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SUCCESSFUL RISK MANAGEMENT

HOW TO INTRODUCE QUALITATIVE ELEMENTS TO ACHIEVE A BALANCE BETWEEN THE TRADING AND BANKING BOOKS

White paper

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Recent market turmoil has compelled regulators to introduce new measures to help financial institutions meet the challenges of globalized financial markets. And firms themselves are looking for new ways to improve and tighten risk management.

A close examination of the Basel Committee's new trading book requirements reveals how these new rules will have an impact on the way banks assign assets to both their trading and banking books.

A key component of the new requirements is the incremental risk charge (IRC). The inclusion of CDOs, CDSs and other structured and exotic products in the trading book inevitably produces a rise in default risk, correlation and skew risk. These are risks that ought to be captured in specific risk models. However, in practice they have proved difficult to capture adequately with VaR. The July 2009 IRC Guidelines Paper introduces a new minimum regulatory capital charge, which captures default risk and credit migration.

The IRC will have a measurable impact on the trading book's capital charge, compounded with the proposed 'stressed VaR' (also published in the July 2009 paper and based on historical data from a 12-month period of severe market stress). The quantitative impact study, published by the BIS Committee in October 2009, demonstrated that these changes to the trading book framework will increase average trading book capital requirements by two to three times their current levels.[1]

This paper examines the new rules and shows how they relate to two of the most important tasks of modern risk management: moving away from 'silos' to an integrated approach encompassing market price, credit, (including counterparty risk exposure methodologies), liquidity and operational risks; and, re-integrating qualitative elements into risk-management models.

[1] Analysis of the trading book quantitative impact study, October 2009

INCREMENTAL RISK – THE KEY ISSUES

New rules follow market turmoil

Losses from credit migrations, combined with the widening of credit spreads and a reduction of liquidity, led the Basel Committee on Banking Supervision (BIS) to expand the scope of its capital charge for incremental default risk. (This is the default risk in the bank's trading book that is incremental to any default risk captured in the bank's VaR model.) It was introduced in October 2007, and revised proposals for the charging of capital for Incremental Risk (IR) were released in July 2008 and in January 2009.

IRC sets a high standard

For banks seeking to model specific risk, the trading book capital charge comprises three essential components: the general market risk charge and the specific risk charge (using a 10-day VaR at the 99 percent confidence level) plus the Incremental Risk Charge (IRC) that must be calibrated to and measured at a 99.9 percent confidence level over a capital horizon of one year. IRC-covered risks include default risk and credit migration risk.

The BIS requires the banks to base the IRC calculation on the assumption of a constant level of risk over a one-year capital horizon, admitting that it would be appropriate for incremental risk charges to reflect market liquidity considerations (the time required to sell a position or hedge all material risks covered by the IRC model in a stressed market.[2]

The development of an internal model for calculating the IRC puts very high demands on banks. From the outset, a constant level of risk over a one-year capital horizon has to be modeled, preferably taking into account well-founded assumptions on the liquidity horizons of different products or asset classes. As with default risk, analogies of functions like probability of default (PD)(t) and loss given default (LGD)(t) are needed to integrate issuer-related credit migration risk and credit spread risk.

The capture of event risk and jumps in credit spreads

How can firms capture sudden jumps in credit spreads, such as those caused by event risk? Throughout 2007 and 2008, some banks adopted historic migration matrices and credit spreads of the issuers to model such jumps. However, bearing in mind the inherent problems with such figures, it may make sense to gain a qualitative perspective of historic and actual issuer-related single events and to analyze any corresponding jumps in credit spreads. In the wake of systemic concerns, we must also identify 'triggering' events and seek to understand the interaction between single events.[3]

We must delineate 'relevant' events, establish how they are linked, and if possible classify them. The aim is to estimate price jumps for calculating expected future market values and to produce benchmarks. The following hypothesis offers a good starting point to start dealing with these challenges.

