VERSION:
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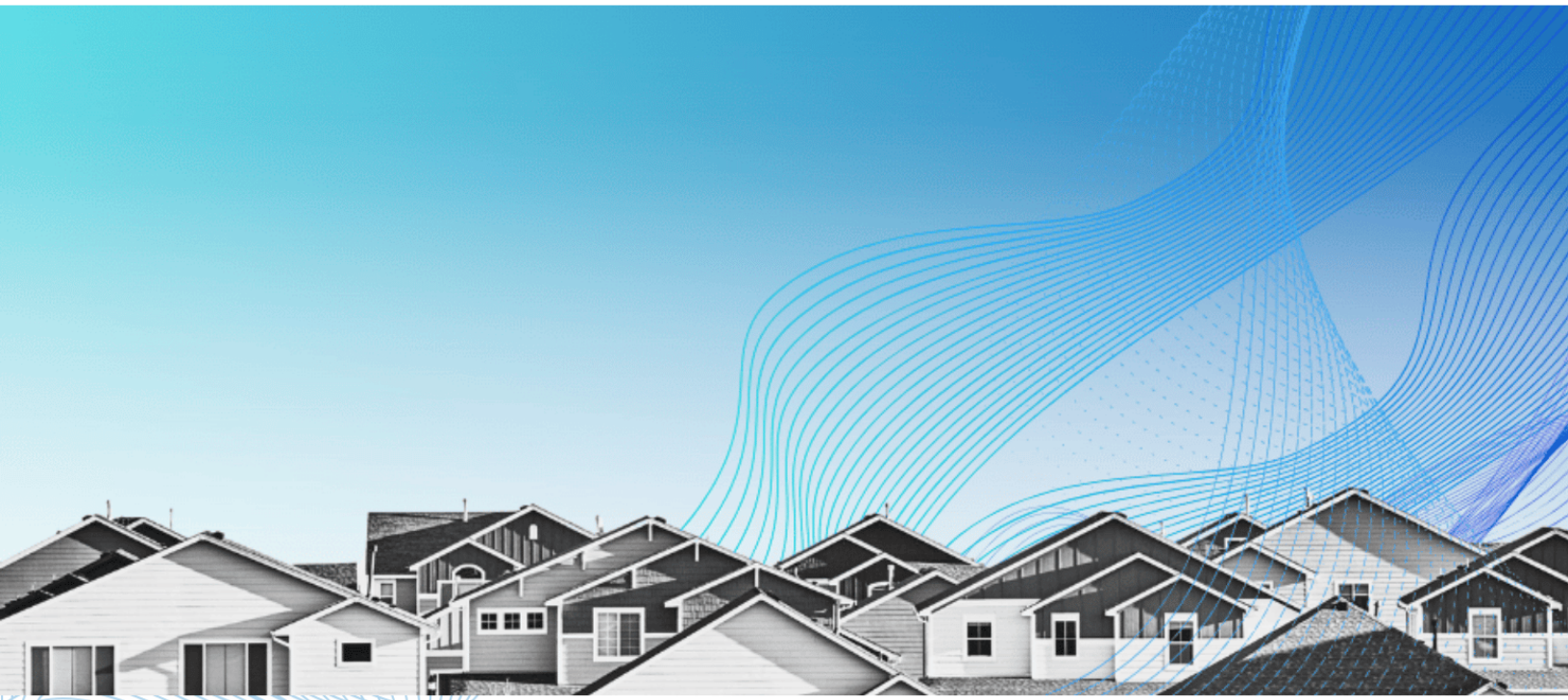
ValuSTREAM™

COMPLIANCE AND DUE DILIGENCE GUIDE



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Introduction

ValuSTREAM™ is an automated valuation model (AVM) cascade engineered to provide the highest standards of quality and performance. It uses the results of quarterly independent third-party AVM testing to design the cascade ranking based on county-level performance.

ValuSTREAM provides three different options to choose from depending on a customer's intended use and whether they care more about **Accuracy**, **Balanced** or a **Coverage** approach.

- **ValuSTREAM-Accuracy:** Focused on optimal valuation accuracy, this option delivers the best possible accuracy while ensuring reasonable coverage. It provides coverage in 1,155 counties.
- **ValuSTREAM-Balanced:** This option strikes a balance between accuracy and coverage. It provides coverage in 1,317 counties.
- **ValuSTREAM-Coverage:** Prioritizing maximum coverage, this option aims for the highest hit rate while maintaining good accuracy. It provides coverage in 1,819 counties.

