REFURBISHING TRADITIONAL ANALYSIS TECHNIQUES
Client Expectations

Be able to substantiate credibility in an objective fashion.
TOPICS
1. Adjustment Extraction Methods
2. Residuals & Randomness
3. Nature of an Adjustment
4. Use IVM & Appraiser AVM
5. Science of Data Management
Two Questions

1. Why do appraisers struggle when extracting adjustment Rates?
Two Questions

2. How accurate should an adjustment rate be?
Add a step that is necessary to the sales comparison approach.
Provide some tools and XL functions that you can use immediately.
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THE VALUATION ANALYST
Research in Extracting Adjustment Rates

There are some related videos on the AVTtools website.
Tests Analysis Methodologies in Real World Situations.
Reacting to a Changing Environment
Traditional Appraisal Valuation Techniques

Classical Statistical Analysis Techniques

Best Combination of Both
TOPIC 1

Adjustment Extraction Methodologies
<table>
<thead>
<tr>
<th>Extraction Methods (Direct to Indirect)</th>
<th>Most active and efficient</th>
<th>Least active and efficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market Divisions</strong></td>
<td>One A</td>
<td>B</td>
</tr>
<tr>
<td><strong>Market Categories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automated Extraction Algorithms</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Multiple Linear Regression</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Simple Regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matched Paired Analysis</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cumulative Paired Data Analysis</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Slope of the Residuals</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Residual (MAPE &amp; Avg. Deviation)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Income Based</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cost Based</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sensitivity Analysis</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Grouped Data Analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surveys/Interviews</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Logic Based</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Which Method is Best?

It depends on...

The Data
The Quantity and Quality of the Data

Depends on...

The Efficiency of the Market
Residuals & Randomness
Residual:

Actual Sale Price Minus Model’s Prediction
<table>
<thead>
<tr>
<th>Sale</th>
<th>Sale Price</th>
<th>GLA</th>
<th>Coefficient</th>
<th>Pred Prices</th>
<th>Residuals</th>
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<tbody>
<tr>
<td>1</td>
<td>$170,136</td>
<td>1,728</td>
<td>$80.00</td>
<td>$138,240</td>
<td>$31,896</td>
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<tr>
<td>2</td>
<td>$156,550</td>
<td>1,700</td>
<td>$80.00</td>
<td>$136,000</td>
<td>$20,550</td>
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<tr>
<td>3</td>
<td>$169,950</td>
<td>1,800</td>
<td>$80.00</td>
<td>$144,000</td>
<td>$25,950</td>
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<tr>
<td>4</td>
<td>$171,600</td>
<td>1,900</td>
<td>$80.00</td>
<td>$152,000</td>
<td>$19,600</td>
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<tr>
<td>5</td>
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<td>2,000</td>
<td>$80.00</td>
<td>$160,000</td>
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<tr>
<td>6</td>
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<td>2,100</td>
<td>$80.00</td>
<td>$168,000</td>
<td>$7,680</td>
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<tr>
<td>7</td>
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<td>2,200</td>
<td>$80.00</td>
<td>$176,000</td>
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<tr>
<td>8</td>
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<td>$80.00</td>
<td>$184,000</td>
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<tr>
<td>9</td>
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<td>$192,000</td>
<td>$70,080</td>
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<tr>
<td>10</td>
<td>$241,390</td>
<td>2,500</td>
<td>$80.00</td>
<td>$200,000</td>
<td>$41,390</td>
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</tbody>
</table>
Residual:

See Table 3 on page 27
Random Variance:

Random Variance in sales prices is any movement in the price that the modeler can’t account for.

The randomness in a market can be measured by residual Analyses.
Causes:

Human behavior

Properties are not comparable

Data Accuracy & Completeness

Modeling Errors
Randomness in Sale Prices....

...is the main barrier to overcome in an analysis.
A comparison Grid is a Market Model
TOPIC 3

The Nature of an Adjustment Rate
Are adjustment rates single-point facts that are set in stone?
Hypothesis

Adjustment rates are single-point facts that are set in stone.
Two Tests

1. Survey Method

2. Mathematica Proof with Regression Analysis.
Survey Method

What is a pool Worth?
What is a pool worth?

What would you personally pay for a swimming pool for this $500,000 house?
Conclusion Survey Method

1. Adjustment rates typically exist in ranges of value.

2. Some adjustments like swimming pools are present in very wide ranges.
Mr. Numbers tries Regression

➢ A sophisticated analysis like regression should get the correct answer.

➢ Monte Carlo simulation specifications page 72.
Research: Testing Hypothesis

1. Create a hypothetical market
2. Randomize the data
3. Apply the Analysis
4. Test answer
5. Calculate the probability of success.
Our Guess at Accuracy

➢ How good should regression do for this relatively simple market?

➢ Say a ___% interval (range)

➢ For a $30,000 pool this would be $________ to $________.
Results

At the 90% confidence interval for the pool the interval range averaged 37%.

Meaning that the correct answer for a $30,000 pool could be anywhere from about $24,450 to $35,550.
Danger Will Roberson!

The 37% average CI found in this mathematical proof is only applicable to the specific conditions presented.
Which Appraiser is Correct?

The pool is worth:

1. $25,000
2. $35,000
Hypothesis (True or False)

Adjustment rates are single-point facts that are set in stone.
Hypothesis

FALSE

See page 76, paragraph 2
The Nature of an Adjustment:

➢ Adjustment rates are **not** single-point facts that are set in stone.

➢ They exist in the market in wide ranges.
Appraisers and Users...

Have talked themselves into unrealistic expectations when it comes to extracting adjustment rates.
Correct single-point adjustment rates simply don’t exist in real property markets.

If you still don’t believe me write down the acronym for line item adjustment rate.
Process:

➢ Find reasonable range of the adjustment rates.

➢ Apply them in proportions that predict most probable price.
TOPIC 4

Interactive & Automated Valuation Models
Let’s apply what we have learned.
Refurbished Traditional Analyses

> We used the same adjustment grid- but added residual analyses.

> We used sensitivity analysis- but we quantified it.

> We used ranking analysis- but in an objective way.
Refurbishing Methods

1. Sensitivity analysis measured by the slope of the adjusted sale prices.

2. Residuals (Shadow Grids)

3. Made ranking objective by creating value ranges for each property rank
TOPIC 5

Science of Data Management
Tasks (partial list)

Collection of data
Verification of data
Recording data (retrieval, editing, editing)
Scrubbing the Data

Vast set of tasks all with a coordinated goals.
It is not OK to remove an outlier solely based on its residual. But, a high residual may indicate properties that should not be in the dataset to begin with, or has some serious data errors.

- Properties with High Residuals (Outliers)
  - Not Comparable
  - Comparable but need Corrections
  - Comparable is relevant, accurate. Indicative of a market with a lot of randomness
CONCLUSION
Answers...

...to the test questions from beginning of session.
Where are appraisers
Where are appraisers
Psychology of Change

> Fear that your knowledge & skills won’t meet expectations.

> Head in the sand: we’re protected.

> Deer in the headlights
THOUGHT

Why wait to see what happens, when you can shape the future now?
Necessary Skill Set

See List of Topics
Professional Appraisal Organizations

JOIN
Be Active
Push Organization to be Proactive
THANK YOU!