CubeMatch

WHITE PAPER

# TRENDS IN COLLATERAL MANAGEMENT

**A CubeMatch Publication**
2007

# Foreword

Ted Allen, Principal Consultant with CubeMatch, discusses the main trends in the collateral market today, highlighting some of the innovative techniques now being used to add value to the collateral process and focuses on the opportunities available to extend the benefits of a collateral programme.

This paper is a discussion of the current trends in the market for the collateralisation of trading book activity. In particular we will look at the OTC derivatives, repo, securities lending and FX markets. As well as highlighting general market directions we will discuss the drivers behind these and some of the challenges facing the collateralising institution. We will discuss the different approaches demanded by the hedge funds contrasted with the more traditional approach of the sell side. We will also examine the issues with expanding the base of the collateral portfolio and the future market directions in terms of cross product / cross entity collateralisation and alternative approaches to the operational management of collateral through outsourcing arrangements and tri-party collateral management.

*Ted Allen*

**Ted Allen**
Principal Consultant



CubeMatch

## Table of Contents





## Growth in the Market

The annual ISDA Margin Survey has been undertaken since 1999. It has consistently proved a useful way for the collateral manager to benchmark what they are doing against the market. The use of collateral as a credit risk mitigant in the OTC derivatives market has grown consistently over the years of the survey. The average annualised growth since 1999 is 48% and we have illustrated this graphically in figure 1.

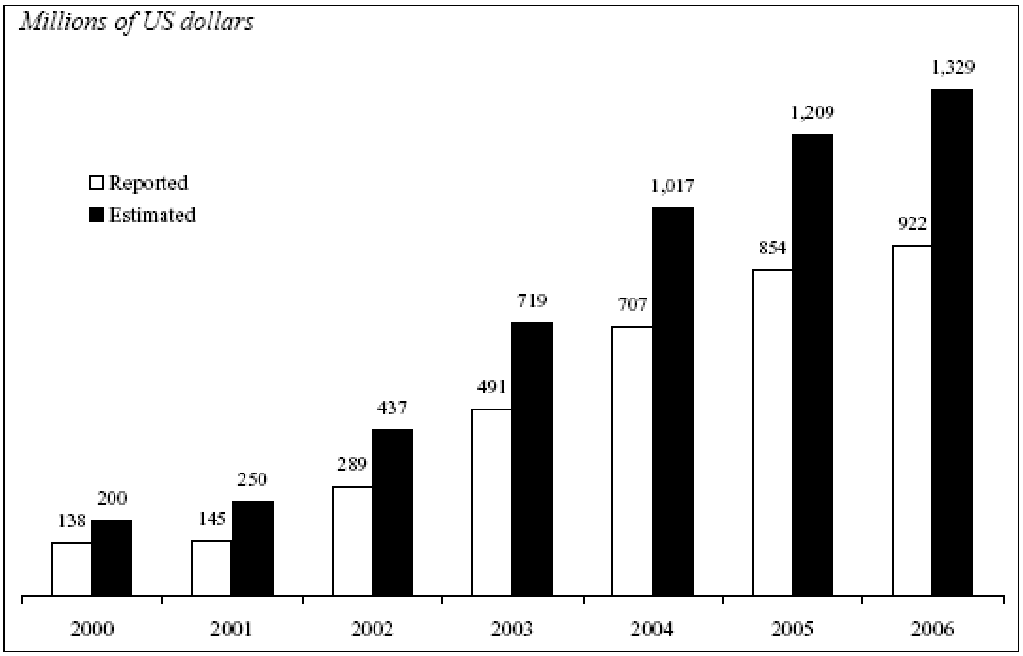


**Fig 1. Growth value of total reported and estimated collateral, 2000-2006**
Source: ISDA Margin Survey 2006

The European section of the International Capital Market Association (ICMA, previously ISMA) in its survey of December 8, 2004 confirmed the enormous size of the European Repo market by fixing the lower boundary of that market at EUR 5 trillion in terms of outstanding contracts. It also revealed strong year-on-year growth of about 22%. The previous growth rate was put at 32%.

