Repeat Sales Index Report
Residential • February 2010

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The latest data for November 2009 reveals that overall house prices declined by 17 percent in the Phoenix metro area, which is slightly less than the 20 percent decline for October and 23 percent in September (Table 1). The decline in the index which began in March 2007 has continued for 33 months compared to the 17 month decline in the early 1990s. Preliminary estimates for December and January 2010 have prices declining at progressively slower rates, 13 and 9 percent respectively. The slowdown in the rate of decline has been accelerating for several months and if the present trend continues, prices will level off later this spring. In contrast to the overall 17 percent annual decline, the November to November decline for lower priced homes was 23 percent compared to 15 percent for more expensive houses. While lower priced houses have been declining at a much faster rate, the preliminary estimate for January is -8 percent while it is -10 percent for more expensive houses. The total decline in prices from the mid-2006 peak is now 47 percent, which breaks down to 58 and 39 percent declines for the lower and higher priced houses, respectively. The overall median price for sales that were included in the November index was $135,000, up from $131,000 in October. Preliminary median prices for December and January are $132,500 and $125,000, respectively. Both prices are within the range that has persisted since last summer.

| TABLE 1 |
| CHANGE IN RESIDENTIAL PRICES |
| (Percent) |

<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>Nov. 2008 – Nov. 2009</td>
<td>-17.3</td>
<td>-22.7</td>
<td>-14.9</td>
<td>-27.6</td>
<td>-8.9</td>
<td>-21.0</td>
</tr>
<tr>
<td>Oct.-Nov. 2009</td>
<td>-0.4</td>
<td>2.2</td>
<td>-0.4</td>
<td>-0.2</td>
<td>4.6</td>
<td>0.2</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–Nov. 2009</td>
<td>-47.2</td>
<td>-57.5</td>
<td>-38.7</td>
<td>-49.2</td>
<td>-51.5</td>
<td>-40.8</td>
</tr>
<tr>
<td>Median Price - Nov. 2009</td>
<td>$135,000</td>
<td>$102,000</td>
<td>$260,000</td>
<td>$89,000</td>
<td>$120,000</td>
<td>$165,000</td>
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</tbody>
</table>
The prices of foreclosed houses declined at a 9 percent rate from November 2008 to November 2009 but the preliminary decline for December was 5 percent and based on very limited data, the decline for December appears to be only two percent. If the preliminary numbers hold up, the foreclosure segment of the housing market may be very close to the bottom, at least in terms of price declines. In contrast, non-foreclosed house prices declined at an annual rate of 21 percent in November with the rate of decline decreasing to 17 percent by January. The decline in foreclosed house prices peaked at -32 percent in October 2008 and gradually slowed through last September (-18 percent), leading up to a dramatic slowing that has occurred the past several months. A leveling out of the foreclosure RSI would reflect both the substantial decline in prices that has occurred over the past two years and recent increases in median prices that reflect increased demand from first-time buyers and investors.

While the foreclosure segment of the market is turning around, non-foreclosure house prices have been declining at approximately a 20 percent annual rate since October 2008, finally slowing to less than 20 percent in the preliminary numbers. The decline in foreclosure house prices was driven primarily by mortgage related issues but the continuing decline of non-foreclosure prices has more to do with weak economic conditions, especially in the Phoenix area, and the difficulty buyers’ face in qualifying for mortgage loans. The median price in November for foreclosed houses was $120,000 up 25 percent from its low in May with preliminary estimates for December and January of $120,000 and $115,000 respectively. For non-foreclosed houses the median price was $165,000 in November with preliminary estimates of $160,000 and $155,000 respectively for December and January, continuing the long-term trend. The improvement in the foreclosure segment of the market is offset by continuing weakness in the more important non-foreclosure portion of the market.

The decline in the townhouse/condo RSI slowed to -28 percent in November compared to -31 percent in October with preliminary rates for the next two months below 30 percent. It appears that the most rapid declines (-36 percent) occurred last summer but this segment of the housing market is still declining. The median price of townhouse / condo units was $89,000 in November with continuing declines to $84,600 and $80,000 forecasted for the next two months.

**Regions**

Following a trend that began last June, price declines continued to slow in November from the annual rates in October across all regions. The declines ranged from 15 percent in the Northeast to 24 percent in the Central region (Table 2). Slight up and down changes in the monthly rates also continued across regions. In terms of total declines from the 2006 peak, the Southwest is down the
most, 59 percent, but even in the Northeast prices have dropped 35 percent. Of the five regions, the RSI for the Northeast has not hit bottom, which is a necessary first step before price appreciation is even possible, since the annual change in prices is based on the year-to-year change in the index. For the other four regions price changes could turn positive later this spring but for the Northeast that change is not likely until much later in 2010.

TABLE 2
CHANGE IN HOUSE PRICES BY REGION
(Percent)

<table>
<thead>
<tr>
<th>Region</th>
<th>Central</th>
<th>Northeast</th>
<th>Southeast</th>
<th>Northwest</th>
<th>Southwest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 2008 –</td>
<td>-23.7</td>
<td>-15.1</td>
<td>-15.4</td>
<td>-17.3</td>
<td>-19.5</td>
</tr>
<tr>
<td>Nov. 2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct.-Nov. 2009</td>
<td>1.8</td>
<td>-0.5</td>
<td>-0.3</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>2006 – Nov. 2009</td>
<td>-52.9</td>
<td>-35.2</td>
<td>-44.9</td>
<td>-51.9</td>
<td>-59.2</td>
</tr>
</tbody>
</table>

