Selective Reappraisal (sales chasing) Testing through Comparison of Average Value and Subjective Variable Changes

This procedure document is intended to assist the assessor in testing for selective reappraisal practices. The comparison of average value changes will provide a good indication of whether or not sold and unsold properties were equitably reappraised. The comparison of subjective variable modifications may assist in identifying how sold vs. unsold properties were treated differently.

This document should be utilized in conjunction with IAAO standards. No test on its own can be solely relied upon as irrefutable proof of selective reappraisal. The results should always be reviewed with consideration given to sample size, random sample error, market conditions, and unique sale data, among many other potential influences.

Required Data:

To perform the following tests the appraiser first must have the ability to extract property data from their CAMA system and import that data into an excel spreadsheet. The data elements required are as follows:

- Parcel identification number (or other parcel specific identifier)
- Total parcel value
- Value attributed to new construction in change year (if applicable)
- Sale status (did the property sell or not)
- Subjective variable data (this can differ depending on the CAMA model being utilized)
  - Grade and/or quality rating
  - Effective age and/or condition rating
  - Override values
  - Appraiser determined obsolescence (whether lump-sum or percentage)
  - Any other data element which is subjective and adjustable by the appraiser.
    - Non-subjective data **should not be included**. These characteristics can be easily identified as correct or incorrect, examples include finished square footage, decks, bedroom and bathroom counts, etc.

Along with this data you may want to extract classification, jurisdiction, appraiser/CAMA user ID, sale study qualification status, sale date, or anything else you will be using to narrow down your inquiry. However, this is not required information if you are able to extract only the sample data that you want to test by eliminating properties that do not meet certain criteria from the data extract altogether.
Process:

1. Determine your test parameters

Timeframe:
You will need to first determine which time period you want to review for sales chasing. For this example I am going to review changes made for the 1/2/2013 assessment. An appraiser might make the mistake of separating sold vs. unsold based on sales occurring in the relevant 12-month study period (10/1/2011 through 9/30/2012 for the 2013 assessment). I would suggest considering 1; when was the CAMA system unlocked for editing property information for the 1/2/2013 assessment and 2; what is the typical lag time between the sales actually occurring and when it is documented with the county or city (brought to the appraiser’s attention).

![Diagram showing sales period and assessment dates](image)

For the beginning date consider that most of the February 2012 sales were trickling in after the system was locked for editing the 1/2/2012 assessment. For the ending date it would depend what time of year I was running the report. If running the report on 3/1/2013 I could utilize sales from February 2012 through the end of February 2013 (13 months) because I know that the appraiser had access to all February 2013 sales in the system at that time. However, if I’m running the study May of 2013, then many of the sales from February of 2013 may have been entered after the system was locked and the appraiser didn’t have access to them.

Every situation will be different depending on the above mentioned factors. For this example I’m going to utilize the February 2012 through January of 2013 sales because I am confident that those best represent the sales the appraiser had access to when considering the reappraisal for the 1/2/2013 assessment.
Properties to be tested:
The second step in the process is to determine what group of properties you want to test. Depending on the data extraction methods for your jurisdiction you may be able to include more data in the extract and then filter in the spreadsheet. Otherwise you could filter properties out when performing the extract. For this example I am filtering the extract to include only residential properties which are improved with a home and located in a specific city. This means that I do not need to include classification or jurisdiction in the data output. Most of the time it makes sense to include as many data elements as possible for filtering and sorting in the spreadsheet, that way you do not have to run exports and format spreadsheets over and over again.

2. Get the data into a spreadsheet

Most CAMA systems provide a method for extracting data from the system and importing into a spreadsheet. If you have never done this before you should consult with your vendor and/or I.T. department to determine how this may be possible. Even if a built-in method doesn’t exist, your I.T. department should be able to assist you in finding a creative solution such as opening a text document in excel and utilizing “fixed-width” settings to create the necessary columns.

You can extract the data in as many segments as is required. You will likely end up with two excel files including data for the two assessment years that you will be comparing. For the 1/2/2013 assessment date I will be comparing the final 1/2/2012 data to the updated 1/2/2013 data. For various reasons, I have four different data extracts that I run. Whatever the number of extracts you have, each should be entered on its own separate sheet of a single excel file.
For this demonstration I have queried the system for:

- 2012 and 2013 values and subjective property characteristics
  - Home quality rating, effective age, and obsolescence
- Value attributed to new construction for the change year (2013)
- Sale price and sale ratio
  - Within the sale date range as determined in step one.
  - In reality, all that you need to know is whether or not the property sold in that timeframe, but the additional data will allow you to perform distribution analyses based on sale ratio if desired (eg. how were properties treated when sale ratios fell below 80%)?

