June 2006

Discussions on Further Advancing Operational Risk Management (1)
——— Summary of Discussions of the "Study Group on the Advancement of Operational Risk Management"

I. Introduction

In November 2005, the Study Group on the Advancement of Operational Risk Management (hereinafter the Group) began discussions among experienced practitioners of operational risk management to consider various approaches necessary for advancing operational risk management. (See Appendix for members' list.) The Group has taken into consideration discussions abroad and approaches actually adopted by foreign banks with advanced operational risk management expertise (especially pertaining to risk quantification). The Center for Advanced Financial Technology of the Bank of Japan's Financial Systems and Bank Examination Department serves as the Group's Secretariat.

This paper presents the highlights of the discussions at the five sessions held through March 2006.[1]The Group aims to widely disclose its discussions to financial circles in Japan so that each financial institution may refer to them in advancing operational management. This paper is mainly written for financial institutions that aim to establish and strengthen risk management in line with top international practices. Information on discussions at the sixth and subsequent sessions is due to be published in the future.

This paper does not intend to draw conclusions for each of the issues discussed. It simply aims at presenting issues and discussions concerning the advancement of operational risk management. Opinions here are those of members and do not necessarily represent those of the organization each member belongs to.

II. Discussions at the Second Session (held on December 22, 2005)

A. Selecting the type of distribution for risk quantification

1. Potential Issues

Typically, operational risk (in a broad sense) is quantified by the Loss Distribution

[1] At the first session (held on November 29, 2005), members confirmed the Group's management policy and issues for discussion. Actual discussions started from the second session.

Approach (LDA)[2] ― where the loss frequency distribution indicating the number of loss events during a set predetermined period and the loss severity distribution indicating the loss amount per loss event together lead to estimates of the type of distribution of the cumulative annual loss amount.

The Poisson distribution is often used for loss frequency distribution in LDA. In practice, however, there is no convergence towards a de facto practical standard approach in connection with the types of distribution for loss amounts. Likewise, there is no convergence in practice toward a de facto practical standard approach in connection with the methods for estimating (or validating) parameters for types of distribution.

Since risk amounts may vary considerably depending on the types of distribution selected and the methods used for estimating parameters, their selection is an important issue. The fact that there is nevertheless no convergence toward a de facto practical standard approach can probably be attributed to the following circumstances.

(1) There are two categories of operational risk-related losses ― risk events at the quality of process level (high frequency low severity losses) and tail events that do not occur often (low frequency high severity losses) ― and it is difficult to select distribution types that can identify them both accurately.

(2) There is a possibility that the loss data sets held by financial institutions are not sufficient in that they do not necessarily represent the actual risk profile from such viewpoints as number and diversity of samples[3], and observation periods.

2. Participants' Views

When selecting the type of distribution, whether it fits the loss data well is an important deciding factor, but that is not the only one. Given that the loss data held

[2] Sometimes, "scenario-based approach" is also used to refer to a quantification method that primarily uses scenarios and limits LDA to cases of quantification using only actual historical data (internal and external). Here, however, the term "loss distribution approach" is used for an approach that estimates loss frequency and loss severity distributions from data, including scenarios, then combines the two to ascertain the annual cumulative loss distribution. It should also be noted that "loss distribution approach" is used in a broad sense when other approaches are combined with it.

[3] For example, even large numbers of samples may be biased towards specific business lines, event types or entities, or there may not be enough data on tail events, which are important for quantification.

by financial institutions are normally inadequate in terms of the number of samples and their diversity, it is important to select the type of distribution after taking such limitations into consideration.

If, for example, the distribution type that best fits the available data is selected even though these data are insufficient, sensitivity of quantification results to data set could be extremely high (i.e., its stability would be low). In such cases, efforts should be made to make up for the data's defects by formulating scenario data, etc., and models should be adapted to inhibit any instability that defective data may cause in quantification results. In view of the situation, and bearing in mind that information on the superiority of individual approaches is currently limited, each financial institution is expected to select the most desirable data supplementation method and loss distribution type as it carries out sensitivity analyses using different data samples and different types of loss distribution.

Moreover, in light of the insufficiencies of the loss data sets held by financial institutions, one of the following approaches is necessary when quantifying operational risk.

(1) Select a distribution type that fits after drawing up scenario data to supplement data sets[4].

