Excerpt from: Mass Appraisal of Real Property-IAAO

Sales Ratio Trend Analysis

Sales ratio trend analysis involves the analysis of sales ratios over time. When sale/appraisal (S/A) ratios rather than A/S ratios are used in the analysis, an upward trend in the ratios indicates inflation; a downward trend indicates deflation. All the appraisals must reflect the same appraisal date.

The pattern of the ratios can be visualized through a scatterplot. Figure 5 shows a plot of 148 vacant land ratios over a twenty-four month period (month "0" corresponds to the previous reappraisal date). The plot indicates inflation.

The overall change in prices can be discerned by comparing the beginning and ending S/A ratios. In this case, the ratios increased from an average of 0.97 in month "0" to 1.19 by the end of the period. This suggests an approximate rate of change of 1 percent per month:

$$\text{Percentage change} = (1.19 - 0.97) + 0.97 = 0.227 = 22.7 \text{ percent;}$$
$$\text{Rate of change} = 0.227 + 23 = 0.0099 = 0.99 \text{ percent, say } 1.0 \text{ percent.}$$

As with unit-value comparisons, regression analysis could also be used to extract the rate of change. For illustration, a regression line has been fit to the data in figure 5. Figure 6 shows the regression output. To calculate the indicated rate of change, divide the regression coefficient by the regression constant:

$$\text{Rate of change} = .00957 + 0.96878 = 0.99 \text{ percent per month, say 1 percent.}$$

These methods of extracting the monthly rate of change assume straight-line appreciation or deflation, that is, that the indicated rate of change will be applied to sales prices on a noncompounding basis. For example, if a property sold twelve months ago for $100,000 and the rate of inflation were 1 percent per month, the time-adjusted sale price would be calculated as

$$\$100,000 \times (1 + 12 \times .01) = \$100,000 \times 1.12 = \$112,000.$$

Figure 5
Plot of Sale/Appraisal Ratios
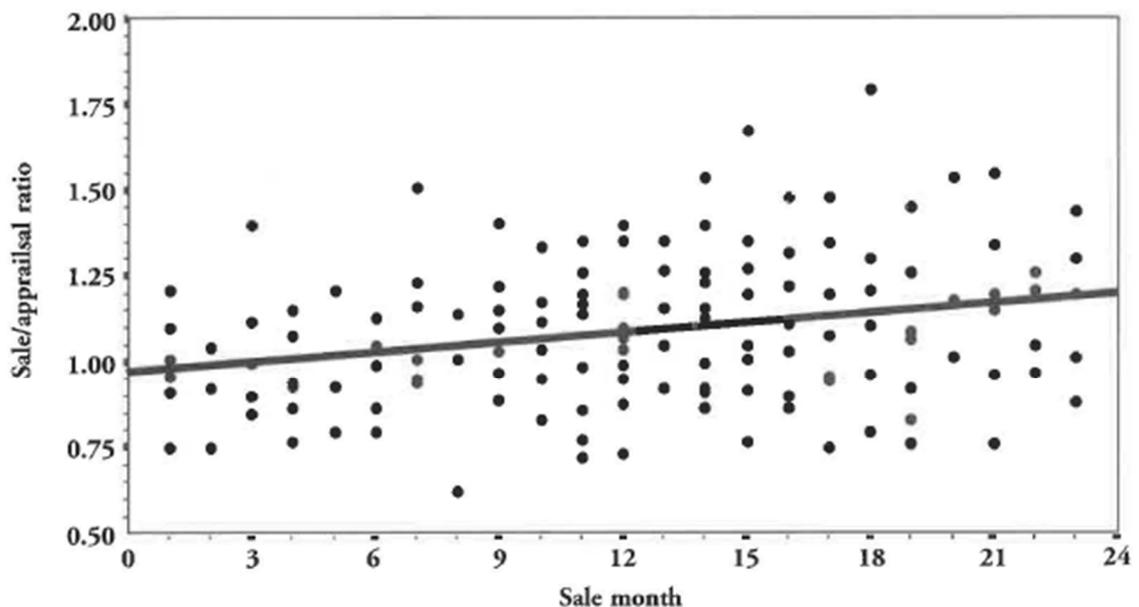
Month	Average of RATIOS
1	1.157941154
2	1.241430569
3	1.271247398
4	1.361774562
5	1.392018618
6	1.401731049
7	1.485315355
8	1.464643167
9	1.414729473
10	1.539150214
11	1.560097838
12	1.476110277

school_id

Average of RATIOS

Sale/Appraisal Ratios

MONTH