Market Value and Ratio Studies

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Market Value, Statistical Tests, and Category Comparisons

Idaho Statutes

- **Section 63-205 I.C. Assessment - Market Value for Assessment Purposes**

- (1) All real, personal and operating property subject to property taxation must be assessed annually at **market value** for assessment purposes as of **12:01 am** of the **first day of January** in the year in which such property taxes are levied…

Idaho Statutes

- **Section 63-208 I.C. Rules Pertaining to Market Value – Duty of the Assessor**

"The rules promulgated by the state tax commission shall require each assessor to find market value for assessment purposes of all property, except that expressly exempt under chapter 6, title 63, Idaho Code…"

Mass Appraisal

- The process of valuing groups of properties as of a given date, using standard methods, employing common data, and allowing for statistical testing.
  - Evolved out of a need for uniformity and consistency in the assessment of large groups of properties
  - Key difference from single property appraisal is scope and use of statistical modeling
  - Mass appraisal prioritizes efficiency and uniformity across a jurisdiction

What is Equalization?

*…process by which a supervisory (or oversight) or review agency adjusts initial assessments as determined by local assessors to ensure that the assessments **overall** (not individually) are at the legal level of assessment or are uniformly assessed.*

Fundamentals of Tax Policy

International Association of Assessing Officers

Tax Commission Role

Section 63-109 I.C. Equalization by Categories

- (1) If the state tax commission has reason to believe that a county assessor has improperly assessed a category of property, it shall provide notice to the county assessor and board of county commissioners of the alleged improper assessment no later than the **first Monday of April.**

Section 63-109 (2) IC

- The state tax commission shall equalize the assessments of property throughout the state, by categories, as shown by the abstracts transmitted by the several county auditors, county by county.
- In such equalization, the state tax commission shall have the power to increase or decrease the total value of any category of property in any county…

Why equalize - STC?

- Tax levy rate calculation
  - **Property Tax Budget ÷ Net Taxable Value = Levy Rate**
- Property tax rates are required to be uniform throughout each taxing district
- Equalization ensures that taxes levied by taxing districts are uniform if all categories are assessed at common level – **market value**
- Locally and centrally assessed property
  - Operating property - public utilities and railroads are centrally assessed by STC

Joint Taxing Districts

- **41** of **44** Idaho counties have joint taxing districts (*Exceptions - Boundary, Clark, and Teton*)
- Contain property valued by more than one county assessor
- Contain property equalized by more than one set of county commissioners
- Include **53** school districts, **6** joint cities, and **68** other taxing districts, some of which are in four counties

Professional Standards

- **I**nternational **A**ssociation of **A**ssessing **O**fficers (**IAAO**)

- Standard on Ratio Studies
- Standard on Verification and Adjustment of Sales
- Standard on Mass Appraisal of Real Property
- Property Tax Administrative Rule 003.

The Ratio Study

- **Ratio Study** – A statistical study of the relationship between assessed values and market values (sale price)
- Compares assessed values to market values
- The primary tool for measuring mass appraisal performance
- Market values are represented by adjusted sale prices of individual transactions

The Assessment Ratio Formula

Assessed Value ÷ Sale Price (A÷S)

For example:

Assessed value $540,000

Sale Price $600,000

$540,000 ÷ $600,000 = 0.90 or 90%
(Assessment Ratio)

Assessment Timetable

- January 1, 2026 – Date of Assessment
- Assessment Data collection
  - Calendar Year 2025
- Assessment notices
  - 1st Monday in June 2026
- County Board of Equalization
  - 4th Monday in June 2026 to 2nd Monday July

Compliance Ratio Study Timeline

- **Visit Assessors:** – Collect data December 2025, January 2026

- **Study timeframe:**
  - October 1, 2024, to September 30, 2025

- **Testing:** January 1, 2025, Assessments
  - Sale prices adjusted to reflect January 1, 2025

- Property Tax Administrative Rule 131

Analytical Independence

- Separate Ratio Study Timeframe Prevents:
  - **Overfitting –** creating a model that matches the training dataset too closely and fails to make correct predictions on new data
  - **Circular Reasoning -** the analysis loops back to validate the conclusion, rendering the argument invalid and unsupported
    - An example is using data from a model to "prove" its accuracy, then using that assumed accuracy to justify the model's output.