—— The conditions that should be considered when drawing up scenarios are highly dependent on the quantification method adopted. To make sure that choices are objective and persuasive to external observers, therefore, it is important to: (i) identify an image of the scenario data necessary for quantification; (ii) make comparisons with external data; and (iii) ensure a certain degree of comprehensiveness. With regard to (i), it is possible to consider a priori settings for various frequency and severity distributions associated with the overall data, as well as information on the probability of individual events collected from front-line sections and external sources, and to use them in identifying the conditions that the scenario data must satisfy.

(2)Estimate the parameters of the distributions to fit the data set after specifying loss frequency distribution and loss severity distribution using a priori information.

[4] Please refer to "Discussions at the Fourth Session" for views concerning the preparation and the use of scenario data.

An analysis of practices at financial institutions shows a notable preference for approach (1) "Select a distribution type that fits after drawing up scenario data to supplement data sets." This is probably because they are conscious of two points. (i) With approach (2) "Estimate the distribution type parameters to fit the data set after specifying loss frequency distribution and loss amount distribution using a priori information," it is difficult to present management with persuasive arguments concerning the relationship between the selection of distribution type and risk quantification results, or changes in these results. (ii) On the other hand, the fact that scenarios are drawn up in cooperation with front-line sections in the case of approach (1), and that their results are reflected in risk quantification facilitates their application to internal controls.

Whether the management can understand the risk quantification methods easily or not is also an important point when selecting them. Although the management board members should be able to grasp the characteristics of models, they are not necessarily required to understand the contents of these models in detail[5].

One possible way of confirming the source of problems concerning risk quantification methods is to compare these results with risk amounts calculated using BIA (Basic Indicator Approach)/TSA (The Standardized Approach). In the ongoing process of change in risk profiles and the gross income of banks on which BIA/TSA are based, however, it should be well understood that it may become very difficult to interpret these comparative results.

III. Discussions at the Third Session (held on January 26, 2006)

A. How to think about “risk class” and dependency among the units when quantifying risk

1. Potential Issues

Compared with market risk, credit risk and other types of risk, operational risk comprises a diversity of risk factors. It is necessary to adopt numerous assumptions when quantifying operational risk, including types of distribution for loss frequency and loss severity, and independence between loss events. However, operational risk is not easy to quantify under common premises because it comprises a diversity of

[5] This point is discussed on a later date in the session on "Internal controls concerning operational risk, and their application in management."

risk factors. Operational risk events should therefore be classified into groups (herein referred to as "risk class") so that individual groups can then be quantified using common premises for each group.

An analysis of the criteria used in practice by major Japanese and overseas financial institutions for classifying these risk classes shows that they vary, and there is in fact not enough convergence yet toward a de facto practical standard approach. Units are classified by event type, by business line, by event type and business line, by cause of loss, and by legal entity, and in some cases all data are treated as a whole.

Risk class settings and the question of how to establish dependencies[6] between the set risk classes have a major impact on risk quantification results. For example, if the results of quantifications of individual risk class are simply added together, the aggregated risk amounts tend to increase, the more subdivided the risk classes get. In general, on the other hand, the more subdivided the risk classes get, the easier it becomes to fit certain prerequisites. However, the number of data in each risk class decreases and it becomes difficult to perform highly reliable risk quantification estimates without somehow supplementing the data (there is also the possibility that robustness vis-à-vis additional data inputs will be weakened).

When estimating dependencies between risk classes, it is necessary to take into consideration the possibility that the degree of dependency may differ considerably according to the loss amount, for example (specifically, this refers to cases where the dependency in the tail is extremely high even though the dependency in the distribution body is small). In other words, there may be cases where it is inappropriate to use figures (such as correlation coefficients) that show dependencies that flatten overall distribution in order to estimate risk amounts with a high confidence level of 99.9%.

2. Participants' Views

a. Setting risk classes

The following points are kept in mind when setting risk classes for quantification using the standard LDA.

[6] Here, "dependencies" is used to refer to the relationships of risk amounts, loss frequencies and loss amounts between risk classes. In general, the term "correlations" is frequently used, but this paper has adopted the term "dependencies" in order to avoid any confusion with the narrowly-defined dependencies indicated by coefficients of correlation.

