

Automated valuation models:

Changes in the housing market require additional risk management considerations



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Overview

From 2003 to 2006, the US residential real estate market experienced an unprecedented increase in the volume of real estate financing transactions. Growth was driven by low interest rates and rising property values which led to unprecedented numbers of new home purchases, refinancing of debt on existing homes, and new home equity loan transactions. During this time period, there was a need to increase the speed and lower the costs associated with real estate financing transactions. This need led many institutions to use automated property valuation tools in underwriting, risk management, and internal control activities such as fraud detection and prevention, borrower default and prepayment modeling, and loss mitigation. The combination of these phenomena resulted in an increased use of Automated Valuation Models (“AVMs”)¹ for determining or confirming the value of property securing real estate financing transactions.

Over the past several months the real estate and mortgage banking industries have experienced unparalleled change. Delinquency and foreclosure rates are on the rise causing lending institutions to re-evaluate their product offerings, credit practices and operational policies and procedures. Many real estate markets are experiencing declining values and/or uneven appreciation while other markets are flat and/or appreciating. The

volatile market has made it difficult to estimate or confirm property values in many geographic areas of the country causing lending institutions to re-evaluate their property valuation processes.

On May 16, 2005, the federal banking agencies² released interagency guidance³ applicable to all financial institutions engaged in home equity lending (both home equity lines of credit and closed-end home equity loans). The guidance outlines expectations for sound risk management practices for home equity lending programs. One particular element of the guidance⁴ addresses collateral valuation management practices. Specifically, the guidance states that, for institutions to use AVMs to support property appraisals in a safe and sound manner, institutions must validate the AVMs periodically to “mitigate the potential valuation uncertainty” in the model, and to ensure that institutions utilize the most reliable and accurate AVM for underwriting and risk management purposes. Additionally, the guidance states that the AVM validation process must include “back-testing a representative sample of valuations against market data on actual sales.”⁵

It is useful to re-visit how this guidance can be applied to manage credit risk and AVM model risk in light of current housing market conditions.

¹ AVMs are proprietary valuation models developed and licensed by vendors, or developed by mortgage secondary market participants. AVMs employ property-level information from databases and sophisticated modeling techniques to estimate the fair market value of real estate collateral.

² Collectively the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, the Office of Thrift Supervision, and the National Credit Union Association.

³ Office of the Comptroller of the Currency Bulletin 2005-22, “Credit Risk Management Guidance for Home Equity Lending” May 16, 2005.

⁴ The guidance covers a variety of risk management elements including product development, marketing/sales activities, third-party originations, collateral evaluation management, account management, portfolio management, operations/servicing/collections, secondary market activities, credit risk classifications, loan loss reserves and capital.

⁵ Also, the guidance refers institutions to the model validation guidance outlined in the Office of the Comptroller of the Currency’s (“OCC”) Bulletin OCC B-2000-16, “Risk Modeling – Model Validation” that was issued May 30, 2000.

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An approach to AVM validations

Validating an AVM typically requires selecting a sample of properties from recent originations to be submitted to one or more AVM vendors in order to evaluate the accuracy of the AVM and the reliability of the vendor. After receiving the AVM estimates from a vendor, an institution should analyze the AVM's performance using a range of performance metrics, statistical analyses and tests. The results of these analyses should be formally documented and analyzed, with conclusions, and the basis for the conclusions should be fully supported and documented as well.

AVM property sample

According to the interagency guidance, the AVM sample must include properties that are “representative of the geographic area and property type” for which an AVM is used by the institution. The size of the sample will likely depend on a number of factors, but will be driven primarily by the size of the institution's lending footprint, the diversity of the institution's loan portfolio, and the number of properties a vendor will permit an institution to submit to it for evaluation purposes. This is an important consideration as an institution must be able to periodically submit a sample of properties to a vendor that is large enough to be representative of the institution's geographic area and property types, among other factors. Institutions should consider this validation requirement when negotiating a licensing agreement with an AVM vendor. Ideally, the property sample should be

based on recent transactions in which the sales price or appraised value has not been publicly recorded, and therefore the property value has not reached the public databases used by AVM vendors.

In light of slowing growth in new and existing home sales and increasing property foreclosure rates, it is becoming increasingly difficult to develop a representative sample of properties. These factors help reduce the population of recent home sales transactions from which to draw a sample. In addition, increasing foreclosure rates means that some recent sales transactions may include foreclosures sales that may not be representative of a transaction between a willing buyer and willing seller and therefore may not represent a meaningful data point for the property sample. As a result of this recent market trend, it is important to establish an on-going plan to capture representative transactions that can be used for validation.

AVM performance analysis

Analyzing the performance of an AVM is challenging because it can be evaluated across a number of different factors. Typically however, institutions evaluate AVM performance in two main areas:

- **Coverage**—The percentage of properties for which an AVM returns estimates for a given set of properties. All other things being equal, more coverage is better than less coverage.

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- **Accuracy**—The precision of the AVM estimate relative to a benchmark value such as a property sales price (ideally) or appraised value. All other things being equal, a more accurate AVM is better than a less accurate AVM.

AVM coverage varies by AVM vendor. Some vendors offer AVMs that provide national coverage, while others offer regional coverage. AVM accuracy is typically measured at the property level using an error rate (i.e., AVM estimate minus Sales Price divided by Sales Price). Error rates for a group of properties in the sample can be summarized by key statistical measures: mean error rates, median error rates, or the distribution of error rates. Statistical tests, such as analysis of variance and t-tests, can be performed on the error rates in order to assess whether the differences in the error rates exist for geography (e.g., state level or county level), property type (e.g., single family detached or condominium), and property value ranges.

After completing the AVM performance analysis, the institution should document the assumptions, conclusions, and recommendations for review and approval by management.

Role of risk management and credit policy in the process

An institution's Risk Management and Credit Policy groups are critical parties that should be involved in the oversight of the AVM validation process. From a model governance and risk policy perspective, Risk Management typically has a role in defining an institution's approach (broadly) to model validation, including defining roles and responsibilities that ensure independent, objective reviews, developing policies and procedures, and establishing documentation requirements. Any AVM validation program would typically be executed in conformance with corporate standards.

As it relates specifically to the design of an AVM validation program, Credit Policy and/or Risk Management typically have a role in defining criteria for what constitutes "acceptable" uses of an AVM and acceptable performance of an AVM (i.e., accuracy and reliability). Institutions and regulators are applying more scrutiny of the performance of AVMs and studying potential risk of overvaluation bias that may be introduced by the use of AVMs in declining markets. Risk Management's/Credit

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Policy's involvement in defining AVM model validation standards and the acceptable use of AVMs should continue given current housing market conditions to help measure and manage model risk as well as credit risk.

How can PwC help?

PwC has AVM model validation professionals with experience helping institutions understand and measure risks associated with using AVMs and manage model risk through the design and execution of model validation programs. Our professionals can help you understand

your potential mortgage and home equity collateral risk exposure as a result of using AVMs and refine your credit and AVM model risk management strategies to more effectively cope with changing housing market conditions.

For questions on AVM validation programs and processes, please contact:

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