Repeat Sales Index Report
Residential • October 2010

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The return of price declines, which reappeared last month for the first time since March, continued with the preliminary September decline (-4 percent) at a slightly faster rate than in August (-2 percent). Because of volatility in the housing market, it is hard to be sure that this is the start of a new downward trend but an accelerating decline next month might well confirm that to be the case. The ASU-RSI has been relatively stable for over a year and recent changes in the index that are leading to the declines are still relatively small. However, continuing weakness in the Phoenix economy, the flow of foreclosures into the market and the seasonal slowdown that occurs in housing toward the end of the year are reasons to be pessimistic about house prices. Positives are the strong presence of investors who are showing confidence in the long-term potential of the Phoenix area and the major price declines that have already occurred, which has dropped prices back to levels not seen since the end of 2001. It could be argued that the price adjustments that have already occurred and improved housing affordability make large future price declines less likely.

Foreclosure prices also declined for a second month with September prices -6 percent lower than September 2009, twice the rate of decline in the August data. Foreclosures have been one of the stronger segments of the market for many months but the continued softening in prices means there is insufficient demand to absorb the steady stream of foreclosures that continue to enter the market. Non-foreclosure prices have been declining at an annual rate of 9-13 percent since March and the September decline (-9 percent), which is the same as August, is a continuation of that trend. Relative to other segments of the housing market, price stability can be seen as a positive factor. This is the segment of the market that is of interest to most homeowners, whether they are waiting to sell or simply interested in knowing when their equity will stop shrinking. Unfortunately, the data doesn’t provide a basis for much optimism at this time.

Lower priced houses show a small decline (-2 percent) in the preliminary September data for the first time since last spring. Since many foreclosures are also lower priced houses, it is not surprising that both segments of the market are showing a similar trend. Higher priced houses continued their pattern of single-digit declines which began last spring with a September decline of 5 percent. The trend of falling prices continued in September for townhouse/condos. Their prices have been declining at the much higher rate of around 20 percent per year since March.

The overall median price for sales that were included in the July index was $129,900 and the preliminary figure for September is $124,900 (Table 1). Since June 2009, prices have fluctuated between $122,000 and $135,000 reflecting the instability that characterizes the current market and recent median prices are still within that range in spite of indications that the market is softening. The median price for foreclosed houses in July was $120,000 but the preliminary estimate for September is $110,000, the same as in August and September 2009. The non-foreclosure median in September was $155,000 compared to $149,200 in July. The range for the past year has been $155,000 - $165,000 with the exception of the July figure. Median prices in the lower and upper segments of the
market have also fluctuated for the past year rather than showing a clear trend in any direction for more than a couple of months. This kind of volatility in the underlying price data is one reason why it is difficult to decide whether annual changes in the RSI reflect short-term fluctuations or are the start of longer-term trends. The preliminary median price of townhouse/condo units in September dropped to $62,000. Unlike other segments of the housing market, townhouse/condo prices appear to be on a downward trend.

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>July 2009 –</td>
<td>0.0</td>
<td>8.0</td>
<td>-3.7</td>
<td>-17.6</td>
<td>3.0</td>
<td>-10.8</td>
</tr>
<tr>
<td>July 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 2010 -</td>
<td>0.2</td>
<td>-0.9</td>
<td>0.5</td>
<td>-2.8</td>
<td>0.0</td>
<td>-0.1</td>
</tr>
<tr>
<td>July 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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–</td>
<td>-49.4</td>
<td>-59.7</td>
<td>-40.7</td>
<td>-59.1</td>
<td>-55.4</td>
<td>-45.5</td>
</tr>
<tr>
<td>July 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Price</td>
<td>$129,900</td>
<td>$98,000</td>
<td>$275,000</td>
<td>$76,900</td>
<td>$120,000</td>
<td>$149,200</td>
</tr>
<tr>
<td>July 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regions

Regional price changes in July were weaker than in June meaning that increases were a little smaller while declines were a little larger. The Central and Southwest regions have had the largest increases in recent months but the July increases were more modest while the June increase in the Northwest region turned into a small decline in July. The Northeast region continues to show the largest decline (-5.4 percent) but the July decline is only marginally worse than in June. In terms of total declines from the 2006 peak, the three hardest hit regions are still in excess of 50 percent with the Southwest down the most, 57 percent (Table 2). Even in the Northeast, prices have now dropped by 37 percent.
Cities

