



Department of Local Government Finance

Ratio Studies

Deven Harris and Barry Wood
January 2023



Ratio Studies

- What is a Ratio Study?
- Deadline
- Time period for sales
- Sales - All sales are candidates
- The sample is a representation of the population
- Components of the Ratio Study
- Questions?



Ratio Studies

- Definition:
 - “Ratio study” is used as a generic term for sales-based studies designed to evaluate assessment performance. It is a study of the relationship between appraised or assessed values and market value-in-use as reflected by sales or other information.
 - 50 IAC 27-2-10



Ratio Studies

- The Ratio Study is used as a “measurement and evaluation of the level and uniformity of mass appraisal models” and as a “determination of whether administrative or statutory standards have been met.” – IAAO Standard on Ratio Studies
- Ratio studies are intended to measure the accuracy and consistency of assessments.



Ratio Studies

- Ratio studies are required for the following property classes:
 - Vacant Residential
 - Improved Residential
 - Vacant Commercial
 - Improved Commercial
 - Vacant Industrial
 - Improved Industrial



Ratio Studies

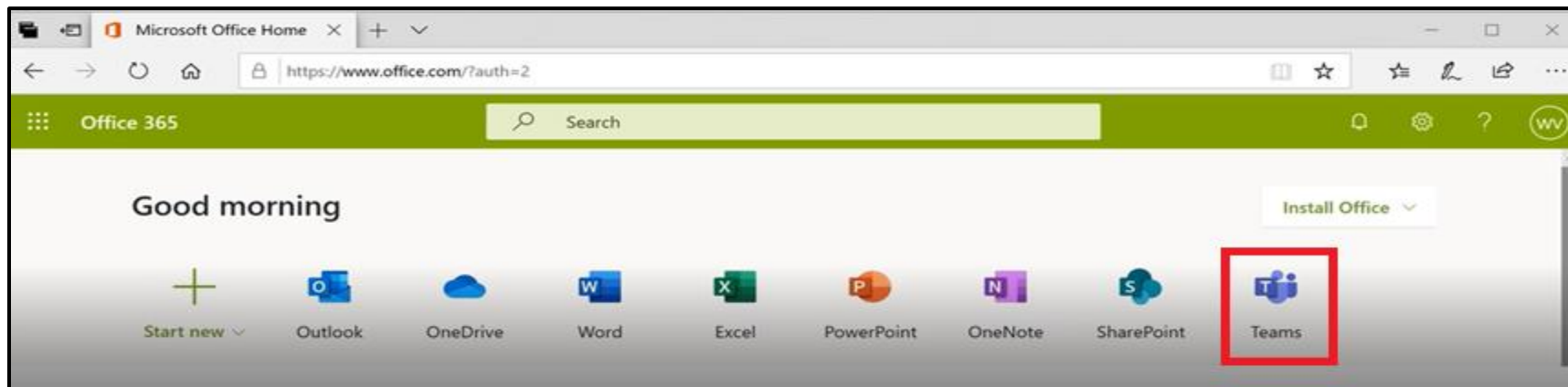
- Beginning with the 2020 Ratio Study review process, all file sharing and communication has been conducted through Microsoft Teams.





Ratio Studies

- Teams is accessible through the desktop app (downloaded onto your computer) or the web app.
- To access the web app, go to www.office.com
- If Teams asks for a password, it is your Windows login credentials. To access your channel, you do not need a password. You would need to contact your IT representative to resolve that issue.





Ratio Studies

- Counties and vendors will be added to Microsoft Teams as guests. Other than assessors, guests will not be added without the express consent of the county. Guests will receive an invitation to join the team via email from Microsoft. Please follow the prompts in the email to accept this invitation. Guests who were included in the 2022 Ratio Study review will be carried over for the 2023 review.
- During the Ratio Study season, always keep Microsoft Teams open to get notifications immediately (Note: Set Microsoft Teams up to auto-start. Microsoft Teams will open when you start your computer.).



