THE APPLICATION OF BASEL II TO TRADING ACTIVITIES AND THE TREATMENT OF DOUBLE DEFAULT EFFECTS

ENTEERPRISE RISK MANAGEMENT SOLUTION

This paper summarises the major changes detailed in the amendment relating to Credit Exposure of the Trading Book. It explains the changes and describes the impact on a Financial Institution, and discusses how a modern risk management solution enables the Basel II requirements to be met cost effectively as part of a strategic internal risk management solution.

INTRODUCTION

In July 2005, the Basel Committee on Banking Supervision (BCBS), as established by the Bank of International Settlements (BIS) published a major amendment to the Basel II framework in its application to a bank's Trading Book. This amendment describes changes relating to Credit Exposure of the Trading Book, treatment of Guarantees, and changes to the regulatory specific risk calculation.

What does this Basel II amendment mean?

The Basel II amendment aims to address a number of perceived weaknesses in the new Basel II standard as it applies to a bank's Trading Book. These changes to the accord for the first time for Counterparty Credit Risk **(CCR)** allow:

- → Use of Internal Model **(IM)** for calculation of regulatory capital;
- → The recognition of Portfolio Effects in trading book exposures
- → An improved treatment of Close-out netting agreements to support cross-product netting and
- → The recognition of Double Default effects.

These changes allow a bank - given the regulators approval - the opportunity to significantly reduce the capital requirements of their trading book through the use of sophisticated risk measurement techniques.

What are the benefits for banks that adopt the new provisions?

The key benefits for banks adopting the new provisions are:

- → Reduction in the Regulatory Capital charges for the trading book;
- → Closer alignment of the internal capital and regulatory capital requirements and treatment of products and
- → Less regulatory capital will be required for a well hedged and diversified portfolio.

How are portfolio and netting effects treated under the new provisions?

The new approach covered by the Basel II amendment incorporates as Expected Positive Exposure **(EPE)** methodology. This methodology accounts for portfolio effects (economic offsetting) and cross-product netting effects in the regulatory capital calculation process. Cross Product Netting enables exposure for a particular counterparty to be offset against each-other in the event of default. The Basel II amendment recognise Close-Out Netting Agreements and allows exposure reductions resulting from the application of Netting Agreements within a particular Asset Classes. The Basel II amendment does place some restrictions on the application of Netting Agreements across Asset Classes, so the full exposure reduction benefits are not captured in all cases.

What is this portfolio effect?

Portfolio Effect is a term for the tendency for the risk on a well-diversified holding of investments to fall below the risk of most and sometimes, all of its individual components. The portfolio effect, sometimes known as economic offsetting, captures the fact that not all deals are in or out of the money at the same time.

Take a simple case: If a counterparty has two equal and opposite deals, for example, two GBP/USD FX forward deals with the same face value, maturity, counterparty and rate. They form a perfect hedge, their MTM's will offset exactly. If the bank has a close-out agreement in place with the counterparty, the exposure of these two deals would net to zero. However, without an agreement in place there will be some forward exposure to both of the deals. Since only one of these deals can generate exposure at any one time, then if one deal has a positive exposure, the other deal must be negative, and vice versa.

Beyond this simple case, and taking into account a real-world portfolio with multiple deals, many of these deals will offset each other probably not as a perfect hedges that can be easily identified; however the effective exposure on a day to day basis will be significantly lower than would be represented by the simple Current Exposure Method **(CME)** or Standardised Method **(SM)** approaches in which no deals are considered to offset unless there is a netting agreement in place.

