Comptroller of the Currency
Administrator of National Banks
US Department of the Treasury

ENSURING A SAFE AND SOUND
NATIONAL BANKING SYSTEM
FOR ALL AMERICANS

Validation of Credit Rating and Scoring Models

A Workshop for Managers and Practitioners

February 2-3, 2006
The Omni Shoreham Hotel
Washington, DC

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Welcome

Welcome to ***Validation of Credit Rating and Scoring Models***, a workshop sponsored by the Office of the Comptroller of the Currency (OCC). That you for attending, we hope you find the conference useful and informative.

For some time, banks have relied upon automated statistical models for assessing borrower creditworthiness during the underwriting process. Increasingly, banks are using rating and scoring models for measuring and managing portfolio credit risk. Even those banks that not participated in this recent trend will have to develop models if they choose to participate in the advanced internal ratings-based (AIRB) approach to regulatory capital.

The application to portfolio credit risk and regulatory capital elevates the level of model risk in rating and scoring models. This implies a commensurate increase in the emphasis that must be placed upon model-validation as a control.

The banking industry and OCC have identified sound validation principles over the years, and we have elaborated on those principles in OCC Bulletin 2000-16. This workshop expands upon 2000-16 in two ways. First, we discuss the application of those general validation principles to the specific case of scoring and rating models. Second, we describe the degree of validation rigor that we expect to become the industry standard for portfolio credit-risk models.

The Office of The Comptroller of the Currency

The OCC was established in 1863 as a bureau of the U.S. Department of the Treasury to charter, regulate, and supervise all national banks. It also supervises the federal branches and agencies of foreign banks. Headquartered in Washington, D.C., the OCC has four district offices plus an office in London to supervise the international activities of national banks.

The OCC is headed by the Comptroller, who is appointed by the President, with Senate confirmation, for a five-year term. The Comptroller also serves as a director of the Federal Deposit Insurance Corporation and as a director of the Neighborhood Reinvestment Corporation.

The OCC's nationwide staff conducts on-site reviews of national banks and provides sustained supervision of bank operations. OCC staff analyze a bbank's loan and investment portfolios, funds management, capital, liquidity, sensitivity to market risk, and compliance with applicable laws and regulations. They review banks' internal and external audit and risk-management information systems to help evaluate bank management's ability to identify and control risk.

The agency issues rules, legal interpretations, and corporate decisions concerning banking, bank investments, bank community development activities, and other aspects of bank operations. In regulating national banks, the OCC has the power to

· Examine the banks.
· Approve or deny applications for new charts, branches, capital, or other changes in corporate or banking structure.
· Take supervisory actions against banks that do not comply with laws and regulations or that otherwise engage in unsound banking practices. The agency can remove officers and directors, negotiate agreements to change banking practices, and issue cease and desist orders as well as civil money penalties.
· Issue rules and regulations governing bank investments, lending, and other activities.

The OCC does not receive any appropriations from Congress. Instead, its operations are funded primarily by assessments on national banks. National banks pay for their examinations, and pay for the OCC's processing of their corporate applications. The OCC also receives revenue from its investment income, primarily from U.S. Treasury securities.

An Important Note

The workshop organizers have worked hard to put together a set of presentations that describe sound model-risk control processes in the context of credit rating, scoring, and portfolio credit-risk measurement and management. Nevertheless, the fact that a particular procedure is described during a presentation does not necessarily imply that the OCC requires or expects banks to implement the procedure; nor does it imply that a particular set of procedures will necessarily ensure a sound validation process. Statements made by presenters are their own, and do not necessarily represent the views of the Office of the Comptroller of the Currency or the U.S. Department of the Treasury.