Again, these data pieces and descriptions will differ based on what’s being utilized in various jurisdictions.

3. **Utilize the VLOOKUP excel feature to merge data onto one sheet**

The VLOOKUP function will look at data from different sheets and merge them onto the same line for consolidation. You can’t simply copy and paste even if you have all of the necessary info on two county-wide lists because parcels will have been created, retired, had class changes, etc.

For this example we will consolidate all of the data into sheet one which is currently labeled “2012 Data”. Open the sheet and select the cell in the first blank column and the row below the header. Click on the “insert function” button and find the VLOOKUP function. Select VLOOKUP and press enter.
For the “lookup_value” select the PID in that row. This is the data it will be looking to match from the other sheet in order to bring back information.

Click in the “Table_array” box. Now click on sheet two which is currently labeled “2013 Data”. Now you should click on the “A” and drag to “E” so that you are selecting all of the columns containing data on this sheet. Once the perforated line is outlining the data click on the 3rd box “Col_index_num”.

![Excel screenshot](image-url)
In the “Col_index_num” field you enter the column number from the sheet you have selected from which you want data returned. Column B is 2, C is 3, D is 4, and so on. In this case I wanted the “Total Value” column from the “2013 Data” sheet to report back. Once making the column entry be sure to change the “Range_lookup” to “false”. Press OK.

You will now see that the 2013 total value has been added to the sheet.

In order to copy and paste this into the next columns you must add dollar signs ($) in three locations.

=VLOOKUP($A2,'2013 Data'!A:E,2,FALSE)

Insert those dollar signs into the actual function for the cell.
Now copy and paste the formula into the next three columns because you are pulling 4 total columns of data from this sheet. You will notice that it returns the same data in each cell. You must go into each cell and change the column number to correlate with the data you want from the “2013 data” sheet. Click on each cell and update the column number as seen below.

Now that you have merged two years worth of data you will want to relabel your header accordingly to something you can understand.

Repeat the above steps to add the data from any additional sheets in your workbook until all data is consolidated. You have to completely start with a new VLOOKUP function for each new sheet. Below I have consolidated all of the data from each sheet as displayed on page three of this procedure document.
Once this is completed you can copy and paste the formulas for all of the columns.

At this point I recommend saving the workbook, copying all of the data, and pasting into a new Excel workbook for the remainder of the process. This will preserve the original data in case you need to go backwards. Sorting data and working with the pivot table will also run more smoothly as you will have eliminated the formulas and lookups.

4. Clean up the data

Sort the data by new construction amount, delete all parcels with new construction values. Sort the imported grades column and delete any “NA” data, these are properties where the parcel may have been deleted from the CAMA system, the building was removed, etc. (eg. row 44532 in the above screen capture would be deleted from this test because the parcel no longer exists in 2013 due to a split of the property).

At this point I like to rearrange the columns so that similar data pieces are next to each other as seen below. This is accomplished by cutting and pasting a column into the desired location.
5. Add columns to report changes in value and subjective variables

Create a column for % change in value from 2012 to 2013. By right-clicking the column D label and selecting “insert” I have created a new blank column and labeled it % CHG. I then type in the appropriate formula and copy-paste it into the entire column.

Once you have pasted this formula for the entire column one last data clean-up process needs to take place. Sort the % change column by value to identify any outliers. There isn’t a magic range to utilize, but if a property value changed by more than ±100% I would give it a second look. For instance, the property below with a 210.7% increase in value was actually a tear-down and rebuild of a lake home property. The appraiser failed to enter a new construction value for the 2013 assessment so it was included in the test. Depending on sample size having one 200% ratio probably isn’t going to throw off the overall results. There are a number of scenarios that could possibly result in a 1,000% or more change which can seriously affect the test results.
Insert another blank column next to each subjective variable pairing. Below I have done so for the “Quality” rankings. Insert the column and find the “IF” function.

In the “logical_test” field enter the two columns for comparison. To determine if a quality change occurred I have inputted the parameters to determine if the 2012 quality rating is equal to the 2013 quality rating (E2=F2). In the next box I have entered a “0” if the quality ratings are equal to each other, indicating there is no difference in rating. In the third box I have indicated that if there is a difference a “1” should be returned. You could utilize a no/yes output here, but for statistical analyses later the 0/1 relationship is easier to work with.
Copy and paste that formula throughout the entire column. You will notice that the properties which received a change to the quality rating are indicated by a “1”.

Repeat this process for all subjective variable data in your sheet.