Based on a customer's preferred option, ValuSTREAM employs an AVM selection process to determine the value of a subject property. The cascade establishes a hierarchical ranking for approved AVM models within a specific geographic area (typically a county). This ranking is based on predefined performance metrics and determines the order in which the cascade will request valuations from these models.

Overview of Methodology

ValuSTREAM ensures reliability and performance with independent, third-party AVM testing conducted quarterly for rigorous due diligence. This testing is *powered by CoreLogic® OptiVal®*, to select top-performing AVMs based on real-world data. The testing accurately assesses AVM performance and drives compliance with Interagency Appraisal and Evaluation Guidelines. **Due diligence is required of AVM users and is provided directly from *CoreLogic's OptiVal* to the AVM user.**

AVM evaluations are analyzed at the county level. *OptiVal* analytics span more than 1,800 counties *(depending on the type of cascade)* with 93% population coverage across the United States.

AVMs that are included in ValuSTREAM include:

- VeroVALUE® Preferred
- VeroVALUE®
- Agile Insights
- CA Value
- CA Value MC
- ClearAVM™
- Procision®
- QVM
- RVM
- SiteXValue
- THVx Origination
- THVx Risk Management
- ValueSure

All these AVMs are tested but only the top three models are used in the AVM cascade for that county. This is updated each quarter.

CoreLogic's OptiVal testing process uses proprietary benchmark data which is collected internally. Each week, data is collected on 25,000 to 30,000 benchmark properties, and this weekly data is then aggregated to produce quarterly results. The cascade uses the results of quarterly testing data based on nearly 400,000 benchmarks to design the cascade order at the county level. Benchmark data is collected on Monday each week and is extracted from the previous 7 days of transactions ensuring that the data is current. For each County/State, four metrics are calculated as part of the performance evaluation.

AVMs are tested on a combination of four different metrics –

1. **Hit Rate** – the percentage of target properties for which an AVM returns a valuation
2. **Accuracy as measured by P10** – the percentage of time the AVM is within +/-10 percent of the benchmark value
3. **Large Outliers** - proportion of overvaluations and undervaluations larger than 15%
4. **Confidence Score Correlation** – the correlation between an AVM's confidence scores and accuracy as measured by P10

An advantage of ValuSTREAM is that AVMs are tested comprehensively, where benchmarks include both purchase and non-purchase (refinance/HELOC) transactions. This is important because AVM performance can often differ by type of benchmark used, and by using both, ValuSTREAM ensures that top performing AVMs must perform well with each type of benchmark. AVMs are tested utilizing transactions which are still in process and have not closed or been recorded.

While some cascades use only purchase transactions, the use of 1004 appraised values in ValuSTREAM as one type of benchmark value allows the use of refinance transactions as well.

Strategy for Ranking AVMs In Differing Cascades

To ensure the reliability of the calculated metrics, ValuSTREAM's testing procedures are conducted with adequate sample sizes. ValuSTREAM assesses AVM performance based on the following 4 metrics:

1. **Hit Rate** - The percentage of benchmark addresses that an AVM was able to provide a prediction. The hit rate is based on the AVM's ability to locate the address as well as the confidence the AVM has in its prediction of value for the address. A "hit" means the AVM was able to provide a valuation with sufficient confidence

   Example:

   - Imagine a dataset of 100 benchmark property addresses. An AVM is run against these addresses.
   - If the AVM successfully provides a valuation with sufficient confidence for 80 of those addresses, then the hit rate would be 80% (80/100).
   - If the AVM can only confidently provide valuations for 60 of the addresses, the hit rate would be 60% (60/100).

2. **Accuracy** – The metric used to assess accuracy is P10. This is the percentage of properties that the AVM values within 10% of the benchmark value. Hence if the benchmark value is X, then the AVM value should fall between 0.9X and 1.1X for the AVM to be considered accurate.

   Example:

   - Consider a house with a benchmark value of $200,000.
   - An AVM valuation of $180,000 (0.9 * $200,000) or higher, but not exceeding $220,000 (1.1 * $200,000), would be considered accurate.
   - The P10 score for a set of properties is calculated as the number of properties that lie within the +-10% range divided by the total number of properties, expressed as a percentage.

