Repeat Sales Index Report
Residential • June 2010

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The Phoenix housing market continued to show gradual improvement overall through May but with mixed results in various segments of the market. The March decline of 2.6 percent for the entire market reverses to a 2.7 percent annual increase in the preliminary May data (Table 1). Based on index values from last year and current conditions in the housing market, it is likely that small increases in house prices will continue for only a few months, followed by an extended period of relatively flat prices. The trend of improving performance continues for lower priced houses with a 4.1 percent increase in March increasing to 12.7 percent by May and for higher priced houses, -5.8 percent in March to -1.2 percent by May.

The foreclosure and non-foreclosure indexes both provide relatively weaker preliminary numbers in May compared to March. Foreclosure prices turned positive on an annual basis for the first time in March (4.6 percent) followed by a preliminary April increase of 5.3 percent but a slowdown to 3.0 percent by May. An analysis of the foreclosure index indicates that those prices are also likely to increase slowly for a few months followed by an extended period of relative price stability. Non-foreclosure price declines continue to slow through April (-8.2 percent compared to -13.6 percent in March) but the preliminary annual rate of decline increases to 13.1 percent by May. Non-foreclosure prices are likely to decline for many months before leveling off toward the end of 2010. This will not be good news for those homeowners worried about the equity in their homes or who are waiting for the housing market to recover so they can sell their houses.

### TABLE 1

<table>
<thead>
<tr>
<th></th>
<th>OVERALL</th>
<th>LOWER PRICED</th>
<th>HIGHER PRICED</th>
<th>TOWNHOUSE / CONDO</th>
<th>FORECLOSURES</th>
<th>NON-FORECLOSURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 2009 – March 2010</td>
<td>-2.6</td>
<td>-4.1</td>
<td>-5.8</td>
<td>-19.3</td>
<td>4.6</td>
<td>-13.5</td>
</tr>
<tr>
<td>Feb. 2010 - March 2010</td>
<td>-0.1</td>
<td>0.2</td>
<td>0.3</td>
<td>4.4</td>
<td>0.2</td>
<td>-0.1</td>
</tr>
<tr>
<td>1989–1992</td>
<td>-7.7</td>
<td>-3.9</td>
<td>-12.8</td>
<td>-3.9</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>2006–March 2010</td>
<td>-48.0</td>
<td>-56.7</td>
<td>-39.6</td>
<td>-54.0</td>
<td>-52.9</td>
<td>-42.8</td>
</tr>
<tr>
<td>Median Price - March 2010</td>
<td>$132,000</td>
<td>$100,000</td>
<td>$265,000</td>
<td>$83,500</td>
<td>$117,000</td>
<td>$158,500</td>
</tr>
</tbody>
</table>
The townhouse/condo segment of the market appears to be leveling off but at an annual rate of decline around 20 percent. The gradual slowdown in price declines, which was 26.3 percent in February, improved to -19.3 percent in March but was essentially the same in April with a preliminary decline of 20.6 percent by May (Table 1). The total decline in prices from the mid-2006 peak is now approximately 48 percent, which breaks down to 57 and 40 percent declines for lower and higher priced houses, respectively.

The overall median price for sales that were included in the March index was $132,000 and the preliminary figure for May is also $132,000. The median price moved back to $130,000 last September and has fluctuated within $5,000 of that figure since then. The median price for foreclosed houses in March was $117,000 up substantially from a low of $97,000 last May but the preliminary median for May is up only slightly to $120,000. Prices since October 2009 have been in the range of $115,000 to $120,000 and may well remain in that general range for the foreseeable future unless there is a significant change in the number of houses going into foreclosure or a turnaround in the Phoenix economy. Median prices for the lower and higher priced houses in Table 1 increase to $106,000 and $275,000 respectively by May. For non-foreclosure houses the median price increased to $165,000 by May while for foreclosures the median was $120,000. The preliminary median price of townhouse / condo units in May declined to $80,000.

Regions

Continuing the trend, price declines slowed in March and they were in the single digit range for all regions (Table 2). If the trend continues, the Central, Northwest and Southwest regions, which have shown dramatic improvement the past few months, could show price increases with the April data. In terms of total declines from the 2006 peak, the Southwest is down the most, 58 percent, but even in the Northeast prices have dropped 36 percent. Three regions still show total declines in excess of 50 percent.

