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TRADING STRATEGIES

**The Demands of Derivatives:
*OTC Instruments and Buy-Side
Technology***

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The last few years have seen a significant surge in popularity for derivatives. Where once they were found primarily in the portfolios of a few, select hedge funds, they are now widely adopted by more mainstream investors.

This is partly because hedge funds themselves have enjoyed a period of enormous growth. They are now one of the key cogs of the investment value chain, and attract a new generation of investors that have traditionally avoided the high-risk, high-reward world they represent.

Secondly, an aging population and low inflation rates in mainstream markets have meant that returns from traditional equities and bonds have been disappointing. Even the most conservative of institutional investors and asset managers are looking to diversify portfolios with derivatives and new strategies like 130/30 in an attempt to boost returns.

In addition, the implementation of the UCITS III regulations in the European Union has enabled funds to buy derivatives speculatively in order to enhance returns, rather than using them exclusively for hedging purposes. As a result, more fund managers and clients have become interested in using alternative instruments to gain exposure to various markets, looking beyond target-based long-only equity strategies, and accepting the higher risks for higher returns.

There are also definite advantages to adopting derivatives over and above the improvements in a portfolio's margins. The custodial issues and costs that are associated with holding bonds do not apply to derivatives. The use of derivatives makes it easier to replicate the portfolio benchmark more efficiently and to make specific bets without large numbers of instruments in the portfolio or the need for large numbers of trades.

What's more, derivatives can be used to isolate risk factors much more accurately than more traditional asset classes. So, for example, a credit default swap can be used to isolate credit exposure to a particular corporate entity and hedge the specific risk.

It is perhaps no wonder, therefore, that the outstanding notional value of OTC interest rate, currency, credit, and equity derivatives continues to grow. In its most recent published figures, the Bank of International Settlements indicates that notional amounts of all categories of OTC contracts rose by 15 percent to US\$596 trillion in the second half of 2007, following a 24 percent increase in the first six months of the year. In the same period the notional amounts of outstanding credit default swaps (CDSs) increased by 36 percent to US\$58 trillion.¹ In March 2008, Liffe alone traded more than 87 million futures and options contracts. Notwithstanding the challenges associated with certain types of derivatives that have

been exposed by the credit crunch, these asset classes will not go away, even if there is a notable uplift in the returns from equities and bonds. On the contrary, anecdotal evidence suggests that even though standardization is under way, in the form of a central clearing house and netting for CDSs, derivatives will probably become more complex in a response to current market conditions.

THE CHALLENGES OF DERIVATIVES TRADING

Approximately 90 percent of derivatives trading activity occurs between banks rather than between buy-side and sell-side firms. Nonetheless, the increased use of derivatives has certain implications for asset managers as well as investment banks. There is, for example, a need to analyze the exposure of any given portfolio in far greater detail than is possible with standard gross risk measures, such as duration, that can be applied to more traditional asset classes. Trading derivatives is all about the detail, and as the original trade decision grows more precise, isolating the contributing factors to a portfolio's performance becomes a much more intricate process.

Until recently, spreadsheets have been the most common tool for managing derivatives trading on the buy-side. However, the weaknesses in this approach had begun to appear long before the credit crunch highlighted the problems faced by colleagues on the sell-side.

The Aite Group has recently reported that a single contract traded verbally and recorded on article can involve between 80 and 100 variables in terms and conditions. Because of the unique quality of each over-the-counter derivatives execution, the ad hoc pricing structures, and the complex risk and confirmation processes involved, each trade can take up to a day and a half to complete if the trader is relying on manual processes. Clearly this is unacceptable in an environment where even a second's delay can wipe significant value off a trade.

THE FIRST GENERATION OF DERIVATIVES TRADING TECHNOLOGY

Because of the challenges associated with incorporating derivatives into portfolios, which have become more acute in current market conditions, existing small-scale tools are no longer adequate. There is a clear and growing requirement for more appropriate technology that can handle the very specific demands of derivatives trading.

It may be tempting simply to bolt on additional functionality to an existing single-asset system. But even if this proves to be an effective method of trading derivatives in the first instance, it can only be a short-term solution at best, and the inadequacies inherent in it will soon become apparent.

Having dismissed the "bolt-on approach" to acquiring a derivatives system, the buy-side faces a number of further options. There are certainly more sophisticated systems available that have the particular characteristics required for derivatives trading built in from the outset. But the big-name systems in the market have largely been provided to the sell-side. This is perhaps not surprising, since the valuation of an OTC trade has traditionally been one of the services offered by brokers.

However, this too is changing. Because buy-side traders need to apply due diligence to the prices they are being quoted, because of the best execution requirements in place, and because buy-side institutions may now be originators of derivative products themselves, the relationship between the buy-side and the sell-side is shifting. The dominance enjoyed by system providers on the sell-side is being eroded.

This presents the buy-side with a sizable opportunity. The problem with the majority of the sell-side systems on offer is that they are too functionally rich, cumbersome, and costly for the buy-side, and lack buy-side-specific functionality and processes. Even though the buy-side has enthusiastically embraced derivatives trading, the volumes seen are still some way short of those experienced by the sell-side, and it is these much higher numbers for which the sell-side systems are designed. As a result, they frequently include a number of elements that are simply not required by buy-side traders, which tends to make them prohibitively expensive.