3. **Large Outliers** – This metric measures the percentage of times an AVM produces a value that significantly differs from the actual or benchmark value of a property. We consider two types of significant differences, both defined as being more than 15% away from the benchmark:

   P15H**:** This is the percentage of times the AVM *overvalues* the property by more than 15%.
   P15L**:** This is the percentage of times the AVM *undervalues* the property by more than 15%.
   The total percentage of outliers is simply the sum of these two = P15H + P15L

Example:

- For example, consider a house with a benchmark value of $1,000,000.
- An AVM valuation greater than $1,150,000 would be considered an outlier because it's more than 15% *above* the benchmark. (15% of $1,000,000 is $150,000, and $1,000,000 + $150,000 = $1,150,000)
- An AVM valuation of less than $850,000 would also be considered an outlier because it's more than 15% *below* the benchmark. (15% of $1,000,000 is $150,000, and $1,000,000 - $150,000 = $850,000)
- Any AVM valuation between $850,000 and $1,150,000 (inclusive) would *not* be considered an outlier in this example.

4. **Confidence Score Correlation** – AVM estimates can deviate from actual market values due to limitations in the underlying algorithms, data availability, and other factors. To account for these potential variations, AVMs generate confidence scores that reflect the provider's certainty in the estimated value. A higher score suggests greater probable accuracy, while a lower score indicates less certainty. The Confidence Score Correlation measures how well the AVM's stated confidence aligns with its actual accuracy (as measured by P10). This is done by calculating the correlation coefficient between the confidence scores and the corresponding P10 values.

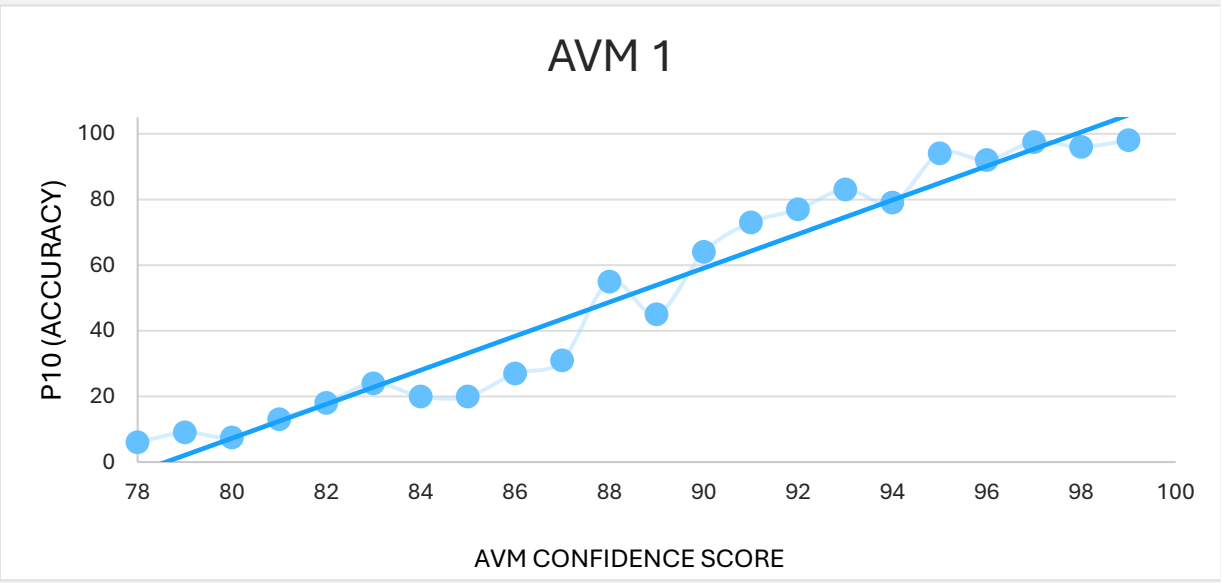
   Here is how the P10 value for a specific confidence score is determined at the county level:

   - Identify all properties within a county that have been assigned a particular confidence score by the AVM.
   - Calculate the P10 accuracy for this group of properties. This is done by determining the percentage of properties within this group whose AVM valuations fall within 10% of their benchmark values. (For example, suppose an AVM provides valuations for 25,000 properties in a county, of which 2,000 have a confidence score of 97. If, out of these 2,000 properties, 1,900 have AVM valuations within 10% of their benchmark values, then the P10 value for a confidence score of 97 in that county is 95% (1900/2000 = 0.95).
   - This process is repeated for other confidence score levels, and then the correlation coefficient is calculated between the confidence scores and their corresponding P10 values.

