

# Auto pilots

Quick and accurate identification of the most appropriate loss-mitigation strategies has never been more important – for borrower and lender alike. Can automated valuation methods really rival the established – but time-consuming – standard of broker price opinions? First American Core Logic's **Mark Fleming** and **Robert Walker** investigate

The stock of homes in foreclosure in the US has been rising for the past two years, a trend expected to continue through 2008 and beyond. The number of homes in foreclosure throughout the US stood at 1.5% in May 2008, compared with 0.8% in May of 2007. Serious delinquency rates, 90 days delinquent, are also rising – up 2.2% in May 2007 and 4% in May 2008. Furthermore, 2008 is the year in the US in which subprime adjustable rate loans reset at their highest rates. By early 2009, the vast majority of subprime adjustable rate mortgages will have reached their reset date (figure 1). In order to address their resetting loan payments, these borrowers will be facing hard decisions about how to pay the new loan payment – and if they cannot make that payment, do they have equity available to enable sale or refinancing? A proportion of these loans will default, or arrive in default (and potentially foreclosure) in 2009.

In addition, as the US economy lags, unemployment rates rise, and commodities such as food and gas become more expensive, the economic stress on US households will increase and cause some to experience a serious stage of delinquency or default. It is in this environment that servicers must find ways to efficiently and cost-effectively manage their distressed portfolios to determine the best strategies for loss mitigation – loan modification, short sale, forbearance or foreclosure. All these actions require an accurate understanding of the likely property value and an anticipated loss severity.

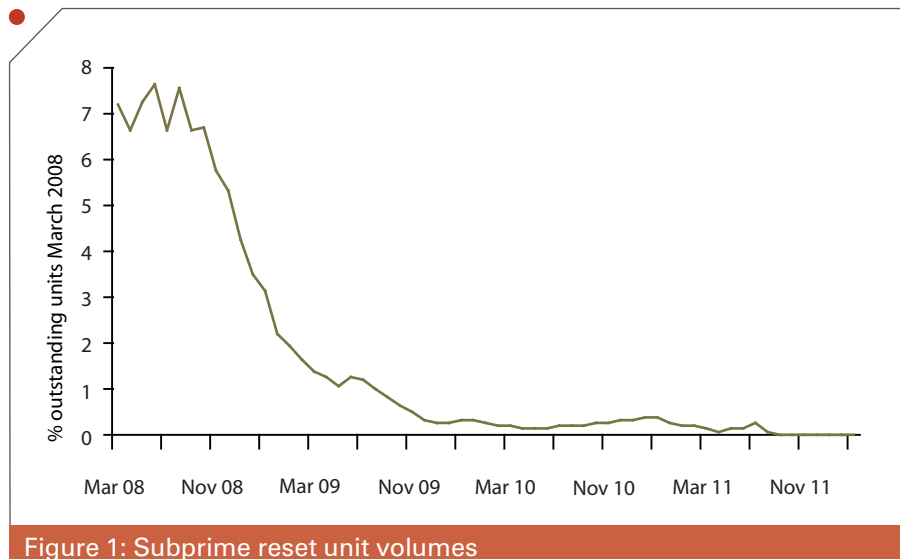


Figure 1: Subprime reset unit volumes

## Broker price opinion: a history

For almost 20 years, servicers in the US have employed broker price opinions (BPOs) to assess delinquent or foreclosed property values. BPOs originated during the late 1980s in the nation's oil-producing region, primarily Texas and Oklahoma, when high interest rates and the collapse of the oil industry in that region created a high stock of foreclosures, depressed prices, and a large inventory of properties for sale (the resemblance to other markets today in the US should be noted). Mortgage servicers and the government's Resolution Trust Corporation held large real estate owned (REO) property inventories. The BPO was born from the need for periodic valuations to comply with regulations, coupled with the

availability of underemployed real estate agents willing to provide value opinions for much lower fees than appraisers. Today, BPOs are used throughout the industry to assess value without the cost of a full appraisal.

Typical selection criteria for BPO providers include turnaround time, customer service and price, but rarely – if at all – is valuation accuracy considered. In fact, there is little documented research indicating the accuracy of BPO valuations. This means there is no understanding of the risk associated with an inaccurate valuation causing either an underassessment of likely loss severity or a decision to proceed with a loss-mitigation strategy that is not optimal to the servicer or borrower.

**What are the alternatives?**

In the era when BPOs became popularised as a method of valuation, there were few alternatives to full appraisals. Today, there are more alternatives, ranging from automated valuation models (AVMs) to desktop valuations, BPOs, drive-by appraisals, and external and internal appraisals. The decision about which method to use requires an understanding of the valuation accuracy, as well as considerations such as price and turnaround time.

