



The Changing Risk Management Landscape in Derivatives

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Management Summary

Introduction

The credit crisis has forced remarkable changes in the financial industry, with the OTC derivatives market now facing immense scrutiny. Critics remark that the opaque nature of this market increases counterparty credit risk, thus contributing to systemic risk events.

It has been proposed that trades be cleared through central counterparties (CCPs), significantly reducing default risks. The exchange-traded model also offers liquidity and transparency. Thus, there is now an increased recognition of the benefits in moving away from the opaque and bilateral OTC trading methodology.

Key Findings

- **OTC Derivatives Regulation** – Regulatory bodies around the world increasingly favour a move towards cleared contracts. To this end, banks expect capital incentives and the expansion of regulation to more products.
- **Risk Management** – Even with overarching regulation, it is not yet clear whether risk management will need to adapt significantly. At the moment there has not been any significant change in risk management procedures at the banks interviewed by Lepus.
- **Benefits of Listed Markets** – The OTC market is recognised as being flexible, but exchange-traded contracts, coupled with clearing houses offer transparency, and reduced counterparty risk..
- **Concerns** – While the benefits of listed markets are many, banks stated that OTC markets provide the ability to trade complex, illiquid products with low barriers to entry for customers.

Conclusion

Following the demise of Lehman Brothers, counterparty credit risk has become a major concern. Thus, there are prudent reasons as well as regulatory pressures for banks to execute derivatives trades on exchanges or through CCPs. With gradually increasing innovation in exchange-traded products, the popularity of OTC markets may taper in the near to medium term future. However, regulators and market participants must interact continuously to deliver outcomes that are beneficial to the industry, instead of simply reducing its size.



The Changing Risk Management Landscape in Derivatives

Introduction

The financial services industry has changed irrevocably as a result of the credit crisis and many now agree with Warren Buffet's long held view, which depicts derivatives as "financial weapons of mass destruction".

While some market participants and critics cite the use of complex OTC derivatives and securitised products as the fundamental cause of the credit crisis, derivative instruments remain important risk management tools, tools that facilitate different hedging and investment strategies.

The regulatory spotlight is firmly on OTC Derivatives. It is contended that their lack of transparency and elevated counterparty credit risk increase the threat of systemic risk and thereby threaten the stability of financial markets. Hence, regulators and market participants alike have begun to view exchange-traded derivatives as a more prudent alternative.

Central counterparties, acting as intermediaries between market participants, have an extremely beneficial role to play in eliminating default risk and reducing the transaction costs that can be incurred in unwinding OTC trades.

There have been drastic changes in the structure of the exchange-traded options market over the past few years. Trading volumes on options exchanges have continued to rise as banks and investors seek the comfort of more transparent and liquid markets. New exchanges have come into being. There has been renewed interest in clearing house guarantees.

Through interviews with leading market participants, and wider secondary research, this report will look at the changing risk management landscape in derivatives in the wake of the credit crisis. Further to this it will seek to identify the key benefits that are driving the trend away from OTC derivatives and towards exchange-traded, clearing house guaranteed alternatives. The analysis is broken down into the following sections:

- **Regulatory Changes**
- **OTC vs. Exchange Trading**
- **Risk Management**
- **Benefits of an Exchange-Traded and Clearing House Guaranteed Model**



Regulatory Changes

Financial markets are anticipating the overhaul of regulation and a new hard-line enforcement attitude from regulators. The days of soft touch regulation seem to be over. At this stage it is unclear how prescriptive regulators will choose to be.

Regulators in the US, UK and continental Europe are trying to drive OTC derivatives towards a cleared environment. If successful, regulators will be able to monitor the multi-trillion dollar OTC derivative markets with greater clarity, with the aim of preventing similar systemic threats to the industry as those seen at the height of the credit crisis with the failures of Lehman Brothers and Bear Stearns. Undisclosed bilateral agreements common in the over-the-counter market will be replaced with more transparent contracts guaranteed by a clearing house and, possibly, traded on exchanges.

