Assessment Administration:
Sales Ratio Studies

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Poll question:
On a scale of 1-5, how significant are ratio studies to your assessment office?
Outline

- Background, Key Concepts, and Motivation
  - Components of a sales ratio study
  - Practicalities of performing a sales ratio study
  - Areas of impact on an assessment office
- Application and Technical Advice
  - Real data exercises
  - Stratification
  - Outlier handling
What is a sales ratio study?

“A statistical analysis of the distribution of assessment ratios of a sample of recent sales made for the purpose of drawing inferences regarding the entire population of parcels from which the sample was abstracted.” (WPAM Glossary G-44)

- Assessment ratio = $\frac{Assessed\ value}{Sale\ price}$
- Ideally, all assessment ratios = 1
- However, the complexity of the real estate market and limitations of mass appraisal mean that’s rarely the case
Why are sales ratio studies important?

- Assessors are required to meet level of assessment and uniformity requirements found in 70.32 and WPAM Chapter 10

- Provide a ‘report card’ on specific areas of assessment operations

- Help you understand your community, the real estate market, and the local economy overall
Components of a Sales Ratio Study

- Sales verification procedure and resulting records
- Access to complete data
- Technical capabilities and knowledge
Sales Verification

- Thorough sales verification procedures are vital to high quality sales ratio studies.
- WPAM Chapter 10, IAAO Standard on Sales Verification, and DOR PAD Manual all provide guidance on best practices.
- Key aspects of sales verification for ratio studies include:
  - Determining whether the sale arms-length and valid
  - Was the sale valid for ratio study use?
  - PRC updates as a result of verification
Sales verification is only one part of the equation when it comes to sales ratio studies—other assessment information is fundamental for the process.

Types of data needed for an SRS:
- Sales information – sale date and sale price
- Valuation data – assessed value, assessment date, appraiser
- Property characteristics

An underappreciated aspect of the management of a sales ratio study is ready access to all of this data in a format suitable for analysis.
As assessors, we are required to manage office resources to ensure we can complete our duties - SRS creation is no different.

Required technical skills to have on your staff:

- Data extraction and manipulation
- Statistical calculation and interpretation
- Real estate market knowledge

If you notice one or more of these missing, that’s a sign you might need to allocate resources to training!
Practicalities of a Ratio Study

- Process is straightforward:
  - Get a table with assessed value, sale price, and stratification characteristics
  - Identify and remove outliers
  - Calculate the statistics
  - Summarize and interpret the results
- The application exercises will cover all of these areas in more depth
Measures of Assessment Level

- **Median**: in an ordered list of ratios, the middle value
- **Mean**: the sum of all ratios divided by the number of ratios in the list
- **Weighted mean**: the sum of all assessed values divided by the sum of all of the sales prices
- Each tells us something different about the level of assessment, but little about assessment uniformity
Measures of Assessment Uniformity

- Coefficient of dispersion (COD): average percentage deviation of the ratios from the median ratio

<table>
<thead>
<tr>
<th>General Property Class</th>
<th>Jurisdiction Size/Profile/Market Activity</th>
<th>COD Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential improved (single family dwellings, condominiums, multifamily housing 2-4 family units)</td>
<td>Very large jurisdictions/densely populated/newer properties/active markets</td>
<td>5.0 to 16.0</td>
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<tr>
<td></td>
<td>Large to mid-sized jurisdictions/older &amp; newer properties/less active markets</td>
<td>5.0 to 15.0</td>
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<td></td>
<td>Rural or small jurisdictions/older properties/depressed market areas</td>
<td>5.0 to 20.0</td>
</tr>
<tr>
<td>Income-producing properties (commercial, industrial, apartments,)</td>
<td>Very large jurisdictions/densely populated/newer properties/active markets</td>
<td>5.0 to 15.0</td>
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<td></td>
<td>Large to mid-sized jurisdictions/older &amp; newer properties/less active markets</td>
<td>5.0 to 20.0</td>
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<tr>
<td></td>
<td>Rural or small jurisdictions/older properties/depressed market areas</td>
<td>5.0 to 25.0</td>
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<tr>
<td>Residential vacant land</td>
<td>Very large jurisdictions/rapid development/active markets</td>
<td>5.0 to 15.0</td>
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<td></td>
<td>Large to mid-sized jurisdictions/slower development/less active markets</td>
<td>5.0 to 20.0</td>
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<td>Rural or small jurisdictions/active markets</td>
<td>5.0 to 25.0</td>
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<tr>
<td>Other (non-agricultural) vacant land</td>
<td>Very large jurisdictions/rapid development/active markets</td>
<td>5.0 to 20.0</td>
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<td></td>
<td>Rural or small jurisdictions/active markets</td>
<td>5.0 to 30.0</td>
</tr>
</tbody>
</table>

Source: IAAO Standard on Ratio Studies (2013)
Measures of Assessment Uniformity

- Price-related differential (PRD): an index of vertical equity obtained by dividing the weighted mean by the arithmetic mean.

- Price-related bias (PRB): An index obtained by regressing percentage deviations from the median ratio on percentage changes in a value proxy obtained by giving equal weight to assessments and sales prices.

Source: IAAO Standard on Ratio Studies (2013)
Why do these statistics matter?

- 70.32 and case law provide requirements for both level of assessment and uniformity

- Combined with stratification, ratio studies are a powerful tool for assessment offices

- Provide concrete evidence to stakeholders about your performance
Areas of Impact in an Assessment Office

- **Budgeting**
  - Ratio studies help you defend your values and overall performance
  - Also provide direction for where additional resources might be needed

- **Resource allocation**
  - Where do you need to improve?
  - Are individual employees performing well? Do they need more training?
  - Are your models performing well?
  - Do you need to conduct a revaluation?

- **Statutory requirements**
Discussion and Break

ASK YOUR QUESTIONS USING THE Q & A FEATURE