Repeat Sales Index (RSI)

ASU - W. P. Carey School of Business

Center for Real Estate Theory and Practice

The use of repeat sales is the most reliable way to estimate price changes in the housing market because the repeat sales approach obviates the need to deal with the many issues associated with the heterogeneous nature of housing. In essence, repeat sales measures the price change of the same housing units over time. In contrast, a statistical model such as regression analysis provides 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 period. The percent changes based on averages would reflect not only changes in prices but also differences in the sizes, ages and other characteristics of the houses in each sample.

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 precisely followed. However, the cleaning process used with the ASU - RSI excludes pairs where the first sale involved new construction and pairs where sales are within six months of each other, which does follow S&P/Case-Shiller. 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. It is not known how these were handled by S&P/Case-Shiller.

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 even if they were accurate. 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 as applying to a calendar year but in this report the annual rate for a particular month would be measuring change over the preceding twelve months. These annual rates of change are calculated on a monthly basis and the graphs that go with this report are plots of the monthly data.

The ten graphs contained in this report cover two time periods. Five of the graphs present price changes from January 1990 through June 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 Phoenix metro area has been divided into five regions and an index has been calculated for each region. 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. An index has also been estimated for eight individual cities where there are a sufficient number of repeat sales to calculate a reliable index.

The extraordinary nature of the recent housing cycle is apparent when reviewing the metro Phoenix graph for the entire period beginning with January 1990. Housing price increases peaked in September 2005 at an annual rate of 43 percent. The rate of change continued to be positive but at a decreasing rate until February 2007. Beginning in March 2007, the annual change became negative, meaning that house prices were lower than they had been in March 2006. The rate has continued to decline since then and it is declining more rapidly each month. While the situations are not entirely comparable, the last time housing prices declined for consecutive months on an annual basis was in the early 1990s. After peaking in July 1990, prices declined from the prior year for 17 consecutive months between August 1990 and December 1991. At that time, the Phoenix economy and all sectors of the real estate market were suffering the consequences of market excesses, the Resolution Trust Corporation bailout of the savings and loan industry and the 1990-1991 recession.

The regional indices show interesting differences from the overall metro index. All regions peaked within a few months of each other in fall 2005. At their maximum,

TABLE 1

CITIES INCLUDED IN REGIONS

REGION	CITIES
NORTHEAST	
	CAREFREE
	CAVE CREEK
	FOUNTAIN HILLS
	PARADISE VALLEY
	SCOTTSDALE
NORTHWEST	
	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

annual appreciation rates varied from 48 percent in the southeast region to 39 percent in the northeast and all regions except for the northeast exceeded the overall metro rate. While house prices in the northeast had the lowest peak, it is the only region where prices have been essentially flat in 2007 compared to the same months in 2006. This suggests that at least through June 2007, the housing market in the northeast is in better balance than it is in other parts of the metro area. Prices declined on an annual basis in four of the regions beginning in either January or February 2007 and the decline is accelerating, except in the northeast as noted. The central region (city of Phoenix) was the last to decline beginning in June 2007.

