A holistic approach to collateral optimisation

The need for effective collateral management has never been more critical, especially with the learned lessons and feedback loop related to the last decade of regulations, says Wassel Dammak, head of collateral solutions strategy at VERMEG

The regulatory waves triggered following the 2008 financial crisis resulted in a growing need to pledge collateral assets. Posting collateral has an immediate impact on financial institutions' (FIs') liquidity and capital. The related costs and liquidity risks are amplified in periods of stressed market conditions, as seen in recent episodes like the 2022 issues related to the liability-driven investment (LDI) funds in the UK.

Regulations like the Uncleared Margin Rules (UMR) have expanded the spectrum of collateral asset types that can be pledged. This has been extended in many jurisdictions to assets like equities and money market funds. Digital assets are also making their way. This extension offers more flexibility and options to face

liquidity strains but introduces more complex eligibility schedules and rules when pledging collateral assets.

Spikes in margin calls have impacted trading margins and spreads. Front office desks and portfolio managers are under pressure to further scrutinise their cost of trading, including collateral assets and processing costs.

As a result, optimising collateral assets and processes has become a critical need shared by financial institutions' treasuries, operations, front office, and XVAs desks. Each of these departments has an interest in achieving further efficiencies when pledging collateral and being prepared to face counterparty and liquidity risks in times of market-wide stress.

Many questions might arise from this — is there a potential to optimise? What kind of optimisations are possible? How can these be achieved? Who should lead this effort in FIs and what governance should be put in place? What is the best approach, especially in environments where many trading desks operate in silos? What are the tools? And most importantly, how can the benefits be quantified to apprehend a return on investment (ROI)?

Which optimisation?

There are mainly three types of optimisations when trading derivatives and securities finance products: pre-trade optimisation, positions' optimisation, and post-trade optimisation. The first and the third concern the collateral to pledge. The second aims to reduce exposure when netting and compression mechanisms apply.

Pre-trade optimisation

Pre-trade optimisation calculates up-front, before trade execution, the potential initial margin to mobilise, bilaterally or to the central clearing houses (CCP) for centrally cleared trades. Tools to replicate calculation models or to connect to CCP and exchanges via APIs can help in this case to either calculate or retrieve the data in real-time and help the front office make the right decisions and choose the appropriate trading venues.

Positions' optimisation

Positions optimisations apply during the trade lifecycle by netting and compressing trade nominals to reduce large exposures against the same counterparties and related margin calls. Many utilities offer a trade compression service with both bilateral and trilateral models.

Post-trade optimisation

Post-trade optimisations apply when pledging collateral during margin call workflows (daily workload) or when reassessing the 'optimality' of collateral assets already pledged. It aims to reduce funding costs, identify the 'cheapest to deliver', and preserve inventories for

trading or liquidity purposes. We will focus on this third type of optimisation in the rest of this article.

A journey of pragmatism

Many people think that optimisation is about fancy algorithms and mathematical models but let me say that this is the easiest part of the process, as many models are available and open publicly. Appropriate ones to solve the optimisation challenges can be onboarded through APIs integration. Collateral optimisation is a journey that needs strong alignment within financial institutions, clear governance, and a certain transparency to centralise and clean underlying data.

Alignment

Historically, many banks have been running collateral optimisation in a siloed model for years. For example, treasury front officers provide the collateral team with a list of assets that can be delivered with potentially a ranking reflecting an internally calculated cost and constraints to preserve high-quality liquid assets. At the same time, trading desks might also ask to avoid pledging certain assets deemed needed to grow trading activities and bring revenues. Meanwhile, operations will try to deliver the cheapest assets based on their own parameters or other metrics provided by front office teams.

The first step to collateral optimisation is a strong alignment around the objectives and a will to centralise a common pool of assets that can be used to pledge collateral across multiple traded asset classes and business lines.

Governance

Collateral optimisation is a function that is central by nature as theoretically, the wider the scope is, the more effective the results are. However, we have seen that certain FIs spend years discussing governance and never progress on centralising that function. There needs to be a pragmatic starting point and a first push by the team seeing immediate benefits to lead the initiative across many stockholders. It should trigger the Target Operating Model thinking with a mindset

of putting in place the foundation that will allow in the future to extend the scope and onboard additional teams interested in optimising their collateral assets with their respective objectives, constraints and data (inventories, eligibility schedules, etc).

Data

One can think about the collateral optimisation function as a scheduled or on-demand service that receives inputs, runs the appropriate algorithms, and produces the most optimal collateral allocations. The quality of the data input will highly influence the optimisation results, regardless of the algorithm used. Data preparation is the most difficult part of any collateral optimisation project, as you need to gather and potentially maintain complex data in quasi-real-time. It can be categorised as follows:

Contractual: Eligibility schedules, concentration limits, haircuts, wrong-way risks, etc. It is important to deliver collateral that is fully compliant with these legal constraints that are not always available in digitised formats.

