Repeat Sales Index Report
Residential • January 2008

Karl L. Guntermann
Fred E. Taylor Professor of Real Estate

Adam Nowak
Research Associate
The use of repeat sales is the most reliable way to estimate price changes in the housing market because the repeat sales approach eliminates the need to deal with the many issues associated with the heterogeneous nature of housing. A repeat sale measures the price change of the same housing unit over time. A large number of repeat sales over many years can be analyzed to develop a repeat sales index. In contrast, indices developed using regression analysis provide estimates of price changes over time while simultaneously attempting to control for differences in house characteristics, location, demographics and market conditions, etc. within the model. Regression analysis can and does produce meaningful estimates of price changes but the results are not as reliable as those produced using repeat sales data. An even less rigorous approach would be to simply average sale prices by zip code or some other geographic area where the mix of housing sizes and ages, etc. would be different each month. The percent changes based on medians or averages would reflect not only price changes but also differences in the sizes, ages and other characteristics of the houses sold each month.

The W.P. Carey School of Business – Repeat Sales Index (RSI) tracks very closely to the S&P/Case - Shiller index for Phoenix since the same methodology is employed for calculating both indices. The S&P/ Case-Shiller index has been developed for 20 metropolitan areas and is being used as a basis for trading housing futures contracts in many of those markets. Any differences that exist between the two indices are partly due to the use of a different house transactions database and possibly by the way the data has been cleaned prior to the calculation process. The S&P/Case-Shiller index is proprietary so the cleaning procedure used in connection with that index could not be completely duplicated. However, following S&P/Case-Shiller, the cleaning process used with the ASU - RSI excludes pairs where the first sale involved new construction and pairs with sales within six months of each other. With the ASU - RSI, transactions with sale prices less than $5,000 were dropped and pairs with more than 60 percent annual changes in price also were excluded. One notable difference would be in the treatment of For Sale by Owner (FSBO) sales, which are not included in the S&P/Case-Shiller index but are included in the ASU-RSI.
The house price data used in the S&P/Case-Shiller index starts in January 1989. Beginning with January 1990, the percent change from the same month in the previous year is reported. The ASU – RSI also begins with January 1989 data so the same percent change calculation also begins in January 1990 and is reported for each month since then. There is seasonality in house price data so month to month changes may not accurately reflect changes in market conditions and would cover a very short time period. Calculating a percent change from the same month in the previous year controls for whatever seasonality may be present in the data. Annual rates of change typically are thought of applying to a calendar year but in this report the annual rates that are reported would be measuring change over the preceding twelve months.

The graphs contained in this report show the annual rate of change in house prices for the Phoenix metropolitan area on a monthly basis. The ten graphs cover two time periods. Five of the graphs present the price changes from January 1990 through October 2007 while the other five graphs cover the recent housing cycle beginning in January 2004. The S&P/Case-Shiller index is published only for the entire Phoenix metro area. One major advantage to the ASU-RSI is that in addition to the overall index, the metro area has been divided into five regions and an index has been calculated for each region. An index has also been calculated for eight individual cities where there are a sufficient number of repeat sales for the index to be reliable. All repeat sales used in the metro index are included in one of the regional indices. A list of the cities included in each region is in Table 1.

Analysis

The latest data through October 2007 reveal a continuation of earlier trends of house price declines compared to October 2006 for the overall Phoenix metro area. On a moving twelve month basis, price changes became negative in March 2007. The rate of decline has gradually accelerated throughout 2007, reaching -4.6 percent by October 2007. The peak rate of price change occurred from September 2004 to September 2005 at 43.0 percent. While the rate of increase slowed after September 2005, house prices continued to increase until July 2006. From July 2006 through September 2007, the total decline in house prices has been close to 5.0 percent. However, there are considerable variations in both the rates of decline and the total decline in house prices across regions and cities.

In the Central region, annual price changes have been slightly negative since June 2007 and the October data continues that pattern (-1.3 percent). House prices have declined approximately 2.0 percent since peaking in November 2006. House prices in the Northeast region have held up well relative to other parts of the metro area although the annual change from October 2006 to October 2007 has again turned slightly negative. The total decline in prices in the Northeast since the October 2006 peak is slightly over 1.0 percent. In contrast to the Central and Northeast regions,
which have low rates of decline and small total declines from their peaks, the rates of price decline in
the Southeast, Northwest and Southwest regions continued to accelerate slightly in October 2007.
The decline in the Southwest reached -11.1 percent while the Southeast and Northwest regions
declined at approximately 8.0 and 9.0 percent annual rates respectively.

TABLE 1

CITIES INCLUDED IN REGIONS

<table>
<thead>
<tr>
<th>REGION</th>
<th>CITIES</th>
</tr>
</thead>
</table>
| NORTHEAST    | CAREFREE
               | CAVE CREEK
               | FOUNTAIN HILLS
               | PARADISE
               | VALLEY
               | SCOTTSDALE |
| NORTWEST     | EL MIRAGE
               | GLENDALE
               | PEORIA
               | SUN CITY
               | SUN CITY WEST
               | SURPRISE
               | YOUNGTOWN |
| CENTRAL      | PHOENIX               |
| SOUTHEAST    | APACHE
               | JUNCTION
               | CHANDLER
               | GILBERT
               | HIGLEY
               | MESA
               | QUEEN CREEK
               | SUN LAKES
               | TEMPE    |
| SOUTHWEST    | AVONDALE
               | BUCKEYE
               | GOODYEAR
               | LITCHFIELD
               | PARK     |
Similar variations exist in the indices for individual cites where rates of change in house prices from October 2006 to October 2007 ranged from -1.5 percent in Scottsdale / Paradise Valley to -11.7 in Sun City / Sun City West. This is the first decline for Scottsdale / Paradise Valley since January 2007 and for the first time house prices have declined on an annual basis in all regions and cities. The declines were only slightly negative in Tempe (-3.1 percent) and Phoenix (-1.3 percent) while for Chandler, Mesa, Glendale and Peoria the price changes reflected in the October 2007 data were in the seven to eight percent range, essentially unchanged for the last three months. However, in Sun City / Sun City West the October rate of decline in house prices accelerated from 9.3 to almost twelve percent. To keep things in perspective, total and annual rates of decline are still small compared to the 40+ percent rates of appreciation registered in the fall of 2005.
Metro Phoenix Repeat Sales Index (RSI)
Percent Change from Same Month Previous Year
January 1990 - October 2007

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Metro Phoenix Repeat Sales Index (RSI)
Percent Change from Same Month Previous Year
January 2004 - October 2007

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Regional Repeat Sales Index (RSI)
Percent Change from Same Month Previous Year
January 1990 - October 2007

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Regional Repeat Sales Index (RSI)
Percent Change from Same Month Previous Year
January 2004 - October 2007

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Glendale, Peoria, & Sun City/Sun City West Repeat Sales Index (RSI)
Percent Change from Same Month Previous Year
January 2004 - October 2007

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data