(1) Use a single model to handle data within the same risk class (characteristics and causes of losses are common, and identically distributed).
(2) Data bundled in the same risk class are mutually independent.
(3) Secure ample data volumes within a single risk class
(4) It is useful for internal control purposes (for example, consistency between risk classes and actual risk management units)

An analysis of actual practice at financial institutions shows that (3) the number of data and (4) the internal control considerations referred to above are important determinants. Since the absolute number of data is small, there are institutions that adopt classifications based on one criterion instead of the two criteria of event type and business line (matrix classification). A conspicuous number of institutions use event types instead of business lines as their criterion for classifications. This reflects a number of circumstances such that (i) The business lines typically seen in the West do not necessarily match practices at Japanese banks, (ii) Even if business lines are selected in line with practices at Japanese banks, handling dependencies is difficult as like the case of aggregation of losses for multiple sections, (iii) Classifications based on type of event have an affinity with conventional operational risk management (cross-functional management encompassing risk related to manual operations, IT risk and compliance), and (iv) The fact that while the differences between risk profiles based on type of event are large, those between risk profiles based on business line are small.

Although standard approaches to classification methods have not yet converged to within a certain range, it is important to be able to explain in quantitative or qualitative terms that the possibility of underestimating the results of risk quantifications due to adopting specific classifications is small, or that loss data bundled in the same risk class have the same characteristics[7].

b. Handling dependencies
For the risk quantification purpose, dependencies are often considered (i) when classifying individual data, and (ii) when aggregating quantified risk amounts of each unit. It is notable when analyzing practices at financial institutions to find that

[7] It should be noted that Basel II prescribes classifications according to a matrix based on event type and business line for numerical reports to the authorities (although the same classifications are not required for risk quantification <i.e. regulatory capital and economic capital>).

while the responses of (i) tend to adopt methods that lump together mutually related loss data event, those of (ii) tend to adopt methods that seek to ascertain the overall risk amount for the bank by simply adding risk amounts for each risk class.

While it can generally be assumed that risk amounts obtained by simply adding risk amounts for each risk class may exceed the results of quantifications that lump risk classes together without classifying them, it can also be assumed that on occasions the opposite may occur (the so-called "breakdown of subadditivity[8]"). For this reason, it is considered important to perform tests comparing the simple total for the results of quantifications of individual risk classes with the results of quantifications of all risk classes lumped together.

IV. Discussions at the Fourth Session (held on February 23, 2006)

A. Using scenario data pertaining to risk quantification

1. Potential Issues

Using scenario data is one possible approach to supplementing internal loss data (especially low frequency high severity losses) when quantifying operational risk. Preparing scenario data makes it easier to incorporate information pertaining to risk profiles as recognized by the front line sections even though losses have yet to materialize, and is useful in risk analysis and overall management.

When internal loss data supplemented by scenario data are introduced into models when quantifying operational risk, the scenario data determine the majority of the risk amount if much of the low frequency high severity losses are dependent on them. In other words, the risk amount changes considerably according to the scenario data setting, so the extent to which objectivity and persuasiveness to outside observers can be incorporated into the scenario generation process is extremely important.

In connection with the above, the following conditions are likely to become points at issue but there is not as yet enough convergence within the industry concerning related approaches and methodologies.

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[8] When the overall risk amount (in this paper, the overall amount of operational risk for financial institutions) falls below the total of individual risk (in this paper, the operational risk for individual risk classes), said risk amount is said to "satisfy the axiom of subadditivity." The term "breakdown of subadditivity" used here refers to the situation where this relationship does not hold.

(1) Information assumed by scenarios	── Overview of the emerging risk events that bring losses ── Loss amounts ── Frequency of events ── Dependencies between events ── Whether the relationship of loss amounts and frequency of events is estimated as deterministic, or as stochastic as like probability distribution
(2) Sensitivity analysis	── Consider the sensitivity of the results of risk quantifications against the information assumed above in the scenario formulation process
(3) Basis for scenarios and ensuring objectivity	── Corroborate using objective external data ── Corroborate using models that structure causality ── Compare and contrast with standard method in the industry ── Consensus views shared within the organization
(4) Comprehensiveness	── Comprehensiveness of the scenario data from the viewpoint of both the management and front-line sections
(5) Use in risk management	── Methods to ensure that the scenario formulation process and the results of scenario analyses are reflected in improvements in front-line risk management

2. Participants' Views

When formulating scenario data, it is necessary to keep in mind the points below when: a. determining the scope necessary for the purposes of scenario analysis and scenario formulation, and drawing up scenarios from the managerial viewpoint (top-down approach); b. drawing up scenarios from the business lines' viewpoints (bottom-up approach); c. verifying scenarios; and d. applying in management.

a. Determining the scope necessary for the purposes of scenario analysis and scenario formulation, and drawing up scenarios from the managerial viewpoint

(top-down approach)
Scenario analyses have two objectives. The first is to supplement the low frequency high severity loss data that allows appropriate assessments of risk amounts in the tail. The second is to obtain a forward-looking grasp of the risk situation and reflect the profile thus identified in the data.