There are a number of issues with OTC derivatives trading that are fuelling the regulatory preference for the exchange-traded or clearing house guaranteed model. These include the following:

- **Private Negotiation of Transactions** – With OTC trading the market is less transparent, with no guarantees to ensure that a trade has been done at the ‘best’ price.
- **Lack of counterparty insurance** – Just as an OTC trade is undisclosed, the contract between the two parties is also private. When one of the parties fails to deliver on their obligation, the other is left holding a contract that will not be fulfilled, requiring the counterparty to go to law to achieve compensation, a potentially expensive course of action with no guarantee of success.
- **Systemic Risk** – The failure of a major firm with a large OTC derivative portfolio can have a huge impact on the financial services sector as a whole. As an example, when Bear Stearns was in distress, the US Federal Reserve had no option but to intervene, and brokered the purchase of the bank by J.P. Morgan. This was necessary to prevent and mitigate a potential ripple effect, the severity of which was difficult to determine due to the less transparent nature of OTC trading.

To prevent similar events happening again in the future, global regulators have focused much attention on ensuring greater transparency. In early 2009 global leaders of the G20 concurred that there needs to be a coordinated global approach to regulating OTC derivatives trading.

The US has kicked off proceedings addressing OTC derivatives reform with the Obama Administration proposing ‘The Over-The-Counter Derivatives Market Act of 2009’. The proposed bill calls for derivatives to be cleared through a derivatives clearing organisation regulated by the CFTC or a clearing agency regulated by the SEC. Furthermore the bill requires regulators to impose higher capital and margin requirements on non-cleared OTC derivatives.

In December 2009, the Financial Services Authority in the UK, where 43% of OTC derivatives market activity is currently located, disclosed the measures they had



formulated to reform OTC derivatives trading. Similar to proposals made in the US, these proposals sought to address counterparty risk issues and the lack of transparency in OTC derivatives markets. The paper stated that capital charges for banks and investors should 'reflect appropriately the risks posed to financial systems. These should be higher for non-centrally cleared trades'. The key points made by the 'Reforming OTC Derivative Markets: A UK Perspective Paper' were:

- Greater standardisation of derivative contracts.
- Higher capital charges for non-centrally-cleared trades.
- The registration of all derivative trades in trade repositories.
- International agreement on which products should be clearing-eligible.

Maintaining the industry's focus on the subject, the Basel Committee on Banking Supervision released a proposal to strengthen global capital and liquidity regulations, highlighting measures to encourage a movement to central clearing and exchanges. The Committee proposed the strengthening of capital requirements for counterparty credit risk exposures arising from derivatives and other securitization methods. The consultative proposals stated that 'The strengthened counterparty capital requirements will also increase incentives to move OTC derivative exposures to central counterparties and exchanges'.

Predictably, the banks interviewed by Lepus stated that complying with regulatory demands is always a focus. As a direct result, banks are likely to prioritise compliance with the impending new regulatory framework for OTC derivatives. As with any new regulatory initiative, compliance will be resource intensive and time consuming, although probably less expensive than the consequences of another credit crunch.

The banks that Lepus spoke to had widely comparable views on how OTC derivatives regulation will change in the near future.

The representative at one of the continental European banks that Lepus spoke to expected to see capital incentives to move transactions to central counterparties. In addition, the source also anticipated a large capital increase for OTC products that are not transferred to a central clearing model. It was anticipated that this increase will come in the form of a large increase in trading book market risk capital.

In a similar vein, the respondent from another European bank said that the main discussion points at the moment were future regulatory developments and the interaction between ISDA and the clearing houses. The source added that there should be a lot of discussion with ISDA in order to communicate any issues and ascertain potential future developments.

Expanding on this theme, the banker stated that there has also been a lot of discussion about OTC markets, given that regulators are keen to see a transition towards an exchange-traded and CCP guaranteed environment, although he believed that there will always be a place for OTC markets as they can more easily handle a greater level of contract customisation.

