



Minimizing Collateral Damage:

The case for integrating collateral management into the risk group

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The use of collateral for OTC energy derivatives has increased dramatically. The increasing presence of banks and hedge funds in the energy trading sector, where collateral is commonly used to mitigate counterparty risk, has contributed to that growth.

Some of the benefits of establishing a collateralized relationship with a counterparty are the ability to facilitate more profitable business, a reduction in the cost of credit, as well as the possibility of freeing up trading lines and achieving savings in regulatory capital for regulated entities.

Collateral management for OTC derivatives is gradually moving from an ancillary back-office, often silo-based, function into the heart of integrated credit and liquidity risk management.

The importance of Collateral Management: Amaranth and MotherRock

To illustrate the importance of collateral management, we will briefly analyze Amaranth and MotherRock's liquidity problems.

Many hedge funds delegate collateral management to their clearing brokers and custodians. Even though setting up a collateral management infrastructure may be costly at first, the benefits many times outweigh the costs.

A dynamic simulation of their strategies complemented with a liquidity-based stress testing program could have shed light into the problems that they could be facing if markets were to turn against them.

In the case of Amaranth, another associated problem was the role of its Prime Broker, JP Morgan Chase & Co, in the liquidation of its energy derivatives book. Investment banks have set up highly profitable Prime Broking operations for hedge funds providing a wide range of services. In good times, it is a mutually beneficial relationship. It also another example of how a good business relationship can turn sour very quickly when conditions change.

JP Morgan Chase & Co was on the hook for any losses that Amaranth could face. In order to mitigate that risk, they held Amaranth's collateral and also had a final say on how the fund would be allowed to unwind its positions to get that collateral back.



After experiencing serious losses that prompted a liquidity crisis in early September, Amaranth originally started negotiating with Goldman Sachs and other parties to take the energy derivatives book off their hands. Within a few hours, Amaranth reached a preliminary agreement with Goldman Sachs that would substantially reduce the risk of their books in exchange of \$2 billion¹. However, without the consent of JP Morgan Chase & Co to release the cash on collateral, the deal could not go through as Amaranth did not have enough cash in their books and they had already liquidated many of their other positions.

Despite Amaranth's desperate requests, JP Morgan and Chase Co refused to release Amaranth's collateral on the basis that they believed that would still be bearing significant risk from Amaranth's positions if the deal went through. The Goldman Sachs deal ultimately did not go through, possibly because Goldman did not want to run the risk of being a subordinated lender to JP Morgan in bankruptcy court.

Amaranth kept bleeding and lost an additional \$800 million as their position became more vulnerable and transparent to other market participants. As the Wall Street Journal pointed out² "... the Amaranth case shows how Wall Street dealt with a fund after it had traded its way into a deep hole. Information the fund revealed about its holdings as it grasped for a lifeline let other commodity-market players, Wall Street firms included, exploit its positions. As they drove prices relentlessly against Amaranth, its losses swelled, and instead of facing a big but possibly survivable setback, it collapsed."

Two days later JP Morgan Chase & Co and Citadel took Amaranth's book at a significant larger cost for Amaranth. It is reported that JP Morgan made at least \$725 million in profits from quickly unwinding Amaranth's trades.

Should Collateral Management be integrated in the Risk Group?

There are many synergies that can be accomplished by having collateral managers working within the risk teams. A proactive, integrated collateral management function can give trading firms a competitive advantage. Risk management can help identify the right assets to use or receive for collateral given credit concentration and liquidity constraints as well as determine the risk-reward characteristics of re-usable assets. Risk management can also assist in negotiations related to the contract terms for the collateral agreements before entering into a collateralized relationship.

Other key benefits from integrating collateral management within the risk management team is the centralization of the responsibility for monitoring changes in the counterparty risk exposures, as well as the evaluation of the impact in the credit and liquidity risk profile of the firm counterparties approaching their rating triggers. Credit risk managers can work closely with the collateral managers to determine the counterparties that need changes in their collateral terms as market and credit conditions change.

¹ See Davis et al (2007) for an excellent description of the events in the last days of Amaranth's debacle.

² See Davis et al (2007)

Collateral agreements reduce, but do not fully eliminate, counterparty risks. For instance, for collateral agreements that have a weekly or monthly margin call frequency, market movements may result in a large exposure between the time of the last collateral exchange and the time when default is determined and the trades are closed out. Many collateral agreements also have minimum threshold below which no payments are made

In addition, the use of collateral transforms counterparty risk into operational, settlement, market, credit, and legal risks that need to be clearly understood and quantified. For example, the collateral received/posted can depreciate or appreciate in value during the close-out period introducing market risk. Having a well-defined process of establishing ‘haircuts’ for collateral can minimize the market-related risk of collateral held and posted.

