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(**Editor's Note:** This criteria article is no longer current. It has been superseded by the article "**U.K. RMBS Methodology And Assumptions,**" published on Dec. 9, 2011.)

Property valuation is a key driver in Standard & Poor's credit assessment of mortgage portfolios for RMBS transactions. This credit assessment estimates the likelihood of default (the foreclosure frequency) and the amount of loss on default (the loss severity) for each loan in the portfolio. The proportion of the loan to the property value (the LTV ratio) is a major factor in determining the probability of borrower default and the magnitude of loss severity. More specifically, a higher LTV ratio results in greater loss severity and higher probability of default.

Automated Valuation Models (AVMs)

A valuation carried out by a surveyor is based on a physical inspection of the property. In contrast, an AVM is a desktop model that excludes any physical check of the property, and relies on comparables and market information. A user inputs the target address and certain property characteristics and the model returns a value for the target property.

In the U.K., AVMs have been available to the market since 1999. The two major providers at present are UKValuation Ltd. and Hometrack Data Systems. Both providers have produced hedonic-based valuation models. Hedonic-based AVMs rely on a large database of property valuations and sale prices, and conduct an automated search for comparable properties to the target property.

Comparable properties are selected by their similarity and proximity to the target property, based around various property characteristics such as room counts, age, floor area, and property type.

Each valuation estimated by these AVMs is also associated with a corresponding measure of confidence (e.g., 1 to 7 for Hometrack Data Systems), or a level of uncertainty (e.g., 8 to 20 for UKValuation), which is generated from the fit of the target property to the comparables. More specifically, the main ingredients that contribute to the measurement of confidence (or uncertainty) are physical similarity between the target property and the comparables, the proximity of the target property to the comparables, and the homogeneity of the neighborhood of the target property.

Show

Risks Of Using An AVM

If any particular valuation technique results in consistently overvalued properties, the calculated LTV ratios are likely to be underestimated. For example, if a loan value is assumed to be 80 and the "true" value of the property is 100 (hence a "true" LTV of 80%), an overvaluation of 110 will result in an LTV of approximately 73%. As lower LTVs are viewed as more favorable in terms of default and loss, the overvaluation of the property would result in an underestimation of both default frequency and loss severity. If this were to occur across a significant proportion of a mortgage portfolio, the potential loss on the portfolio could be underestimated.

Accuracy Of An Automated Valuation And Confidence Levels/Uncertainty

To test the accuracy of AVM-generated valuations, the estimated valuations from these models were compared to those reported by an actual full survey of a large sample of properties. The differences between the automated valuations and their corresponding surveyor values across a portfolio tended to follow a random normal distribution centered on a mean of 0 for both of the U.K. AVM providers.

Generally for every "overvalued" property, there was also an equivalently "undervalued" property. There was, however, much variation in the magnitude and frequency of these under/overvaluations, the level of which was directly related to the confidence or uncertainty associated with the valuation. The higher the level of confidence (or conversely, the lower the uncertainty), the less variation there was in the accuracy of the valuation.

Chart 1 shows indicative examples of this variation based on confidence or uncertainty. To standardize Standard & Poor's approach across providers, confidence levels and uncertainties have been grouped into five levels of accuracy, and are plotted in chart 1 as "variation levels" 1 through to 5.