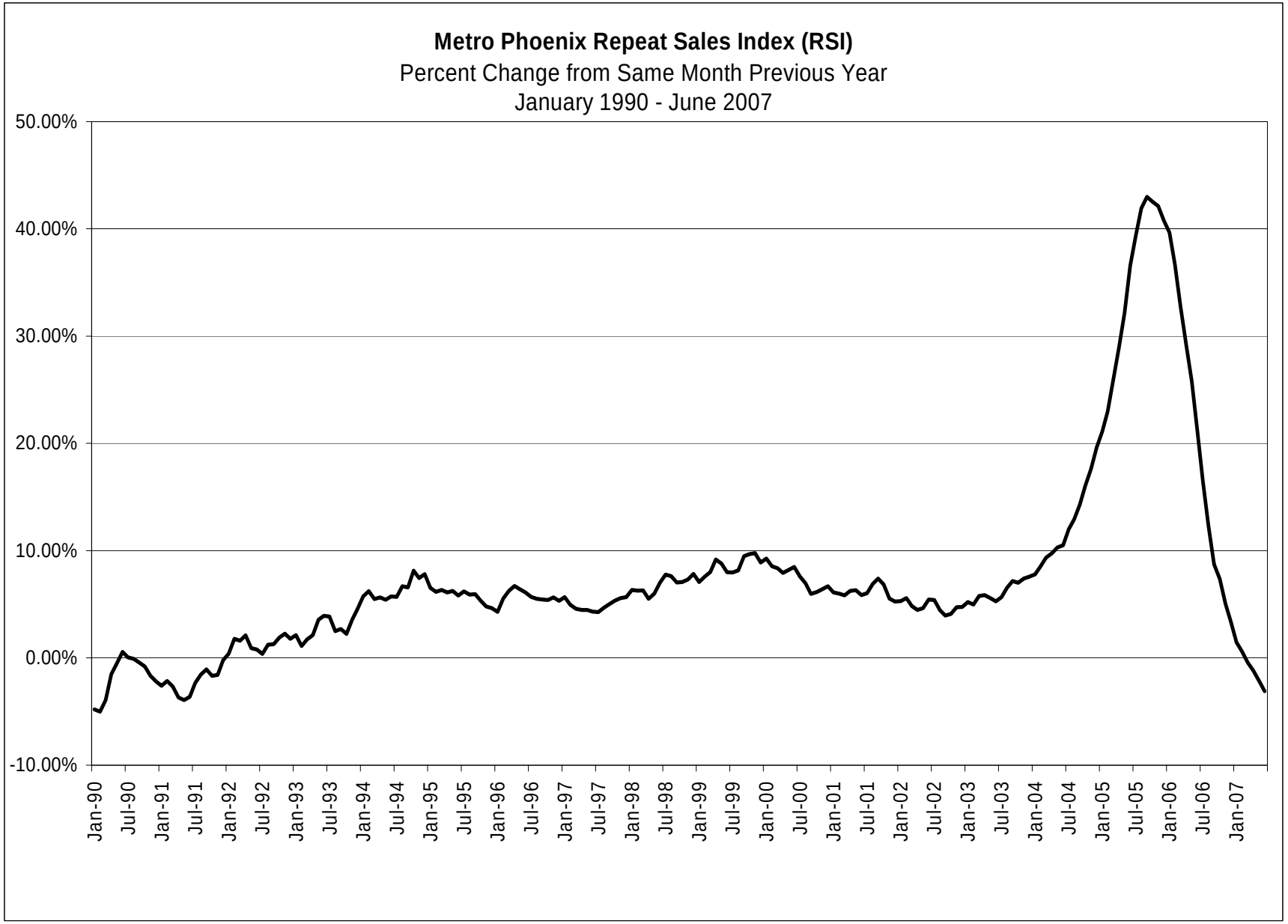
An examination of the city graphs reveals the higher variance associated with some of these estimates because of the smaller sample sizes. This is especially the case for the early years of the indices. To make the comparisons more interesting, the eight city indices have been grouped into three graphs based on the location of the cities within the Phoenix metro area. The graphs containing Chandler, Mesa and Tempe show that Chandler had the highest annual rate of appreciation at close to 48 percent for the twelve months ending September 2005. The indices for all three cities peaked in August or September 2005 and then the rate of appreciation slowed steadily throughout 2006. The index became negative for Chandler in December 2006 and throughout 2007 prices have been declining at an accelerating rate. Chandler was followed by Mesa where prices are trending downward in basically the same way. In contrast, prices never rose as rapidly in Tempe as in the other cities but in 2007 prices were essentially flat instead of declining until June when they also began to decline in Tempe.

The Glendale, Peoria and combined Sun City / Sun City West indices are presented together in graphs covering both time periods. The apparent volatility in the indices for Peoria and Sun City / Sun City West, especially in the early 1990s, reflects the limited number of repeat sale for some months rather than actual variations in house prices. The Glendale and Peoria graphs are similar to the three Southeast Valley cities in terms of when appreciation rates peaked and when house prices began to decline. Appreciation rates peaked in Sun City / Sun City West in July 2005, the earliest of any city and became negative in December 2006. Once prices began to decline in Glendale or Peoria, the decline has accelerated as it has in Chandler and Mesa. The pattern of price changes in 2007 is somewhat different in Sun City / Sun City West. After progressively larger declines for four months, the annual rate of decline has stabilized since March in the annual range of 5 to 7 percent. If other cities follow this pattern, it

would be good news in the sense that the double digit rates of appreciation seen for two years would not be matched by similar double digit rates of decline. However, It must be remembered that the Sun City / Sun City West market caters to those 55 years of age or older so price changes there may not be representative of the larger Phoenix market.