Most large derivatives market players have a collateral risk policy in place. One of the items covered by the policy is usually the collateral management process, which comprises a series of steps where various groups within the trading firm must be involved (see Figure 1).

Table 1: Stages in the collateral management process

Stages in the collateral management process	Players involved
Make the decision to enter into a collateralized relationship	Credit Risk officer, business sponsor
Negotiate the terms of the collateral agreement	Collateral Manager, Credit Risk Officers, Business Sponsors, lawyers
Establish new agreement in collateral management system	Collateral Manager
Calculate collateral to be received or posted	Market Risk, Credit Risk, Collateral Manager
Make collateral call and agree delivery and return amounts	Collateral Manager
Settle collateral receipts and deliveries	Settlements
Update records to show changes in collateral balances	Collateral Manager
Reflect collateral holding in credit and liquidity risk management system	Collateral Manager, Credit Risk Officer
Collateral risk management	Collateral Manager, Risk Managers
Management reporting	Collateral Manager, Risk Managers

Source: Based on Davenport (2003)

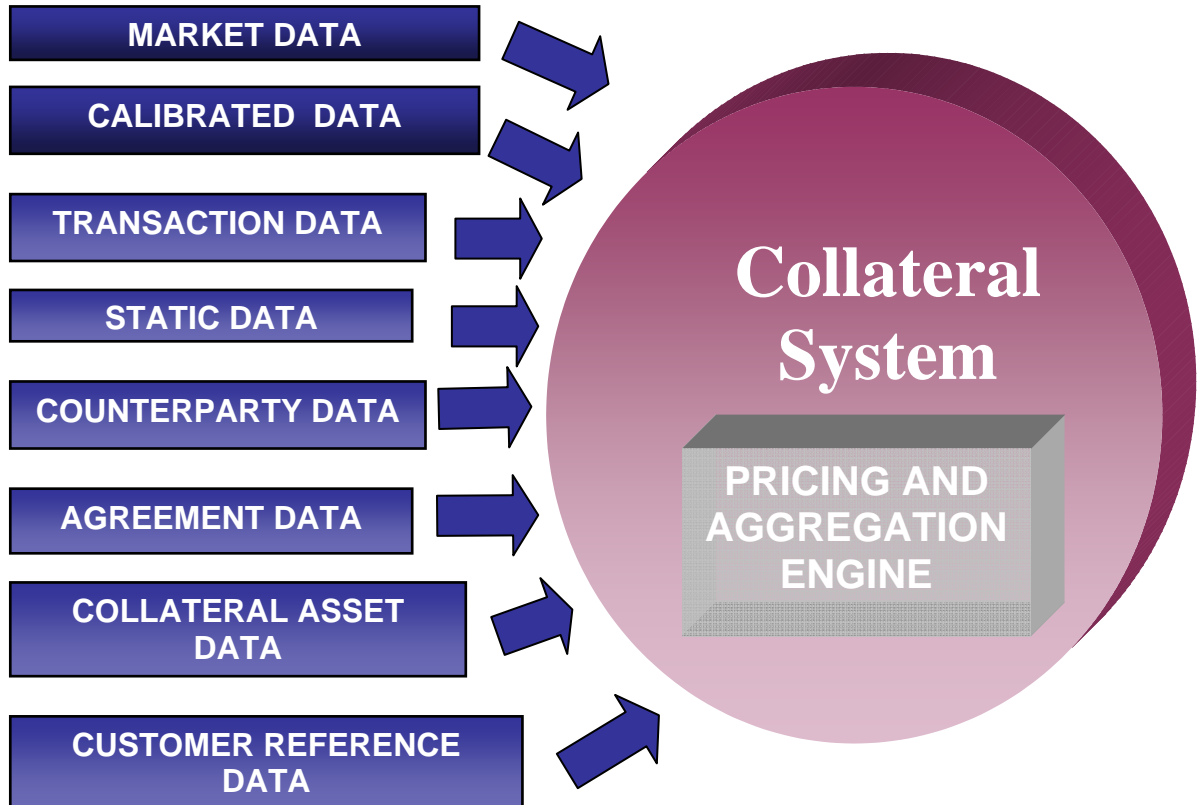
Collateral-at-Risk Calculations.

Another benefit of having the collateral management function within the risk group is the proactive management of potential funding liquidity problems.

If the risk group has a Potential Future Exposure (PFE) engine for counterparty risk analysis, adding collateral and netting terms in the simulation framework can provide early warning signals of potential problems. In fact, collateral should be taken into

account when performing potential future exposure calculations as PFEs are considerably lower than equivalent PFEs for non-collateralized exposures.