AVMs, for example, can potentially satisfy the price and turn-time criteria, in addition to performing with sufficient accuracy to warrant use in the assessment of servicing portfolios. Less costly and much faster – typically instantaneous – than other valuation methods, AVMs are routinely tested for accuracy and assessed for value reliability. Therefore, comparing other valuation method accuracy against AVMs can provide valuable insight.

In this article, the accuracy of BPOs, the current standard in distressed asset valuations, is studied and compared with the accuracy of an AVM where the benchmark value is the REO sale price. The REO sale price is the observed market valuation of a distressed property and the ultimate value that determines loss severity to the mortgage holder. However, traditional AVMs typically over-predict REO values significantly and are therefore not appropriate for this study. Instead we use an AVM for the analysis that has been explicitly designed and calibrated to predict a ‘distressed value’ for the property as opposed to a market value.

**Assessing accuracy**

For the purpose of this study, accuracy is defined via a set of statistical measures that describe how close each valuation method is to the benchmark value. Therefore, the first step is to define that difference on a transaction-by-transaction basis. The transaction-specific difference between the benchmark REO value and the valuation method estimate of value, error, is:

$$e_i = \frac{\left( p_i - \hat{p}_i \right)}{p_i} \tag{1}$$

where  $p_i$  is the benchmark REO sale price and  $\hat{p}_i$  is either the BPO or distressed AVM predicted price.

Based on  $e_p$ , the following accuracy statistics can be estimated for both valuation methods. The dispersion, or standard deviation, of the error is calculated as:

$$\sigma = \sqrt{\frac{\sum_i^n \left( e_i - \bar{e} \right)^2}{n}} \tag{2}$$

where  $\bar{e}$  is the mean error, and  $n$  is the number of non-zero valuation predictions from each method. The average error, the typical amount of over- or under-prediction that can be expected over a large number of valuations is:

$$\mu = \frac{\sum_i^n e_i}{n} \tag{3}$$

Another popular measure of accuracy is the percent of prediction errors (PPE) within a specified percentage distance of zero. The PPE is calculated as:

$$Ind_i = 1 \text{ if } x \leq e_i \leq y, \text{ else } Ind_i = 0$$

$$ppe\_x \text{ to } y = \frac{\sum_{i=1}^n (Ind_i)}{n} \tag{4}$$

where  $x$  and  $y$  are the conditional threshold (such as 5, 10 or 1%) that an individual transaction error must satisfy.

Each of these statistics gives interesting insight into the performance and accuracy of the two valuation methods. The standard deviation provides an overall assessment of the dispersion of the errors with a penalty for outliers in either the positive or negative direction. The lower the standard deviation, the better, as a low standard deviation indicates a less dispersed error distribution with fewer outlier events. The standard deviation is centred around the mean error of the distribution and therefore will not reflect any systematic bias in the valuation technique. This is an important consideration because traditional AVMs have been highly biased when applied to the REO sale value predic-

tions. Therefore, it is important to check that the distressed value AVM does not have the same issue. Bias can be measured by simply looking at the average error. A negative average error indicates that the REO sale price is on average less than the valuation prediction by the magnitude of the mean. The PPE statistic captures both the bias and the dispersion in one statistic, but does not have the penalty for outliers that standard deviation has. In this analysis the percent of predictions within 10% (PPE10) is used. Therefore, the more biased a valuation technique or the more inaccurate, dispersed, a valuation technique, the lower the PPE10 statistic.

**Source data**

In order to perform this comparative accuracy analysis, a sample of REO sale transactions with BPOs and distressed value AVM predictions was required. A sample of distressed properties (borrowers in serious delinquency) with BPOs was collected. At this point, the properties had not been sold as REO, so many properties were expected to fall out of the sample as they were either cured or a loss mitigation strategy other than foreclosure and REO was completed. These distressed property BPOs were collected in March 2007.

