about the TCN, or get involved in the next Design Partner Group please reach out to your J.P. Morgan representative.

Digital Collateral Hub

The TCN is at the core of our Digital Collateral Hub, but there is a lot more in this rapidly evolving area.

There are increasing numbers of fixed income securities being issued directly onto Blockchain, and J.P. Morgan Tri-party is working with issuers, primary market makers, crypto custodians and clients/holders to create a secondary market for use of natively digital bonds as collateral. Watch this space for another market first, as we continue to advance the future collateral ecosystem.

CREATE

- Convert multiple disparate pools of assets into a single global digital collateral pool
- Creation can occur through J.P. Morgan or external providers

MOBILIZE

Through a network of participants across internal and external platforms, the Digital Collateral Hub allows digital or tokenized assets to maneuver through both traditional and digital ecosystems.

UTILIZE

Connectivity to multiple Collateral consumers, such as bilateral counterparts, Tri-party Agents, DLT Repo, and Collateral Agents, will provide the utilization opportunities and create scale and infinite reuse.

Konnichiwa from Tokyo

Bringing Japan into focus: Rikako Uehara and Evelyn Yeung update us on the expansion of the J.P. Morgan Collateral Services Tokyo team and recent enhancements to Asset Servicing for JGB and Japanese Equities

RIKAKO UEHARA
Executive Director
Product Manager

EVELYN YEUNG
Associate
Client Service Manager

ARTICLE THREE

J.P. Morgan is proud of its history in Japan, since opening our first office in Tokyo in 1947. We began Securities Services operations in 1974 and global custody services began in early 1990, followed by our first Japanese tri-party trade in 2003.

The collateral balances of Japanese securities have grown significantly over time, now accounting for more than 30 percent of global balances supported by J.P. Morgan's Tri-party program. The servicing of Japanese securities has never been more important to J.P. Morgan. We have doubled the number of people in our Tokyo-based team over the past year to address this increasing demand. Our new team members come from diverse backgrounds and were added across a variety of functions including sales, onboarding and implementations. The new joiners complement our existing expertise in client service and product management. Fluent in the local language and proficient in the culture, the team interacts with our Japanese clients daily. They offer exceptional support and experience across the tri-party securities financing spectrum.

While the Tokyo team is core to our service offering, J.P. Morgan has also continued to invest in the development of our product capabilities. Most recently, J.P. Morgan enhanced the income processing for Japanese Government Bonds and Japanese equities in collaboration with our local custodian. The new process allows collateral providers to access same day cash income payments from securities. This benefits our clients by delivering cash with a minimum time lag, thus increasing cash reinvestment opportunities. This will become the standard process for all clients, and the new service will be available to all J.P. Morgan clients who are using Japanese securities in tri-party.

Asset Servicing has been extended locally to the APAC region, providing end-to-end service support across all corporate action related inquiries and assisting clients across the local time zone. Japanese clients will benefit from greater expertise in local markets including Hong Kong – China Stock Connect, Korea, Taiwan (and many others).

We have doubled the number of people in our Tokyo-based team over the past year

Lastly, but most importantly, clients can now access the full suite of J.P. Morgan services through our Japan franchise. We have dedicated Japan onshore product to support our clients who want to exchange collateral within the Japanese legal framework. In addition, clients can access any of our global or domestic products through Japan and enjoy synergies between local and international activities. All of these services are supported by J.P. Morgan's single global platform, Collateral Central. These activities are not limited to collateralizing securities lending activity, but also include those related to repo transactions, uncleared margin rules, and more.

There really hasn't been a better time for you to speak with a J.P. Morgan representative on how our expertise can support the expansion of your Japanese business. If you have not yet said konnichiwa to our Japanese offering, please get in touch with the team for more details!

皆様とお話できるのを楽しみにしております。(We look forward to discussing further with you).