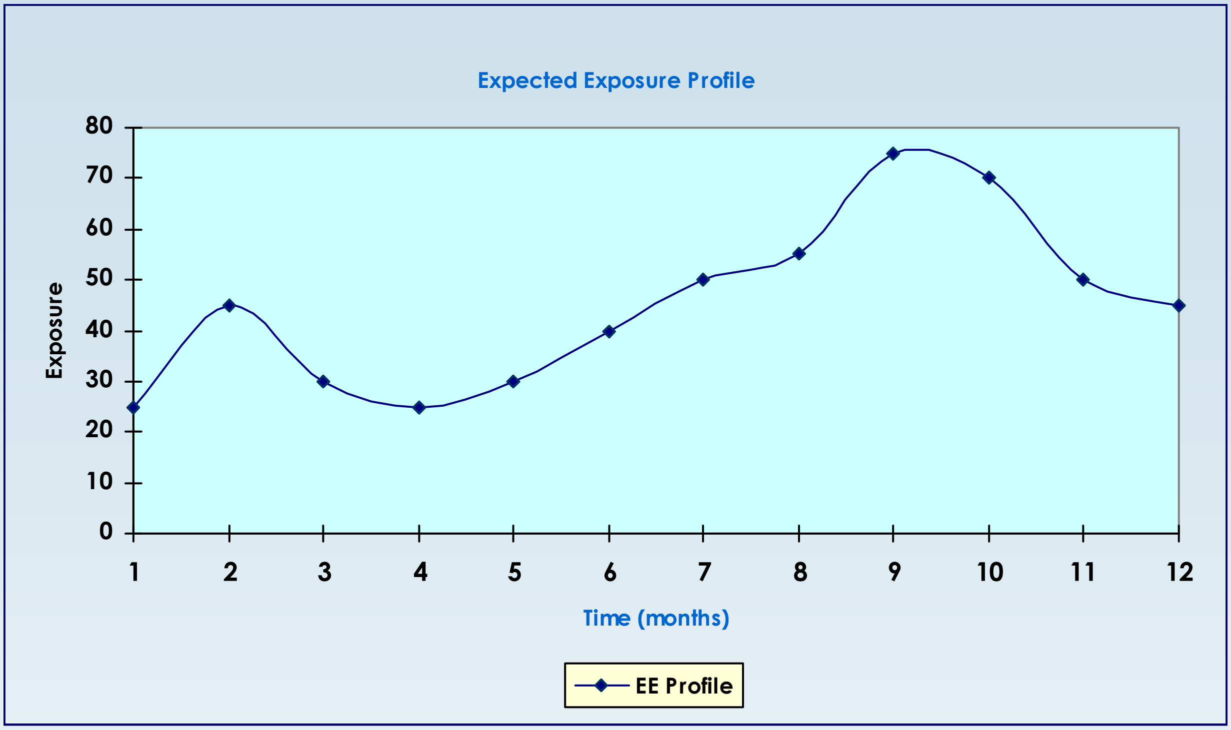
In order to calculate the portfolio effect an approach such as Monte Carlo Simulation must be performed which reliably measures the exposure of an entire 'Portfolio' of deals, rather than the sum of the exposure of individual deals.

This approach recognises that well-diversified and well hedged portfolios have significantly lower exposures compared to un-hedged or poorly diversified positions. This will reward the bank with lower capital charges for well managed low-risk portfolios in a way that was not possible prior to the adoption of the revised methodology.

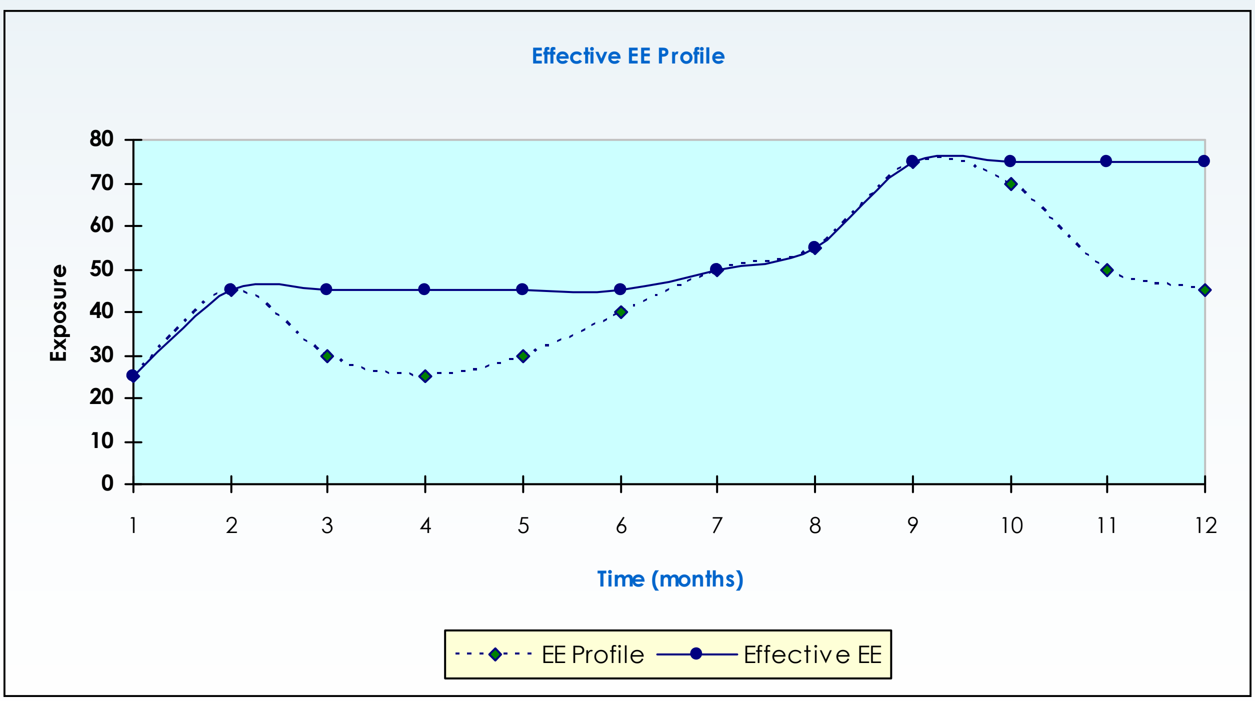
How is my trading book capital charge calculated under the revised internal model?

