

Capital Modelling

Capital allocation is the key to Basel II

A crucial aim of the new Basel accord is to bring a bank's regulatory and economic capital into line. In a guest article, SunGard's *David Rowe*, *Dean Jovic* and *Richard Reeves* explain why

The final form of the complex, risk-focused Basel II upgrade of international minimum capital rules for bank safety is not the core implementation issue confronting banks. The key question is whether a bank has organised its data well enough to perform and document the necessary calculations.

Tackling the data issue properly will allow banks to leverage their Basel II efforts to help improve their risk management processes generally, and not just pour money into regulatory compliance alone.

Financial firms must take an integrated view of risk measurement and capital determination. The various elements - risk-adjusted pricing of products, assessing the risk exposures at different aggregation levels (enterprise-wide level, business unit level, product and/or transaction level) and the measurement of profitability against risk or the allocation of economic capital - are different aspects of the same problem. They should not be viewed separately.

Solving the puzzle

Solving the integrated risk and capital management puzzle is inevitably linked to the need for a bank to manage its risk portfolios more effectively than its competitors. And a core aim of the Basel Committee in devising Basel II is to bring regulatory capital (the minimum required of banks by their supervisors) more closely into line with economic capital, (the amounts that banks themselves estimate they need to guard against the risks they face).

Banks evaluate and take risks daily as part of their core business. For example, commercial lending inherently involves weighing the credit risk of new loans and their associated mitigants. This means assessing credit-worthiness, the effectiveness of guarantees, collateral, cross-default and other forms of credit protection. But banks also must judge the impact of portfolio diversification - for example, in terms of geographical or industry concentration - and the degree of correlation between balance sheet exposures.

A bank must have effective ways of deter-

mining the capital needed to absorb unexpected losses arising from market, credit and operational risks. In addition, business profits need to be evaluated relative to the capital necessary to cover the associated risks - so-called risk adjusted performance measurement (RAPM). These two major links to capital - risk as a basis to determine capital and the measurement of profitability against risk-based capital allocations - explain the critical role of capital in the management of bank portfolios.

Setting economic capital

If you can measure risks, shouldn't it be straightforward to determine risk-based capital, as economic capital is often called? And why are economic capital and regulatory capital so sharply distinguished?

Determining economic capital is a challenge because the market, credit and operational risks facing banks are each very different. They have specific metrics, if they can be quantified at all, and are difficult to capture in a common measure, such as Value-at-Risk (VaR) which gives a single number estimate of a bank's potential loss within defined confidence limits and a set time. Ideally, a common risk measure should not only capture all relevant exposures, but also account for all the correlations. But economic capital frameworks are often seriously deficient when it comes to calculating economic capital on an integrated basis.

There are two reasons for the gap between regulatory and economic capital. The first is that banks are free to choose the economic capital calculation that they believe most accurately reflects the risks of a specific position or portfolio. This often makes it difficult for outsiders to compare the capital management practice of different banks.

The second reason is that methods of calculating regulatory capital are prescribed to a far greater extent by regulators to assure greater comparability among banks and, as a result, tend to lag behind economic capital calculations in terms of incorporating state-of-the-art risk measurement methods.

The question is not whether the gap between regulatory and economic capital

will disappear, but whether it is too big.

If this gap is too big, it encourages so-called regulatory capital arbitrage. That's where banks try to restructure those risk positions which they believe generate unrealistically high regulatory capital requirements. The risk is often transferred to the capital markets through securitisation whereby a bank, for instance, might issue marketable securities backed by some of its loans. Arbitrage releases regulatory capital for use in other parts of the business or to back risk positions that don't require as much regulatory capital relative to economic capital needs.

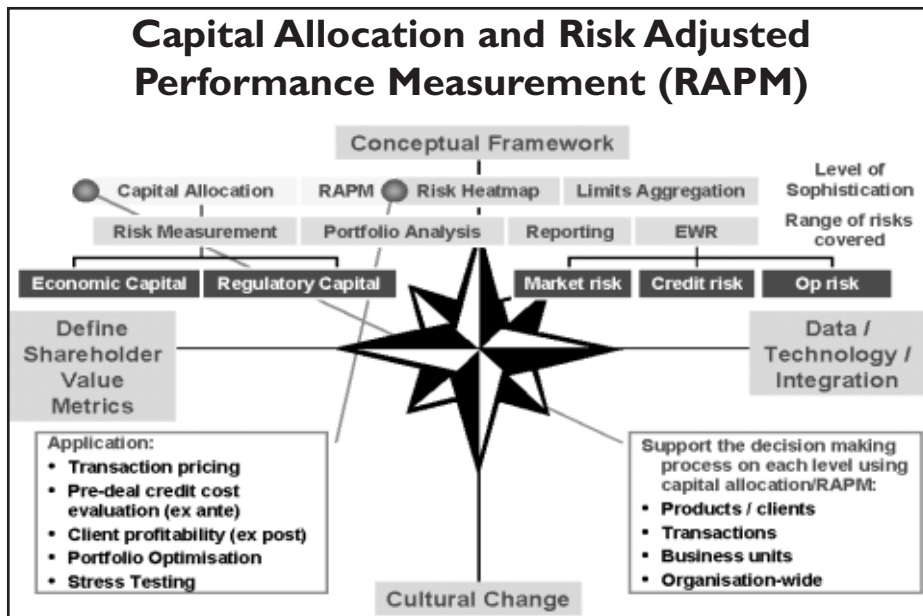
As the diagram shows, building an advanced economic capital framework assumes banks find conceptual solutions to measuring risks, defining shareholder value measures and determining capital based on risk measures and correlations. Implementing economic capital schemes poses the key challenges of building comprehensive databases and their supporting technology and mastering a significant cultural change. The cultural challenge, and its implications for staff incentives and compensation, is often one of the main causes of capital management project failures.