[2] The liquidity horizon for a position or set of positions has a floor of three months. Compare "Guidelines for computing capital for incremental risk in the trading book", Basel Committee on Banking Supervision, January 2009
[3] Compare "Principles for Sound Liquidity Risk Management and Supervision", Basel Committee on Banking Supervision, September 2008

THE IMPACT OF ISSUER-RELATED EXTERNAL EVENTS AND UNDERLYING CONDITIONS

Issuer-related events are only relevant to sudden price jumps once the events have become public knowledge or are at least known to some market participants. Consider some different types of issuer-related public events.

Rumors. If these are about liquidity related to an issuer, then markets react immediately. This is even more pronounced in nervous markets as this example shows:

On Wednesday, September 24th, 2008, depositors lined up outside the branches of Bank of East Asia (BEA) in Hong Kong to withdraw their money. The savers were worried by rumors that the BEA was unstable as it held a large number of assets linked to the failed US investment bank Lehman Brothers and the troubled insurance giant AIG. The rumors were spread by text messages and over the internet. According to media reports, some disgruntled savers had to be held back by police as they battled to get inside a branch before it closed. The BEA extended opening hours to deal with the rush of customers. The bank's shares slumped more than 11 percent on Wednesday, but rose after the BEA and the Hong Kong Monetary Authority (HKMA) insisted that the rumors of BEA's financial instability were unfounded.[4]

Accounting issues. In the light of Enron and WorldCom, even a suspected accounting fraud is enough to cause severe falls in an issuer's stock price. Witness the damage suffered by the Swiss recruiting company Adecco in 2004:

In 1996, the French company Ecco and the Swiss company Adia formed the recruiting company Adecco. The company took over the US-based company, Olsten in 1999. By 2003, Adecco became the leading global temporary employment agency. On January 12, 2004, Adecco deferred publishing its financial figures – scheduled for 4th February 2004 – for an indefinite period. The explanation for the deferral is the detection of severe deficiencies in its internal control system in North America and accounting problems in some of its foreign subsidiaries. The markets feared a new accounting scandal and the Adecco share price fell more than 47 per cent.

Subsequently, Standard & Poor's and Moody's downgrade Adecco and its CFO and head of business operations in North America step down. Two weeks later, Adecco announces further financial details, which reveal that its operating results will be reduced by EUR 40 million to EUR 50 million. This statement stabilizes the Adecco share price. The company – also listed in the US – justifies its information policy with reference to the strict stock exchange regulations in the US. The company's record is presented on June 1st 2004. In March 2005, the SEC abandons its investigation.[5]

When looking at historical issuer-related events in more detail, several more incident types emerge. For example, consider cases of death that are associated with the products of particular companies, such as the Merck Vioxx disaster and the Spanair catastrophe. Other examples include severe cases of fraud or rogue trading, which bring about huge losses, like those of SocGen. Any of these factors might cause sudden jumps in the credit spreads of the issuer. Similarly, political events or serious operational failures can have a similar impact.

[4] Sources: "The Australian", September 25th, 2008; BII Risk Data
[5] Sources: BII Risk Data, BII Market Moves

THE CASE TO STOP ORGANIZING RISK MANAGEMENT FUNCTIONS IN SILOS AND INTEGRATE QUALITATIVE MEASUREMENT INTO RISK MANAGEMENT MODELS

It is generally accepted practice to tabulate external events and classify them into categories like "operational risk". However, for incremental risk – and also for stress-testing and liquidity risk management purposes – we need an industry-wide classification that extends beyond financial institutions to all industries. In addition, such categories must accommodate damages to the reputation of an issuer as well as certain strategic issues.

What determines an event as relevant? Our two examples above demonstrate that the relevance of an event highly depends on the conditions and circumstances prevailing at the time of occurrence. It is perhaps analogous to a marriage, when a single event might be non-threatening in the good times but it might cause breakdown when a couple is already at loggerheads. In practice, issuer-related events that are initially seen as low-impact should not be a priori excluded. All scenarios and mathematical models should be built with sufficient flexibly to accommodate changes in underlying conditions and circumstances.