The revised methodology derives a single exposure value **(Effective EPE)** from the bank's portfolio of deals. The starting point for this methodology is an Expected Exposure **(EE)** profile for the bank's trading book, based on Potential Future Exposure **(PFE)**, also known as Peak Exposure, which is the maximum exposure estimated to occur on a future date at a high level of statistical confidence, as commonly used by banks employing a simulation method to calculate exposures for their credit limits.

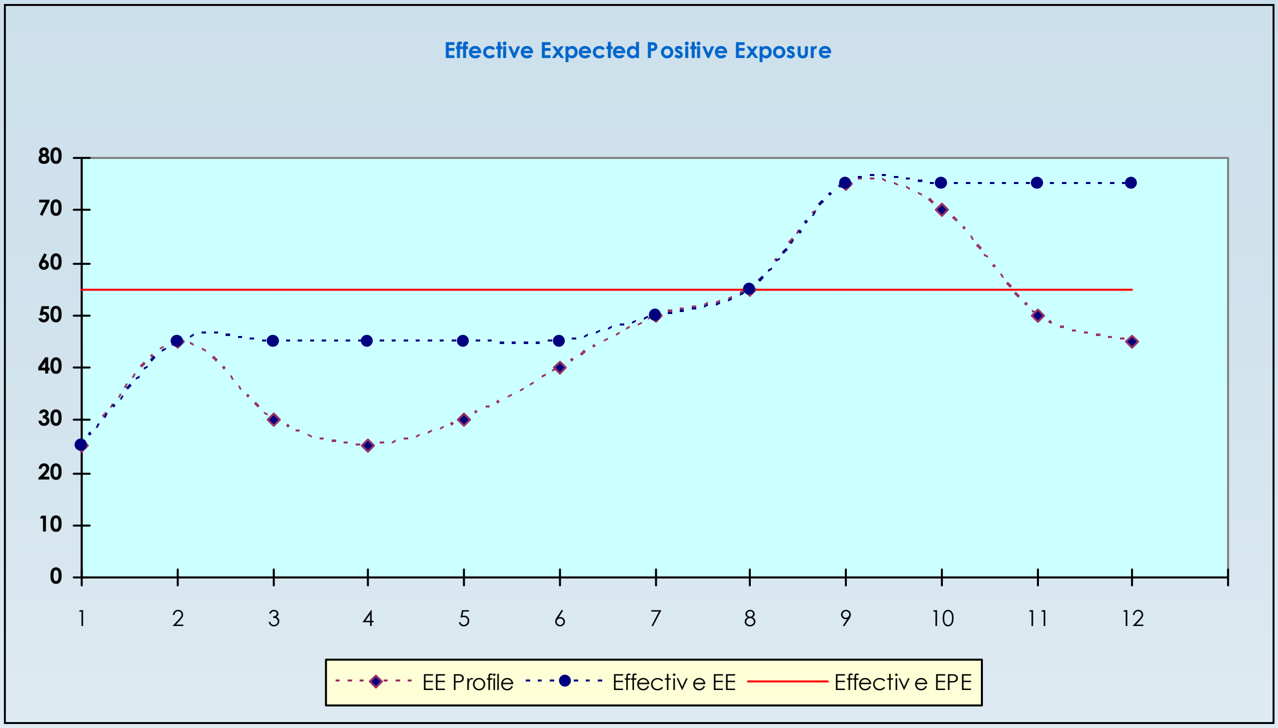
The Expected Exposure Profile depicted in the graph below was derived using a Monte Carlo simulation and calculating the probability weighted mean (average) exposure of the distribution of exposures at any future date for the portfolio of transactions. This exposure takes into account all netting and portfolio effects. The **EE** profile is commonly used by banks that use a simulation approach to calculate exposures for their credit limits.