Seated from the left:
Ryo Nakamura, Head of securities services Japan sales | **Rikako Uehara**, Head of collateral services Japan

Standing from the left:
Aya Yoshimatsu, Client service manager | **Evelyn Yeung** – Client service manager | **Yuhmi Nagasao** - Client onboarding and implementation manager | **Mari Nagaoka** – Tri-party customer account service officer | **Ryoji Kanazawa** – Tri-party sales Japan

Tri-party Program Analysis

KRISHAN CHOLERA
Associate
Product Manager

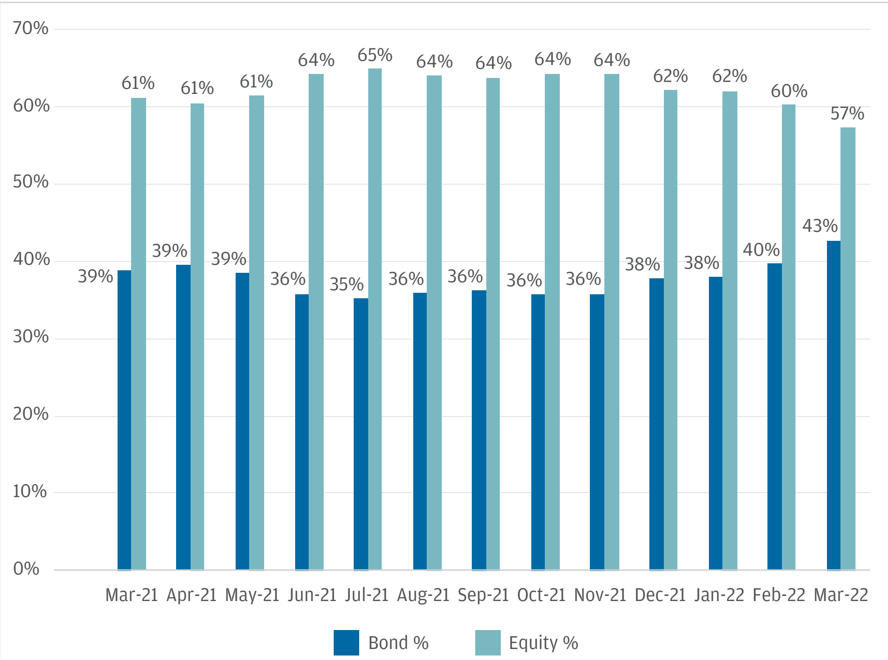
ARTICLE FOUR

J.P. Morgan's Tri-Party program participants are increasingly diverse in terms of client type, jurisdiction and underlying activity being collateralized. This article aims to provide color on the overall program and shines a spotlight on the increased fixed income collateral portion of the program.

Overall Program Growth

After several years of significant growth, the last year has had more stable overall balances but with a changing composition of program participants and collateral held. The equity-fixed income split is trending between 57 percent to 65 percent in favor of equities (see monthly breakdown in the chart). If we compare this to the 2020 average split of 55 percent, it demonstrates a return to the pre-pandemic picture with equities being the dominant asset class of the program.

Equities vs. Fixed Income - percentage breakdown by month.



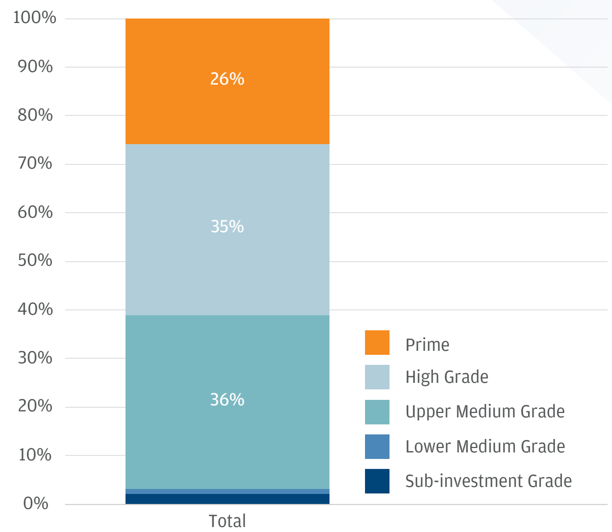
Source J.P. Morgan Tri-party

Fixed Income Highlights

J.P. Morgan Tri-party fixed income collateral has increased by 23 percent in the last two quarters and up 12 percent YTD. In this section we will explore the components of fixed income collateral and the specific areas of growth we have seen across the program.

Credit ratings are often utilized by lenders to set a floor on the quality of the bond collateral they are willing to accept. J.P. Morgan Tri-party supports both issue and issuer ratings-based eligibility tests. Of our rated debt securities, 97 percent of fixed income collateral in the J.P. Morgan Tri-party program is A-/A3 and above, of which 26 percent is Prime (AAA/Aaa) and 35 percent is High Grade (AA-/Aa3 and above). High credit quality bonds are utilized in Segregated Initial Margin to meet uncleared margin rules (UMR), in repo financing of Treasuries and in securities lending transactions to source hard-to-borrow equities or more liquid bonds.

