Two-regime approach saves up to 30% op risk capital

Modelling shift to 'crisis mode' mitigates pro-cyclical calculations

Article by Carol Alexander on Risk Net

Using the two-regime model

Operational risk losses can be better predicted – and capital more accurately computed – assuming banks operate in one of two regimes at any point, according to forthcoming research using loss data from US banks.

Georges Dionne and Samir Hassani of Canada's HEC Montreal business school used data over the period 2001 to 2010 to show operational risk losses were not homogenous over time.

Instead, institutions tend to alternate between long stretches of a baseline 'low' regime, in which losses showed relatively low mean size, low standard deviation, and a roughly normal distribution, and short periods in a 'high' regime, associated with economic downturns or crises, with larger and more volatile losses displaying a wide, skewed *t*-

distribution. The authors looked at, but rejected, models in which both regimes were normally distributed, and those in which banks alternated between three rather than two regimes. The research will be published in the *Journal of Operational Risk*.

Dionne and others have already done similar studies on US credit spreads, which they also found moved between a "level" and a "volatility" regime, but Dionne argues the operational risk study is significant because of its implications for capital modelling, and the debate over the proposed standardised modelling approach (SMA).

Back-testing supported the theory for data at two banks, US Bancorp and Fifth Third Bancorp, and Dionne is confident the results would be echoed elsewhere: "We do not think there would be any problems replicating the test for banks with good information on their business lines, types of risk and size – but there is more weight on the size variable. Do not forget the model is applied to banks with $1 billion or more of assets. We cannot say very much about smaller banks since we did not analyse them."

In the two back-testing cases, using the two-regime model demonstrated significant benefits – savings of 30% and 25% of operational risk capital for US Bancorp and Fifth Third Bancorp respectively.

Distribution of losses is not the only thing that changes between the normal and high regimes – the two-regime model also detects effects on loss size from the interaction of the high-loss regime and factors such as internal fraud, employee practices and agency services. But Dionne warns this might not be a permanent effect: "The recent recession was at the same time as the financial crisis. So the big variations in losses... were in 'clients, products and business practices', because banks had problems with subprime mortgages and the associated derivatives or structured products during the financial crisis. We believe the general effect related to business cycles will continue to be important, but the specific variations of losses may depend on the recession type."

Internal modelling of operational risk capital is due to be phased out as a regulatory requirement, as the advanced measurement approach (AMA) is superseded by the simpler SMA, but Dionne argues the two-regime model reduces the extent to which capital calculations are pro-cyclical, a problem with capital modelling since the introduction of the Basel II rules. "Capital risk with [the inclusion of] business cycles will always be lower than without business cycles," he says. "The [difference] may depend on the risk exposure of the bank to business cycles. We also observe the difference is larger for larger banks."

There is no proof that SMA is better, notes Dionne: "Our contribution shows how to improve internal models in AMA by proposing a method to consider business cycles in the computation of capital for operational risk. It would be interesting to compare our results with those corresponding to SMA using the same data." Banks could use economic and credit spread data to detect which of the two regimes they were in – and therefore which model should be used – at any given point in real time, he proposes.