Program Overview

Validation of Credit Rating and Scoring Models

The Omni Shoreham Hotel
Washington, DC 20008

Thursday, February 2, 2006

10:00am-1:00pm On-Site Registration
The Regency Ballroom Prefunction Area

1:00 Workshop Opens
All presentations will be be held in the Regency Ballroom

1:00-1:30 Opening Remarks: **Model Validation as a Process**

1:30-2:45 Session I: **Building and Validating Credit Rating and Scoring Models**

2:45-3:00 Break
All Breaks will be held in the Ambassador Ballroom

3:00-4:15 Session II: **Evaluating Discriminatory Power and Forecast Performance**

4:15-4:30 Break

4:30-5:15 Session III: **Examples of Model Design and Quantification**

5:15-6:00 Audience Discussion

6:30-8:00 Reception
The Empire Ballroom

Friday, February 3, 2006

7:00am Breakfast

8:00-8:45 Session IV: **Process Verification and Data Maintenance**

8:45-9:00 Break

9:00-10:15 Session V: **Monitoring and Benchmarking**

10:15-10:30 Break

10:30-12:00pm Session VI: **Industry Panel and Audience Discussion**

12:15-1:30 Lunch and Speech by Comptroller Dugan
The Empire Ballroom

1:45-3:00 Session VI: **Validation as a Control Function Under Basel II**

3:00pm Workshop Ends

Session Detail

Opening Remarks: Model Validation as a Process

Jeffrey Brown, Senior Deputy Comptroller
OCC International and Economic Affairs

Jeffrey A. Brown is the Senior Deputy Comptroller for International and Economic Analysis in the Office of the Comptroller of the Currency. At the OCC, Brown also served as the director of the Risk Analysis Division. He has published research on the causes of bank failure, the condition of real estate markets, the risks of bank lending to real estate activities, bank behavior in reserving for loan and lease losses, and bank cost efficiencies and credit rating. As a policy advisor at the OCC, Brown has worked on a broad range of issues dealing with risk management, risk measurement, and risk modeling practice. He has participated in the group developing the U.S. interagency supervisory implementation procedures for the internal ratings-based approach to the new Basel Capital Adequacy Framework. Brown holds a PhD. in economics from Brown University.

Session I:
Building and Validating Credit Rating and Scoring Models

Dennis Glennon, Deputy Director for Credit Risk Modeling
OCC Risk Analysis Division

Credit rating and scoring models are used for multiple purposes: underwriting, account management, pricing, and economic capital allocation. As such, the models should be designed to reflect the specific purpose for which the models will be used. Credit scoring models used for underwriting and account management purposes are generally developed to identify relative risk across the portfolio; however, models used for pricing and capital allocation should be constructed to measure absolute risk.

There are industry-accepted methods for constructing and validating credit rating and scoring models. These methods are designed primarily to assess the discriminatory power of the models. In this session, we discuss several of the more commonly used model development and diagnostic tools. We demonstrate the importance of applying a broad range of diagnostic and validation tests to assess the reliability of model performance.

Session II: Evaluating Discriminatory Power and Forecast Performance

C. Erik Larson, Lead Expert for Enterprise Risk
OCC Risk Analysis Division

Increasingly, credit models are being relied upon to produce accurate forecasts of individual loan performance. This presentation considers estimation technique and model assessment when accuracy and goodness-of-fit are modeling objectives.

Session III: Examples of Model Design and Quantification

Mitch Stengel, Lead Expert for Basel II
OCC Modeling and Analysis

Earlier presentations have laid the conceptual groundwork for rating and scoring model validation. This presentation applies that conceptual framework to a concrete example in the form of a bank's risk rating model for its corporate portfolio. While the names and specific details have been changed, this case study is based on current practice at a number of large national banks.

The case study goes through the principal stages of risk rating model design and construction, from data sample selection through the analysis of a hold-out / out-of-time sample. It illustrates and emphasizes the importance of validation processes (developmental evidence) at every step of the way. Finally, it shows that, in spite of differences in detail and terminology, the model building process and concomitant validation activities are fundamentally the same for retail and wholesale portfolios.

Session IV: Process Verification and Data Maintenance

Michael Carhill, Director
OCC Risk Analysis Division

OCC Bulletin 2000-16 points out that models have three components: inputs, processing, and outputs. Most of the intellectual discussion about model validation turns around the validation of outputs, and this conference focuses on that area. However, most of the resources required for a sound validation process will be expended in the validation of inputs and processing. A good validation process will ensure that a model is functioning as intended. In a loose sense, it is practicable to achieve perfection in the model inputs and processing, while it is impossible for model outputs to be perfect. This suggests why some believe that a good model-validation process is successful when it can guarantee that the models are "perfectly wrong."