A high correlation coefficient indicates a strong relationship between the AVM's stated confidence and its actual accuracy. A high correlation between P10 accuracy and confidence scores for an AVM is highly desirable because it makes the confidence score a reliable indicator of the AVM's performance. If the correlation is strong, a high confidence score truly means the AVM's valuation is likely to be accurate. This builds trust in an AVM's output. Users can confidently rely on high-

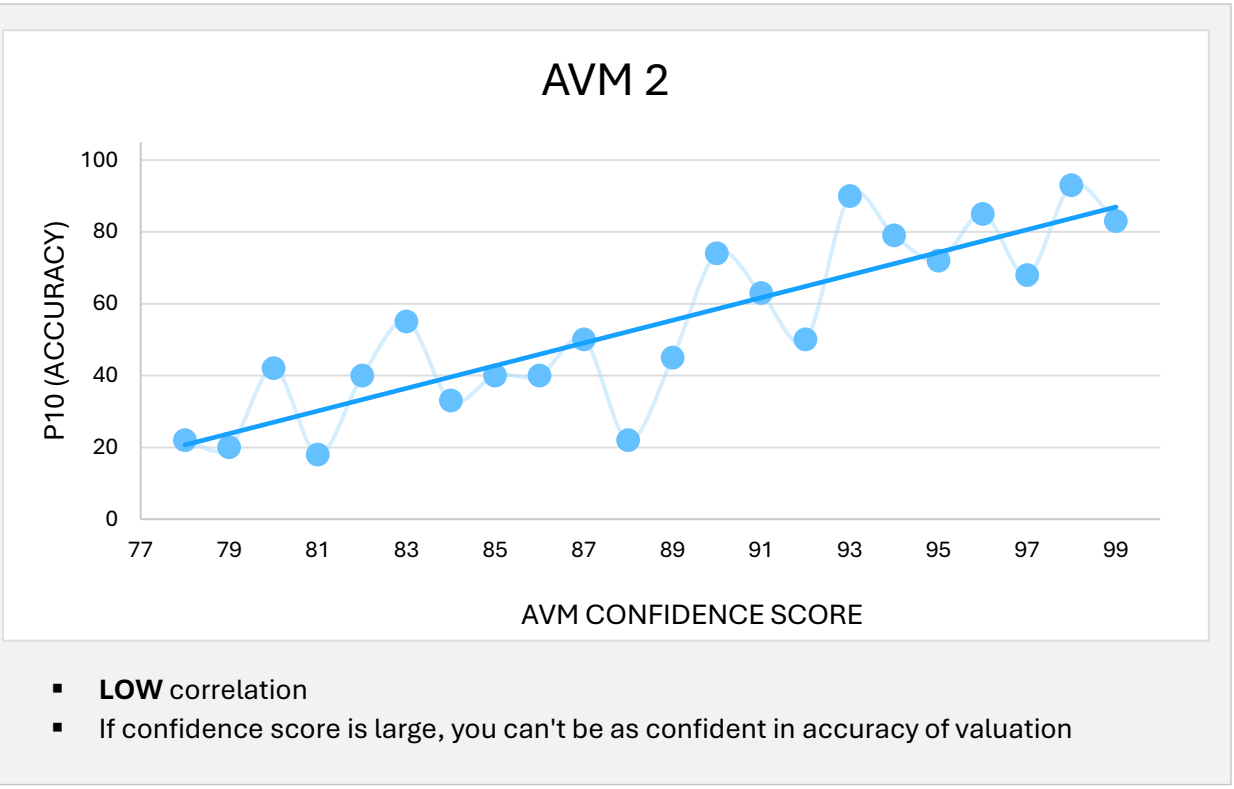
confidence valuations, making the AVM a more useful tool for decision-making. Those AVMs whose accuracy does not correlate well with confidence score cannot be relied upon as confidently.

The diagrams below show scatter plots for AVM 1 and AVM 2. A scatter plot is a graphical representation that shows the relationship between two quantitative datasets – P10 and Confidence Score here. Each point on the scatter plot represents an ordered pair of values from P10 and Confidence Score.



- **HIGH** correlation
- If confidence score is large, you can be highly confident in accuracy of AVM valuation

A strong positive correlation occurs when the values of one dataset (P10) increase as the values of the other dataset (Confidence Score) increase. This is visualized by points that cluster around an upward-sloping line. If the plotted points are close to each other, then we can expect a high degree of correlation between the two variables. However, if the plotted points are widely scattered, then we can expect a poor correlation between the variables. AVM 1 demonstrates a stronger correlation (0.90) between confidence scores and P10 accuracy than AVM 2 (0.75), as the points are closely clustered around the upward sloping line. A perfect positive correlation (correlation = 1) would be represented by all data points falling along a perfectly upward-sloping line. Conversely, a zero correlation would be visualized as a scatter plot with randomly dispersed points, showing no discernible trend. The closer the correlation coefficient is to 1, the stronger the positive correlation between the two datasets. In the chart above, AVM 1 exhibits a stronger positive correlation (closer to 1) than AVM 2 (shown in the chart below).



