Repeat Sales Index Report
Commercial • 2010 Quarter 1

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This report introduces two new repeat sales indices (RSI), which are a complement to the residential ASU-RSI (RRSI) that has been produced by the W. P. Carey School of Business for several years. The first is a commercial index (CRSI) and the second is an index developed for two-fourplex residential units. Between the two reports, virtually all real estate sectors in Phoenix are now being tracked on a regular basis. Like the housing market, commercial real estate in Phoenix has been hard hit by the national recession and corresponding slowdown in the local economy and the related financial fallout. For this reason reliable information on commercial and two-fourplex real estate prices should prove useful to market participants. The first graphs compare the RRSI to the new CRSI and two-fourplex RSI while later graphs attempt to relate the new indices to forecasted earnings per share of corporations headquartered in Phoenix, changes in Phoenix employment and capitalization rates.

The commercial repeat sales methodology is the same as that used to estimate the residential indices except that it has been applied to sale pairs (sales and resales) of the same commercial properties, as explained later in the report. For purposes of the index, commercial real estate is defined as office, retail, industrial and multi-family (five + units) properties, ie. all transactions except those involving vacant land. A second RSI for small residential investment properties (two-fourplex units) has been estimated and is also included in this report. Both indices are considered commercial in contrast to the various indices contained in the residential report, which covers single-family detached houses. A townhouse /condominium RSI is part of the residential RSI report. Since there are far fewer transactions involving commercial real estate, the graphs show considerably more volatility than typically is observed with the various residential indices. For this reason these commercial indices will be estimated using quarterly rather than monthly data and the ASU-CRSI report will be released on a quarterly basis. The data contained in this first quarter, 2010 report is through December 2009.

Figure 1 contains the values for the commercial and two-fourplex indices graphed with the residential RSI for comparison purposes. The indices measure quarterly changes in price indexed with 2000 Q1 =100. The residential RSI continued to rise during the 2001 recession while the commercial index, reflecting economic fundamentals as well as conditions in the commercial market, didn’t begin to increase until into 2003. The sharp run-up in house prices during 2004-2005 led the residential RSI to peak in mid-2006, almost two years before the commercial market peaked. Activity in the housing market moved in response to speculative forces, lax lending standards and low interest rates, etc. which led to affordability problems, the exodus of investors and a growing foreclosure problem. In contrast, the commercial market is tied more directly to economic fundamentals, which remained strong well into 2007. All indices
declined sharply during 2008 but the RRSI leveled off in early 2009 while the CRSI and two-
tfourplex RSIs continue to decline.

The volatility in the non-residential indices is magnified in Figure 2, which graphs the annual change in the indices from Figure 1. Commercial prices peaked at an annual rate of 28 percent in 2006, Quarter 3 and slowed throughout 2007 before beginning a precipitous decline in 2009. While the decline in Quarter 3 was -38 percent, the decline increased only slightly by the end of 2009 to -40 percent. Commercial price changes lagged residential throughout the recent cycle. If this pattern continues, the fourth quarter slowing may indicate that commercial prices will start falling at a slower rate, which has been occurring in the residential market for almost a year. Annual price declines in the two-fourplex market were over 50 percent by the end of 2009 but also appear to be slowing.

Figure 3 contains the commercial and two-fourplex RSI along with total forecasted earnings per share (TFEPS) estimated for all companies in the Bloomberg Arizona Index (BAZX) that are headquartered in Phoenix. The TFEPS series serves as a leading indicator of changes in the CRSI. It is likely that changes in a company’s expected earnings as reflected in financial forecasts would be associated with changes in their demand for real estate, either through acquisition or leasing, and that the resulting price effect would be reflected in the CRSI. The changes in TFEPS for Phoenix based companies may also proxy for broader changes in economic conditions that subsequently impact the Phoenix commercial real estate market. Data on TFEPS comes from the Institutional Brokers’ Estimation System (IBES) accessed through Wharton Research Data Services. Additional information about the data and methodology is included later in this report.

A careful comparison of TFEPS and the CRSI shows that the change in the direction of TFEPS leads the CRSI by one to two years and is particularly clear beginning with the 2001 recession. It is a positive sign for the commercial market that TFEPS reached a turning point early in 2009 but with weak economic fundamentals and continuing refinancing problems, a clear reversal in the CRSI is not likely to occur until later this year. As was the case in Figure 2, the volatility in the indices is magnified when their annual rates of change are calculated as in Figure 4. Swings in TFEPS tend to be larger than in the commercial and two-fourplex RSIs but the severity of the current decline in commercial prices is far greater than in the early 1990s and it may take much longer for prices to recover. The decline in the CRSI is exceeded only by the decline in the prices of two-fourplex projects, which were down by over 50 percent in the last half of 2009.
Changes in Phoenix employment precede changes in the commercial market, typically by several quarters, and Figure 5 provides evidence to support this statement. While there is considerable volatility in the quarterly data, a careful comparison of turning points in the two series reveals the leading nature of employment. Growth in employment peaked at the end of 2005 compared to the CRSI which peaked almost a year later. The longer than normal turnaround in the CRSI relative to employment undoubtedly reflects the same speculative momentum that affected the housing market including readily available financing. The recent unprecedented decline in both employment and the CRSI is apparent over the twenty years covered in the graph. If the historical pattern continues, a turnaround in the index will follow an improving labor market by several quarters.