Ratio Studies

- To submit your Ratio Study files, locate and click on the 2023 channel in your “Team.” At the top of the screen you will see tabs named Conversation, Files, etc. Click on Files. Below these tabs you will find an “Upload” button. Select the Upload button and navigate to the appropriate files. When you select your files and click “Open” they will upload to this channel. Repeat these steps for all files if uploading individually. Excel files should be submitted in xlsx format to allow for editing in Teams.
- Notify the Department by tagging @Barry Wood, and @Julie Waddell in the conversations tab. If you do not use the @mention, the Department staff will not know of your submission. The Department will acknowledge receipt of your Ratio Study.



Ratio Studies

- What is the “Ratio” in Ratio Studies?

$$\frac{\textit{Assessed Value}}{\textit{Sales Price}}$$



Ratio Studies

- The Ratio Study compares assessments to sale prices of similar properties.
- Properties are grouped and the ratios are analyzed to see if assessments reflect market value-in-use.
- The ratio shows how close the assessment of a sold property is to its sale price.



Ratio Studies

$$\frac{\textit{Assessed Value}}{\textit{Sales Price}}$$

$$\frac{\$100,000}{\$150,000} = .67$$

<1 = Under-assessed

$$\frac{\textit{Assessed Value}}{\textit{Sales Price}}$$

$$\frac{\$100,000}{\$80,000} = 1.25$$

>1 = Over-assessed



Ratio Studies

- Time Period
- Statutorily due by March 1.
- Sales Window: January 1, 2022 – December 31, 2022
- Assessing officials may use a different sales window (e.g., November 1, 2021 – October 31, 2022). However, the sales window must cover at least twelve (12) months.
- If an alternative sales window is used, it should not go back more than two (2) months (i.e., November 2022).



Ratio Studies

- A longer time period may be required to produce a representative sample in some counties; however, no more than five (5) years of sales may be used in the ratio study.
- Older sales must be time-adjusted as appropriate and in accordance with the methods prescribed in the 2013 IAAO Standard on Ratio Studies.



Ratio Studies

- Sales
- 50 IAC 27-4-7(f): All sales are candidates for the ratio study unless sufficient and compelling information can be documented to show otherwise.



Ratio Studies

- After the sales submission has received a compliance status, we will use those files to generate a list of potentially valid sales. This includes all sales in the 300-599 class code that are >\$1,000 and do not have a special circumstance marked. These are sales we expect to see in the Ratio Study.
- Sales without a special circumstance marked must have an explanation on the Sales Reconciliation.