6. Create a pivot table in order to analyze the data

Select all of the columns containing data on the sheet and insert the pivot table by selecting the “Insert tab” and then clicking on “PivotTable”.

![Excel Pivot Table](image)
A window will pop-up confirming the data you have selected. If it is correct press “OK”. A new sheet will have been created for the pivot table appearing similar to the one below.

Click and drag the parcel ID, % of value change, and all subjective variable change data pieces into the “Values” box.
Change the formula for the % change from count to average.

Now change all of the subjective variable change settings from count to sum the same way you changed the % of change to an average. The sheet should now look like this:
If you imported any additional data for which you would like the ability to filter by, you need to drag those data pieces into the “Report Filter” box. This may include classification, jurisdiction, cama user, etc. One thing that you must be able to filter by is sold vs. unsold. I have added “ratio” so that I can filter for properties that have a value in that column (sold), and properties that do not (unsold, or “#N/A” on the sheet).

You will need to add simple formulas to the sheet in order to calculate the % of the properties being considered which had the specific subjective variable change. In the example below the formula for cell C5 is “C4/A4”, cell D5 is “D4/A4”, and cell E5 is “E4/A4”. Then all you need to do is reformat those new cells to percentages.

You will notice that all of the parcels in the city are being considered for a total of 8,656. Of those properties the average value change was 3.06%, 4.77% of properties had a Quality change, 7.16% of properties had an effective age change, and 0.02% received an obsolesence change.
7. Build a template for tracking data

This is as simple as copying and pasting the information header below and then creating separate lines for total, sold, and unsold. Because you may have imported more than one city to be analyzed you may have to perform this step for each separate analysis you perform.

![Excel table](image1)

8. Filter data as desired and document results

Per the data for the city total above I have manually entered the first line of data as seen below. I have also changed the labels for my template so that they describe the data being transferred.

![Excel table](image2)
Now filter the data based on sold or unsold. In this case I will determine changes to sold properties by selecting all possible ratio entries and then unselecting any cells with “#N/A”.

Manually type the returned data into the template.
Utilizing the same method, find the results for unsold.

And fully completed below

The particular example used for this procedure document is an excellent example of uniformity when reviewing the way that sold properties were reappraised in comparison to unsold properties.
9. Additional review of data

The overall results may cause concern. This is the case with the data presented below:

<table>
<thead>
<tr>
<th>Status</th>
<th>UNSOLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>4107</td>
</tr>
<tr>
<td>Average</td>
<td>12.27%</td>
</tr>
<tr>
<td>% w/Qual</td>
<td>27.60%</td>
</tr>
<tr>
<td>% w/Eff.</td>
<td>2.70%</td>
</tr>
<tr>
<td>% w/Obs.</td>
<td>1.70%</td>
</tr>
<tr>
<td>Total</td>
<td>4200</td>
</tr>
<tr>
<td>Sold</td>
<td>1000</td>
</tr>
<tr>
<td>Unsold</td>
<td>3200</td>
</tr>
</tbody>
</table>

In this scenario I would suggest actually reviewing the individual data to determine if outliers got through, or some other glitch occurred. Sorting the data by parcel ID number and manually scrolling through the data will immediately reveal the source of such selective reappraisal. It will become apparent very quickly if sold and unsold properties were actually being treated differently as seen below. In this case, the appraiser’s subjective data piece of preference was the quality rating.
“...sold properties may be disproportionately concentrated in growth areas where values have increased more rapidly than elsewhere. For this reason, it can be prudent to allow an acceptable window or tolerance zone, say, 3 percent or 5 percent, before concluding that any observed differences are meaningful.”


Although the IAAO offers a 3 or 5 percent suggested tolerance zone, these zones could be significantly different based on the properties and area. For instance, if you were reviewing one specific neighborhood and the properties were all very similar, the acceptable zone may be less than 3%.

It’s also very important to consider that the 3 or 5 percent zone is intended for the average value change percent. When reviewing subjective variable changes you may notice that 8% of sold properties received quality changes, while only 4% of unsold properties received quality changes. Although this is within 4 percentage points, the situation is clearly different than the average percent value change because sold properties were twice as likely to receive quality changes, indicating that they were clearly being reappraised differently.

Conclusion

Selective reappraisal of properties creates significant issues for assessors by resulting in misleading ratio study statistics. The longer the practice continues the more difficult it becomes to correct without a complete reappraisal.

As assessors we should all be conducting selective reappraisal testing in house. We should welcome the opportunity to review and correct undesired actions by staff, outdated policies, or long standing procedures which have never been reviewed or challenged.