  Chart 1

Chart 1

Distribution Of Valuation Error By Variation Level
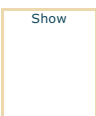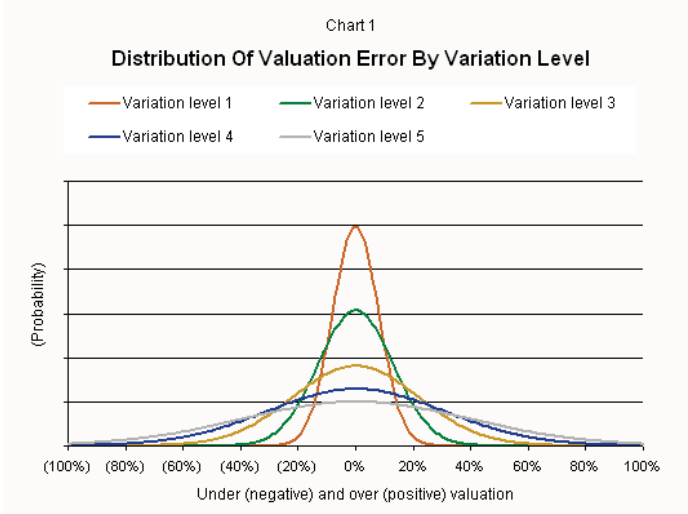
The horizontal axis in chart 1 represents the difference between an automated value and its corresponding observed surveyor value (expressed as a percentage of the surveyor value). Positive differences indicate overvaluation by the AVM provider, while negative differences indicate undervaluation by the AVM provider.

The vertical axis represents the probability of these differences occurring. The five curves are associated with different variation levels. Lower variation levels produce taller, narrower distributions. Here, the difference between an automated value and its corresponding surveyor value tends to zero more often than for higher variation levels; that is, lower variation levels tend to be more accurate than high variation levels.

Accuracy Of A Portfolio Of Automated Valuations

From an RMBS rating perspective, it is more relevant to examine the accuracy of an entire pool of automated valuations rather than the accuracy of an individual valuation, given that portfolios of mortgages are securitized.

Having established some patterns for the valuation error in an individual valuation, it is possible to estimate the overall under/overestimation of a portfolio of automated valuations. For example, a portfolio of 100 automated valuations may have one valuation that is overvalued by 20%, but is unlikely to have all 100 valuations overvalued by 20%.

It would be even less likely for a portfolio of 500 valuations to be overvalued by 20% overall. Some properties would be undervalued to varying degrees while some would be overvalued to varying degrees. Hence, the overall under/overvaluation of a portfolio of automated valuations has a similar distribution to that of a single AVM generated valuation; that is, it follows a random normal distribution centered on zero, but with a comparatively smaller variation than the distribution described in the preceding section.

The distribution for portfolio under/overvaluation is illustrated in chart 2.

Chart 2

Chart 2

**Distribution Of AVM Portfolio Error By Variation Level**
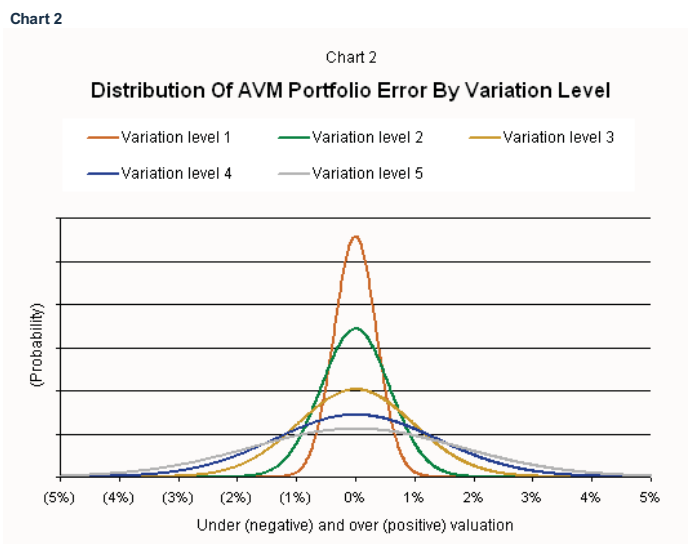
Here the horizontal axis represents the difference between the total automated values of a portfolio and the "true" value of the portfolio.

Positive differences indicate overvaluation of the entire portfolio by the AVM provider, while negative differences indicate an undervaluation of the entire portfolio by the AVM provider.