Ratio Studies





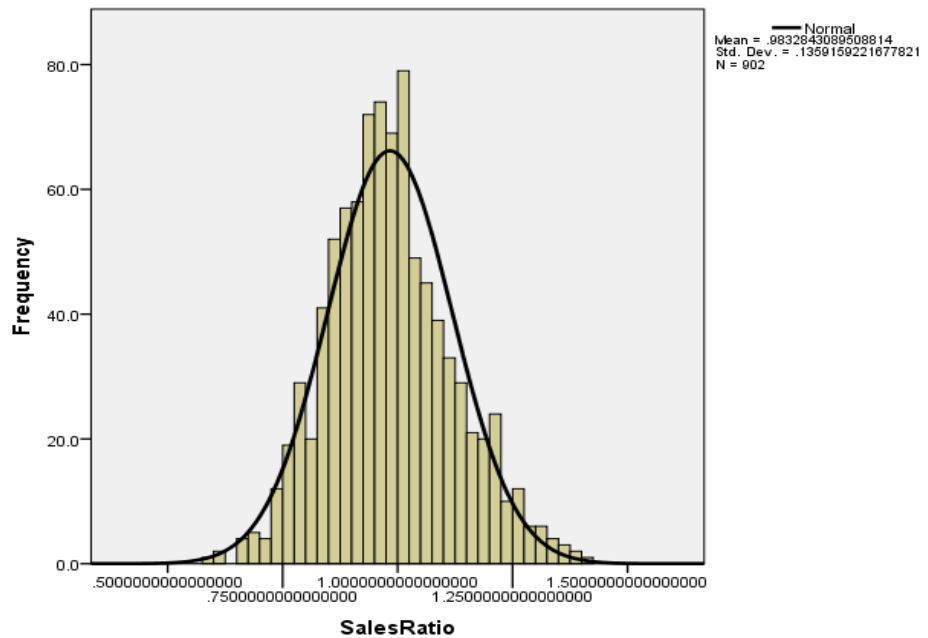
Ratio Studies

- Sample vs. Population
- The distribution of ratios in the population cannot be ascertained directly and appraisal accuracy can vary from property to property. By definition, a ratio study sample would be representative when the distribution of ratios of properties in the sample reflects the distribution of ratios of properties in the population.

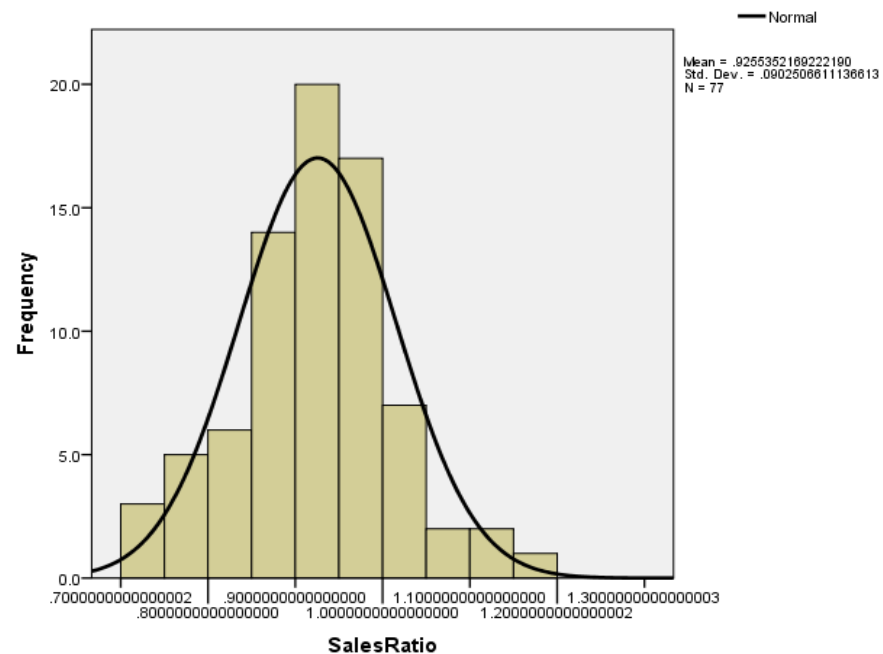


Ratio Studies

Population



Sample





Ratio Studies

- Representativeness is improved when the sample proportionately reflects major property characteristics present in the population of sold and unsold properties. As long as sold and unsold parcels are appraised in the same manner and the sample is otherwise representative, statistics calculated in a sales ratio study can be used to infer appraisal performance for unsold parcels.



Ratio Studies

- If parcels that sell are selectively reappraised based on their sale prices and if such parcels are in the ratio study, uniformity inferences will not be accurate (appraisals appear more uniform than they are). In this situation, measures of appraisal level also will not be supportable unless similar unsold parcels are appraised by the model that produces the same overall percentage of market value (appraisal level) as on the parcels that sold.



Ratio Studies

- Assessing officials must incorporate a quality control program; including checks and audits of the data, to ensure that sold and unsold parcels are appraised at the same level.



Ratio Studies

Operationally, representativeness is improved when the following occur:

1. Appraisal procedures used to value the sample parcels are similar to procedures used to value the corresponding population.
2. Accuracy of recorded property characteristics data for sold property does not differ substantially from that of unsold property.



