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Subject: Proposed Principles for Supervisory Review of Model Validation

Ladies and Gentlemen:

On behalf of the Model Validation Working Group of the American Bankers Association,[1] this letter proposes some principles for supervisory review of the model validation process of a banking organization. The Working Group is composed of financial modeling professionals from 23 regional and money center banking firms. As seasoned financial model developers and validators for major financial institutions, we suggest clarification of some supervisory practices based on Working Group members' interactions with supervisory examiners with respect to:

- independence in model validation,
- the role of internal audit in model validation,
- model validation prior to implementation into production, and
- group validation of vendor models.

[1] The American Bankers Association, on behalf of the 2.2 million men and women who work in the nation's banks, brings together all categories of banking institutions to best represent the interests of this rapidly changing industry. Its membership – which includes community, regional and money center banks and holding companies, as well as savings associations, trust companies and savings banks – makes ABA the largest banking trade association in the country.

Clearly, systematic quantification of business processes through modeling has become a very important tool in bank decision making. The federal banking agencies have taken note of this development and drafted supervisory principles for validation of models. For example, OCC Bulletin 2000-16[2] and the U.S. Basel II proposal of September 2006[3] include such supervisory principles.

A core supervisory tenet is that there are three lines of defense in model validation. First, model builders are expected to follow due diligence in developing a model. Second, there should be independent validation of the model. This should include review of the logical and conceptual soundness of the model, benchmarking against other models or alternative data sources, and outcomes analysis through back-testing. Third, Internal Audit is responsible for reviewing and reporting to the board of directors as to whether the validations of all the institution's models were performed consistently with the institution's policies.

Despite the guidance issued by the banking agencies, several Working Group members have experienced significant differences of opinion with their examiners over model validation procedures. Moreover, discussions within our Working Group have indicated that there are differences in expectations among different teams of examiners.

Based on this experience, the Working Group offers the following suggestions:
- Supervisors should not rigidly enforce any requirement of structural independence between the staff that develop models and the staff that validate models. Competence and autonomy of validators is more important.
- In model validation, internal audit has a function that is distinct from that of independent validators, and should not be expected to replicate the validators' work.
- Full independent validation of a model before it is put into operation is impractical, and in many cases can interfere with bank risk management.
- Supervisors should accept a reputable validation by a consortium of banks of the base models embedded in a vendor-developed system, and consortium members should not be required to do separate validations.

These suggestions are discussed in greater detail below.

Independence in Model Validation

Some Working Group members have had examiners who demanded strict structural independence between model developers and model validators, insisting that the two teams be employed in separate departments within the institution. We believe that structural independence is neither necessary nor sufficient to assure independence in validation and may force inefficient use of

[2] Office of the Comptroller of the Currency, *OCC Bulletin* OCC2000-16, May 30, 2000, www.ffiec.gov/ffiecinfobase/resources/retail/occ-bl2000-16_risk_model_validation.pdf.
[3] *Federal Register* 71(185) 55830, Sept. 25, 2006, www.fdic.gov/regulations/laws/federal/2006/06proposeAC73.pdf.

resources. We recommend broader latitude in assessing the independence of model validators, which is also suggested in the newly proposed Basel II supervisory guidance.[4]

Regulators and practitioners agree on the importance of model validation being independent from model development. Without competent autonomous review, the integrity of a model could be compromised and there could be serious consequences for the institution. However, it is equally important that independence in model validation not be defined strictly in terms of organizational structure. In fact, structural barriers between developers and validators do not ensure the integrity of the validation process. For example, developers can be in an entirely separate department, and yet be able to communicate with and convince, or otherwise pressure, the validators to certify a model without doing appropriate testing. Nor are strict structural barriers necessary to assure independence. Validators can operate autonomously in validation even when they are in the same office as developers – as long as the developers do not influence the validators. In other words, requiring validators to have independence in making a determination on a model is not the same thing as requiring that the organization structure exemplifies independence.

Moreover, supervisor-imposed organizational barriers between developers and validators lead to inefficient use of modeling expertise within an institution. Such enforced separation can prevent the model validation unit from providing specialized, value-added services to the bank. For example, during the course of a validation, independent reviewers may discover flaws in a model, in which case they may best understand how to fix the problem. For another example, a line of business may request that the validation team help build a specific model because of special expertise, or good working relationships with, team members. In either case, functional independence can be restored in the model validation process if other qualified personnel within the validation unit, or else outside the unit and the business line, are available to re-validate the model.

With the number of models that banking firms have come to employ, and the high salaries of competent modelers, having to segregate model development and validation staff, all with similar specialized skills, can be an expensive waste of talent. It can mean that all too often the institution has to go outside to find validators even though there are qualified autonomous validators available among the model building staff. And to satisfy examiners, developers and validators may have to receive training separately. But developers and validators cannot be totally isolated, since the developers will normally need to communicate with the validators to explain a model and its development. Where is the efficient compromise on the degree of partition?

The Working Group suggests the following principles:

- To achieve independence in model validation, the validators do not need to be structurally independent from the model developers in the bank's organizational hierarchy.
- Autonomy between the model development and validation processes – where the validators do not have primary or direct responsibility for building the model, and the developers do not influence the validation – is sufficient to assure independence.