Share of Rated Debt Securities



Source J.P. Morgan Tri-party

Global Diversification

Clients covering exposures with fixed income collateral used assets from multiple markets and in the last two quarters, the J.P. Morgan Tri-party collateral portfolio had 29 percent growth in Japanese Government Bonds (JGB) and 25 percent growth in Euro bonds compared with October 2021. Other core markets where fixed income collateral was posted include Canada, the United Kingdom and the United States.

ARTICLE FIVE

VICKI FULLING
Vice President
Product Manager

Repo Spotlight

Today tri-party supports many underlying trade activities but its origins hail from processing repo transactions. Aided by some recent enhancements, repo activity in the J.P. Morgan Tri-party program has grown by 52 percent over the past year.

As part of our strategic pillars of Collateral Efficiency and Asset Mobilization, we have been re-engineering the end-to-end process for repo within Collateral Central by adding new functionality and improving the user experience and process automation.

Complementing system to system communication, the Instruction Management screen within the Collateral Central Tri-party platform provides clients with the option to directly instruct repo transactions, and provides real time matching and collateralization updates. Clients have an aggregated view of inventory and obligations across counterparty relationships, legal entities, and underlying accounts. Instruction Management has also been a valuable contingency instruction method for our clients.

Workflow automation now extends from point of trade matching to cash release, connecting Collateral Central with treasury systems. Once the value of the cash balance matches the value of the open deals and eligible collateral is available in the longbox, the simultaneous exchange of cash and collateral is performed at the next allocation run, executing the agreed terms of the repo.

As an additional operational efficiency, J.P. Morgan Tri-party offers the ability to automatically net new and maturing repo transactions within the same collateral account (single account netting) or across collateral accounts and eligibility schedules within each repo seller/buyer relationship (cross account netting).

Other enhanced optionality includes Deal Level Attribution, which enables clients to instruct multiple repo shells to a single collateral schedule or the ability for a percentage of the repo principal to be collateralized to facilitate negative haircuts as we've seen in specific cases.

Additional developments to be released this year include the availability of real time repo cash balances directly in Collateral Central along with options to further automate the cash pay away process to achieve full straight through processing.

Together, the automation provided for repo and access to broad collateral criteria, that have been diversified for global markets, asset classes and counterparties provide flexibility to optimize your trading book through changing market conditions.

ARTICLE SIX

Did You Know?

PABLO WICHMANN
Associate
Collateral Operations

Since we rolled out the Collateral Eligibility System (CES), there have been many enhancements based on market and client feedback, Pablo Wichmann, from our Eligibility team in Buenos Aires shares some tips and features to consider when building the schedules in the CES.

Asset allocation order

The Asset Allocation Order (AAO) is used to dictate the order in which assets are prioritized to be used as collateral within the collateral provider's allocation and optimization settings.

The AAO is bespoke to each client and parameters can be configured with many variables to achieve an optimal outcome, Here are a few examples:

- Market capitalization. The AAO can support market capitalization parameters, which can be used to split indexes in different tranches (e.g. Russell 2000 assets below a $500mm market cap are prioritized in the AAO)
- Record date assets. Collateral providers can prioritize assets that are on record date for income and corporate actions on their AAO
- Special Purpose Acquisition Company (SPAC). SPAC assets are also listed on indexes such as the NASDAQ Composite. The AAO has the option to differentiate the assets from non-SPAC assets within the same index

Pricing structured bonds

CES supports different types of Structured Bonds such as various MBS and CMOs, which can be identified by checking the asset subclass in the positions screen on Collateral Central. However, many of them are priced using an evaluated pricing methodology from our pricing vendors. In order to get collateral value for these assets, the evaluated pricing flag should be set as eligible on the eligibility schedule.

Concentration limits

CES provides a huge amount of flexibility to support different types of limit calculations. Limits can be applied against eleven different data points. For example, issuer limits can be set at the company level and/or the parent level, limits for ADRs can apply to the underlying equity and industry sector limits can be applied at up to four levels of Global Industry Classification Standard (GICS).

Buyside Firms Tri-party Expansion

Buyside firm's came into scope for uncleared margin rules (UMR) in phase 5 for the first time in substantive numbers, with many more coming into scope during the final phase in September.