Finally, the International Securities Lending Association (ISLA) estimates that ISLA members represented over EUR 5.99 trillion of available assets and had in excess of EUR 1.2 trillion of stock on loan in June 2004. It is evident from the three studies that collateral management has emerged as one of the most dynamic areas in the market. Other than the business and credit drivers, innovation and technology have helped play a role in providing the tools in assisting the growth of the market.

## Business Drivers for Collateral

So the question we can now pose is "What are the drivers fuelling this tremendous growth?" Intuitively, one would assume that the primary and overriding reason why any institution would wish to collateralise its counterparty credit exposure is to mitigate that risk by minimising the expected loss given the default of the counterparty. In the case of counterparty default, the institution holding the collateral has recourse to assets held to offset the losses it has realised from its counterparty's default.

Collateral does not reduce the likelihood of the counterparty defaulting, however it critically affects the recovery rate in the event of default. By doing so it removes the disparity in credit-worthiness of the two institutions and allows trading to continue where it may otherwise not be possible. By implementing a collateral agreement with a counterparty, the firm transfers the simple credit risk of the counterparty over which it has no control other than the setting of limits into a variety of other types of risk (operational risk, legal risk etc.) over which it has more control. This control can be achieved through operational rigour and policies which are clearly defined and adhered to.

Indeed the reduction of the counterparty credit risk is the main driver behind the growth of collateral use, however many institutions have also switched on to the other ancillary benefits of running a collateral programme. These benefits, whilst perhaps not immediately obvious when looking at the problem from a pure credit risk reduction perspective, can substantially improve a firm's economic performance. An effectively run collateral management programme should have a demonstrably positive impact on the overall profit generated by that business.

The key benefits of an effective collateral programme are:

- To reduce counterparty credit risk
- To reduce the amount of economic and regulatory capital required to support a business activity
- To free up trading lines with counterparties
- To gain access to more complex or higher risk trades
- To price trades competitively and to meet the growing demands for collateralisation from counterparties



## Collateral, Credit Risk and the effect on Capital

Economic capital is the capital that an institution puts aside to support its trading activity. It is designed as a buffer against any potential losses that may arise from this activity. The capital is there effectively because the firm expects to lose money due to the non-performance (i.e. default) of some of its counterparties. Holding collateral mitigates that counterparty credit risk and thus by running an effective and well targeted collateral programme, the firm may reduce the amount of capital it needs to set aside to support this business. The capital freed up in this manner can be used to allow the firm to conduct more business. Doing more business should by implication increase profits.

The return on capital can thus be dramatically improved and this should be an important factor in any firm's decision to implement or expand a collateral management programme. As we saw earlier, the probability of default is not affected by collateral; however the loss given default is reduced.



## Freeing Up Trading Lines

A firm may have a maximum appetite for the amount of exposure it is willing to take on a particular counterparty. Often tremendous effort and money is spent in the setting of these limits and their monitoring which must be done globally and across multiple business lines. Large banks typically spend millions of dollars each year on this activity. They will attempt to create global, cross-product limit management platforms with sophisticated credit risk modelling techniques. The limit structures they create must be multi-dimensional and backed up with effective monitoring and breach and excess management workflows.

They will try to combine this limit setting and (usually) overnight portfolio recalculations with near real-time pre-deal checks. Most banks would prefer that these are performed on accurate simulation-based measures of exposure rather than the more crude and often over-estimation of a mark-to-market plus add-on approach.

Each time a new deal is proposed, banks need to check its effect on each of the multiple credit limits that will be affected, (product, currency, counterparty, country etc.) to ensure that none of these will be broken by the new deal. The ideal is to perform this using a simulation based methodology (potential future exposure or expected positive exposure using Monte Carlo or similar techniques which may provide faster running approximations). This requires significant infrastructure capabilities in terms of storing the huge amounts of data and then providing the speed necessary to perform an incremental scenario based simulation of the effect of the proposed deal on the potential future exposure. Such a platform must store all the previous simulation results sets and identify the effect of the new deal on each of these. This being a pre-deal check, the results must be returned with a yes/no or maximum availability to the trader within a couple of seconds.