Ratio Studies

3. Sample properties are not unduly concentrated in certain areas or types of property whose appraisal levels differ from the general level of appraisal in the population.
4. Sales have been appropriately screened and validated.

IAAO – Standard on Ratio Studies



Ratio Studies

- Statistical Measures
- Level (ratio): 0.90-1.10
- Coefficient of Dispersion (COD) - Equity:
 - <15 for residential improved
 - <20 for other real property
- Price-Related Differential (PRD): 0.98-1.03
- *Note: Spearman Rank rather than PRD is used for groupings with fewer than 20 sales.



Ratio Studies

- The Department will conduct the Spearman Rank test, which is a test for vertical equity. This test is done for groupings with 5-20 sales. If there is vertical inequity, this will need to be corrected.
- The Department will also conduct the Mann-Whitney test, which is a test for the equal appraisal between sold and unsold properties. The Department will review all neighborhoods that have a statistically significant difference between the sold and unsold parcels and request an explanation for specific parcels. A Standard Operating Procedure (“SOP”) for effective age changes is a “best practice” that should be implemented (and will help expedite the review process).



Ratio Studies

- Components of the Ratio Study Submission
- Ratio Study
 - Formatted Tab
 - Separate tab for each major property class
 - Summary Tab



Ratio Studies

- Components of the Ratio Study Submission
- Workbook
- Sales Reconciliation
- Narrative Template



Ratio Studies

- Formatting
- Must be properly formatted before Ratio Study will be reviewed.
- Ratio Study Guidance includes sample spreadsheets with examples of correct and incorrect formatting.



Ratio Studies

- Narrative Template
- If there are Assessed Value (“AV”) changes within a Township/Study Section which are greater than 10%, those explanations must be included in the Narrative Template.
- NOTE: Change from prior years – the AV analysis would be based upon current year class code for both current and prior year.
- In regard to the cyclical reassessment review, was there a land order completed in 2022? Also, please note any other changes or issues. Please note that the Narrative Template is the same as last year.



Ratio Studies

- Things that cause delays
 - Incorrect formatting.
 - Missing or insufficient explanation on reconciliation.
 - Narrative does not explain Assessed Value changes.
 - Delayed response to messages.
 - No or inadequate grouping explanations.



Ratio Studies

- For vacant sales, the total AV shown on ratio study should only reflect the land value.
- Counties need to make sure to use upper case “Y” and “N.”
- Non-multi-parcel sales should have a “Y” in the primary column.
- Counties should be able to match their cyclical reassessment totals in the workbook to their final cyclical reports for this year.
- No new workbooks or ratio study files should be uploaded after the initial submission.



Ratio Studies

- How to get a timely approval
 - Get acquainted with Teams (review how to make changes to files).
 - Submit all files.
 - Format all files correctly.
 - Include all necessary information in the Narrative.
 - Include Standard Operating Procedure for effective age changes in Narrative.
 - Keep Teams open during process.
 - Review notifications immediately.



Ratio Studies

- Standard on Ratio Studies – IAAO
 - https://www.iaao.org/media/standards/Standard_on_Ratio_Studies.pdf
- Standard on Verification and Adjustment of Sales – IAAO
https://www.iaao.org/media/standards/Verification_Adjustment_of_Sales.pdf
- Standard on Mass Appraisal of Real Property – IAAO
<https://www.iaao.org/media/standards/StandardOnMassAppraisal.pdf>
- Indiana Administrative Code: 50 IAC 27
http://www.in.gov/legislative/iac/iac_title?iact=50
- *IAAO = International Association of Assessing Officials



Questions



Ratio Studies

- Deven Harris
- Telephone: 317-234-0940
- Email: dharris@dlgf.IN.gov

- Barry Wood
- Telephone: 317-232-3762
- Email: bwood@dlgf.in.gov

- Website: www.in.gov/dlgf
- “Contact Us” <https://www.in.gov/dlgf/contact-us/>