The source at a UK bank indicated that it is hard to be over-specific on the regulatory changes that are likely to occur. The US Federal Reserve is showing greater involvement



and interest in derivatives markets and this heightened attention is only likely to increase. The source also felt that there will be greater regulation over the next 18 months, covering more products.

Impact on the Business

Changing regulatory standards are likely to have a profound impact on the way derivative businesses operate.

Some commentators have observed that moving OTC derivatives to an exchange and CCP framework would result in a number of corporate participants incurring margin costs (i.e. the good faith deposit levied by clearing houses). According to secondary research, several such companies have already argued against such reforms, expressing the desire to be exempt from central clearing as the associated margin requirements would be too costly. A source at a European bank stated that any additional costs stemming from regulatory changes would be passed on to the end user, potentially reducing the motivation to use derivative products for risk management purposes.

This view on possible exemption from new regulations is not reciprocated by Gary Gensler, chairman of the US Commodity Futures Trading Commission. He expressed doubts about who the true recipients of such exemptions would be. "It is the Wall Street banks that benefit from the so-called end-user exemption from transparency, not the businesses that use derivatives".

Research also shows that the cost implications of a potential transition to a cleared environment are currently being assessed. Interestingly, the dealer community tends to focus on margin costs, but similar studies conducted by exchanges contend that the enhanced price discovery and price competition in listed markets would likely more than offset the additional cost of lodging margin.

The source at another European bank also urged regulators to take care not to discriminate against certain types of firms, and that there should be a level playing field for all. This respondent saw regulation as designed to create a safer trading environment. Changes in regulation should therefore be seen as positives.

The source also stated that there should be a consistent global approach to regulation in order to prevent banks taking advantage of disparities between different locations, so-called 'regulatory arbitrage'.

The source at a UK bank expected to see changes to the business as a result of regulators pushing for OTC derivatives to be traded in a regulated forum, with an impact on the ability to onboard products to meet regulatory needs. Difficulties are likely to arise around on-boarding products to the exchange-traded 'silo'.

These responses suggest that if regulation proceeds carefully then it can be done in a way which has little negative impact on the business and the markets, although the initial regulatory proposals suggest that profound changes are to be expected.



Adapting Risk Management

Changes to the way that the OTC derivative market works would also cause changes in risk management techniques and methodologies, although the representatives Lepus interviewed on this theme do not entirely share this opinion.

A participant at a European bank provided an interesting insight, contending that risk management has always been on a par or even ahead of regulatory changes and proposals. The respondent felt that risk management will continue to adapt to the environment and to some extent lead and assist regulatory changes, given the depth of risk management knowledge in banks. For example, economic capital introduced in Basel I and PD/LGD in Basel II were already being used in risk departments before any regulatory changes were introduced.

This sentiment of modest change thus far, is shared by the interviewee from a UK bank who felt that there had so far been little significant modification to risk management as a consequence of regulatory change. The interviewee further believed that there had been little action to take advantage of reduced counterparty risk by trading via central counterparties.

Expanding on this theme, the respondent from a European bank felt that less time was being spent looking at the build up of risks in the portfolio, with risk management departments increasingly focused on IT systems in order to accommodate and comply with regulatory changes.

Interestingly then, it seems that regulatory initiatives focusing on OTC derivatives have not yet significantly impacted risk management practices and processes, with two of the three participants contending that little change has occurred to date, although a greater focus on calibrating IT systems with risk management requirements is anticipated. However, it is important that banks take a more proactive approach and reassess the current risk practices in order to accommodate the changes that are looming on the horizon. Working together with the regulators around the world will allow firms to be more adequately prepared for the imminent overhaul of OTC markets.

Regulators on both sides of the Atlantic are talking tough. Keeping up with current developments as they occur will allow firms to be better prepared for future implementation.

Ultimately, instead of challenging or doubting the usefulness of impending changes, banks will need to work in partnership with the regulators in order to minimise disruption to the markets and their different businesses.