The goal of this approach is to ensure that the credit risk controls of the bank are not breached whilst at the same time removing all the possible constraints to the business. The credit risk in the portfolio is not necessarily being reduced, but it is being more accurately measured permitting the bank to trade close to its maximum desired limits. However, if you imagine how the costs involved in implementing such an architecture compare to the relative cost of implementing a collateral management programme, the difference between the relative returns on investment can be startling. Often banks that are undertaking this kind of infrastructure investment in credit risk monitoring, may actually be better served turning their attention to the expansion of the collateral programme for a simpler, more cost-effective means of reducing risk and expanding business.



## Trends in the Types of Collateral Used

The greater recognition given to non-cash assets within Basel II should mean that the trend to alternative forms of collateral asset would be increased. The newer entrants to the collateral markets which have fuelled the most growth in both the volumes of collateral agreements signed and in the amount of collateral in circulation, i.e. hedge funds and others on the buy-side, are not natural holders of cash and government securities as are the potential participants, i.e. banks. One would expect therefore that the proportions of cash and near cash equivalent securities would be diminishing on an accelerated basis as the banks adapt their working practices and policies to meet the needs of their buy-side clients.

However, as the ISDA survey results have attested over a number of years, the move away from cash and G7 government securities is not as marked as perhaps one would expect (see figure 2).

*By type, millions of US dollars*

| | | Collateral Received | Percent | Collateral Delivered | Percent |
|---|---|---|---|---|---|
| Cash | USD | 222,213,438,218 | 41.6 | 169,215,713,921 | 43.7 |
| | EUR | 147,250,162,235 | 27.6 | 120,981,854,259 | 31.2 |
| | GBP | 10,441,583,443 | 2.0 | 9,860,439,953 | 2.5 |
| | JPY | 5,278,707,188 | 1.0 | 2,901,426,603 | 0.7 |
| | Other | 4,586,738,751 | 0.9 | 2,230,860,952 | 0.6 |
| **Subtotal** | | **389,770,629,835** | **72.9** | **305,190,295,689** | **78.8** |
| Government Securities | United States | 24,362,840,177 | 4.6 | 33,719,606,850 | 8.7 |
| | European Union | 19,812,074,355 | 3.7 | 30,057,194,998 | 7.8 |
| | United Kingdom | 1,158,741,533 | 0.2 | 2,317,541,336 | 0.6 |
| | Japan | 11,014,496,525 | 2.1 | 2,719,212,624 | 0.7 |
| | Other | 6,820,469,743 | 1.3 | 2,831,970,624 | 0.7 |
| **Subtotal** | | **63,168,622,334** | **11.8** | **71,645,526,432** | **18.5** |
| Others | Govt. agency securities | 22,646,017,489 | 4.2 | 7,215,802,145 | 1.9 |
| | Supranational bonds | 2,146,183,423 | 0.4 | 6,042,221 | 0.0 |
| | Covered bonds | 113,326,961 | 0.0 | 244,531,917 | 0.1 |
| | Corporate bonds | 12,570,655,762 | 2.4 | 845,456,545 | 0.2 |
| | Letters of credit | 11,948,379,410 | 2.2 | 264,641,261 | 0.1 |
| | Equities | 22,439,968,737 | 4.2 | 84,741,754 | 0.0 |
| | Metals and commodities | 806,306,328 | 0.2 | 0 | 0.0 |
| | Other | 8,836,813,422 | 1.7 | 1,655,499,649 | 0.4 |
| **Subtotal** | | **81,507,651,531** | **15.3** | **10,316,715,492** | **2.7** |
| **Total collateral** | | **534,446,903,701** | | **387,152,537,613** | |
| **Grand total** | | | | **921,599,441,313** | |

**Fig 2. Value of Collateral Received and Delivered by Respondents**
Source: ISDA Margin Survey 2006.

Significant market opportunities must surely exist for those banks prepared to adapt their collateral policies to this new reality and expand their range of acceptable collateral (with appropriate regular reviews of haircut strategies, concentration limits and controls around collateral asset pricing and the avoidance of correlation risk).

