

Paul Stevens

Exporting risk management and technology systems for emerging derivatives markets

Fifteen years ago, the only significant derivatives markets were located in the US. Today, more than 46 markets in 24 jurisdictions have initiated derivatives markets. This trend of successful cash markets moving to futures and options markets is an outgrowth of global investors wanting derivatives based on the same instruments that are traded in cash markets—stocks, bonds, and currencies.

As world financial derivatives markets expand, and counterparty credit risk increases in size and complexity, an organization's ability to assess its exposure to market and credit risk becomes critical. In addition, as the nature of these products entails a higher level of risk management, derivatives markets inherently require a more sophisticated risk-based margining system than cash markets.

In the past, many clearing houses utilized strategy or delta-based margining systems. However, these methodologies can be inadequate for the complexities of derivatives markets. To overcome the problems associated with these systems, risk-based margining—a sophisticated approach for measuring monetary risk inherent in portfolios containing derivatives—was introduced. It has since become the industry standard for assessing risk in derivatives markets.

An organization looking for a risk-based margining system has two choices: it can develop an in-house system, or it can purchase an off-the-shelf margining system. No matter which alternative is chosen, several components remain crucial for the successful implementation of a risk-based margining system. These include:

Price Modeling A successful methodology must be able to handle the different product features on the contracts being evaluated. This provides the flexibility needed to account for such different features (ie, American- or European-style options, dividend information, or interest yield curves).

Portfolio Approach An effective system should provide integrated portfolio margining for market participants who hedge cash market positions with offsetting derivatives positions on the same or a different exchange, or across international borders.

Ability to Determine Appropriate Risk Parameters An effective system will calculate risk exposure (mark to market plus risk margin) at any account level (ie, firm, client, or trader accounts), and for different account types (ie, professional and retail), thereby allowing the clearing organization to evaluate the level of risk exposure of its members' or individual clients' portfolios. It will also be flexible enough so parameters can be modified quickly if market conditions should change. The parameters of a successful system will be based on the analysis of historical data, and incorporate standards that are the result of policies approved by clearing house management or the board of directors. In addition, market participants should be able to use the system to calculate their own individual margin requirements, using the same methodology and pricing basis as the clearing organization.

Capacity to Assess Risk on an Intra-Day Basis Because of the effects volatility can have on margins, intra-

day evaluations are becoming a necessity for risk-based margining systems. An effective system will predict intraday requirements based on projections of market scenarios and assess risk at a particular moment in time. These features give the clearing institution the information necessary to issue intraday margin calls that may be required during periods of extreme volatility.

Education No matter which solution an organization chooses, education plays a major role in the development and deployment of any system. It is important that all the participants understand why a certain methodology is chosen, the reasons behind the selection of particular risk parameters, and the intricacies of how a system operates. Working with an experienced provider of risk-based margining methodology is crucial.

The Options Clearing Corporation (OCC) was the first clearing organization to implement a risk-based margin methodology for the US-listed securities options markets. OCC's Theoretical Intermarket Margin System (TIMS) methodology is a system for measuring the monetary risk inherent in portfolios containing cash market, options, futures, and options on futures positions. Introduced as a software system, the TIMS methodology uses an algorithm (or framework) for calculating initial margins, mark-to-market margins, and risk margins. This captures the true risk profile of each clearing member or client within portfolios,

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and, in turn, determines the clearing house's total market risk. Since OCC introduced TIMS in 1986, it has been adopted by exchanges and clearing houses worldwide, including the ASX Derivatives (ASXD) in Australia and the European Options Clearing Corporation (EOCC) in Amsterdam, when they wanted to move from a strategy-based to a risk-based system.

Strategy-based margining attempted to divide a portfolio of options and futures into a series of pre-defined strategies, each with a specified margin. This created processing problems for clearing houses, as the size of portfolios and the number of pre-defined strategies grew. In addition, strategy-based systems are not as efficient because they do not recognize that certain strategies can offset each other.

The common clearing organizations for the Italian, Canadian, and Mexican exchanges, and the Hong Kong Futures Exchange (HKFE) also acquired TIMS. These organizations needed both a new clearing system and a method for managing risk on a wide array of derivative products. TIMS was also purchased by the Deutsche Borse,

which had started to trade options on stocks, and the strategy-based system it had installed did not provide an efficient margining system.

In 1995, OCC introduced CM/TIMS, a Windows-based PC version of TIMS designed to be used at both the clearing house and firm level. This is in line with Group of Thirty recommendations to push risk management down to the retail level so firms can more closely monitor investor risk. The Sao Paulo Stock Exchange in Brazil (BOVESPA) purchased CM-TIMS because it allows BOVESPA's clearing members to use TIMS as a margining and risk management tool for their customer's accounts, and gives them the ability to implement CM-TIMS in the offices of individual broker/dealers so they can monitor risk at the client level.

In Malaysia, it was decided to have a central clearing house for both of the country's derivative markets—the Kuala Lumpur Options and Financial Futures Exchange (KLOFFE), which trades futures and index futures, and the Malaysian Monetary Exchange (MME), which lists financial futures contracts. CM-TIMS was selected as the

margin solution for the central clearing organization, as it was by the Korean Stock Exchange in preparation for trading option products.

It is important to recognize that, wherever a risk management system is implemented, the parameters are determined by that organization's particular circumstances. The methodology does not change, just the parameters do. For instance, an established market place usually requires narrower parameters, as it is more liquid and less volatile. On the other hand, an organization operating in an emerging market would probably call for wider parameters, as its capital markets have the potential for extreme volatility and lack of liquidity.

With an ever-expanding global economy, risk management is here to stay. As the number of new and emerging markets increases every year, the ability to assess market and credit risk exposure becomes more crucial. Risk-based margining is accepted worldwide as the best way to adequately measure the monetary risk inherent in portfolios comprised of cash market and derivatives positions. □

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