New accord rules

Tackling regulatory capital arbitrage is one of the key drivers behind Basel II. The Basel Committee plans to complete the final draft of Basel II by the middle of this year. The rules are currently scheduled to come into effect by the end of 2006.

Basel II has a three-pillar structure involving capital charges for credit, market and operational risks (Pillar 1), review by supervisors of a bank's risk management policies and systems (Pillar 2) and improved market discipline through greater and more consistent information disclosure (Pillar 3). Pillar 1 offers a choice of approaches, ranging from the simple to the complex, for calculating the capital needed to absorb financial loss from banking risks. Banks using sophisti-

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cated methods involving internal databases and models should enjoy lower regulatory capital requirements than banks using cruder approaches.

Integrated Framework

What is a practical way to build an integrated capital framework that not only meets Basel II rules, but that also can add significant value by allowing a bank to allocate economic capital efficiently to its risky portfolios and measure profitability against those allocations?

Implementing Basel II-compliant regulatory capital means being able to perform capital calculations and generate reports in a flexible, transparent and auditable way to meet the requirements of Basel II's three pillars. Banks need sophisticated modelling and analysis to calculate regulatory capital, compare and benchmark it against economic capital and perform credit risk analysis. An appropriate system must also handle stress testing, including multi-dimensional "what if" analysis, and reporting for market disclosure while offering a high degree of flexibility to model different rules from different jurisdictions.

For Pillar 1 capital requirements the most effective tool is a flexible calculation engine working across multiple dimensions. Flexibility means particularly that the system's front-end - the part used to format and process input data - supports multiple variants of the basic formulas in a context-sensitive manner in order to handle different regulations in local jurisdictions. The user should also be able to modify formu-

las, for instance to model proposed changes in regulation, yet keep a 'locked-down' version for external reporting.

Ideally the system also should perform stress testing based on Pillar 2 (supervisory review) requirements for the internal ratings based (IRB) approach to calculating Pillar 1 regulatory capital for credit risk. This is the more sophisticated option on offer for credit risk. The system should support not only the simulation of a variety of credit-risk sensitive conditions over time - for instance by simulating probability of default (PD) and loss given default (LGD) scenarios. It should also support the integration of credit portfolio models (credit VaR) and other internal economic capital models.

A supportive system

The system must be able to compare regulatory and economic capital in all relevant dimensions - both at the enterprise-wide level and when broken down into portfolios, borrower groups, single names and transactions - in a consistent way on a single platform.

Pillar 2 requires banks to show that credit risk calculations are an integral part of a 'risk-aware' process. This includes stress testing. The system should be able to 'drill down' to document fully the details of credit risk calculations.

Pillar 3 requires the regular publication of information on relevant portfolios within the bank, broken down and including qualitative information and quantitative data. An appropriate system will provide a full

audit trail for disclosure publication.

Banks will have to produce enterprise risk information to aid corporate transparency. A truly comprehensive picture of risk should allow for advanced regulatory capital allocation and more effective management of economic capital.

The system should also support internal economic capital approaches and the integration of standard credit VaR models. This includes Monte Carlo simulations of random risk factors based on a variety of statistical distributions, such as the Poisson, beta, gamma and Weibull distributions. It should also include the calculation of 'extreme loss' estimates with any user-defined confidence interval and be able, through 'extenders', to access external models and calculations. Ideally in-house PD/LGD/exposure at default (EAD) models also can be integrated and built on the same technology and platform.

Stress testing

Ad-hoc stress testing should be supported, given this is a key Basel II requirement. Flexibility is essential, as the exact regulatory requirements for stress testing are not yet defined. Pillar 3 disclosure requirements are not yet final so, again, flexibility is essential.

Basel II involves a relatively small set of base calculations, but their specific details will depend on a bank's particular combination of analytical approaches, business segments, capital classes, types of collateral arrangements and other forms of credit mitigation.

Finally, to satisfy internal reporting needs and disclosure requirements, the system should allow defined users to publish common reports, alerts and scenarios. These features promote risk-awareness in the day-to-day running of the business and address key Pillar 2 and Pillar 3 requirements. **GRR**

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