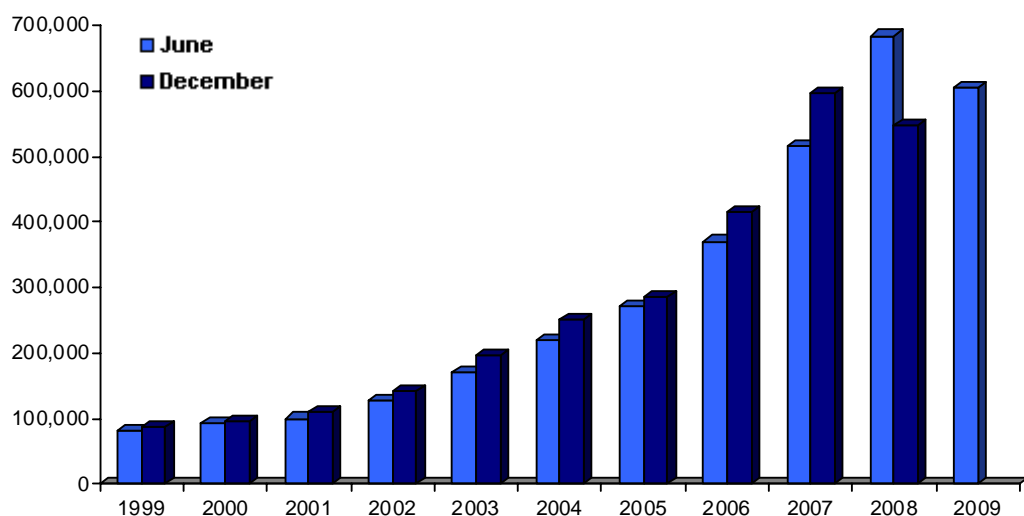


OTC vs. Exchange-Traded Derivatives

The current OTC derivatives infrastructure is not seen to be conducive to longer term stability, and some form of central clearing and regulation for credit default swaps and other OTC instruments seems almost certain. The structure of the OTC market is complex and generally opaque – making it harder to monitor and regulate. It is therefore looked at critically by regulators, who favour more transparent and centralised market mechanisms.

The OTC market has evolved and grown significantly. According to the Bank for International Settlements (BIS), the total outstanding notional amount increased considerably to total almost \$684 trillion by June 2008 (see bar chart). However, by the end of 2008, the volume had contracted by almost 20%, before rising again in June 2009. (No data was available for December 2009).

Figure 1: OTC Trading – Notional Amounts Outstanding (Billion US\$)



Source data: [BIS](#)

In pursuit of greater transparency, regulators are keen to transform the structure of OTC markets to make them more manageable and controllable.

This is most likely to occur via an introduction of central counterparties that will be responsible for clearing. Regulators are keen to migrate OTC markets to an exchange and CCP structure. Naturally, there are a lot of interested parties and numerous stakeholders that are involved. As a direct result, some market practitioners are resisting the proposals, arguing that the OTC markets will be stifled and that this may create new issues and problems. However, instead of challenging future developments, the industry will need to collaborate in order to ensure that a mutually beneficial solution is developed.



Regulatory amendments should permit financial innovation to continue and not impede growth, while at the same time seeking to increase transparency and minimise the associated risks.

Key Differences between Listed and OTC Markets

The most obvious difference is the fragmented nature of OTC markets, with largely unregulated interaction between buyers and sellers. Industry sources cited a number of other differences including:

- **Flexibility** – The source from one of the continental European banks added that decentralisation allows greater flexibility in terms of the trade. This, in turn, leads to high customisability and the ability to easily introduce non-standard products.
- **Counterparty Credit Risk** – Exchanges serve as a marketplace for the buyer and the seller. The associated clearing house sits between the two sides of the trade. Another European bank specified reduced counterparty risk on exchanges as a key difference to the OTC market.
- **Risk Management** – With counterparty risk greatly decreased, the onus of risk management on the bank is markedly reduced. The source at one of the European banks felt that there is much more robust risk management on exchanges in general. This reduces the need for banks to formulate complex and expensive to deliver in-house models for managing counterparty risk.