Figure 6 compares the CRSI to average capitalization rates. Cap rates are calculated from all transactions in the CoStar and Real Capital Analytics databases not just from those sale pairs used to estimate the commercial and two-fourplex RSIAs. Even so, only a small proportion of transactions contain cap rate information, which explains the unusually high volatility in the cap rate data, especially in the early 1990s. The expected inverse relationship between the CRSI and cap rates is readily apparent in the graph. Cap rates had been trending downward since the mid-1990s before starting a sharp decline in 2003 associated with the start of the current real estate cycle. Throughout 2006 cap rates were essentially stable as commercial values, as measured by the index, were appreciating rapidly. This means that rents or at least the stabilized or normalized rents used by appraisers were also increasing. Cap rates began to increase in early 2007 as talk of a recession became more widespread but commercial prices didn’t peak until early 2008. Changes in both the CRSI and cap rates accelerated throughout 2008 and 2009 with the CRSI declining almost 50 percent from its peak and cap rates increasing well over 2 percent. By the end of 2009 both the CRSI and cap rates were back to their early 2003 levels.

The average capitalization series is graphed again in Figure 7 but this time along with the annual change in the CRSI. The extended period of relatively stable cap rates stands in contrast to changes in commercial prices, which peaked at an annual rate over 28 percent by the third quarter of 2006. Double digit increases continued for another year but by early 2008 prices were declining with dramatic decreases occurring throughout much of 2009. Increases in cap rates along with the weak Phoenix economy suggests that commercial prices may continue to decline at unprecedented rates for the foreseeable future. Figure 8 graphs the same data used in Figure 7 except beginning with 2000 to emphasize the current decade.
Methodology

The use of repeat sales is the most reliable way to estimate price changes in real estate markets because the repeat sales approach eliminates the need to deal with the many issues associated with the heterogeneous nature of real estate. Repeat sales can be used to measure the price change of the same property over time and a large number of repeat sales over many years can be combined to develop a repeat sales index. This would be analogous to the use of same store sales in retail for stores open at least one year to measure performance. 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 property 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 properties sold each month.

The W.P. Carey School of Business – Commercial Repeat Sales Index (CRSI) and the two-fourplex RSI use the same methodology as used in the S&P/Case - Shiller index, which has been developed for the housing markets in 20 metropolitan areas and is being used as a basis for trading housing futures contracts in 10 of those markets. Following S&P/Case-Shiller, the cleaning process 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 per square foot prior when matching the sale pairs.

The indices begin with January 1989 data so the percent change calculations start as of January 1990 and are reported for each quarter since then. Since sales and resales occur at various times for individual properties, the estimated rate of price change for a given month is estimated statistically and used to develop the indices. To reduce volatility in the indices the values are a three month moving average and the quarterly index is an average of final monthly values. Annual rates of change may be thought of applying to a calendar year but in this report the annual rates measure change in the CRSI or two-fourplex RSI from the same quarter last year.
Data on employment is from the Bureau of Labor Statistics for the Phoenix metropolitan statistical area (MSA). Reported monthly, the data includes non-seasonally adjusted values for the number of employed individuals. The calculation of total forecasted earnings per share (TFEPS) begins with current earnings per share from the Thompson Reuters database. The earnings per share forecasts come from the Institutional Brokers' Estimation System (IBES) for all companies headquartered in Phoenix that are in the Bloomberg Arizona Index (BAZX). The BAZX contains companies headquartered in Arizona with a market capitalization greater than $15 million. The IBES forecasts are for varying durations from one month ahead to five years ahead. The forecast with the highest correlation (.22) to the CRSI is the one year forecast and it is used in Figures 3 and 4.
Figure 1
Residential, Commercial and Two-Fourplex RSI
1990 Qtr 1 - 2009 Qtr 4

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 2
Residential, Commercial and Two-Fourplex RSI
Annual Percent Change
1990 Qtr 1 - 2009 Qtr 4

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 3
Total Forecasted Earnings per Share and Commercial and Two-Fourplex RSI
1990 Qtr 1 - 2009 Qtr 4

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 4
Total Forecasted EPS, Commercial and Two-Fourplex RSI
Annual Percent Change
1990 Qtr 1- 2009 Qtr 4

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 5
Commercial RSI and Change in Phoenix Employment
Annual Percent Change
1990 Qtr1 - 2009 Qtr 4

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 6
Commercial RSI and Average Capitalization Rates *
1990 Qtr 1 - 2009 Qtr 4

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 7
Annual Percent Change in the Commercial RSI and Average Capitalization Rates*
1990 Qtr 1 - 2009 Qtr 4

*Commercial and Two-Fourplex

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data, CoStar and Real Capital Analytics.
Figure 8
Annual Percent Change in the
Commercial RSI and Average Capitalization Rates
2000 Qtr 1 - 2009 Qtr 4

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