- **LOW** correlation
- If confidence score is large, you can't be as confident in accuracy of valuation

A strong correlation means that **high confidence scores correspond to high accuracy.** When an AVM is very confident in its valuation, that valuation should, often, be close to the true market value. On the other hand, when the AVM expresses low confidence, the valuation is more likely to be further from the true market value.

Cascade Ranking

Cascade rankings are based on a weighted combination of the 4 metrics discussed above. Each metric is mapped to a score of 0 to 100, where 0 represents the worst and 100 the best possible result:

1. **Hit Rate:** A score of 0 corresponds to a 0% hit rate, while a score of 100 signifies a 100% hit rate.
2. **Accuracy (P10):** A score of 0 indicates a P10 of 0%, and a score of 100 represents a P10 of 100%.
3. **Large Outliers (P15H + P15L):** A score of 0 occurs when the combined percentage of large overvaluations (P15H) and large undervaluations (P15L) is 100%. Conversely, a score of 100 is achieved when P15H + P15L equals 0%.
4. **Confidence Score - Accuracy Correlation:** A score of 0 is assigned when the correlation coefficient between confidence scores and P10 accuracy is 0.0. A score of 100 corresponds to a perfect correlation coefficient of 1.0.

The ValuSTREAM cascade models calculate a composite "Cascade Score" based on weighted combinations of these four metrics:

Cascade Score = w1 * (Hit Rate) + w2 * (P10) + w3 * (Large Outliers) + w4 * (Confidence Score Correlation)

Different cascade models use different weight structures (w1, w2, w3, w4, where the weights sum to 1.0) tailored for specific objectives. For example, the BALANCED cascade model assigns equal weights of 0.25 to each metric:

Balanced Cascade Score = 0.25 * (Hit Rate) + 0.25 * (P10) + 0.25 * (Large Outliers) + 0.25 * (Confidence Score Correlation)

Example:

- If a given AVM has a Hit Rate of 90%, a P10 of 80%, Large Outliers of 5%, and a Confidence Score Correlation of 0.80 (represented as 80 in the formula) in a specific County, then its BALANCED Cascade Score would be calculated as follows:
- Cascade Score = 0.25 * (90) + 0.25 * (80) + 0.25 * (95) + 0.25 * (80) = 86.25

Cascade scores could be computed in a similar fashion for other AVMs, and the AVM with the highest cascade score in that County would be the first model that ValuSTREAM would attempt to use. The next highest cascade score would be the second model, etc.

The specific weights used for the accuracy and coverage-focused ValuSTREAM cascade models are proprietary.

Performance of Accuracy Cascade versus Performance of Best AVM Used in Accuracy Cascade

Users of the ValuSTREAM Cascade stand to gain from improved overall performance versus that of any single AVM. AVMs are rigorously and regularly tested to gauge their performance.

The following summarizes testing results from *CoreLogic's OptiVal*:

Performance of Accuracy Cascade:

Overall Mean Error = 5.2%

Overall Median Error = 0.0%

Performance of Best AVM used in Accuracy Cascade:

Overall Mean Error = 17.3%

Overall Median Error = 1.1%

Testing results demonstrate that the gain from using ValuSTREAM is a 1.1% reduction in median error and a 12.1% reduction in mean error. Both metrics show improved cascade accuracy from ValuSTREAM.

Why ValuSTREAM?

1. ValuSTREAM™ has **3 different options** to choose from depending on a customer's intended use and whether they care more about Accuracy, Balanced or a Coverage approach.
2. All cascades throughout the industry use hit rate and accuracy-based metrics, however the correlation to confidence score for ValuSTREAM gives more weight to AVMs whose confidence scores on a given valuation are strongly correlated with that valuation's accuracy.
3. Important - ValuSTREAM incorporates **both purchase and non-purchase** testing data.
4. AVM performance is **assessed at the county level** allowing customization of the cascade by geographic area.
5. The cascade order is **updated quarterly** in ValuSTREAM.
6. Performance is **monitored by an independent third-party** to ensure the highest quality and diligence reporting. ValuSTREAM users receive the quarterly testing due diligence.
7. ValuSTREAM is already **compliant with the new AVM guidelines**.
8. ValuSTREAM allows better accuracy than can be achieved by the best single AVM by itself.

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