This market intransigence is interesting when taken in tandem with the similar (lack of) pace of movement towards enterprise (i.e. cross-product) collateral management. Consolidated cross product collateral calculations, a single margin call per counterparty, a wider range of appropriately haircut acceptable assets coupled with advanced exposure methodologies, such as VaR based margining techniques will provide a compelling business advantage for a sell side organisation. This is not new, but the slow pace of development of the collateral market place is an interesting phenomenon.



## Cross Product Collateralisation

We will turn our attention now to cross-product collateralisation. Even though OTC derivatives, FX margining, repo and stock lending are separate product offerings, from a collateralisation standpoint there are obvious benefits in bringing them together. We would expect to see growth in cross product collateralisation as institutions seek to realise these benefits. There remain significant barriers to the production of a single cross product collateral or margin call, notably the absence of any proven standard documentation.

However while we are waiting for standards to emerge, we would expect to see the infrastructures being put in place to prepare for that possibility. There are considerable advantages to be gained from consolidation of all collateral or margining activity on to a single platform and to a single handling department. These relate to common standards and procedures across products and to the consolidated reporting of counterparties positions and exposures that will become possible. The benefits of such consolidation are essentially the same as in other areas of the bank such as credit risk management, settlements, reconciliations etc.

Returning to the discussion of servicing the buy-side, a single collateral point of contact for a client can be a significant advantage. The lack of a single point of contact for the entire portfolio across subsidiaries is often cited as a major frustration for the buy side who feel that there are limited benefits in using the same provider across businesses, if the benefits in terms of offsetting requirements cannot be realised.



## Collateral Management and Settlements

The natural extension of the discussions so far is that collateral or margin flows in the different business lines should not be seen in isolation either between themselves or with settlements areas. This is relevant on two levels.

The greater the scope for payment netting across multiple business lines, the greater the reduction in settlement risk. Similarly, the greater the scope for the netting of trade exposures into a single margin call, the greater the reduction in the settlement risk relating to margin movements.

Similarly, margin movements and deal settlements should not be seen in isolation. An effectively run collateral programme will have close controls and tight communication in place between collateral and settlements areas. For example the final cash flow on a maturing deal may have a significant effect on the credit exposure to be collateralised as that deal rolls off the portfolio. The right communication between credit, collateral management and settlements areas can avoid or at least pre-warn up-coming unsecured exposures and action can be taken to mitigate this.



## Trends in the use of Independent Amounts

A common topic of discussion within collateral management today is the move away from the use of static initial margins based on either specified amounts or some proportion of the nominal amounts of the trades. These can be crude measures that do not work well for either party.

From the point of view of the bank, each independent amount may have to be negotiated at deal inception with the involvement of the relationship manager, credit, collateral and legal departments which obviously has a high overhead. Also this amount may seem reasonable when the deal is traded but there is no guarantee that it will not understate the risk in the future as the market moves away from the levels where the deal was struck.

From the sell side perspective, use of these blunt instruments can be frustrating as they take no account of the effect of the deal from a portfolio point of view. A new trade may actually be credit risk reducing or risk neutral due to these portfolio effects; however the buyer is still penalised in the form of an additional independent or initial margin amount that must be posted.

There is a rather slow moving trend towards more dynamic Value at Risk (VaR) based calculations.  Organisations that can provide this capability are likely to gain a competitive edge in the market where hedge funds and lower graded counterparties look to reduce the amount of initial margin required.

There are of course downsides to this approach. Namely, that given the simulation nature of a VaR based approach, it may be more difficult to get agreement between the two parties on the appropriate results given that small differences in models, factors, number of draws (simulations run) and market data can have a significant impact on the end results and of course, actually achieving those results requires a sophisticated infrastructure.

The use of VaR will increase the need for good monitoring systems and clear dispute resolution processes for parties involved.



## Dispute Resolution

This discussion brings us on to the topic of dispute resolution and in particular the area of reconciliations. Portfolio disputes arise typically from a combination of two distinct causes:

- Differences in the measurement of the exposure. This may be on a single trade basis due to one party having incorrect terms captured or linked to a structural problem such as model differences for a particular trade type or the use of incorrect market data.

- Differences in the trade population. These differences mean that one party may have trades recorded against the collateral agreement that the other party does not. Again, this can be due to a booking error on a specific trade or a structural problem such as a missing data feed covering specific products or trading locations.