Limited historical data has prevented Goodyear, Avondale and Surprise from being included in the monthly reports until now. The methodology used to calculate the indices for those cities has been modified, resulting in enough sale pairs so that a reliable index can be calculated. The modified methodology is explained in more detail in the methodology section at the end of this report. The only cities with appreciation from July 2009 to 2010 are the three new cities, Goodyear, Avondale and Surprise. Glendale and Mesa, which had small increases with the June data, now have small declines on an annual basis. The remaining cities had declines in June and those losses are slightly larger in July with the decline in Sun City/Sun City West exceeding 10 percent and being close to a 10 percent decline in Tempe. Total declines from the peak are still very large in all cities (Table 3), ranging from -36 percent in Scottsdale/Paradise Valley to over 64 percent in Avondale.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>CHANGE IN HOUSE PRICES BY REGION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Percent)</td>
<td>CENTRAL  NORTHEAST  SOUTHEAST  NORTHWEST  SOUTHWEST</td>
</tr>
<tr>
<td>July 2009 – July 2010</td>
<td>2.4</td>
</tr>
<tr>
<td>June 2010 - July 2010</td>
<td>-0.7</td>
</tr>
<tr>
<td>2006 – July 2010</td>
<td>-53.1</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/ PARADISE VALLEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2009 - July 2010</td>
<td>-5.3</td>
<td>-2.7</td>
<td>-0.5</td>
<td>-0.2</td>
<td>-3.1</td>
<td>-6.0</td>
</tr>
<tr>
<td>June 2010</td>
<td>-0.9</td>
<td>-0.4</td>
<td>-0.5</td>
<td>-2.0</td>
<td>-0.2</td>
<td>1.4</td>
</tr>
<tr>
<td>July 2010</td>
<td>2006 – July 2010</td>
<td>-44.6</td>
<td>-46.5</td>
<td>-56.3</td>
<td>-50.3</td>
<td>-53.5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>SUN CITY/ SUN CITY WEST</th>
<th>TEMPE</th>
<th>GOODYEAR</th>
<th>AVONDALE</th>
<th>SURPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2009 - July 2010</td>
<td>-10.1</td>
<td>-9.5</td>
<td>10.1</td>
<td>6.3</td>
<td>1.3</td>
</tr>
<tr>
<td>June 2010</td>
<td>-2.4</td>
<td>0.3</td>
<td>-1.9</td>
<td>0.0</td>
<td>-4.6</td>
</tr>
<tr>
<td>July 2010</td>
<td>1989 – 1992</td>
<td>-10.5</td>
<td>-1.9</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>July 2010</td>
<td>2006 – July 2010</td>
<td>-41.7</td>
<td>-43.4</td>
<td>-58.3</td>
<td>-64.1</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 change in price of the same housing units 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 (August and September) 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 8-17 contain graphs for the regions and cities for two different time periods. Five of the graphs present the price changes from January 1990 through July 2010 while the other five 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.

Limited historical data has prevented Goodyear, Avondale and Surprise from being included in the monthly reports. However, the methodology used to calculate the indices has been modified and applied to those cities, resulting in enough data to calculate a reliable index for each one. Very simply, if a sale in one of those cities cannot be paired with a prior sale of the same house, the sale is paired with the prior sale of a house that is the same model and in the same subdivision. While model pairing is not ideal, this technique allows these cities to be included in the report. When the model pairing methodology was applied to the existing cities in the report, the index values correlated almost perfectly with those calculated from the traditional sale pair methodology. However, even with the modified pairing technique, fewer pairs are available to calculate the monthly index so the indices for Goodyear, Avondale and Surprise are somewhat more volatile than those for the other eight cities.
<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>
<tr>
<td>NORTHWEST</td>
<td>EL MIRAGE</td>
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<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>
<tr>
<td>SOUTHEAST</td>
<td>APACHE JUNCTION</td>
</tr>
<tr>
<td></td>
<td>CHANDLER</td>
</tr>
<tr>
<td></td>
<td>GILBERT</td>
</tr>
<tr>
<td></td>
<td>HIGLEY</td>
</tr>
<tr>
<td></td>
<td>MESA</td>
</tr>
<tr>
<td></td>
<td>QUEEN CREEK</td>
</tr>
<tr>
<td></td>
<td>SUN LAKES</td>
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<td>TEMPE</td>
</tr>
<tr>
<td>SOUTHWEST</td>
<td>AVONDALE</td>
</tr>
<tr>
<td></td>
<td>BUCKEYE</td>
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<td></td>
<td>GOODYEAR</td>
</tr>
<tr>
<td></td>
<td>LITCHFIELD PARK</td>
</tr>
</tbody>
</table>
Figure 1
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - September 2010

Trend
Metro Area
Upper Range¹
Lower Range²

August and September are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

July: 1, Upper -4%  2, Lower 8%
Figure 2
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - September 2010

Metro Area
Upper Range¹
Lower Range²

August and September are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

July: 1, Upper -4%  2, Lower 8%
Figure 3
Phoenix Median Single-Family House Prices
January 1989 - September 2010

Trend
Metro Area
Upper Range¹
Lower Range²

August and September are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

July: 1, Upper $275,000  2, Lower $98,000
Figure 4
Phoenix Single-Family and Townhouse/Condominium Repeat Sales Index (RSI)
Annual Change
January 1990 - September 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
July: Single-Family 0%; TH/Condo -18%
Figure 5
Phoenix Single-Family & Townhouse/Condominium Repeat Sales Index (RSI)
Annual Change
January 2004 - September 2010

August and September are Preliminary

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

July: Single-Family 0%; TH/Condo -18%
Figure 6
Phoenix Foreclosure and Non-foreclosure Repeat Sales Index (RSI)
Annual Change
January 2001 - September 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

July: Foreclosure 3%; Non-Foreclosure -11%
Figure 7
Phoenix Foreclosures, Non-Foreclosures and Townhouse/Condominium Median Prices
January 1989 - September 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data

July: 1, TH/Condo $76,900  2, Foreclosure $120,000  3, Non-Foreclosure $149,200
Figure 8
Regional Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 9
Regional Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 10
Chandler, Gilbert, Mesa, & Tempe Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 11
Chandler, Gilbert, Mesa & Tempe Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 12
Glendale, Peoria, Surprise & Sun City/Sun City Single-Family West Repeat Sales Index (RSI)
Annual Change
January 1990 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 13
Glendale, Peoria, Surprise & Sun City/Sun City West Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 14
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 1990 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 15
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 16
Avondale and Goodyear Single Family Repeat Sales Index (RSI)
Annual Change
January 1990 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data
Figure 17
Avondale and Goodyear Single-Family Repeat Sales Index (RSI)
Annual Change
January 2004 - July 2010

Source: ASU W.P. Carey School of Business
Data Provided by Ion Data