Overall, exchanges offer better risk management and transparency, albeit with reduced flexibility.

Challenges in Executing OTC Trades

Research suggests that regulatory pressure, as previously outlined, could lead to OTC trades becoming harder to execute in comparison to trades conducted on an exchange.

One of the European banks noted that the bank will seek to utilise a central clearing house and/or exchange where possible, implying that it is becoming more beneficial to trade in this fashion.

The source at another European bank provided an interesting insight, stating that the difficulty in executing OTC trades depends on the liquidity of the associated instruments. For instance, structured products are harder to trade on exchanges as they are not as liquid. However, more liquid instruments, such as calls, puts and vanilla equity derivatives should pose no problem. The interviewee reiterated that OTC markets still offer better execution of illiquid products.

According to a UK bank, while the OTC environment has changed, OTC trades have not necessarily become more difficult to execute in comparison to trades executed on an exchange.

Some recent regulatory proposals suggest that more standardised trades should be migrated to regulated exchanges and more transparent electronic trade execution systems. Moving more standardised OTC derivatives contracts onto exchanges and clearing them through a central counterparty has been one of the main regulatory



proposals – although one of the issues will then be trying to determine what contracts qualify as ‘standardised’.

The banks that Lepus consulted for the purposes of this research agree that although OTC trades have not necessarily become more difficult to execute, they have become more expensive and less capital efficient.

The source at a European bank anticipated that execution of OTC derivative trades will become more expensive and less capital efficient in the future, given the regulatory focus and scrutiny of the OTC landscape. The increasing expense and diminishing capital efficiency will both drive business towards a more standardised and controlled environment.

Another respondent was unsure whether execution of OTC derivative trades would become more expensive, although the source also noted that execution has already become less capital efficient.

The representative at a UK bank commented that it is difficult to say whether executing OTC derivatives trades has become more expensive or less capital efficient given that there are no readily available statistics. However, it is safe to assume that the cost of business will increase in the future, with banks almost certainly required to hold additional capital, the cost of which is likely to get priced into products and passed on to clients. Complying with the numerous requirements posed by the different regulatory entities and agencies will be a considerable task. Banks will need to ensure that reporting is timely, accurate and in line with regulatory expectations.

Activity in less transparent and more risk-prone markets is likely to be discouraged by higher charges and capital add-ons. As regulators continue the drive to reduce counterparty risk in OTC markets, more rigorous capital requirements will be one of the primary means by which such reform will be executed.

Anecdotal evidence already points to a narrowing of the cost gap between OTC and listed US equity options. This may subsequently induce greater reliance on more standardised markets and mechanisms.

However, one bank representative asserted that the proportion of options traded on exchanges has not increased in isolation and volumes across listed markets have increased in general. The number of trades executed through exchanges (although not the underlying value) was considered to be considerably higher overall.

Other banks that Lepus spoke to did not offer a great level of detail on the proportion of options traded through exchanges.

In order to conclude this section of the research report, Lepus sought to examine if more OTC business was being done on a margined basis or not.

A source at one of the European banks stressed that there are incentives to move and conduct more of the OTC business on a margined basis where possible, however it was noted that this has long been the case. While banks do conduct some of the business on a margined basis, there has not been any material increase.

One of the European banks stated that OTC business is generally done on a collateralised basis. The source explained that hedge funds always operate on a



marginated basis although big banks tend not to do so to the same extent. For the bank, more focus is placed on counterparties and what is specified in the ISDA agreement and if there is a Credit Support Annex (CSA) in place or not. However, if for example bonds get downgraded, there are contract terms that allow margin payments to come into play.

According to the source at the UK bank, slightly more OTC business is being done on a marginated basis.

Listed Markets and Innovation

Research suggests that the range of products traded on exchanges is expanding. Still, in the opinion of the interviewed banks, flexibility and non-standardisation are major advantages offered by OTC over listed markets. However, as preference for the benefits offered by listed markets becomes more widespread, it is possible that reduced liquidity and trading volumes of more complex OTC instruments may gradually drive OTC spreads and transaction costs higher.