Operational: Each bank can define additional optimisation constraints to further lower the cost related to the collateral to substitute or pledge, typically reducing the number of bookings to minimise settlement costs.

Costs of the assets: This can be retrieved from (standard) market data, but it can also be calculated internally.

Ranking of the assets: Ranking can evolve from time to time. It is important to have the flexibility to constantly fine-tune the ranking according to market conditions and have proper governance around who owns updating such ranking rules.

Inventories of available asset pools that can be pledged: These will be received from many potential sources and need to be centralised. Streamlined integration is a must to easily load inventories in quasi-real-time or upon request.

Collateral demands: These can be originated by multiple activities like trading across asset classes, both centrally cleared and bilateral, central banks operations, etc. It is important to have a model that can extend in the future across all types of collateral requirements (initial margin, variation margin, etc).

Building the business case

Building the business case for a collateral optimisation function setup is one of the most difficult exercises. The benefits quantification is not straightforward and varies from one department to another and from firm to firm. Generally, the internal stakeholder that will benefit most from that function will make the first move to sponsor the project and coordinate with the other departments to move the business case through the different internal approval levels within the hierarchy.

The most quantifiable benefit is the one around collateral funding costs reduction. It aims to prove the efficiency gains that an optimisation function brings, through the comparison of actual collateral costs to the costs if they would have used sophisticated algorithms. This can be done periodically (daily, weekly, monthly, etc) to compare the actual funding costs of the pledged assets and the cost of available assets that could be delivered.

The second benefit is about regulatory compliance. FIs need to prove that they can keep a high level of automation and a proper management of liquidity risks in times of turmoil and stressed market conditions. Any optimisation function needs to provide capabilities to simulate scenarios and provide what-if analysis upon variation of the input parameters.

The third benefit is about operational risks and cost reduction. Optimisation brings automation, less manual work and errors, and allows staff to focus on controlling rather than operating the collateral pledges allocation.

Real-world example

This is a live example of the process that went through one of the most innovative banks globally. They had challenges mainly around the following topics:

- The bank was looking for a system to centralise its inventory and optimise asset allocations against

margin requirements.

- The front office treasury team was looking to minimise funding costs and make the best use of available inventory.
- The optimisation system must integrate seamlessly with existing treasury and collateral management systems.
- Flexible rules were needed to achieve different results (cost savings versus liquidity preservation).

The solution that was implemented was a standalone collateral management optimisation system, with a number of characteristics including full integration with the bank's internal upstream and downstream systems. It also had an enterprise-wide inventory management tool, front office access towhat were traditionally back-office processes, and automation and straight-through processing.

The results achieved could be quantified and were impressive in terms of the reduction in operations full-time equivalent (FTE) for collateral allocation; holistic management of assets across multiple business units and traded asset classes; and the ability to deal with increased call volumes due to regulatory change (like UMR). Furthermore, it achieved proven and quantifiable cost savings reported to senior management, and the empowerment of front office traders to make better business decisions.

Technological solutions and future trends

When it comes to solution choices, it is important to distinguish prototypes from real and proven solutions. It is also important to decide strategically on the model to put in place: buying optimisation as a service or owning the solution internally. In the latter case, multiple usages can be envisaged like what-if scenario modelling, optimising on-the-fly margin calls, or periodically running optimisation to check whether pledged assets are continuously optimal looking to the latest constraints.

New technologies like AI will certainly disrupt collateral management and optimisation functions with practical use cases that are already in production. AI assistants and agents that are specialised in those fields will take over

all the repeatable human tasks with a certain amount of decision-making and reasoning. For example, if a trades feed does not load for any technical reason, an AI agent can check the problem and retrigger the load. If the same feed was loaded but with the number of trades 10 per cent less than yesterday's, then the same agent can send emails asking to check the trades extraction from the source system, or even call an API to relaunch the extraction and check if there was any problem.

In no later than a couple of years, there will be AI agents specialised in collateral optimisation that will run all types of simulations and possibly find the most optimal combination of assets to deliver in a matter of seconds.

AI capabilities coupled with distributed ledger technology (DLT) allowing 24/7 settlements will lead to a model of real-time collateral management and settlement.

Conclusion

The financial industry is continuously evolving, driven by regulatory changes and market dynamics. The need for effective collateral management has never been more critical, especially with the learned lessons and the feedback loop related to the last decade of regulations. Financial institutions must adopt a holistic approach to collateral optimisation, integrating advanced technologies and fostering collaboration across departments.

By focusing on pre-trade, positions, and post-trade optimisations, institutions can enhance their operational efficiency, reduce costs, and manage liquidity more effectively. The journey towards optimal collateral management requires strong alignment within the organisation, clear governance structures, and a commitment to data quality and integration.

Technological advancements, such as artificial intelligence and blockchain, can streamline processes, improve transparency, and enable real-time decision-making, positioning institutions to better navigate future market stresses.