Kenji Fujii of UFJ Holdings looks at the benefits of using scenario analysis as a means of managing operational risk, and discusses UFJ Bank's scenario-based advanced measurement approach.

Over the past few years, more and more financial institutions have worked hard to develop operational risk management frameworks, particularly those methodologies based on value-at-risk (VAR). These institutions, however, are experiencing a number of challenges. This article examines some of these challenges and explains how the scenario-based advanced measurement approach (AMA) provides solutions to some of the problems, especially within a Japanese context.

Operational risk management and the new Basel Accord

There is no doubt that the new Basel Accord, which explicitly requires a minimum level of capital to be held for operational risk, has triggered this move towards improved operational risk management. The latest consultative paper, CP3, was issued in April last year, and the basic framework for operational risk capital charges has now more or less been confirmed. The Basel Committee has also published Sound Practices for the Management and Supervision of Operational Risk in February 2003, which supports the establishment of sound practices for operational risk management and supplements the regulatory capital framework shown in the CP3.

Developing a framework for operational risk management, however, has not been easy, and the industry has had to cope with a number of unique problems. This article will give two such examples; the quantification methodology and the conceptual issues for particular operational risk categories.

Quantifying operational risk

A number of advanced financial institutions began quantifying operational risk well before the new proposals from the Basel Committee. It was regarded as essential to develop an economic capital management framework to effectively manage and control all the relevant risks in a consistent manner and to make the most of their capital.

Quantifying operational risk, which was regarded as a key risk factor next to credit risk and market risk, has therefore been regarded as a prerequisite to formulate an effective economic capital management framework.

Initially, risk managers tried to apply VAR to operational risk by using internal and external loss data as the sole basis for statistical analysis. Although these efforts have greatly contributed to the discussion of operational risk management, it has been recognised that this mathematical and statistical approach should be supplemented with qualitative analysis. There are several reasons for this. One is that the industry effort to derive a comprehensive loss distribution by including low-frequency, high-severity loss events from publicly available loss data does not bear satisfactory results. This is especially the case for certain external loss events, such as terrorist attacks.

Further, risk practitioners have noticed that loss data collected by other institutions cannot be applied directly into their own risk models because operational loss events are frequently accentuated by internal control weaknesses in the loss institution.

The more operational risk managers try to utilise the quantification results to improve their institution’s operational risk profile, the more qualitative factors they need to include in their operational risk management approach. Indeed, the Basel Committee now recognises the need to employ both quantitative and qualitative approaches in its AMA to operational risk management.

Definition of operational loss events and losses

Under the new Basel Accord, operational risk is defined as “the risk of loss resulting inadequate or failed internal processes, people and systems or from external events”. There is a general consensus over this high-level definition, although there are still some outstanding questions.

There are seven operational loss events described in CP3: internal fraud; external fraud; employment practice and workplace safety; clients, products and business practices; damage to physical assets; business disruption and systems failures; and execution, delivery and process management. Some events are self-evident in terms of risk, but others are more difficult to define. For example, how should the loss of an office building from collapse during an earthquake be calculated? If that building has been depreciating for some time and has a smaller residual book value, is the loss amount the book value or the reconstruction cost? For operational risk management, the devil really is in the detail.

Operational risk management – the Japanese experience

Operational risk management has been a hot topic for Japanese banking institutions since the publication of the CP2 paper in January 2001. Until recently, Japanese banks have...
relied mostly on qualitative management without quantitative techniques. However, Japanese operational risk managers, who normally have a high level of experience with qualitative risk management techniques, are not averse to using quantification methodologies for operational risk management. Further, Japanese banks have relatively simple business lines and global networks, and this has contributed, ironically, to the fast implementation of group-wide operational risk management frameworks. This environment has led to the participation of Japanese banks in the development of operational risk management within the industry. This effort by the domestic industry has also been supported by the initiatives shown by the domestic regulators, especially through the Basel II process.

**Scenario-based AMA**

The proposed new Basel Accord requires scenario analysis for banks applying for AMA, stating “a bank must use scenario analysis of expert opinion in conjunction with external data to evaluate its exposure to high-severity events”. In other words, scenario analysis is to be used to supplement the ‘missing points’ of the operational loss distribution, namely the low-frequency, high-severity loss events.