Thus, in future, it may be more prudent to have such products listed on exchanges, which could help address the issue of flexibility as well. If greater innovation is also being observed in listed markets, it is quite likely that the markets may become more flexible.

At the time of interview, one European bank did feel that such innovation was currently being experienced, albeit to a limited extent. The source remarked that the range of products has increased, but flexibility is still not a key attribute. The move of credit default swaps to a listed trading environment was cited as an exception to this.

The UK based bank also concurred with this assessment. The source stated that over the last two years, greater innovation has been apparent in listed markets. Although it has not been enormous, it is indicative of potential developments and direction in the markets. In terms of proportion, there remains a comparatively larger quantity of vanilla products as opposed to more complex instruments.

Concerns

While the benefits of trading derivatives on exchanges are numerous, market participants have some reservations. Among the more notable is the liquidity of bespoke and complex products as these offerings may not be suitable for exchanges, where trading is dominated by more standardised instruments.

Another concern raised by one continental European bank is the ease of access for a variety of customers. Due to margin requirements for eligibility to trade, several clients face significant barriers to entry into listed trading and may not be able to hedge their risks effectively. Anecdotal evidence from brokers of exchange-traded products, on the other hand, cite line limits and lack of transparency as considerations operating against customers in the OTC market.

In the opinion of another continental European bank, even if the preference for listed products rises in future, OTC markets are likely to thrive through the provision of illiquid and flexible products,

For the UK bank, interoperability and consistency were notable issues. If different exchanges converge towards greater consistency and similar operational processes,



listed products may attract further interest. The source was of the opinion that while uniformity is expected for, say, multilateral trading facilities (MTFs) in equities, this was not true for CCPs as different countries remain defensive about relinquishing control over their respective exchanges and their clearing houses.



Risk Management

In the wake of the credit crunch, counterparty defaults have occurred on an unprecedented scale. One corollary of this situation is the attractiveness of exchange-traded and clearing house guaranteed transactions, due to the reduction in counterparty risk. How important is this concern and how have European banks responded to it?

One of the European banks interviewed felt that after the demise of some of the most prominent firms on Wall Street, counterparty credit risk was now a key concern and priority. As a consequence, the preference for exchange-traded derivatives has risen at the bank. Previously, all products had been traded bilaterally between banks, with collateral agreements in place. Due to this trend, the respondent continued, risk weightings in general, including systematic risk, now favour exchanges, with a zero percent risk weight, resulting in no capital charges. While counterparty risk has fallen, this has not yet been experienced a dramatic decline. As a result, the nature of risk faced by the bank has not yet changed substantially.

Similarly, the representative of one of the European banks stated that counterparty credit risk had now become a critical area of concern. In fact, the bank now had counterparty-centric risk models – however whether this means that the risk is actually being managed more effectively is not clear. What this has not necessarily produced is a push towards exchange-traded derivatives, although regulators may seek to change this in the near future. If banks are margined and collateralised properly, then OTC counterparty risk will be reduced.

On the other hand, a participant from a UK bank stated that it may be convenient to say that the importance of counterparty risk has increased, although this may not necessarily be the case in practice. However, it is certainly true that banks are striving to reduce counterparty risk and manage it more effectively. The UK bank has also experienced higher demand from clients to move towards exchange-traded derivatives.

Managing Counterparty Credit Risk

It has been repeatedly noted in this study that the foremost benefit of exchange-traded derivatives is the dramatic reduction of counterparty credit risk.

Given the lack of a central counterparty, OTC derivatives necessitate sophisticated techniques for managing trading exposure. This can be achieved via a number of different techniques – by charging margins, imposing internal line limits, increasing collateral through haircuts or marking the instruments to market during the trading day. All banks stated that the approaches vary across different trades and portfolios.

The interviewee from one of the continental European banks stated that the Credit Support Annex (CSA) as defined by the ISDA is used whenever possible to set the terms of trade and manage counterparty risk. Additionally, the bank calculates and charges Credit Valuation Adjustments (CVA), which are performed by a designated counterparty exposure management team. US exchange-traded equity options are not currently used to manage portfolio exposure at this bank.