Identifying the cause of a dispute and then resolving the problems can result in a lot of pain and effort. Disputes lead to prolonged margin calls and significantly increase the number of resources required while also increasing the credit and operational risks to the organisation as the total exposure may not be collateralised. All of these increases cost as well as the risks and can negatively affect the level of service provided to a client.

Current complaints from hedge funds range from banks' inability to handle novations properly to poor reconciliation reports and incomplete data on exposure statements. On the flip side current complaints from banks range from poor information from hedge funds in reporting novations to poor quality data provided in reconciling portfolios. What is clear is that the requirements for reconciliations are becoming more important with the associated growth of the market. The ISDA Operations Committee Process Working Group (part of the ISDA Operations Committee) recently produced an introductory paper on the subject of Portfolio Reconciliation which attempts to propose standards for data exchange and reconciliation procedures. Similarly the Hedge Funds Data Standards Working Group ("HFDSWG") has published an extension to the FpML schema to describe the essential elements of a position record (see ISDA 2005 Guidelines section 7.2 for more details). However at the time of writing this report, there was no evidence available to show that a significant portion of the market has undertaken development efforts to meet these standards.

This section of the paper discusses the various approaches that a collateralising institution may adopt to implementing its collateral programme. We will look initially at the opportunities for outsourcing the process. We will consider tri-party collateral management and finally, where it is kept in-house we will look at some of the organisational aspects to be considered.



## Outsourcing Services

Outsourcing of back office activities has generally gained acceptance over the past few years, but what is its relevance for such a key credit risk mitigation task as collateral management? What does outsourcing mean for collateral management and can the potential cost savings compensate for the potential pitfalls?

We see several potential outsourcing areas within collateral management and we will outline two.

**Collateral Service Bureaux –** A small number of banks now provide a one-stop shop collateral management service. This service can have a number of levels and typically includes some or all of the collateral management activities which they undertake on behalf of the client. These are:

- Recording of Collateral Agreement terms and conditions
- Valuation of Collateral Assets
- Valuations of trade exposures
- Calculation of collateral movement requirements
- Delivery of collateral calls
- Processing of received collateral calls
- Issuing collateral movement instructions
- Selection of collateral assets for pledging including rehypothecation of received collateral positions
- Custody of surplus received collateral
- Calculation and payment/reception of interest in cash collateral
- Counterparty dispute resolution
- Trade portfolio reconciliations

A number of players in the market are offering this service to the market and so far the main users of these services are small and medium sized firms. There are many questions that need to be looked at before the outsourcing road is taken, including questions on core vs. non-core activities of an organisation, the potential for disclosing pricing and positional information to a competitor and cost/benefit. However given these caveats, the access to systems and expertise that may not be available internally can create a compelling argument. For custodian banks, this is a natural extension of existing client service offerings and for the buyers of such a service it can remove the potentially significant barriers to entry to the collateral market where the expertise and infrastructure necessary do not exist in-house.



**Outsourced Technology –** The second approach to outsourcing in the collateral management space is to keep the process in-house but outsource the technology and the infrastructure it runs on. A number of vendors now provide a software outsourcing service where they provide software, the IT infrastructure and IT operational services to a collateralising organisation. This can lower the infrastructure costs of collateral management services to the buyer whilst still providing them with the operational control of the day-to-day management of the collateral programme. It reflects the classic value chain model whereby the buyer performs operations relevant to its area of expertise, namely the operation of the collateral programme, whilst the vendor provides the non-core functions, namely the collateral management IT systems and the IT infrastructure including all the redundancy and guarantees around availability that are required in this sensitive environment.



## Tri-Party Collateral Management

Tri-party repo arrangements have been around for many years and are popular thanks to the advantages that such a structure inherently offers. That is the security offered by the tri-party agent, the efficiency in terms of settlements and the cost-effectiveness in terms of the reduced operational costs of moving securities between institutions.