In line with these objectives, it is necessary to specify the necessary scope for scenario formulation (the overall image of the number of items and the scope for both the amount axis and the frequency axis) from a top-down viewpoint and, where necessary, draw up scenarios from a management viewpoint.

(1) Appropriate assessments of risk amounts in the tail
In order to quantify risk for a holding period of one year at a confidence interval of 99.9% with sufficient precision, it is necessary to clarify to some extent approximately how much scenario data should be prepared (how many data items covering which frequencies and amounts are necessary) in cases predicated on the quantification model (especially the type of distribution assumed) of the financial institution in question.

(2) Forward-looking grasp of the risk profile
Even though actual loss events (risk events) may not necessarily have occurred to date, it is important to use scenario data viewed from a top-down perspective to incorporate into front-line risk management any potential loss events that, so far as one can judge from operational processes, may actually occur with a substantial degree of probability. In addition to conducting regular scenario analyses, it is also necessary to carry out continuous reviews using changes in the business and economic environments and loss events occurring at one's own or other banks as triggers.

b. Drawing up scenarios from the business lines' viewpoints (bottom-up approach)
(1) Drawing up scenarios
Separately from the processes of a., banks are required to discuss and identify from a bottom-up perspective and to a certain degree of detail the kind of operational risk they face (the kind of loss events that might occur and the loss amounts and frequencies involved).

—— Examples of loss events include natural disasters such as earthquakes,

terrorism, embezzlement, misappropriation, remittance errors, the occurrence of system malfunctions arising from development project failures, and damages arising from insufficient explanations to customers.

── As for discussion and identification, it is desirable that the risk management department, etc., or another neutral entity that is independent of front-line operations provides overall coordination, and that front-line sections get involved in this. From a management viewpoint, it is also desirable to confirm the comprehensiveness of these activities.

── At such times, it will probably be advantageous to refer to internal and external loss data (including mass media reports, etc.), examples of past and recent operational risk events in Japan and overseas, topical risks such as cash card counterfeiting, remittance fraud and order issuing mistakes in market transactions and, to some extent, try to anticipate environmental changes that can be expected to occur over the next few years.

(2) Estimating loss severity

One possible way of estimating the loss severity discussed and identified in (1) is to make determinations while referring to actual transactions in each section (data pertaining to transaction amounts, settlement authority, etc.) and external data.

── Indirect losses and opportunity cost should also be estimated wherever possible, not just direct losses[9].

── The basic approach to losses from earthquakes is to calculate the assumed amount of damage to tangible assets (based on the damage assumptions of the central and local governments, calculate individual loss amounts according to the earthquake resistance and structures of buildings, etc.). Projections should also cover indirect expenses (labor costs incurred in repair work, etc.), loss of income due to operational interruptions, and higher credit costs (deterioration in the business conditions of borrowers due to damage to their underlying collateral and the regional economy).

(3) Estimating frequency

Although dependence on expert judgments is unavoidable, reference should also be made to actual in-house data and external databases concerning loss events in order to ensure objectivity. Furthermore, in the case where damages arise from earthquakes, for example, the damage assumptions of the central and local

[9] This point is discussed on a later date in a session on "Preparing data concerning operational risk."

governments can also be utilized. In connection with confidence intervals, deeper analyses of grounds for the frequency assumptions are required in cases where marginal changes in assumed frequencies can have a major impact on the results of risk quantifications (especially in cases where the results of minor changes lead to substantial increases in risk amounts).

(4) Other

Since it is not always easy for front-line sections to estimate the loss amounts and frequency of events for scenario data, the following approaches can be considered.

(i) The risk management department can ask the front-line sections to submit responses in a questionnaire format, and then estimate the loss amounts and frequency of events from a standardized viewpoint.

(ii) As there is a possibility that front-line sections will submit under- or over-estimates for scenarios if the results of risk calculations affect allocations of capital or expense budgets to individual sections, the risk management department should check assumed loss severity and frequency from a standardized viewpoint.