Categories Studied for Compliance

- **5 Primary Categories**
  - Vacant Residential Land
  - Improved Residential
  - Vacant Commercial or Industrial Land
  - Improved Commercial or Industrial
  - Manufactured Housing

Statistical Analysis

- **Measures of central tendency and dispersion**
  - Identifies the typical ratio for categories studied

- **Assessment Level**
  - Median – the midpoint
  - Mean – the average
  - Weighted mean – the aggregate

RATIO STUDY Not Official until 'FINAL' dated & initialed	Using 2016 Assessed Values	Assessment Date:	From:	To:
		01/01/2016	10/01/2015	09/30/2016
Sales Price is Time Adjusted	Inflationary Market Trend	1.00%		

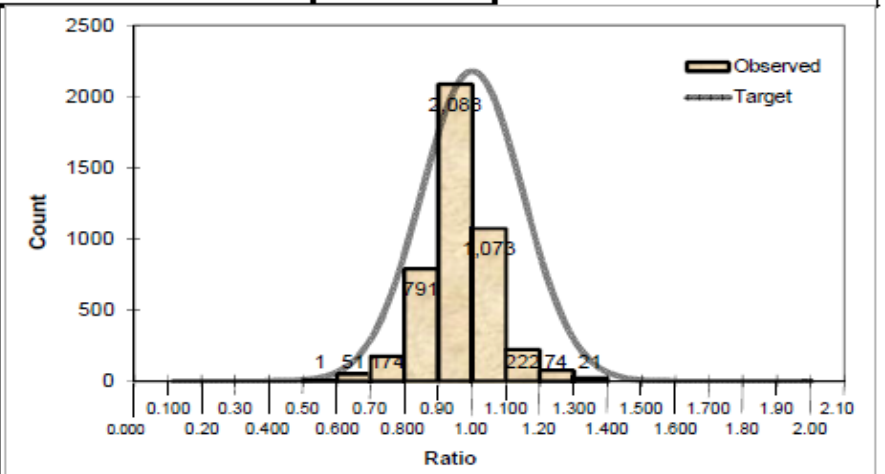
SAMPLE STATISTICS	
Sample size (n)	4,495
Total Assessed Value	$745,268,660
Total Adjusted Sales Price	$778,603,787
Mean Assessed Value	$165,799
Mean Adjusted Sales Price	$173,216
Standard Deviation AV	$72,046
Standard Deviation SP	$74,229
Median Assessed Value	$146,100
Median Sales Price	$151,878
ASSESSMENT LEVEL	
Arithmetic Mean Ratio	96.17%
Median Ratio	96.04%
Weighted Mean Ratio	95.72%
Geometric Mean Ratio	95.65%
UNIFORMITY	
Lowest Ratio	59.90%
Highest Ratio	134.28%
Coefficient of Dispersion	7.62%
Standard Deviation	9.94%
Coefficient of Variation	10.34%
Price-Related Bias	-0.0031
Price-Related Differential	1.00

T-Score: -1.1134

RELIABILITY		
90% Confidence Intervals:	Lower	Upper
Around the Mean	95.93%	96.42%
Around the Median	95.82%	96.28%
Around the Weighted Mean	95.43%	96.01%
Around the COD	7.41%	7.83%
Around the PRB	-0.0085	0.0023
Probability True Mean 90-110	Approx.100%	
80% Confidence Intervals:	Lower	Upper
Around the Mean	95.98%	96.36%
Around the Median	95.86%	96.22%
Around the Weighted Mean	95.49%	95.94%

NORMALITY Test Results:	Non-Normal
Chi Square Test	Non-Normal
Binomial Test	N/A
Mann-Whitney Test	-3.2005
Significance of Value Related Inequity - Strong	
D'Agostino-Pearson	Non-Normal
Shapiro-Wilk W	N/A
Kurtosis (2.5 - 4) = 4.59	Not Trimmed?
Skew (-0.5 - 1) = 0.19	Acceptable

COD Standard	Maximum
Primary Group: Improved Residential (Ref ID 2)	15.00%



Compliance Checks:

Level:	Compliance Met?	
90% Confidence Interval:	☐ YES	☐ NO
80% Confidence Interval:	☐ YES	☐ NO

Uniformity:	COD Standards met?	YES
	COD:	Excellent
	COV:	Very Good
	PRD:	No Observed Bias
	PRB:	Meets IAAO Standard, No Significant Bias

COMMENTS:

1.34% of the originally available population has been trimmed.
Outliers TRIMMED using IQR - Outer Fence @ 3.0
Below 0.581 (5 sales) and Above 1.344 (56 sales)

Secondary Category(ies) with sales

Count	Category	Description
214	1234	Improved Rural Res Tract
495	1537	Improved Rural Res Sub
3,753	2041	Improved Urban Res
33	50	Res Imps on Exempt Land

Compliance

- Primary categories must have median ratios **provably not** more than **±10%** from market value (100%)
- Statistical proof of non-compliance is based on **confidence intervals**, not just the sample medians
- Legal requirements – assessments to reflect market value as of Jan. 1

Statistical Significance (proof)

- **Confidence intervals**
  - The range within which the true measure of assessment level for a population being studied will fall within a known degree of certainty

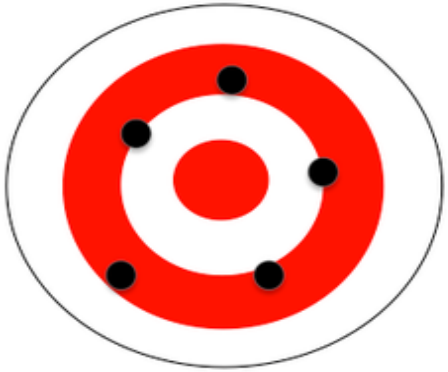
- Assessment level – **Median**

- Known degree of certainty **- 90% Confidence Interval**

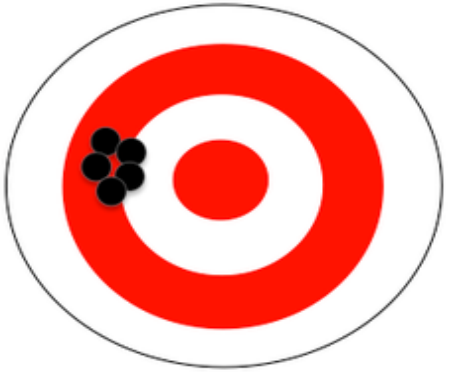
Measures of Appraisal Uniformity

- *Range* – difference between lowest and highest ratio
- *Average absolute deviation* – the average difference between each ratio and the median ratio
- *Coefficient of dispersion (COD)* –expresses the deviation as a percentage of the median
  - **Most used measure of uniformity in assessments**

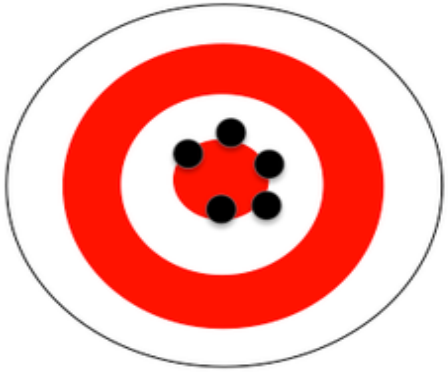
A. Low Accuracy;
Low Precision



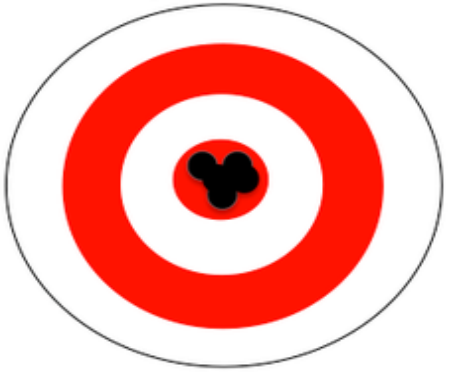
B. Low Accuracy;
High Precision



C. High Accuracy;
Low Precision



D. High Accuracy;
High Precision



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Measures of Appraisal Uniformity