In the US, REO sale transactions are recorded in each county’s official records. This information is publicly available and collected and standardised by data aggregators. After six months, an aggregator’s database of public recordings was searched to determine which properties in the sample were actually taken to foreclosure and where an REO sale occurred and was recorded in the public record.<sup>1</sup> This process resulted in a sample of 849 properties with REO sale prices in the six months after the BPO was collected. The distressed AVM was run on the resulting sample, with the date of the BPO used to return an estimate of distressed value at the same time as the BPO.<sup>2</sup> The distressed AVM returned answers on 85% of the records. In order to remove any differences due to valuation timing, all the REO sale prices were reverse indexed using a repeat

<sup>1</sup> A six-month window is relatively short for delinquency to foreclosure and REO sale. It is expected that more records will be identified as the sample of BPOs seasons

<sup>2</sup> Running the distressed AVM retrospectively, ‘as of a certain date’ excludes all information after the BPO date and ignores any sale information found on the subject property within 12 months prior to the BPO date

sales house price index back to the time of the BPO valuation. Reverse indexing is designed to recognise that property values shift over time due to the prevailing supply and demand for housing and area market trends. To ensure blind results, all transactions where either the BPO or distressed AVM value exactly matched the REO sale price were excluded.<sup>3</sup> After matching to the public records, removing distressed AVM no-hits and exact valuations by either the BPO or the distressed AVM, a sample of 723 properties was found.

### Findings

Using the sample described above, the error was calculated on each transaction for each valuation method. The distribution of these errors is shown in figure 2 for the BPO and the distressed AVM results.

Inspection reveals that both distributions are slightly biased to the left of zero. Note the preponderance of taller bars to the left of zero relative to the right. Furthermore the tail to the left, errors between -0.5 and -0.8, is more pronounced than the same tail to the right. This indicates that both the BPO and distressed value AVM are more likely to over-predict REO value by 50 to 80% than they are to under-predict by that same magnitude. This is an important consideration because while the frequency of this occurrence is not high (the bars are small in the tail relative to the centre of the distribution), this error distribution shows that it is possible for either valuation model to be significantly incorrect. In the event of a significant over-prediction of REO value, the determination of loss severity is by the same proportion underestimated and the incorrect loss mitigation strategy could be chosen.

Using the summary statistics described above one can get more insight into these error distributions. The average error of the BPO valuations and distressed AVM valuations are -14.3% and -7.1 percent, respectively. The average errors confirm what was seen by inspection of the distribution. Both models over-predict REO sale value, but the distressed AVM by half as much as the BPO on average. The standard deviations (measuring the spread or dispersion of these two distributions) are approximately the

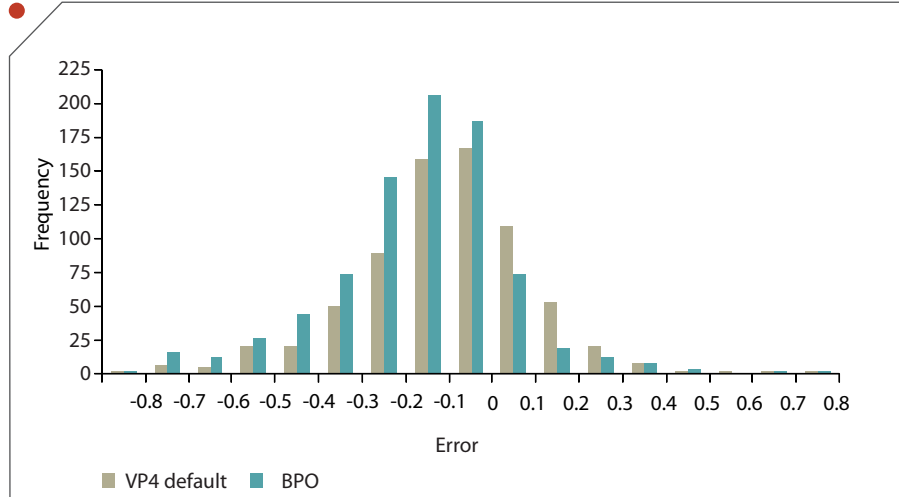


Figure 2: Distribution of error by valuation method

same. The BPOs have a standard deviation of 26.0% and the distressed value AVM shows a slightly better standard deviation of 25.1%. Even though the distressed value AVM error distribution is more centred than the BPO distribution, the standard deviation metric doesn't show this.

Finally, the PPE10 (which accounts for the bias as well as the dispersion in the chart) is 40.3% and 44.0% for the BPO and distressed value AVM valuations, respectively, indicating that the distressed value AVM provides a higher percentage of results within 10% of the true REO sale value.<sup>4</sup>

It was an expectation in this analysis that the distressed value AVM would have an error distribution with tail risk of some magnitude. The distressed value AVM is able to achieve more unbiased (lower average error) relative to traditional AVMs because it has been specifically 'trained' to value REO properties and looks at local neighborhood conditions for the preponderance and trend of properties in distress in that neighborhood. These help inform the distressed value AVM on the prevailing difference between market and distressed values at that point in time in that neighbourhood.