We see many potential parallels in the derivatives collateral market. The length to which participants may outsource the arrangements to a tri-party agent may vary dependent on the relative sophistication of the organisation and of course of the tri-party agent. However, intuitively this would cover everything downstream of a trade being valued. The tri-party agent would hold the details of the agreement, would receive the trade portfolios from each party, would re-price the collateral and would then automatically adjust the collateral balances to reflect the current exposure. The tri-party agent would also be ideally placed to perform the reconciliation and dispute management process, being already in possession of the underlying data from both parties.

Such an arrangement would remove many of the inefficiencies inherent in the bilateral collateral process, such as disputes arising from collateral valuations and perhaps more pertinently, would remove a good deal of the operational risk of ensuring that calls are made in a timely manner, the collateral can be exchanged same day removing much of the lag and that in the event of a dispute, formal resolution processes would be followed rather than the more ad hoc approach that is largely prevalent today.

## Organisational Considerations

Collateral is an integral part of an organisation, with the need for relationships in multiple areas and departments for efficiency and accuracy. The key collateral management functions are calculating collateral and making calls, managing reconciliations and disputes, data management and providing reports to counterparties. Given the cross product nature of collateral management, the collateral managers often also have the most up-to-date position data and will frequently be the first port of call for exposure information in the event of a counterparty defaulting.

The determination of the organisational location of the collateral management function requires the identification of the key drivers for the implementation of the collateral programme. As we saw earlier, these include risk mitigation, economic and regulatory capital reduction and perhaps even access to counterparty valuations. However, generally the most important driver for is the management of counterparty credit risk. The other benefits are significant, but the collateral programme would not have been implemented to only realise these, therefore they must be considered as secondary.

Given this position, the location of the collateral function should be such that the greatest amount of benefit from the key driver can be extracted. A decision by a credit officer to permit trading with a counterparty only on condition that it is collateralised is a credit decision of sorts. It is however very different to a decision to grant a ten-year loan to another counterparty. In the collateralised case, the credit officer is essentially turning a single long term credit decision into a rolling series of short term (even day to day) credit decisions, each of which will be conditioned on the question of whether the collateral came in yesterday.

It is evident therefore, that collateral management is a function within the general discipline of credit risk management. Given this position, it is key that specialist collateral practitioners perform the implementation and monitoring of the collateral arrangements in close collaboration with credit risk decision makers.



Whatever the reporting line within the organisation, Collateral management is a discipline that requires a broad ranging skill-set. The credit aspect has been described, but the role also requires a degree of cross-fertilisation with important operational and control aspects as well as an understanding of the legal issues surrounding collateral. A weakly managed and weakly staffed collateral function could produce significant economic losses (and reputational damage) in the event of a counterparty default if the correct amount of collateral is not in place and enforceable. The identification of the staff to run the function is therefore of paramount importance.

The collateral management function goes well beyond the execution of margin calls and settlement of assets. There is a strong link between collateral management, client services and prime broker services.  There is also a strong traditional link between collateral management and credit. These need to be aligned directly or through cross-functional reporting.  There is some evidence in the market of a convergence between collateral management, credit risk management, client service functions and prime brokerage operations.  However there is also evidence that within organisations, collateral management is best managed as a separate entity within operations. Indeed the ISDA Surveys typically reveal a 60-40 split of the functional alignment of collateral groups between Operations and Credit.

As with most things, there is no one size fits all ad the optimum solution for an organisation will depend on factors such as organisational strategy, range of products/services, organisational culture and technology.



## Why CubeMatch?

CubeMatch is in the unique position of having a specialised Collateral Consultancy Practice that is independent from any software vendor. Our blend of experienced collateral practitioners, banking specialists and IT professionals means we can develop informed and impartial choices to help you maximise the benefit of your collateral programme.

**To receive more information or to view more from our series of Credit related White Papers and Case Studies, please contact any of the names below at our address, email or telephone number.**

| | |
|---|---|
| Peter Leech | Head of Consultancy Services |
| Ted Allen | Principal Consultant |
| Jenny Hadfield | Senior Consultant |

**European Office**
CubeMatch Ltd
Suite 16
Ensign House
Admirals Way
London E14 9XQ
United Kingdom

**telephone**
+44 (0)20 7536 6330

**email**
consulting@cubematch.com