A number of institutions, however, have regarded scenario analysis as much more than just a method to supplement the actual operational loss distribution. Instead, they have positioned scenario analysis at the core of their operational risk management framework and used the actual loss data in validating the assumptions made for scenario generation.

Here, scenarios are understood as the loss events that could happen in the future, while loss event data is something more concrete that has happened in the past. By combining scenarios and actual losses, the measurement methodology is able to integrate loss experiences in the past with the possible losses in the future. Scenario-based approaches sound conceptually attractive to operational risk practitioners due to their forward-looking nature.

All operational risk managers have had experiences of near misses, and have imagined scenarios where these could have led to actual losses. So, the creation of scenarios incorporating loss events from these near misses is necessary to measure the operational risk charge for possible future events. A scenario-based approach also creates the ability to respond to changes of business and organisation.

Scenario-based AMA entails several steps, namely scenario generation, scenario assessment, ensuring data quality, determination of parameter values, model application and model output (see figure 1). The actual approaches applied by these institutions can vary in how much weight is placed on particular scenarios, how many scenarios are generated, what kind of parameters are assumed, what kind of models are used, and so on. However, the core concept shared by the scenario-based AMA approach is the scenario-centred concept, rather than the data-centred methodologies.

**UFJ Group’s scenario-based AMA**

UFJ Group started its pilot project for the quantification of operational risk in 1998, and submitted a final paper in March 2001. Reflecting this work, UFJ Holdings, the holding company of UFJ Financial Group, established a dedicated operational risk management desk within its risk management department, and began operational risk capital allocation for its subsidiary banks in April 2001. The original allocation was made to processing risk and systems risk only, and the other risk categories are planned to be included within the risk capital framework in 2004 (see figure 2).

UFJ Group’s operational risk management approach is categorised as an example of the scenario-based AMA, where scenarios are generated based on comprehensive qualitative assessment. It has also focused on the integration of qualitative and quantitative approaches to operational risk management.

Taking the example of processing risk, a group-wide operational risk assessment table of operation process is generated for every facet of processing within the bank, where each process is broken down into some 10 sub-processes. For example, mortgage loan processing includes such sub-processes as: receipt and validation of the loan application; preparation of the internal loan approval form; registration and collateral; and so on. Then each sub-process is assessed in view of internal control weaknesses, with certain standard assessment keys carrying their own scores.

In the example of mortgage loan process-
operational risk between different risk categories - for example, system risk and physical asset risk - are not perfectly correlated, and consequently there should be a diversification effect. In other words, those institutions that calculate the total operational risk charge as the simple sum of the operational risk charges within each of the seven risk categories are overestimating their actual risk exposure.

It is not an easy job to estimate the correlation factors between operational risk sub-categories, where there is not sufficient operational loss data statistically. However, the operational risk charge should reflect the actual risk exposure, and the diversification effect should be taken into account if this materially affects the result of the operational risk measurement.

Second, it is widely agreed that insurance is an effective tool to mitigate operational risk exposure, especially for low-frequency, high-severity events. There are already insurance products that cover at least some form of operational risk exposure, including natural disaster, theft and director’s liabilities. Indeed, most institutions make use of some of these products. Some US and European financial groups have established captive insurance companies for their group. Some of them have a central function that typically establishes insurance management policy, and manages and controls all the insurance contracts that the institution holds globally.

In this regard, Japanese banks can learn more from other global institutions. A central insurance management function is not common for Japanese banks, and neither are captive insurance companies. The new Basel Accord does not act as a key driving factor to motivate Japanese banks in this area, because the risk mitigation effect from insurance has been limited to 20% of the total operational risk capital charge and this would not provide significant incentive for Japanese banks to develop an insurance management framework. Institutions should instead find their own motivation to make the change.

Naturally, there will be more challenges for the development of the operational risk management in the future. As was mentioned, the devil really is in the detail for operational risk management. However, there is a growing need to manage operational risk properly and operational risk managers will have to work even harder.

Kenji Fujii is deputy general manager of the risk management department at UFJ Holdings. He is also lecturing at the Graduate School of Social Sciences, Hiroshima University. He would like to thank Takayuki Ishida and Daisuke Fujita for helpful comments. The views expressed are the author’s and do not necessarily represent the views of UFJ Holdings or UFJ Bank Limited. E-mail: kenji.fujii.wg87@wharton.upenn.edu