If it is difficult to make one-point estimates (which assume a pair consisting of a loss severity and a corresponding frequency for a particular scenario) when estimating loss severities and frequencies for scenario data (or where it is inappropriate because of the specifications of the quantification model, etc.), it is possible to estimate "width" (assuming multiple combinations of loss amounts and frequencies for individual scenarios <or expressing individual scenarios in the form of distribution type>).

c. Verifying scenarios

It is considered useful to level evaluation criteria (e.g. degree of strictness, degree of refinement) for individual sections or operations, and conduct ex post comparative analyses (verify ex post facto whether actual cases of operational risk occurring after a scenario analysis were forecast by said scenario analysis, and evaluate the comprehensiveness and predictive capability of the scenario analysis). The entities responsible for verification could be either the supervisory divisions in charge of individual business lines, or the operational risk control function for the entire bank. Internal auditors are required to check the verification process itself.

Possible methods for enhancing the external persuasiveness, objectivity and comprehensiveness of scenario data include ascertaining whether the scenario data set obtained from analysis results, for example, satisfies the requirements of a. above (verifying the adequacy of scenario data). Institutions can consider verifying the adequacy of scenario data by deleting several scenarios from their own risk profiles, then using their own models to calculate the extent to which risk amounts changed before and after (sensitivity analyses under rational assumptions).

If the results of the verification show that the requirements are not satisfied, it is to be hoped that the institution in question will supplement the scenario data so that they satisfy the requirements, or review its quantification model (or assumed distribution type) so that it fits with current scenario data. Additionally, comparisons with external data or practices of other banks, etc., pertaining to scenarios can also be considered useful for enhancing external persuasiveness, objectivity and comprehensiveness.

d. Applying in management

It is also important that appropriate explanations to management of key scenarios that have a major impact on risk amounts lead to enhanced understanding of the risk profile and consideration of countermeasures.

V. Discussions at the Fifth Session (held on March 28, 2006)

A. Taking into account operating environmental and internal control factors associated with risk quantification

1. Potential Issues

When only the internal loss data are used for calculating risk amounts, the very fact that they are historical means that risk amounts do not necessarily reflect the latest business environment and internal control factors. If the situation affecting the business environment or internal controls has changed recently, therefore, it is necessary to incorporate these changes into the quantification results in some form or other.

- Depending on the quantification method, the effect of anti-recurrence measures is not necessarily reflected in the risk amount even in cases where huge amounts of actual historical losses occurred but then measures are formulated to prevent the risk from recurring.

More specifically, the use of qualitative risk evaluation ratings to adjust risk amounts, and the linkage of specific Key Risk Indicators (KRI) with risk amounts can be considered in addition to the use of scenario data (including the exclusion and scaling of specific internal loss data). Qualitative risk evaluation methods include Control Self Assessments (CSA), evaluations by the risk control function, evaluations by the internal auditor, and adjustments in accordance with managerial judgments.

However, there remains to be seen enough convergence, even within the industry, as to the precise definitions of "business environment" and "internal control factors" as referred to in this paper, or the types of measures that should be used to reflect them in risk amounts, and it is difficult to ensure the objectivity of the methods themselves.

It is also hoped that using such methods will strengthen the incentive to reduce risk amounts by reflecting the results of risk reduction efforts by individual sections. However, given that there has not been enough convergence toward defining business environment or internal control factors, or reflecting them in risk amounts, strong front line opposition to incorporating them directly into an incentive system might be expected.

2. Participants' Views

In the case where business environment and internal control factors are factored in, it is important for the scenario to accurately reflect the most recent situation affecting banking operations. From this viewpoint, the scenario data must satisfy the conditions that have been discussed, in particular incorporating information suggestive of recent changes in the business environment and/or the results of internal evaluations of the risk management situation.

- As it is sometimes difficult to anticipate revisions of regulations, etc., it is sufficient to factor them into scenarios when the probability of such revisions has increased.

In cases where risk amounts are revised using qualitative evaluations pertaining to the risk management situation, approaches such as the following should be considered in order to enhance objectivity and persuasiveness.

(1) In light of the limitations on the objectivity of qualitative evaluations, establish limits to the extent of revisions in advance in order to avoid huge short-term changes in capital requirements (e.g. limit revisions to x% of upper and lower ceiling).

(2) Carry out ex post facto verifications of the relationship between qualitative ratings and actual risk events, and between the results of risk amount revisions and actual risk events.

(3) Conduct organization-wide studies of qualitative evaluations, and approve them. As with scenarios, it is important to find out whether evaluation levels do not differ from section to section or from operation to operation, whether the operational risk control function or the internal auditors check the results of evaluations of each section, and whether management approvals are obtained.