SAGAR PATEL
Executive Director
Product Manager

ARTICLE SEVEN

For most buyside firms, there's heavy reliance on a combination of custodians, collateral managers and FinTechs to provide an end-to-end service to support their initial margin framework. Many custodians and collateral agents, such as J.P. Morgan, have developed holistic solutions that cross business lines internally and with third party FinTechs. These solutions surround the tri-party operating model and include calculating initial margin, threshold monitoring and sourcing eligible collateral, to name a few.

These buyside institutions include pensions, hedge funds and insurance companies, of all sizes. Many are using a tri-party agent as a collateral provider for the first time. There is much more connectivity involved as a collateral provider than a simple collateral receiver. Although these firms acknowledge the benefits of tri-party, this historically hasn't been a priority to affect their models.

Over the years, J.P. Morgan has focused on expanding tri-party functionality to serve more of our clients' business by combining tri-party functionality with bilateral settlement models, adding on supplementary services and widening the types of collateral receivers on the platform.

Sourcing Eligible Collateral.

At J.P. Morgan, sourcing eligible collateral for our clients is an area where we're able to provide additional value on top of the tri-party service offering, by leveraging products across our Securities Services business. The solutions to source eligible collateral include reversing in securities via a repurchase agreement, collateral for collateral swaps and also transforming cash to money market funds – all of which can be mobilized in a tri-party program for initial margin. The main intent of these solutions is of course to source eligible collateral needed for initial margin but could also help optimize portfolios by maximizing the usage and the return of assets that are available in a client's portfolio.

> More buyside firms are exploring creative end-to-end solutions to support their initial margin requirements

Peer to Peer.

If more buyside firms use tri-party as collateral providers, could this help drive more peer-to-peer activity? Tri-party programs give participants a standardized and efficient operating model and a highly adopted counterparty legal framework. They are also versatile and able to support various transaction types. There are many considerations for peer-to-peer structures, where being operationally capable and having efficient models to interface with counterparties are key.

Tri-party's value proposition addresses those type of challenges as the collateral provider pools all their assets into a single location (aka the "longbox") and the tri-party agent manages the posting of collateral to and from counterparties using an algorithm. The parties use a shared set of features and operating workflows on the platform which replaces the need for any bespoke or cumbersome processes unique to specific transaction types or counterparties.

The benefits of peer-to-peer are well-known such as diversification of counterparties, increased distribution and reduction of volatility in balances at quarter/year ends. Tri-party can positively contribute to achieving these objectives.

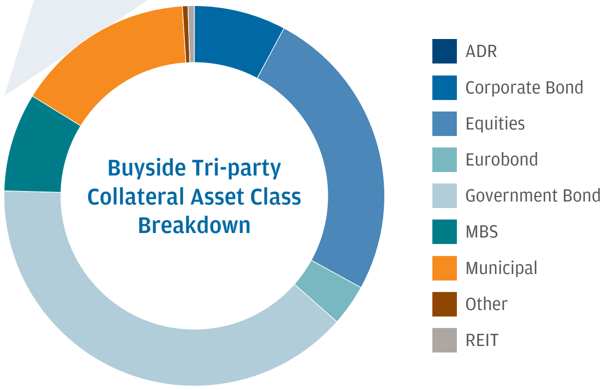
Holistic Collateral Management.

Separately, many buyside firms have been self-managing all collateral processes, including variation margin, where they don't use any collateral manager or tri-party agent. This was also the case for many of the firms in the earlier phases of UMR and the new requirement to post initial margin has been a catalyst for these firms to review their collateral models holistically. For example, many buyside firms are dipping their toes in outsourcing their initial margin processing with tri-party and are looking to use the same collateral manager to support their variation margin. There are various tools and functionality offered by collateral managers like J.P. Morgan and the market has realized this is a good opportunity to streamline and reduce operational risk by leveraging our scale and expertise versus managing in-house. By utilizing these services more holistically, the buyside firms can be relieved of the operational burden of managing day-to-day collateral processing and focus more on strategic initiatives.