Cities

The decline in house prices from March 2009 to March 2010 slowed compared to the February data for all cities with only Tempe continuing to show a double digit decline. Peoria is likely to be the first city to show an increase in prices but other cities may follow in the next few months. There is a wide range across cities in total price declines from the 2006 peak. Older cities such as Glendale, Mesa and Peoria still have declines over 50 percent but the declines are still substantial in all other cities with the smallest being Scottsdale/ Paradise Valley at over 35 percent.
TABLE 2
CHANGE IN HOUSE PRICES BY REGION
(Percent)

<table>
<thead>
<tr>
<th></th>
<th>CENTRAL</th>
<th>NORTHEAST</th>
<th>SOUTHEAST</th>
<th>NORTHWEST</th>
<th>SOUTHWEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 2009 –</td>
<td>-3.1</td>
<td>-8.7</td>
<td>-7.1</td>
<td>-2.2</td>
<td>-1.1</td>
</tr>
<tr>
<td>March 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 2010 –</td>
<td>-1.7</td>
<td>1.8</td>
<td>-1.7</td>
<td>0.6</td>
<td>-1.2</td>
</tr>
<tr>
<td>March 2010</td>
<td></td>
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<tr>
<td>2006 –March 2010</td>
<td>-54.4</td>
<td>-36.4</td>
<td>-47.4</td>
<td>-52.7</td>
<td>-58.4</td>
</tr>
</tbody>
</table>

TABLE 3
CHANGE IN HOUSE PRICES BY CITY
(Percent)

<table>
<thead>
<tr>
<th></th>
<th>CHANDLER</th>
<th>GILBERT</th>
<th>GLENDALE</th>
<th>MESA</th>
<th>PEORIA</th>
<th>SCOTTSDALE/</th>
<th>SUN CITY/</th>
<th>TEMPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PARADISE VALLEY</td>
<td>SUN CITY WEST</td>
<td></td>
</tr>
<tr>
<td>March 2009 –</td>
<td>-9.5</td>
<td>-7.7</td>
<td>-7.2</td>
<td>-6.6</td>
<td>-3.3</td>
<td>-8.6</td>
<td>-6.2</td>
<td>-14.2</td>
</tr>
<tr>
<td>March 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 2010</td>
<td>-1.2</td>
<td>-2.0</td>
<td>-0.2</td>
<td>-1.2</td>
<td>-1.7</td>
<td>1.9</td>
<td>1.3</td>
<td>-3.6</td>
</tr>
<tr>
<td>March 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989 – 1992</td>
<td>-7.6</td>
<td>na</td>
<td>-19.6</td>
<td>-10.9</td>
<td>-7.3</td>
<td>-9.7</td>
<td>-10.5</td>
<td>-1.9</td>
</tr>
<tr>
<td>2006 – March 2010</td>
<td>-44.9</td>
<td>-47.1</td>
<td>-56.2</td>
<td>-50.5</td>
<td>-53.3</td>
<td>-35.3</td>
<td>-38.8</td>
<td>-40.7</td>
</tr>
</tbody>
</table>

Methodology

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. Repeat sales can be used to measure 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 10 of those markets. Any differences between the two indices are probably due to 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 where sales occurred within six months of each other. Sale pairs with extremely high or low annual rates of price change are excluded since at least one of the transactions may involve a data error. The same justification is used to drop sales with extremely high or low prices or prices per square foot prior to matching the sale pairs. A more detailed explanation of the data cleaning and calculation process is contained in the ASU-RSI Methodology Report.

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 last 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. To smooth the index, the rate of return calculated from each sale pair is included in calculations for a total of three months before it is published. Results using data for the two newest months are labeled as preliminary.

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, indices have been calculated for higher and lower priced houses, smaller geographic areas (regions and selected cities) and for the housing market segmented in various ways. Price changes for the attached portion of the housing
market (townhouse / condominiums) are presented as a repeat sales index using the same methodology and indices are also estimated for higher and lower priced single-family detached houses and for foreclosure and non-foreclosure sales. The monthly data are divided into two groups based on the median price of all single-family houses sold. Sales are then paired within each of the two data sets and a repeat sales index is calculated for each. The foreclosure sale pairs are formed using two foreclosure sales or with a foreclosure sale paired with an earlier non-foreclosure sale of the house. The metro area has also been divided into five regions and an index has been calculated for each. All repeat sales used in the metro index are included in one of the five regional indices. Indices have also been calculated for eight individual cities where there are a sufficient number of repeat sales a reliable index to be estimated. A list of the cities included in each region is in Table 4.