[4] Federal Deposit Insurance Corporation, Federal Reserve System, Office of the Comptroller of the Currency, Office of Thrift Supervision, "Proposed Supervisory Guidance for Internal Ratings-Based Systems for Credit Risk, Advanced Measurement Approaches for Operational Risk, and the Supervisory Review Process (Pillar 2) Related to Basel II Implementation," Feb. 15, 2007, www.fdic.gov/news/board/07feb15reg.pdf, section S 7-2 on pages 102-103.

- It is more important that the validators have sufficient skills to do the validation, and are capable of understanding the model's nuances and mathematical formulae.
- The board-approved model validation policy should include a provision on the essential independence of the model validation process from the influence of model developers. Internal Audit is responsible to ensure that this provision is enforced.

The Role of Internal Audit in Model Validation

The third line of defense in model validation is the internal audit. Some Working Group members have had experiences with examiners who expected internal auditors to essentially replicate the review of the model validators. Such duplication is unproductive. Auditors have an important and separate role from validators, and should not serve simply as checkers checking checkers.

The essence of the problem is that model validators and internal auditors need different skill sets. It would take exceptional individuals to be competent in both roles. Instead of redoing the validators' work, the auditors have important and distinct roles. The role of Internal Audit is to make sure that:

- appropriate controls are in place for the model validation exercise;
- validations follow the policy and procedures of the bank, as approved by the board of directors (or its designee);
- the data is valid from the source systems;
- the modelers react to post-validation recommendations by the validators; and
- its findings are reported at least annually at the appropriate level of the bank.

This is not to say that internal auditors cannot competently perform some model validation. Auditors may have the expertise to review models that are not based on theory or assumptions, where validation does not require a high degree of modeling know-how. Examples of such "non-model models" or calculators include compliance screening systems and financial statement spreadsheet software.

Note, however, that it is not necessary for Internal Audit to be structurally independent of model validation. While the internal audit function is different from the model validation function, it is not necessary for the staffing for these separate functions to be separated within an organization. In some banking firms, the model validation unit is housed within the Internal Audit group. The point is that the staffs are different, not that they should be divided.

Model Validation Prior to Implementation into Production

OCC 2000-16, in defining responsibilities in model validation, states that, consistent with best practices, policies should specify that, before a model can enter production:

- the independent model validation unit or external reviewer must document the model validation tests and the reasons for concluding that the model is valid, and
- internal audit must verify that no models enter production without formal approval by the validation unit.

Some Working Group members report that examiners have interpreted this passage to mean that a model must go through full independent validation before it is put into operation. However, prior comprehensive independent validation is generally impractical, and in many cases can impede bank risk management.

Bank supervisors need to realize that full independent model validation prior to implementation is not feasible in many cases. For a true test, some models must be implemented to see how they work in production, and then outcomes results must be collated for a period of time for back-testing. In some circumstances, management may judge that there is immediate need for a model before independent validation can be fulfilled, in order to control risk. In such cases, the judgment is that the benefit of immediate implementation outweighs the risks of using a pre-validated model. With reasonable budget limitations on validation staffing, a model should be allowed to be in a queue for validation and put to use while waiting its turn.

The Working Group suggests the following interpretation for supervisors. For a high-impact model – one that applies to a large business volume and thus has significant impact on the revenues and earnings of the bank over the next year – there needs to be independent validation prior to the implementation. Even in this case, the independent validation must as a practical matter be limited to:

- developmental evidence and out-of-sample testing, where available;
- the conceptual framework of the model;
- the documentation prepared by the developers; and
- judgment of whether the model will be used in a manner consistent with the purpose for which it is intended.

This prior validation should not require a full-blown validation. The supervisors can require the bank to complete the full validation as soon as sufficient outcomes data is available. Internal audit can verify that a new model enters production and that full validation is completed later in timely fashion.

New models that are not high-impact models could be put in a queue for the prior validation or be put into operation with the approval from the internal audit that the full-blown validation will be followed in timely fashion.

Group Validation of Vendor Models

Vendor-developed models in use in a number of financial institutions tend to be large and complex systems with one or more engines that are based on well-known paradigms and concepts from academic or practitioner literature. Since these base models are common to all of the users, full and proper validation of that part of the vendor system contains the same steps and methodology irrespective of the institution using the system. These base models are the most complex parts of the vendor system and take the most effort to validate (otherwise, institutions would develop the models themselves), so replication of the validation by each user can be an unnecessary duplication of efforts.

A more efficient and effective approach would be collaboration on validation of the system – if supervisors will accept this approach. Cooperative validation of the system can yield considerable savings in industry expenses and the release of hard-to-find skilled personnel for validation of other aspects of the vendor-developed systems. And vendors may be more open with independent third party validators than with user institutions.

The Working Group, therefore, suggests that the bank supervisory authorities should allow:

- banks to work together in a consortium to validate collectively the base models in a vendor model;
- the consortium to hire an independent, reputable third party to do the validation; and
- an individual institution to rely on that consortium validation if it has participated in the group.

To reiterate, these suggestions apply only to validation of the base models in a vendor-developed system. Consortium banks would still be responsible for validation of the implementation of the application of the system within their own specific operations.

Conclusion

The Working Group very much appreciates consideration of the supervisory principles put forth in this letter. Please contact Robert Strand of the American Bankers Association at (202) 663-5350 if you would like to set up a broader discussion of the suggestions raised herein.

Sincerely,

Ashish Dev

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