Cities

Variations similar to those observed in the regional data are also apparent in the city data (Table 3). The declines in house prices from November 2008 to November 2009 slowed compared to the October data for all cities, continuing a well established trend. In all cities but Glendale and Mesa the annual decline is now less than 20 percent. Prices have declined by over 50 percent in Glendale, Peoria and Mesa since they peaked in 2006 with substantial declines in excess of 30 percent in all other cities including Scottsdale / Paradise Valley. As with the Northeast and Southwest regions, the RSI for Scottsdale / Paradise Valley and Sun City / Sun City West continues to decline, although its rate is slowing. While prices in most cities may stop declining later this spring, at this time there is no way to estimate when the decline will end for Scottsdale / Paradise Valley and Sun City / Sun City West.
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANDLER</td>
<td>-12.3</td>
<td>0.8</td>
<td>-7.6</td>
<td>-41.3</td>
</tr>
<tr>
<td>GILBERT</td>
<td>-11.9</td>
<td>0.1</td>
<td>na</td>
<td>-44.3</td>
</tr>
<tr>
<td>GLENDALE</td>
<td>-20.7</td>
<td>0.0</td>
<td>-19.6</td>
<td>-53.5</td>
</tr>
<tr>
<td>MESA</td>
<td>-20.4</td>
<td>0.4</td>
<td>-10.9</td>
<td>-49.6</td>
</tr>
<tr>
<td>PEORIA</td>
<td>-19.3</td>
<td>-0.5</td>
<td>-7.3</td>
<td>-52.3</td>
</tr>
<tr>
<td>SCOTTSDALE/ PARADISE VALLEY</td>
<td>-15.5</td>
<td>-1.0</td>
<td>-9.7</td>
<td>-34.7</td>
</tr>
<tr>
<td>SUN CITY/ WEST</td>
<td>-12.8</td>
<td>-0.9</td>
<td>-10.5</td>
<td>-38.0</td>
</tr>
<tr>
<td>TEMPE</td>
<td>-15.8</td>
<td>0.3</td>
<td>-1.9</td>
<td>-36.5</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 that exist 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 (November and December) in Figures 1-6. 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 September 2009 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>
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<td></td>
<td>CAVE CREEK</td>
</tr>
<tr>
<td></td>
<td>FOUNTAIN HILLS</td>
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<tr>
<td></td>
<td>PARADISE VALLEY</td>
</tr>
<tr>
<td></td>
<td>SCOTTSDALE</td>
</tr>
<tr>
<td>NORTHWEST</td>
<td>EL MIRAGE</td>
</tr>
<tr>
<td></td>
<td>GLENDALE</td>
</tr>
<tr>
<td></td>
<td>PEORIA</td>
</tr>
<tr>
<td></td>
<td>SUN CITY /</td>
</tr>
<tr>
<td></td>
<td>SUN CITY WEST</td>
</tr>
<tr>
<td></td>
<td>SURPRISE</td>
</tr>
<tr>
<td></td>
<td>YOUNGTOWN</td>
</tr>
<tr>
<td>CENTRAL</td>
<td>PHOENIX</td>
</tr>
</tbody>
</table>
SOUTHEAST
APACHE JUNCTION
CHANDLER
GILBERT
HIGLEY
MESA
QUEEN CREEK
SUN LAKES
TEMPE

SOUTHWEST
AVONDALE
BUCKEYE
GOODYEAR
LITCHFIELD PARK
Figure 1
Phoenix Single-Family Repeat Sales Index (RSI)
Percent Change Same Month, Previous Year
January 1990 - January 2010

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

November Median Prices: 1, Upper $260,000  2, Lower $102,000
Figure 2
Phoenix Single-Family Repeat Sales Index (RSI)
Percent Change Same Month, Previous Year
January 2004 - January 2010

Metro Area
Upper Range¹
Lower Range²

December and January are Preliminary

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

November Median Prices: 1, Upper $260,000  2, Lower $102,000
Figure 3
Phoenix Median Single-Family House Prices
January 1989 - January 2010

- Trend
- Metro Area
- Upper Range¹
- Lower Range²

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

November Median Prices: 1. Upper $260,000  2. Lower $102,000
Figure 4
Phoenix Single-Family and Townhouse/Condominium Repeat Sales Index (RSI)
Percent Change Same Month, Previous Year
January 1990 - January 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 5
Phoenix Single-Family & Townhouse/Condominium Repeat Sales Index (RSI)
Percentage Change Same Month, Previous Year
January 2004 - January 2010

December and January are Preliminary

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 6
Phoenix Single-Family
Foreclosure Repeat Sales Index (RSI)
Percentage Change Same Month, Previous Year
January 2001 - January 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
November Median Prices: 1, Foreclosures $120,000 2, Non-Foreclosures $165,000
Figure 7
Phoenix Foreclosures, Non-Foreclosures and Townhouse/Condominium Median Prices
January 1989 - January 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
November Median prices: 1, TH/Condo $89,000  2, Foreclosures $120,000  3, Non-Foreclosures $165,000
Figure 8
Regional Single-Family Repeat Sales Index (RSI)
Percent Change Same Month, Previous Year
January 1990 - November 2009

Central
Northeast
Southeast
Northwest
Southwest
Metro Area

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)
Percent Change Same Month, Previous Year
January 2004 - November 2009

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)
Percent Change Same Month, Previous Year
January 1990 - November 2009

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)
Percent Change Same Month, Previous Year
January 2004 - November 2009

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 West Repeat Sales Index (RSI)
Percent Change Same Month, Previous Year
January 1990 - November 2009

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)
Percent Change Same Month, Previous Year
January 2004 - November 2009

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)
Percent Change Same Month, Previous Year
January 1990 - November 2009

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)
Percent Change Same Month, Previous Year
January 2004 - November 2009

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