For the second European bank, the management of exposure also involved a combination of different tools and methodologies. Approaches utilised could be trade or portfolio specific, with the latter primarily reliant on rules, Value at Risk (VaR), stress tests and/or more dynamic methods. For High Volume Direct Market Access (HVDMA) products, the bank primarily charged intraday margin, though this was not the case for other asset classes.

Similarly, the UK bank also followed varying approaches for different products, with margin requirements as the most common method.

The Risk Management Process: OTC vs. Exchange Trading

Given that the fundamental structure of exchanges and OTC markets is different, with counterparty risk being much lower in the former, it is interesting to examine how risk methodologies across the two converge and/or vary.

The cleared market relies heavily on models familiar to market risk management. These include established ones such as Value at Risk, SPAN, Monte Carlo simulation and TIMS or other more customised varieties.

For OTC derivatives, one of the European banks presently uses VaR and internal models.

On the other hand, the models relied upon by another European bank are identical to the ones featured on exchanges. According to the interviewee, this is the case because the concern in either instance, whether in listed or OTC trades, is effective management of counterparty exposure. The only difference with listed instruments is that the responsibility for managing risk is transferred to the clearing house by paying a margin. Hence, the actual risk management procedures should not be any different.

More specifically, this bank uses historical VaR. Internal models are based on Monte Carlo simulation or stress tests, but some rules-based ones also exist, depending on the specific products.

This approach was echoed by the representative at a UK bank, who confirmed that risk management practices in OTC derivatives are no different from the ones used in exchange-traded markets. Thus, risk management techniques are uniform across OTC and exchange-traded derivatives.

Managing Interbank Lines

Interbank lending virtually ceased during the peak of the credit crisis – unsurprisingly so given the bleak outlook for a number of previously ‘sound’ institutions. Confidence in counterparties was eroded and banks were extremely reluctant to continue with ‘business as usual’. The fact that the execution method of choice for many of these banks was OTC further exacerbated the situation.

The interconnected and opaque nature of the OTC market was underlined by the US action on Bear Stearns, where government intervention became necessary to ensure its survival. Lack of transparency in the OTC derivatives market meant that it was impossible to accurately determine the impact that the bank’s failure would have on the financial



industry. Strengthening the regulation of derivative trading will enable banks to monitor interconnectivity, and prevent over-exposure to any single counterparty.

In this respect, the contact from one of the European banks that Lepus spoke to stated that interbank lines have been reduced over recent months.

Reinforcing this sentiment, contacts from another European bank and a UK bank highlighted the fact that there has recently been a more vigilant policing of interbank lines. The respondent from the second European bank added that risk was being monitored more proactively, limits kept under control and that there was considerably more focus on unsecured exposures. The UK bank further added that many more people are now involved in interbank credit management. Both banks also agree on the fact that – unlike comments from the other European bank – they have not experienced any reduction in interbank lines.

It is clear from the responses that confidence in trading between banks is not at the level that it was in the boom years prior to the credit crisis. The increased use of exchange-traded derivatives and CCPs may go some way to help restore confidence.



Benefits of an Exchange-Traded and Clearing House Guaranteed Model

As discussed at the beginning of the report, regulatory pressures to move away from bilateral OTC trades are based on the market's opacity, which can exacerbate and contribute to systemic risk events. From the responses received and presented below, it is evident that the theoretical benefits of trading on exchanges are also replicated in practice.