Quantifying Risks By Variation Level

A theoretical overestimation of the value of a portfolio of AVM-generated valuations can be determined by the distribution of portfolio level under/overestimation given by each variation level. High overvaluation lies on the extreme right of the curve, while lower overvaluation lies on the center-right of the curve. Standard & Poor's has assumed a rating dependent amount of overvaluation per variation level. The higher the rating level, the higher the amount of assumed overvaluation and the further to the right of the distribution the overvaluation amount will lie (as illustrated by chart 3).

Chart 3
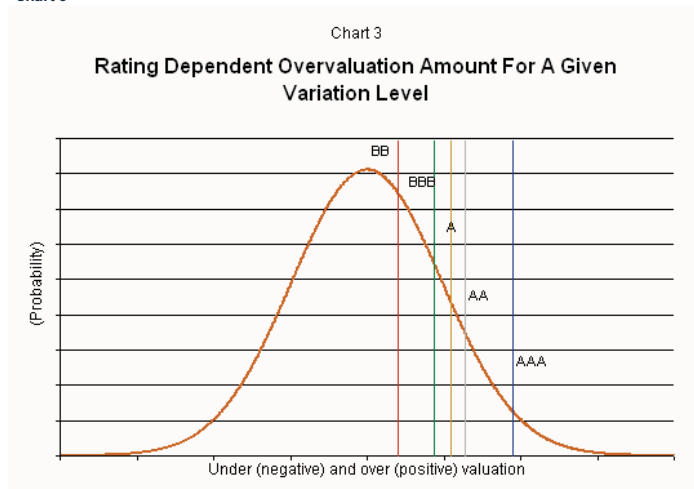
To reflect the risk of overvaluation across a portfolio of mortgages, AVM-generated valuations will be reduced by the amount of assumed overvaluation per rating level for each variation level. This will have the effect of producing higher LTVs for the portfolio. The extent to which this impacts the probability of default and degree of loss severity will depend on both the initial LTV of the pool and the average portfolio variation level. The table below summarizes the reductions that will be applied to portfolios with AVM-generated valuations.

Reductions To AVM-Generated Valuations

Variation level	AAA	AA	A	BBB	BB
1	1.07%	0.72%	0.63%	0.54%	0.27%
2	1.74%	1.16%	1.02%	0.87%	0.44%
3	2.95%	1.97%	1.72%	1.48%	0.74%
4	4.16%	2.77%	2.43%	2.08%	1.04%
5	5.37%	3.58%	3.13%	2.68%	1.34%

For example, in a 'AAA' rating scenario, a portfolio (with variation level 4 for all valuations) is assumed to be overvalued by 4.16%, whereas in a 'BBB' scenario, the same portfolio with variation level 4 is assumed to be overvalued by 2.08%. A portfolio with an AVM valuation of £100,000,000 with variation level 4 would receive a corresponding reduction of 4.16% in a 'AAA' rating scenario. This would bring down the portfolio value to its "true" value of £96,006,144 (see formula below). If the original weighted-average LTV for the portfolio was 75%, this reduction would raise the weighted-average LTV to 78%.

Example Formula

$$\frac{£100,000,000}{1+0.0416} = £96,006,144$$

The Future Of AVMs

AVM use in the U.K. is growing rapidly. There are various companies exploring the idea of introducing their own AVMs; for example, Rightmove.co.uk Ltd. is set to launch its own AVM in early 2006. The key drivers for the success of AVMs are their relative cost and time efficiencies. Future regulatory issues may further drive their use, with the mandatory Home Condition Report coming into effect in 2007. Here, a property is inspected (but not officially valued) prior to the property going on the market. This report could be used in conjunction with an AVM to underwrite a mortgage speedily, or as a quality control spot check. Given that AVMs can generate valuations in moments and are relatively inexpensive, AVM use in property purchasing and origination of mortgage loans will likely continue to grow in the future.

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