What the buy-side needs is a derivatives system that has a more lightweight front end that is supported by a powerful pricing and analytics engine and data that is fully integrated and available in real-time, and can be sent directly to the blotter of an order management system (OMS) to enable an end-to-end investment management workflow.

However, the advantage of sell-side systems is that they come attached to a number of key services, not least the gathering, manipulation, and analysis of a significant volume of complex, specialized data such as yield curves, credit spreads, and volatilities. It is imperative that buy-side institutions ensure they have adequate sources of this

kind of information once they reduce their reliance on sell-side systems and services.

It is equally important to remember that even the most knowledgeable and experienced vendors of buy-side systems do not necessarily have the skills to build the necessary data models themselves. Nor should potential clients be taken in by vendors who claim expertise in this field. Instead, the solution lies in the growing number of partnerships between system vendors and industry-leading analytics houses, as well as data providers so that data feeds are pre-built into the order management blotter. Accurate and up-to-the-minute data is integral to successful derivatives trading, and is an essential consideration when implementing a derivatives solution.

Asset managers should also ensure that they are confident that their chosen vendor has taken into account the way that the more exotic instruments are traded on a daily basis, and that it has true multi-asset capabilities. Derivatives may be a feature in a growing number of portfolios, but they are used to boost returns through diversity, rather than to replace more traditional instruments completely. Their use as part of an asset swap linked to trades in equities and bonds, or to change an existing portfolio's exposure characteristics, means it is still extremely rare to find a portfolio that uses derivatives in isolation.

Deploying a separate system for each asset class is not only an inefficient and costly solution, it is likely to increase the operational risks faced by the asset manager by failing to unwind a hedge. Any solution therefore needs to be able to handle multiple asset classes as well as all types of derivatives, including interest rate, inflation, credit swaps, equity swaps, and total return swaps, as well as equity futures and options, to name a few.

THE SECOND GENERATION: COMPLIANCE

Having established automated trading capabilities for OTC derivatives, the next challenge is integrating with compliance systems. There is greater recognition across the industry that risk and compliance are now inextricably linked, which has been given huge impetus by the recent market conditions. Although no one could have predicted the event that set in motion the series of write-downs and profit warnings that have characterized the markets since the summer of 2007, the impact of inadequately controlled trading of toxic securities on the sell side has served as a warning for asset managers.

They have also made a stricter regulatory climate almost inevitable on a global basis. In the European Union, the key relevant legislation is UCITS III, which established several controls regarding derivatives exposure. Consequently, EU funds have been protected from the full impact of sub-prime-derived assets, and where European organizations have been affected by the crisis, it has either been through problems relating to withdrawal of liquidity, or because proprietary trading desks—not covered by the UCITS regulations—were exposed.

As a result, very few European funds have been directly affected by exposure to sub-prime-derived assets, except for a small number of hedge funds, and it seems likely that UCITS III will form the basis for any regulation to be implemented in the U.S. and Asian markets. Whereas many firms have currently looked to UCITS III as a model of good practice, that will soon be transformed into an issue of regulatory compliance.

UCITS III stipulates that no fund is allowed to be exposed to more than 100 percent of its net asset value through derivatives. Since it is possible to have a 10 percent holding in derivatives that is equal to 100 percent of the NAV, it is designed to keep exposure to derivatives within manageable limits.

Similarly UCITS III limits the exposure to an individual counterparty to a maximum of 20 percent if it is a credit institution and 10 percent if not. Achieving both these stipulations is within the capabilities of many compliance systems currently available. However, it is the third area—underlying issue exposure—that is more problematic and more difficult. If a fund holds a single bond option, it is exposed only to the underlying bond. But if it holds an option on an index with 500 bonds in it, it has exposure to each one of those 500. Calculating the underlying and primary exposure together is that much more complex.

The challenge here is that the compliance systems in place at asset management firms, which are relied on to manage pre- and post-trade compliance of other, more straightforward asset classes, often do not have the necessary functionality to manage derivatives. Historically they have held a bond or equity view where exposure is based on market value. In these circumstances calculating exposure is straightforward: “This is what I hold, therefore this is my exposure.”

However, as this is almost never the case with derivatives, particularly those that have zero market value on the day of execution, it requires a new and more complex set of calculations and analytics. The net result is

that, until now, a trader could have a net position of \$100 million and conduct a number of executions in relation to that position, but have no way of automatically checking whether it falls within the parameters set by UCITS III.

However, buy-side systems that can conduct all the right calculations and analytics in a specialized derivatives trading engine, or the order management system, and then send those to be assessed by the rules engine, will enable funds to analyze and highlight exact exposure to CDSs and CDOs, simple swaps, and complex indices.

Once funds have the ability to get exposure calculations mathematically correct, they can tie them into an underlying exposure. For example, a CDO spread consisting of 1,000 underlying assets of synthetic exposure can be added up and fed into the correct mathematical formulas to produce a single exposure calculation. Underneath, the compliance solution checks the exposure, drilling down to the underlying holdings, the counterparty, and the global exposure to ensure that both client mandates and regulatory demands are met.