Session V: Monitoring and Benchmarking

M. Nazmul Hasan, Lead Expert for Credit Risk Modeling
OCC Risk Analysis Division

This presentation provides a conceptual framework for ongoing monitoring and benchmarking. Although monitoring and benchmarking may appear to be two distinct and independent validation processes, effective monitoring cannot be conducted without appropriate benchmarking. This may include front-end analysis of the score distribution, back-end analysis of performance measures, and analysis of risk characteristics (risk drivers). To conduct such analyses the common benchmarks considered are development sample and alternative models. Banks should continue to explore and develop new statistical methodologies and quantitative techniques for this element of validation.

Industry Panel

Chaired by Nicholas M. Kiefer
Cornell University and OCC Risk Analysis Division

Luncheon Speaker

John C. Dugan, Comptroller of the Currency

John C. Dugan was sworn in as the 29th Comptroller of the Currency in August 2005. Prior to his appointment as Comptroller, Mr. Dugan was a partner at the law firm of Covington & Burling, where he chaired the firm's Financial Institutions Group. He specialized in banking and financial institution regulation. He also served as outside counsel to the ABA Securities Association.

He served at the Department of Treasury from 1989 to 1993 and was appointed assistant secretary for domestic finance in 1992. While at Treasury, Mr. Dugan had extensive responsibility for policy initiatives involving banks and financial institutions, including the savings and loan cleanup, Glass-Steagall and banking reform, and regulation of government-sponsored enterprises. In 1991, he oversaw a comprehensive study of the banking industry that formed the basis for the financial modernization legislation proposed by the administration of the first President Bush.

From 1985 to 1989, Mr. Dugan was minority counsel and minority general counsel for the U.S. Senate Committee on Banking, Housing, and Urban Affairs. There he advised the committee as it debated the Competitive Equality Banking Act of 1987, the Proxmire Financial Modernization Act of 1988, and the Financial Institutions Reform, Recovery, and Enforcement Act of 1989.

Among his professional and volunteer activities before becoming Comptroller, he served as a director of Minbanc, a charitable organization whose mission is to enhance professional and educational opportunities for minorities in the banking industry. He is also a member of the American Bar Association's committee on banking law, the Federal Bar Association's section of financial institutions and the economy, and the District of Columbia Bar Association's section of corporations, finance, and securities laws.

A graduate of the University of Michigan in 1977 with an A.B. in English literature, Mr. Dugan also earned his J.D. from Harvard Law School in 1981. Born in Washington, D.C. in 1955, Mr. Dugan lives in Chevy Chase, Md., with his wife, Beth, and his two children, Claire and Jack.

Session VI: Validation as a Control Function Under Basel II

Mark Levonian, Deputy Comptroller
OCC Modeling and Analysis

The Basel II framework includes explicit expectations for robust validation of banks' credit-risk systems under the internal ratings-based (IRB) approach to capital. Banks using IRB must validate their internal processes for differentiating risk as well as for quantifying that risk. Validation should be viewed as an integral part of the broader control processes around IRB systems, and evaluated within the context of those other controls. Generally accepted validation principles and generic types of validation tools can and should be applied. However, the specifics of validation may be different in this new setting, and banks are likely to need new tools and data.

Expert Profiles

MIKE CARHILL

Mike Carhill joined the Office of the Comptroller of the Currency as a financial economist in the Department of Economic and Policy Analysis in 1991. After serving as Deputy Director from 1995-2003, in December 2003 he was appointed Director of the Risk Analysis Division (RAD). Before joining the OCC, Carhill served as a staff economist with the Federal Home Loan Bank of Atlanta, and researched the role that interest-rate risk plays in thrift profitability. Carhill holds a Ph.D. in monetary theory from Washington University.