The next step is to determine an Effective Expected Exposure **(Effective EE)** profile, which is introduced to cater for the replacement of maturing transactions such as Securities Funding Transactions.



This approach effectively places a high-water mark on the expected exposure profile. The final step is to calculate the Effective Expected Positive Exposure **(Effective EPE)**.



Effective EPE is a single number representing the time weighted average of **Effective EE** over the 12 month horizon. This gives a value of the **Effective EPE** in this example of 55. If all transactions mature before the 12 month horizon, the **Effective EPE** is the average **Effective EE** until the transactions mature.

The **Effective EPE** estimate corresponds with the exposure that can be calculated in the current economic climate. However, in order to capture a deteriorating economic climate the final number must be scaled by a regulatory defined factor called "Alpha", this value is currently set at 1.4

Therefore in this case the regulatory capital or **EAD** (Exposure at Default) for this example would be:

- **Capital = Effective EPE x Alpha**
- **Capital = 55 x 1.4**
- **Capital = 77**

As the use of the new methodology is adopted and seen to work in practice, it can be expected that the value for Alpha will be adjusted by the regulators on a periodic basis. N.B. The "Alpha" factor of 1.4 for the internal model is similar but significantly lower than the "Beta" factor (2.0) applied to the Basel II Standard Model.

What are the challenges that a bank faces in adopting these provisions?

The following challenges must be addressed by a bank when adopting the new provisions:

- The level of trade detail required for the calculation of capital on Credit Risk increases to match that required for Market Risk, increasing data integration requirements;
- Increased analytical complexity in pricing all Trading Book transactions and calculating the Effective Exposure and
- Significantly increased processing requirements.

Will the bank be forced to adopt these provisions?

The bank need not adopt the Internal Model provisions, they can make use of the CEM and Standard model approaches. However, the bank must use the same approach for both the trading and banking books. Therefore, if the bank wants to use the Internal Model approach for their banking book, they must adopt the Internal Model approach for their trading book as well.

Further, a bank that does not adopt the new provisions will be at a significant competitive disadvantage as other banks obtain a significantly improved return on capital due to the reduction in capital charges that they receive through using these methods.

When can these benefits be realised?

The individual regulators determine the timeframe within which these changes can or must be implemented and there is no current consensus between the regulators on this. However, the BIS rules do mandate that the provisions must be implemented satisfactorily for at least a year and approved by the regulator before the changes in capital can be regulated. The earliest that the changes can take affect is 2008, therefore to obtain the maximum benefit through the earliest introduction of these changes banks should aim to have these provisions implemented by 2007.

How can Razor assist the bank?

IT&e's **RAZOR** product calculates credit exposure using Monte Carlo simulation. **RAZOR** has released a Basel II Trading Module that fully supports the Basel II Trading Book amendments.

RAZOR'S high performance Monte Carlo simulation engine enables the bank to calculate the **EPE** numbers required to a high level of accuracy in real time. Further, **RAZOR** has full support for the complex tasks of "Back-testing" the model, and stress testing; these requirements must be reliably met in order for the bank to receive and maintain its accreditation to use this approach.

The Basel II Trading Module can be fully integrated with **RAZOR'S** other Risk Management Modules. This enables the Basel II regulatory requirements to be fully met and provides a platform for Strategic internal Market and Credit Risk Management.

One of our experienced risk management sales staff would be more than happy to discuss the Basel II amendments with you, and demonstrate how **RAZOR** will help your organisation meet these regulatory requirements.

For more information on **RAZOR** and IT&e please visit our website **www.ite-fs.com** or contact IT&e directly at:

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IT&e also offers two other flagship products, **Monarque®** and **PTX™**, to financial institutions. Monarque is an Securities Trading Platform solution for Treasury and Capital Market activities at major banks and broking houses, and comprises modules designed to automate front-to-back office functions. PTX enables on-line trading across multiple asset classes (Securities, Money Market, FX, Etc.).

IT&e is headquartered in Sydney with offices in Melbourne, London, New York and Chennai. IT&e offers a highly skilled team of specialists, providing technology services across the financial markets and risk management business areas.

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