Since the majority of the business in derivatives has, to date, been between broker/dealers rather than between buy-side and sell-side firms, that activity has generated the biggest exposures. But as interest grows within the buy-side community, and the volume of derivative trades for both speculative and hedging purposes increases, then technology to monitor compliance with the appropriate regulatory frameworks becomes essential.

Of course, it is all too easy to overstate the capabilities of technology; and in the current climate, it is important to stress that such technological capabilities would not have prevented the sub-prime crisis in the first place. But technology can certainly assist in the prevention of a similar situation spreading through buy-side operations and thus avoid and mitigate against some of the risks involved in derivatives trading.

THIRD GENERATION: INTERACTIVE HEDGING

With order management and compliance for derivatives trading in place, the holy grail of powerful real-time P&L and pricing analysis—validation and reporting, and therefore an end-to-end investment management workflow—has remained elusive.

The hurdle has primarily been that of the difficulties associated with measuring exposure to underlying instruments. However, having developed that

ability to calculate both primary and underlying exposure of derivatives within a fully cross-asset system, a new range of opportunities in terms of modeling and portfolio management opens up. Once integrated data and analytics are incorporated into the system, a more interactive approach to hedging becomes a possibility.

Currently the standard buy-side way of changing exposure to a given market is to buy or sell bonds or securities to change duration. Portfolio management tools generate models, and anything that is misaligned against targets is highlighted, enabling portfolio managers to balance the portfolio against any variants, usually by buying or selling more securities.

But with an accurate and comprehensive exposure number, the portfolio manager can change duration through an interest rate swap, with the certainty that he is getting the exposure to markets that he wants from the choices that are now available. It is no longer necessary to hold the underlying asset, and incur the management and cost issues that come with it, since a swap can be created and the system populated with all the resultant data with one simple mouse click.

As an example, a fund manager who wants to change the duration on exposure numbers holds bonds plus interest rate swaps for managing duration, credit default swaps for managing the credit risk of the portfolio, and inflation swaps to hedge inflation. One option open to him is to arrange an interest rate swap. However, with interactive hedging capabilities, he can highlight a number of bonds that need duration management, and then use the system to propose the most appropriate swap. The duration numbers can then be massaged and, with one swap, can be changed for a portfolio of 20 bonds in a move that would previously have required buying and selling several bonds with different lengths of maturity.

The same technique can be applied equally successfully to inflation and credit management, or even to LDIs (liability-driven investing) that need very long-term duration.

Once interactive hedging becomes possible, there is nothing preventing the capability from being extended to interactive speculation: looking at the impact of using derivatives on a cross-asset class portfolio. It becomes possible to model any number of strategies, including butterflies, caps and collars, barriers, and even the increasingly popular 130/30s, to build positions that cover all possible scenarios, and then execute the preferred strategy in an immediate response to moves in the market. In effect,

managers with multi-asset portfolios will have the tools to test theories, look at portfolios from a modeling point of view, and implement strategies when satisfied that they will work.

WHAT'S NEXT?

There is one final hurdle that technology for trading derivatives needs to overcome. Until now most have concentrated purely on a front-office solution. However, the functionality required in the middle and back office for confirmations, risk management, and accounting is frequently missing. Given the high-risk characteristics that make derivatives so attractive to returns-hungry investors, this poses a major challenge, as has recently been demonstrated.

This is certainly not a new problem. Developers of software on the sell side have long seen the need to address it, and it is an issue that will remain as focus moves to the buy side. A front-office specialist is unlikely to have the necessary skills and experience to develop an isolated product that fulfills the needs of the middle and back office. The most promising solution to this dilemma is for front-office specialists to partner with existing providers of back and middle office derivatives processing, matching, and confirmation tools. Coming full circle, the most fertile source of such specialists is the hedge fund sector.

Derivatives may be the current stars of the investment world, but they work as part of a diversified investment strategy. Similarly, the technology that is necessary to support derivatives trading cannot be a stand-alone tool, operating separately from other asset classes, compliance systems,

or back office infrastructure. Any system therefore needs to have the necessary architecture that ensures it can be easily integrated with all other elements at each stage in the workflow.

Equally, the ability to support derivatives trading will not reside in one vendor alone. To meet the need to support the increased use of derivatives, we will see the supplier community enter into a series of collaborative partnerships, with each party delivering its core area of expertise to create a fully functional solution.

The beauty of derivatives is that they can deliver returns, regardless of market conditions: something the more traditional asset classes have failed to do. But their potential has been locked away for too long by manual processes and intransigent systems, the risks involved have proved to be resistant to effective management, and the benefits of full asset-class portfolios have yet to be realized. However the technology is moving fast. A fully realized combination of integrated full-asset functionality, data analytics and exposure calculations gives both greater scope and greater control to all portfolio managers.

ENDNOTE

¹OTC derivatives market activity in the second half of 2007, The Bank of International Settlements Monetary and Economic Department, May 2008. http://www.bis.org/publ/otc_hy0805.pdf?noframes=1

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