DENNIS GLENNON

Dennis Glennon is Deputy Director for Credit Risk Modeling in the Risk Analysis Division at the Office of the Comptroller of the Currency. His research interests are in the areas of credit scoring, credit risk modeling, and bank failure analysis. His current research projects include the application of maximum entropy econometric techniques to bank-failure and loan-default modeling, the development of competing-risk models of SBA loan default and prepayment behavior, and the development of alternative methods of assessing model risk. He actively participates in the supervision of retail lending and mortgage credit-scoring and pricing models. Glennon received his doctorate in economics from the University of Missouri - Columbia.

M. NAZMUL HASAN

M. Nazmul Hasan is Lead Expert for Credit Risk Modeling in the Risk Analysis Division at the Office of the Comptroller of the Currency. In his supervisory experience, Hasan has worked on such subjects as credit scoring, risk rating, pricing, and asset valuations. Prior to joining the OCC, Hasan was a senior manager in the Customer Information Management Division at American Express and an assistant professor at Illinois State University. His research interests include both theoretical and applied topics in economics. Hasan holds a master's degree in statistics and a Ph.D. in economics from the University of Illinois at Urbana-Champaign.

NICHOLAS M. KIEFER

Nicholas M. Kiefer is the Ta-Chung Liu professor of economics at Cornell University, where he is a member of the graduate field faculties in economics, statistics and hospitality administration. He is widely known for his theoretical and applied contributions in the econometric modeling of duration data, the estimation of dynamic programming models under learning, and financial market microstructure. Kiefer's current research includes applications in financial economics, credit scoring and risk management, consumer trend forecasting, and development of quantitative management techniques for the restaurant and retail industries. Kiefer is an internationally recognized expert, having published in excess of 100 journal articles. books, and reviews. He is a Fellow of the Econometric Society, and a past recipient of the Guggenheim Memorial Fellowship.

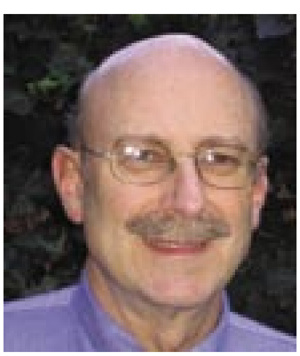
C. ERIK LARSON

C. Erik Larson is Lead Expert for Enterprise Risk the Risk Analysis Division of the Office of the Comptroller of the Currency. His present work involves traveling to the largest of our nation's banks and examining the models developed and used by these institutions to measure and manage risk. Larson's research focuses on statistical and econometric issues in the modeling of credit risk and economic capital. Prior to joining the OCC, Larson analyzed and developed individual and corporate income tax policy in the Office of Tax Analysis at The Treasury. He also taught courses on probability, statistics, and econometrics while on the faculty of the University of Southern California School of Business Administration, and served as a private consultant, specializing in the development of methods to value financial assets. Larson holds a Ph.D. in economics from Cornell and a B.A. from Syracuse University.

MARK LEVONIAN

Mark Levonian is Deputy Comptroller for Modeling and Analysis at the Office of the Comptroller of the Currency. Previously, he served as vice president of Banking Supervision and Regulation at the Federal Reserve Bank of San Francisco. In addition to publishing extensively, Levonian has taught finance at San Jose State University and the University of California at Berkeley and has been an advisor or consultant to the International Monetary Fund, the World Bank, and various foreign central banks. He holds a Ph.D. in economics from M.I.T. and a B.A. in economics from the University of California.

MITCHELL STENGEL



Mitchell Stengel is Lead Expert for Basel II in the Modeling & Analysis department of the Office of the Comptroller of the Currency (OCC). He has served on numerous Basel committees and task forces at the international and U.S. levels since 2000, with a primary focus on the retail credit aspects of the new Accord. Prior to his Basel work, he was Deputy Director of the Credit Risk Modeling unit in the OCC's Risk Analysis division (RAD); in the early 90's he did research on fair lending issues in residential mortgage markets. Stengel holds an A.B. from the University of Michigan and a Ph.D. from Harvard University. Before coming to Washington, he taught economics at the University of Michigan and Michigan State University.