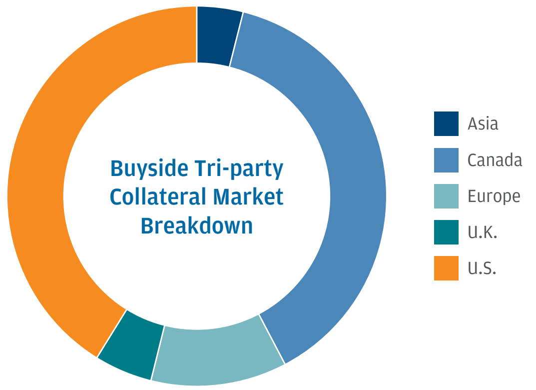
Steppingstone

More buyside firms are exploring creative end-to-end solutions to support their initial margin requirements. We see this as an opportunity for them to address other potential challenges using these services. Both the market and capabilities of the tri-party agents have evolved, making the tri-party connectivity for initial margin a steppingstone for other types of collateral management and securities financing activity. Currently the sell-side are the primary collateral providers on tri-party and have had a strong influence on new developments and tri-party platform roadmaps. As the makeup of the collateral provider market segments on tri-party continues to evolve and the buyside becomes more prominent in the market, they will naturally have a seat at the table.

The current activity of the buyside as collateral providers in the J.P. Morgan Tri-party program is quite diverse across asset classes, securities markets and transaction types.



Source J.P. Morgan Tri-party



Source J.P. Morgan Tri-party

Recent Product Enhancements

Collateral optimization, mobilization and global availability are core to recent and future releases on Collateral Central℠.

PHIL ROSS
Vice President
Product Development

Optimization Enhancements 1H 2022	
Description	J.P. Morgan Tri-Party designed and released a new optimization strategy, incorporating client feedback, to produce a full-book Optimization across all positions and accounts
Users	Collateral Providers
Benefits	▸ Optimal allocation across the portfolio ▸ Increased calculation efficiency resulting in improved performance and speed

CCP Expansion 1H 2022	
Description	J.P. Morgan Tri-Party went live with its CCP Exchange offering in 2021 and has expanded the current service to support CME European assets
Users	Collateral Providers
Benefits	Provides the ability to propose and settle Euroclear assets at CME

Recent Product Enhancements *(continued)*

Deal Processing Enhancements 1H 2022	
Description	Instruction Management System (IMS) provides clients with visibility of cash balances for repo transactions
Users	Collateral Providers and Receivers
Benefits	Gives clients a view into the cash balances and subsequent repo status of any in-flight deals

Collateral Eligibility Service 1H 2022	
Description	J.P. Morgan Tri-Party introduced the seven new TSE indices announced earlier this year, the MSCI World ESG Small Cap Index, as well as an additional 30 IHS Markit indices used for ETF's We also enhanced the export function to incorporate client feedback and provide a sign-off front sheet
Users	Collateral Providers and Receivers
Benefits	▸ Enhanced risk mitigation with support of additional indices ▸ Improved Client experience and usability with the export enhancements

Recent Product Enhancements *(continued)*

Enhance vendor interoperability with Pirum 1H 2022	
Description	J.P. Morgan Tri-Party has automated the transmission of data with Pirum to allow clients to tailor their optimization parameters
Users	Collateral Providers
Benefits	The connection with Pirum's Collateral Connect platform delivers a real-time, automated, and comprehensive collateral solution for clients to efficiently manage and optimize collateral, funding, and liquidity

CSDR Regulatory Enhancements 1H 2022	
Description	J.P. Morgan Tri-Party now provide reporting and penalty distribution to support the regulatory requirements that came into effect in February 2022
Users	Collateral Providers
Benefits	▸ Adherence to mandatory regulation ▸ Client visibility of penalties and associated trades

Looking Ahead – Future Releases

Algorithm Enhancements

- New core strategy bringing together allocation and recall into one process with self-service components to improve operational workflow for clients
- Enhanced simulation strategy to mirror the new optimization and core algorithms and provide increased variables for hypothesis
- Continue to improve algorithm performance and stability

Collateral Eligibility Service

- Delivery of workflow improvements to further automate eligibility rule changes enhancing collateral receiver exclusion capability
- Additional reference data points to be added to expand eligibility testing capabilities

CCP Margin Exchange

- Expansion of eligible collateral beyond Euroclear and U.S.
- Enhancements to the CCP Margin Exchange offering to mobilize collateral across additional CCP's

Repo Deal Processing

- Further automation of the cash movement of payments made externally to J.P. Morgan to complete the repo settlement process

Onboarding & Performance

- Re-platforming tools to enhance the speed, accuracy and flexibility of client and account onboarding, as well as enhancements to improve User Interface performance

Resiliency

- Completion of data center migration and move of allocation engine to AWS (Amazon Web Services) as part of modernization of tech infrastructure

We would welcome the chance to answer any questions or discuss the topics covered here with you in greater detail. Please contact your Client Service representative.

J.P. Morgan Tri-party Team

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