- *Standard deviation* – common statistical measure of dispersion

- *Coefficient of variation (COV)* – expresses the standard deviation as a percentage of the mean

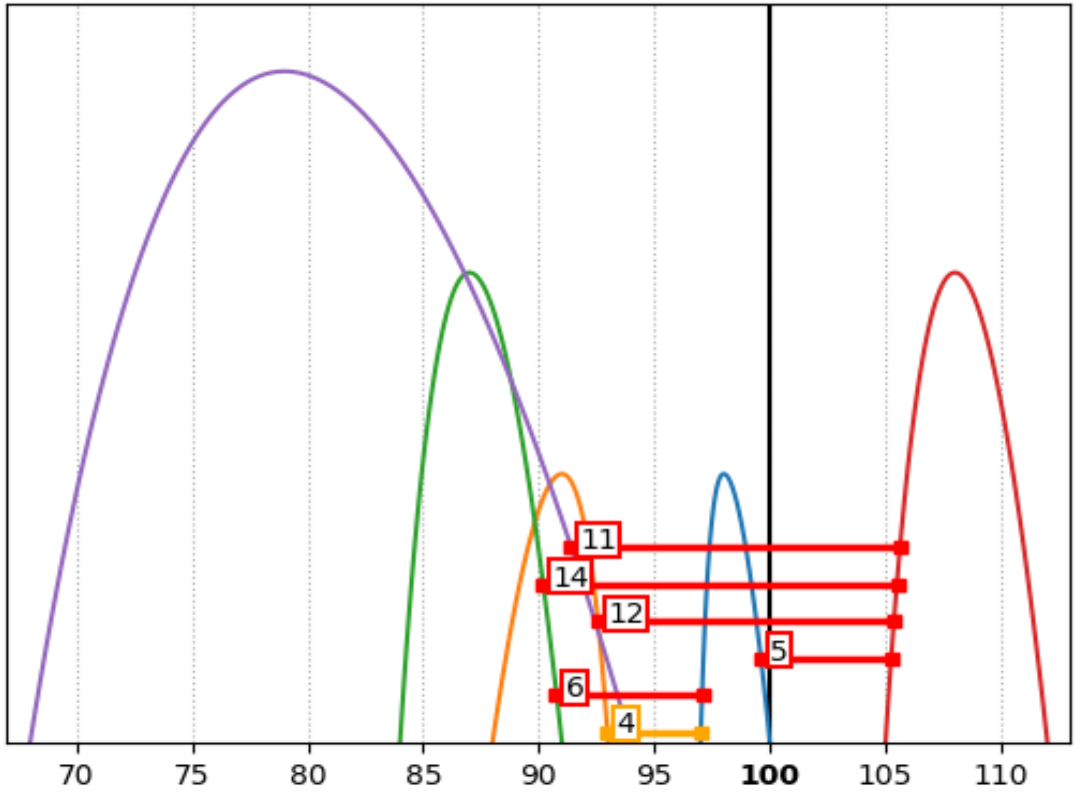
- Price-related differential (PRD) -measures if assessments of high and low value properties are similar

What's new for 2026?
(2025 ratio studies)

- Primary categories must have median ratios with ***provably*** **not** more than 5% difference between categories

- Failure would be cause for STC intervention

Sample County
Annual Ratio Study—90% Upper and Lower Confidence Intervals
Around the Median of Each Category Studied



	Lower CI	Median	Upper CI
Improved Residential	97	98	100
Vacant Residential	88	91	93
Improved Commercial	84	87	91
Vacant Commercial	105	108	112
Manufactured Housing	68	79	94

What can be tested with ratio studies?

- Is the assessment level for a category lower or higher than market value?
- Is the assessment level for a category more than ±10% from market value?
- Is assessment level for one category more than 5% different from that of a different category?

What cannot be tested in this way?

- Are ***individual properties*** in a given category at market value?

- Are ***individual properties*** in a given category within ***10% of market value?***

Assessment Ratio Studies

- Similar statistical measures can provide estimates of the ***proportion of properties*** above or below or between given ratio points

- Small samples and poor uniformity lead to wide confidence intervals which make proving these conditions difficult

In the absence of proof, compliance is assumed