- **Efficiency and Price Competition** – Because of reduced counterparty credit risk, the appeal of cleared, exchange-traded markets is quite strong. In addition, trading on exchanges is predominantly in simpler, vanilla products with high demand. These two attributes lead to high numbers of market participants and intense price competition. Two thirds of the interviewed banks agreed with this sentiment.
- **Transparency** – As expected, exchanges and CCPs by their very nature increase transparency as the products are listed on exchanges and trades are reported publicly. All of the participating banks cited this as one of the major advantages.
- **Liquidity** – Given the high volume of trading and market participation from numerous sources, exchange-traded derivatives benefit from higher liquidity and tight spreads. Sources from European banks highlighted that exchange trading and clearing house guarantees further enhanced the liquidity of standardised products. On the same topic, one bank pointed out that a sustained focus on exchange-traded and clearing house guaranteed contracts could inadvertently cause liquidity in OTC markets to decline.
- **Clearing House Guarantees** – In the event of a default by a participant in a trade, the clearing house can draw on its guarantee fund or liquidate margin collateral to settle trades on the defaulter's behalf. Thus, the trade is guaranteed and counterparty risk is dramatically reduced. All the banks interviewed stated that this feature was particularly beneficial.
- **Netting** – The move from a bilateral trading environment to a CCP-guaranteed one has implications for netting. Firms would lose the existing OTC benefit of netting across asset classes bilaterally and would replace it with the CCP benefit of netting within a particular asset class multilaterally. Hopefully, these would offset each other.

One possible area of concern is the relatively limited range of products available on exchanges as compared to OTC markets.



Conventional wisdom has dictated that exchange-traded products need to be standardised, thus disqualifying more complex instruments. However, as gradual as the evolution may be, exchanges have historically demonstrated a strong capacity for innovation. While it is uncertain when complex and illiquid products may plausibly be moved to exchanges, the widening range of exchange-traded derivatives is evidence that it may well happen. Regulators have shown themselves to be keen to encourage the migration of many standardised OTC products (e.g. CDSs) into a clearing house environment.

To summarise, the major benefits of trading listed derivatives include greater efficiency, transparency, liquidity, clearing house guarantees and netting, while the comparatively limited range of available products is a potential area of concern.



Conclusion

BIS statistics show that the total outstanding notional amount of OTC derivatives trading totalled \$684 trillion in June 2008, testimony to the fact that the medium has traditionally enjoyed an integral role in financial markets. However, subsequent to the painful demise of Lehman Brothers and the continuing economic turbulence, regulatory pressures to move towards clearing houses and exchanges are mounting and OTC volumes have fallen from their previous highs.

In addition to the 'push' of regulation, the move is being encouraged by the 'pull' of considerations like transparency, liquidity and lower counterparty risk. Counterparty credit risk is now far more important than prior to the collapse of Lehman Brothers and banks concede that one of the positive aspects of pending regulatory changes will be greater reliance on the clearing house guarantee model, which mitigates these risks significantly.

However, while the banks are certainly more aware of the CCP model, it can be debated just how receptive to it they really are. Banks have historically been able to reap commercial benefits from the more opaque structure of the OTC market, although regulatory developments on the heels of recent events will probably change this.

According to a recent independent study by an economist at the IMF, should the proposed reforms to establish CCPs in the OTC market go ahead, some of the biggest US banks, namely Bank of America Merrill Lynch, Citigroup, Goldman Sachs, J.P. Morgan and Morgan Stanley – would need to pledge approximately \$200bn extra collateral between them, reflecting the size of their OTC exposure. Therefore, there is likely to be opposition from sell side firms to the proposed reforms.

Aside from the apparent lack of flexibility in exchange-traded options, there is very little downside to such a model and as research has indicated, these markets are becoming more innovative, with an expanding range of products. Equity options exchanges, for example, have matured significantly over the past few years and there is now more product diversity and competition, especially in the US.

The appetite for complex OTC products has subsided as a result of the credit crisis, so now is an ideal time to encourage a greater proportion of trading to move to exchanges, underpinned by their CCP guarantee. However, rash or short-sighted requirements from the regulators may not be prudent and constructive for the industry overall. Any future developments will need to be thoroughly assessed, reviewed and carefully implemented.

Nevertheless, there is a growing need to address the lack of transparency that pervades the OTC derivatives markets. Future developments need to ensure that the banking system is made more resilient and not necessarily just reduced in size. Market participants and regulators must cooperate on a continuous basis in order to develop a mutually beneficial solution.