MANAGING CAPITAL CHARGES FOR THE TRADING BOOK: THREE COUNTERPARTY RISK EXPOSURE METHODOLOGIES EXPLAINED

Incremental risk offers a clear example of the need to move away from a silo approach towards integrated risk management. However, it does have the effect of increasing the capital charge. The more advanced counterparty risk exposure methodologies proposed by trading book requirements illustrate what an integrated approach looks like; however, these may have the effect of decreasing the capital charge.

Two new methodologies are considered here alongside the current exposure method (CEM). These are: the standardized method (SM) and the internal model method (IMM), using the concept of expected positive exposure.[6]

The IMM is a more comprehensive approach but is only available to banks that have been qualified by regulators to use internal market risk models. The SM is available to banks that do not qualify for an internal model but would like to use a more risk-sensitive methodology than that outlined in the 1988 Basel accord.

Current exposure method

The capital charge for a portfolio of transactions covered under a legally enforceable bilateral netting agreement is calculated using the net-to-gross ratio:

Exposure at Default = Replacement Costs + Add-on

Where Add-on is calculated as the product of the notional and the regulatory risk factor, which is based on the remaining maturity and type of underlying instrument (interest rates, foreign exchange rate). The Add-on for a portfolio is calculated by the Basel I formula:

Add-on (portfolio) = (0.4 + 0.6 x (full netted position)/ (position under no netting))

For collateralized positions, the replacement cost can be adjusted by the volatility-adjusted collaterals, amount C, which reduces the mark-to-market value of the portfolio:

Replacement Costs = maximum (0, Market Value (portfolio) – C)

There are several weaknesses associated with this current exposure methodology, which was designed for Basel I: changes of risk factor are not taken into account, exposures cannot be fully netted, and financial transactions in securities cannot be considered.

[6] "The Application of Basel II to Trading Activities and the Treatment of Double Default Effects", Basel Committee on Banking Supervision, July 2005

THREE COUNTERPARTY RISK EXPOSURE METHODOLOGIES EXPLAINED CONTINUED

Standardized method

The standardized method (SM) was designed for banks that do not qualify to use the IMM, but wish to run a more risk-sensitive method than the CEM. The standardized method can be used only for OTC derivatives.

The main principle is the 'building block' approach for building hedging sets, which is already used in non-internal model capital charge calculations for market risk. The standardized approach is designed to capture certain key features of the internal model approach for counterparty credit risk.

The standardized approach was also designed to be simple to implement. It therefore includes some simplifying assumptions: for example, it does not recognize diversification effects.

The building-block approach for netting sets splits risk positions into key risk drivers, such as foreign exchange risk per currency pair, interest rate risk per maturity class and government / non-government rate or equity risk per index. Transactions are mapped to these risk positions that represent key risk drivers using the modified duration-for-debt instruments and the delta concept for options.

For example a cross-currency swap is mapped to a foreign exchange risk position and a receiver and paying interest rate risk position. Each interest rate risk position mapping depends on the currency, maturity class and reference rate category (sovereign / non-sovereign-issued instruments). The remaining maturity for floating rate notes and floating rate legs of interest swaps are taken into account with the next adjustment of the interest rate.

Risk positions within a netting set of the same risk driver form a hedging set. Building hedging sets for interest rate risk positions produces the additional requirement that only interest rate positions that have similar interest rates can be netted. For each hedging set, only the net amount can be used to calculate the exposure amount.

Under the building-block approach for building hedging sets, the exposure at default (EAD) is calculated by:

(i) The larger of the net current market value or a "supervisory EPE", times
(ii) A scaling factor, termed beta:

EAD = Beta x Max [Net-market value(Portfolio); Sum_i Risk position Hedging-Set_i x CCF_i]

With beta of 1.4.

The credit conversion factors that apply are taken from the following table.