### The problem of asymmetric information

Moreover, this analysis quantifies the accuracy of the BPO on the same distressed properties, allowing servicers to understand the relative risks of alternative valuation methods, but there are asymmetric information issues in this analysis that should additionally be considered. Consider carefully the process by which the REO sale occurs. The first step that a servicer takes is to get a valuation of the property completed – in our case, the BPO. Based on the results of the BPO, decisions were made about an appropriate loss-mitigation strategy. Only those properties in which the BPO result led the loss-mitigation strategy to be foreclosure and ultimate REO sale were observed in the public records as REO sales. In other words, the initial BPOs compared to the REO sales in the analysis described here are the same BPOs that helped to determine REO sale as the appropriate loss-mitigation strategy in the first place. Therefore, there is an asymmetry of information between the BPO results and the distressed value AVM results giving, at least in theory, an advantage to the BPO. Additionally, the BPO provider has the ability to inspect (at least externally) the

<sup>3</sup> In a blind test, it is imperative that the valuation preparer (or model) not have knowledge of the sales price when the valuation is made, otherwise known sample bias is introduced. For this reason, the analysis eliminates any transaction where the BPO value or the AVM value exactly matches the ultimate REO sales price

<sup>4</sup> The distressed value AVM valuation accuracy represented here is consistent with larger blind tests and internal validation studies of the distressed value AVM versus REO sales prices. Additionally, these results are also very consistent with a recent large lender test of the distressed value AVM versus reconciled property values. In this case, reconciled values means that there had been multiple BPO and/or appraised values submitted on the property. Using a team of valuation professionals, each property received a reconciled value. When compared with the reconciled property value, the distressed value AVM performed consistently with the results presented in this analysis

condition of the property and reflect the condition in the prediction of value. This is an additional asymmetry of information of the BPO over the distressed value AVM. The hypothesis prior to conducting this analysis was that BPO accuracy would be higher than the distressed value AVM because of the existence of asymmetric information that favoured it. The analysis shows that this is not the case, at least based on this sample.

**Integrating valuation methods**

Given the small sample size of this analysis and the asymmetric information advantages that BPOs – or any human eyes on the property valuation method – possess, the optimal solution to managing valuation accuracy combines the speed and cost efficiency of the distressed value AVM with asymmetric-information-advantaged valuation methods. The methods can be combined based on initial risk and loss severity. For example, given a sample of 1,000 distressed properties, one could initially run the distressed value AVM on all properties. Based on the distressed value AVM answer, the current UPB and assumptions on carrying costs and legal fees etc, one could estimate a likely loss severity on each property. These loss severity estimates could then be used as a triage mechanism to determine the best strategy for loss mitigation. For those properties where the loss severity estimates are high (or those where the loss severity, as indicated by the distressed value AVM, are negative and therefore potentially an outlier on the part of the distressed value AVM) the importance of getting an alternative

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valuation, such as a BPO, is warranted. Based on the BPO results, the loss severity estimates can be updated and loss mitigation strategies revised. This blended approach to determining distressed value yields more efficient and cost-effective results on a per-property basis and leverages the asymmetric information advantages of the BPO to determine value on properties where the risk warrants the expense and condition impairment is a concern.

**Conclusions**

Given the current and expected mortgage market conditions in the US, the importance of servicing to the industry is paramount today. The industry as a whole is under the scrutiny of regulators, consumer advocates and political entities. Within this highly scrutinised environment, servicers have increasing inventories of distressed assets that they must manage efficiently and fairly. So efficient and cost-effective methods that can accurately determine the most appropriate loss mitigation strategy, for both mortgage holder and borrower, are vital. This article has described the importance of understanding one’s valuation method not purely in terms of price and speed of delivery, but also accuracy, as well as exploring the availability of alternative methods to the standard BPO, such as

distressed value AVMs. Comparison of these two valuation methods revealed that distressed value AVMs can perform at parity to traditional BPO valuations for REO properties. The accuracy statistics indicate less bias, higher percentages of predictions within 10% of the REO sale value, and slightly better standard deviations.

Given these results, distressed value AVMs should be considered as a viable alternative to BPOs for early-stage loss mitigation, REO pipeline management and loss-severity estimation. However, this analysis is not a definitive determination that in all cases the distressed value AVM is better than the alternatives. BPOs have asymmetric information advantages over a distressed value AVM, meaning that the optimal valuation method of determining loss mitigation strategies would rely on a blend of the two. Although the precise mix of valuation methods will depend on the specific purposes and reasons for a valuation, distressed value AVMs should be considered by anyone hoping to offer a quick, cost-effective and reasonably accurate solution.

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