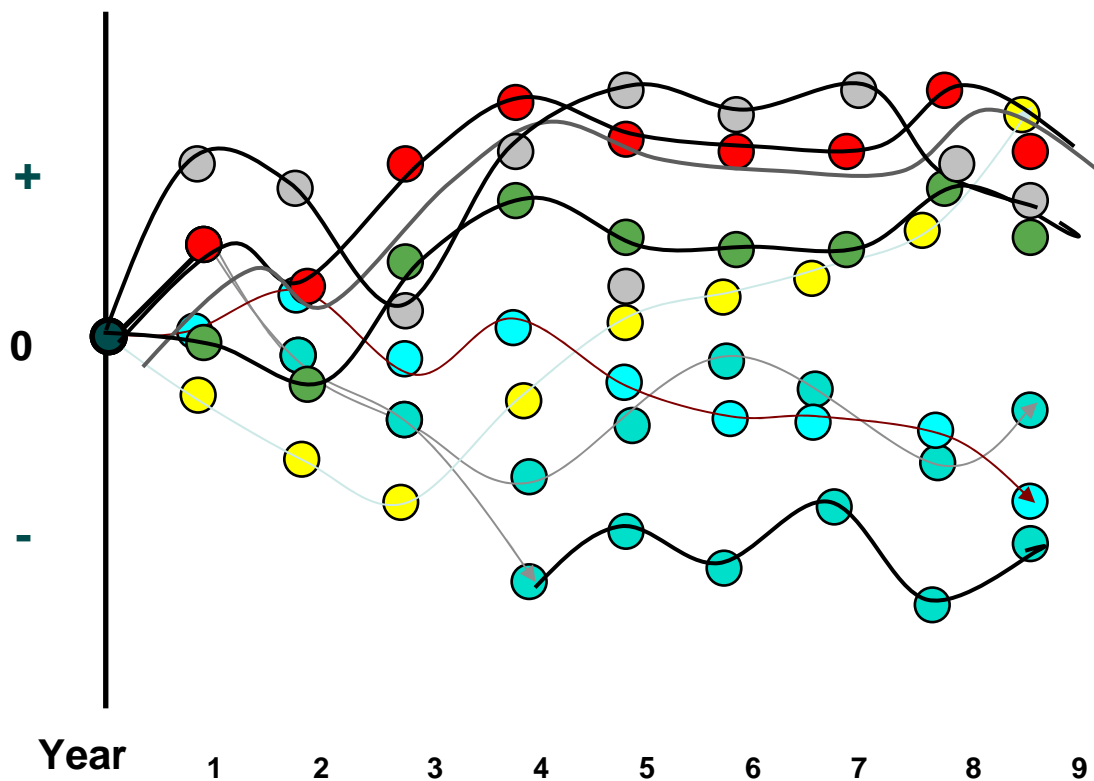
Figure 1. Inputs in the collateral system



Traditional collateral systems were designed to aggregate information and calculate collateral calls. Some of those systems are now integrating risk analysis within the collateral management framework. From a risk perspective, a key requirement of new collateral systems is the ability to perform dynamic risk calculations such as potential future exposure, and collateral or margin at risk.

A potential application is to analyze the impact in collateral/margining in a multi-step simulation where portfolio changes are a function of the strategy and the simulated market scenarios (see Figure 2).

Figure 2. Dynamic simulation incorporating trading strategies and tracking collateral posted-received at each time step



Source: Black Swan Risk Advisors

Some of the rules could involve change in the positions based on the balance in the margin account as well as the market risk of the positions vs. the VaR limits. For example, let's suppose that our risk policy states that we need to remain within VaR limits at all times, and if the margin account for the derivatives book falls below a pre-determined threshold, we must take some action to increase our cash position by liquidating certain instruments in our portfolio. The simulation framework could include certain rules that would indicate that in order to meet our risk policy constraints, we must either liquidate other parts of the portfolio to raise the cash to meet margin calls to X% above the threshold, or reduce the size of the positions. The rules for making such a choice depend upon the full portfolio and may be applied to each time step in each scenario.

Another benefit of integrating VaR and PFE within the collateral management framework is that the Credit Support Annex (CSA) may include clauses where margin and collateral is not just based on MtM fluctuations but also on VaR of PFE of OTC derivatives. In order to effectively negotiate the margining terms, a simulation-based tool can provide negotiators with an edge in terms of understanding the consequences of agreeing to certain clauses.



Conclusion

As collateral management gradually moves from being an ancillary back-office, silo-based passive function into the heart of integrated credit and liquidity risk management, risk managers will need to become familiar with collateral management practices to add value in the overall process. In this article, we have shown that proactive collateral management can provide tangible benefits for trading firms. Those firms that fail to develop the internal capability to manage their collateral in an integrated fashion will have to rely on clearing brokers and third parties to perform a critical component of their risk process. Even though delegating collateral management to a third party may appear cost-effective at first, not having a proactive collateral management process may turn into a deciding factor in times of crisis. Firm that made a decision to ‘outsource’ their collateral management process should be aware that they are ‘drinking at their own risk’.

References

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