The graphs contained in this report show the annual rate of change in house prices for the Phoenix metropolitan area on a monthly basis as well as median house prices. Figures 1 and 2 compare the change in the overall, lower and higher priced indices to the overall trend in the index, where the trend was estimated using data from January 1989 through December 2003. Figure 3 makes the same type of comparison using the median price of single-family sales that were used to form sale pairs for the current month, not the median price of all sales that occurred during the month. Since each index is a moving three month average, preliminary estimates of the index and future median prices for the entire market are included for the next two months (April and May) in Figures 1-7. Figures 4 and 5 include the townhouse / condominium RSI compared to the single-family RSI presented earlier in Figures 1 and 2. The foreclosure and non-foreclosure RSIs are in Figure 6 while Figure 7 has median prices for foreclosure and non-foreclosure houses and townhouse / condo units. Figures 8-15 contain graphs for the regions and cities for two different time periods. Four of the graphs present the price changes from January 1990 through March 2010 while the other four graphs cover the current housing cycle beginning in January 2004. Due to data limitations, a reliable index for Gilbert could not be calculated until January 1999 so the annual changes for Gilbert in Figures 10 and 11 start in January 2000.

**TABLE 4**

CITIES INCLUDED IN REGIONS

<table>
<thead>
<tr>
<th>REGION</th>
<th>CITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTHEAST</td>
<td>CAREFREE</td>
</tr>
<tr>
<td></td>
<td>CAVE CREEK</td>
</tr>
<tr>
<td></td>
<td>FOUNTAIN HILLS</td>
</tr>
<tr>
<td></td>
<td>PARADISE VALLEY</td>
</tr>
<tr>
<td></td>
<td>SCOTTSDALE</td>
</tr>
</tbody>
</table>

5
<table>
<thead>
<tr>
<th>Region</th>
<th>Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTHWEST</td>
<td>EL MIRAGE, GLENDALE, PEORIA, SUN CITY / SUN CITY WEST, SURPRISE, YOUNGTOWN</td>
</tr>
<tr>
<td>CENTRAL</td>
<td>PHOENIX</td>
</tr>
<tr>
<td>SOUTHEAST</td>
<td>APACHE JUNCTION, CHANDLER, GILBERT, HIGLEY, MESA, QUEEN CREEK, SUN LAKES, TEMPE</td>
</tr>
<tr>
<td>SOUTHWEST</td>
<td>AVONDALE, BUCKEYE, GOODYEAR, LITCHFIELD PARK</td>
</tr>
</tbody>
</table>
Figure 1
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - May 2010

Trend
Metro Area
Upper Range¹
Lower Range²

April and May are Preliminary

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

March: 1, Upper -6%  2, Lower 4%
Figure 2
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - May 2010

Metro Area
Upper Range¹
Lower Range²

April and May are Preliminary

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

March: 1, Upper -6%  2, Lower 4%
Figure 3
Phoenix Median Single-Family House Prices
January 1989 - May 2010

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

March: 1, Upper $265,000   2, Lower $100,000
Figure 4
Phoenix Single-Family and Townhouse/Condominium Repeat Sales Index (RSI)
Annual Change
January 1990 - May 2010

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

March: Single-Family -3%; TH/Condo -19%
Figure 5
Phoenix Single-Family & Townhouse/Condominium Repeat Sales Index (RSI)
Annual Change
January 2004 - May 2010

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

March: Single-Family -3%; TH/Condo -19%
Figure 6
Phoenix Single-Family Foreclosure Repeat Sales Index (RSI)
Annual Change
January 2001 - May 2010

April and May are Preliminary

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

March: 1, Foreclosure 5%; 2, Non-Foreclosure -14%
Figure 7
Phoenix Foreclosures, Non-Foreclosures and Townhouse/Condominium Median Prices
January 1989 - May 2010

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

March: 1, TH/Condo $83,500  2, Foreclosures $117,000  3, Non-Foreclosures $158,500
Figure 8
Regional Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 9
Regional Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 10
Chandler, Gilbert, Mesa, & Tempe Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 11
Chandler, Gilbert, Mesa & Tempe Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 12
Glendale, Peoria, & Sun City/Sun City Single-Family West Repeat Sales Index (RSI)
Annual Change
January 1990 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 13
Glendale, Peoria, & Sun City/Sun City West Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 14
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - March 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 15
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - March 2010

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