(4) Finally, in cases where it is later discovered that, as a result of nonfeasance or negligence on the part of individual section managers, the results of risk countermeasures are overestimated or risk profiles (or changes therein) are underestimated, it is important to create performance evaluation schemes that may impact the responsibilities of managers in business sections. Possible examples include: the case in a. where an internal audit highlights heightened risk for the first time; and the case in b: where the manager of the section in question may be subject to penalties because he did not carry out appropriate evaluations based on the "hoped-for" duties of care, and failed to identify the risk in question until the accident actually occurred. On the other hand, it is also important to continue creating a “corporate culture” whereby the front line takes the initiative in curtailing risk, while at the same time remaining aware that explicit incentive systems always have their limitations.

Apart from risk amount adjustment methods that use the above-mentioned qualitative evaluations, there are also methods for estimating risk amount by verifying the risk management situation using CSA, etc., and reflecting this in scenario data frequencies and severities.

Even if measures are adopted to prevent the recurrence of operational risk events following a huge loss but the model's enlarged quantification results are allowed to stand as they are, the question emerges of how to factor the recurrence

countermeasures into risk quantification and sectional allocations of quantification results. Various approaches can be considered for this, including: (i) not using the loss data associated with the causal event in quantifications (deleting it from inputs into the quantification model); (ii) adjusting scenario analyses (adjusting frequency and loss severity); and (iii) deducting risk equivalent amounts matching the causal event in question from allocated risk amounts when allocating the results of quantifications to individual sections. As yet, however, enough convergence has not yet been reached on a de facto practical standard approach.

In general, KRI is not directly used in adjusting risk quantifications because it is difficult to uncover risk factors that develop in a common manner when the risk profiles of individual sections differ. However, some institutions use KRI when adjusting frequencies and amounts for scenario data.

Another pending issue is the creation of a mechanism that can persuade the front line to agree to the verification of CSA by the risk control function or internal auditors, or their use in CSA results evaluations. However, it is important to establish appropriate checking functions and incentive schemes in order to ensure more accurate risk evaluations, and necessary to consider mechanisms that enable internal auditors and operational risk control function to secure these functions by stipulating risk evaluation criteria.

B. Risk amount allocation criteria

1. Potential Issues

The discussion on allocating risk amounts broadly breaks down into two topics: (i) the home-host issue[10] and (ii) internal management issues[11]. At this time, however, the discussion focused on (i) the home-host problem (the current session also touched on (ii) internal management issues briefly, although a future session is scheduled to discuss it in a section entitled "Internal controls concerning operational

[10] In cases where risk amounts for the entire group are quantified while taking into account the risk diversification effect between entities, and said risk amounts are allocated among individual subsidiaries on a top-down basis, the problem is how to deal with the possibility that when overseas (host country) subsidiaries are viewed on a non-consolidated basis, their capital may be underestimated <in particular, cases may arise where the parent bank in the mother country (home country) cannot provide smooth capital support>.

[11] In the same cases with the above but all entities are domestic ones, the risk amounts allocated may differ from the risk situation recognized by the subsidiaries. The problem in this case is how to deal with the possibility that the subsidiary in question may find it difficult to proactively manage risk based on the quantified, allocated risk.

risk and their application in management").

2. Participants' Views

Risk amounts should be calculated for each section and division in order to utilize risk quantification results in comparing risk for each section and division, and applying incentives. However, since data limitations make it difficult to quantify risk at the organizational unit level with the precision required for internal management, it is necessary to allocate bundled quantification results to individual sections and divisions using some kind of indicator.

Risk amount allocation results become particularly problematic in the case where the regulatory capital of locally incorporated subsidiaries overseas is calculated using the allocation method. There are two problems: (i) when risk amounts (factoring in the diversification effect) calculated for the group as a whole are subject to simple allocation, the capital of the subsidiary taken on its own may be underestimated; and (ii) it is necessary to devise allocation methods that reflect the risk of individual subsidiaries (the crux of the home-host problem).

Depending on their future overseas strategies, the home-host problem could well become an important problem for Japanese banks. Within Japan, too, problems can arise in cases where the regulatory capital of regional banks under a bank's umbrella, etc., is calculated using the allocation method because the subsidiary banks may find it difficult to manage if they do not know how the risk amounts are allocated.

If the allocation method is used by locally incorporated subsidiaries overseas when calculating regulatory capital adequacy ratios and the risk amount changes, it is desirable to be able to identify to some extent how much is due to changes in the risk profile of the local subsidiary itself, and how much to the diversification effect.

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