FX	CCF	EQUITY	CCF	IRP 1 YEAR	CCF	IRP 5 YEARS	CCF
USD/EUR	3,22%	S&P	4,35%	USD	0,19%	USD	0,30%
USD/JPY	2,71%	FTSE	7,36%	EUR	0,14%	EUR	0,19%
USD/GBP	2,79%	DAX	6,62%	JPY	0,05%	JPY	0,13%
EUR/JPY	3,13%	NIKKEI	4,30%	GBP	0,12%	GBP	0,18%
FX (TBR)	2,50%	EQUITY (TBR)	7,00%	IRP (TBR)	0,20%	IRP (TBR)	0,20%

Table 1: Credit Conversion Factors (standardized method)

One key conceptual difference between the CEM and the SM is the recognition of hedging within netting sets. It follows that well-hedged counterparty interest rate risk positions can lead to a lower capital charge. This should provide the incentive to manage counterparty risk with a more risk-sensitive approach than the CEM. However, by using a beta of 1.4 no general conclusions can be drawn about a capital charge reduction using the SM.

Internal model method

Regardless of the capital charge method used, banks are expected to employ sound practices in managing all aspects of their counterparty risk exposures. Many use Monte Carlo simulation, complemented by a wide variety of stress scenarios. This is the most appropriate methodology for accurately calculating credit exposure and understanding the underlying sources of risk, especially for derivatives portfolios. The Basel Committee proposed the internal model approach to encourage the use of the potential future exposure (PFE) as a way to encourage best practice methodologies. Some enhancements were included to establish an advanced and robust capital charge framework for counterparty credit risk called Expected Positive Exposure (EPE). One reason to extend the PFE concept for capital charge calculations is rollover risk, which is not adequately covered within standard PFE concepts.

The main concept of EPE is to use the time-weighted average of individual expected exposures for a one-year forecast horizon. The basic process of calculating this exposure is to generate Monte Carlo scenarios covering one year and various market risk factors including interest rates, exchange rates and credit spreads. The process values each transaction under each scenario then aggregates the transaction values. Credit mitigation forms can be taken into consideration to calculate exposure to individual counterparties at each future date. Finally, the appropriate maximums and averages over one year (or the effective maturity of the longest-dated transaction) are taken. This methodology accounts for portfolio effects (economic offsetting) and cross-product netting effects in the regulatory capital calculation process.

In order to capture a conservative economic climate, the final number is scaled by a regulatory defined factor called "alpha". This value is currently set at 1.4 and can be estimated by bank specific estimations which have to be approved by the regulators and can be minimized up to 1.2.

The advantage of this IMM approach is to implement best practice methodologies. These can be applied to counterparty risk for capital charge calculations using advanced risk management techniques, like cross-product-netting for OTC derivatives and securities financing transactions, diversification and hedging effects which can reduce the capital charges for trading activities.

This framework can also be used for the next challenge: setting up a counterparty stress-testing framework to strengthen the robustness of risk management processes. An advanced counterparty stress-test framework could cover concentration risk and correlation risk as well as the integration of market and credit risk.

The topics described above will clearly have an important influence on the fundamentals of risk management in the trading book. The qualitative aspects of risk management, like adequate risk factor simulations, external events and stress-testing, can unify risk departments. At the same time, the use of counterparty methodologies, such as a standardized approach or IMM, will allow offsetting capital-charge increases brought about by incremental risk.

ABOUT MISYS

Misys is at the forefront of the financial software industry, providing the broadest portfolio of banking, treasury, trading and risk solutions available on the market. With 1,800 customers in 120 countries our team of domain experts and partners have an unparalleled ability to address industry requirements at both a global and local level.

Misys was formed by the merger of Misys with Turaz, which includes the award-winning Kondor+ product line. Combined they are able to address all customer requirements across both the banking and trading book businesses. Misys is the trusted partner that financial services organisations turn to for help solving their most complex problems.

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