Phoenix and Scottsdale / Paradise Valley have been combined in one graph. Phoenix is similar to Tempe in the sense that appreciation rates declined gradually but did not become negative until June 2007. The Scottsdale / Paradise Valley index had a peak appreciation rate that was less than that observed for any other city (37 percent) but its peak was more like a plateau, which lasted from June 2005 to January 2006. Appreciation rates declined as rapidly for Scottsdale / Paradise Valley as they did for other cities but price changes have remained essentially positive in 2007. From February through June 2007, house prices in Scottsdale / Paradise Valley have appreciated at approximately a 1 percent annual rate. While this is a very low rate by historical standards, it is in stark contrast to the declines that are apparent in all other cities, including Tempe and Phoenix.

The fact that house prices are declining in 2007 in all but one city and that the rate of decline is accelerating in most cities is not a good sign for the housing market. The good news is that the rate of decline on an annual basis is still in the single digit range.



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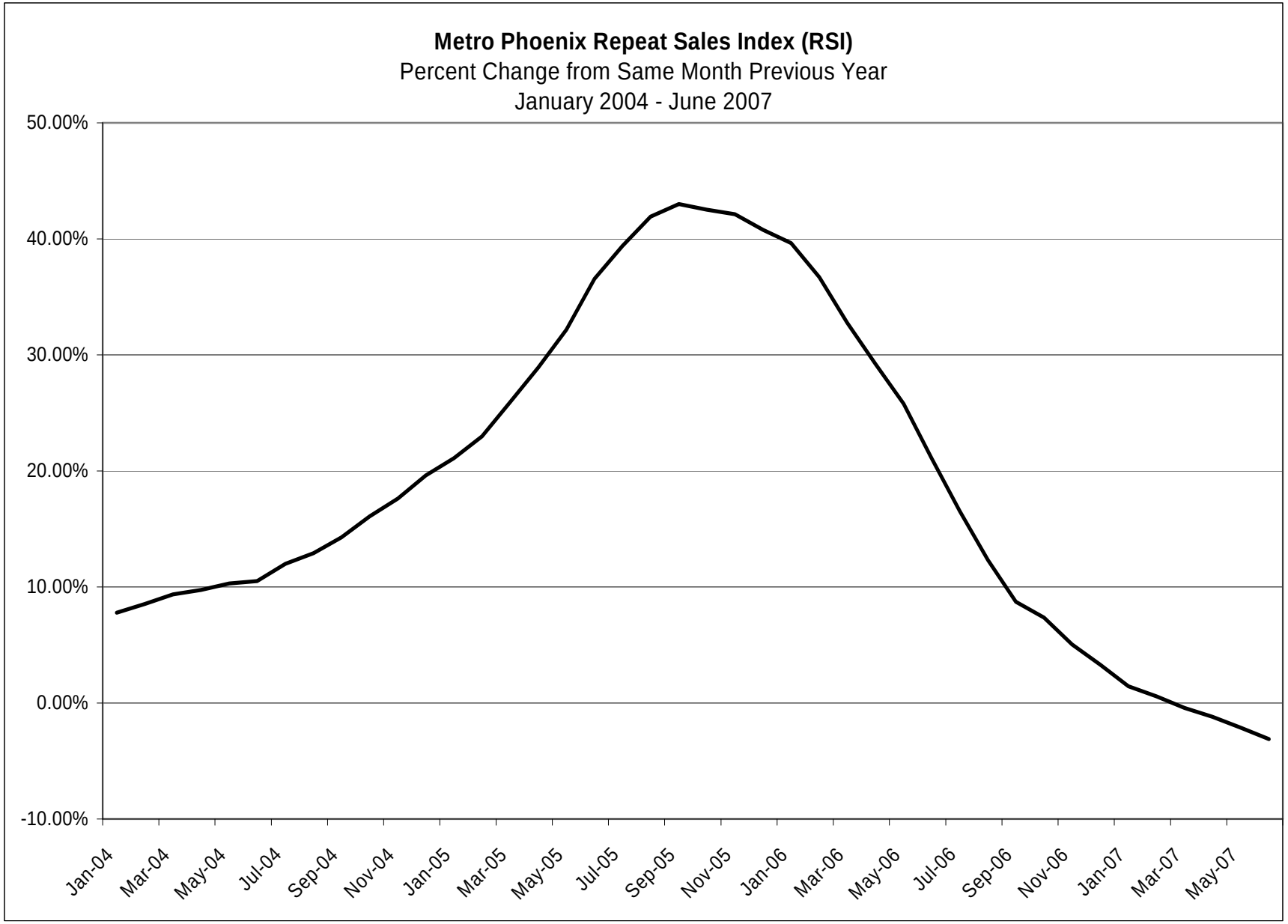

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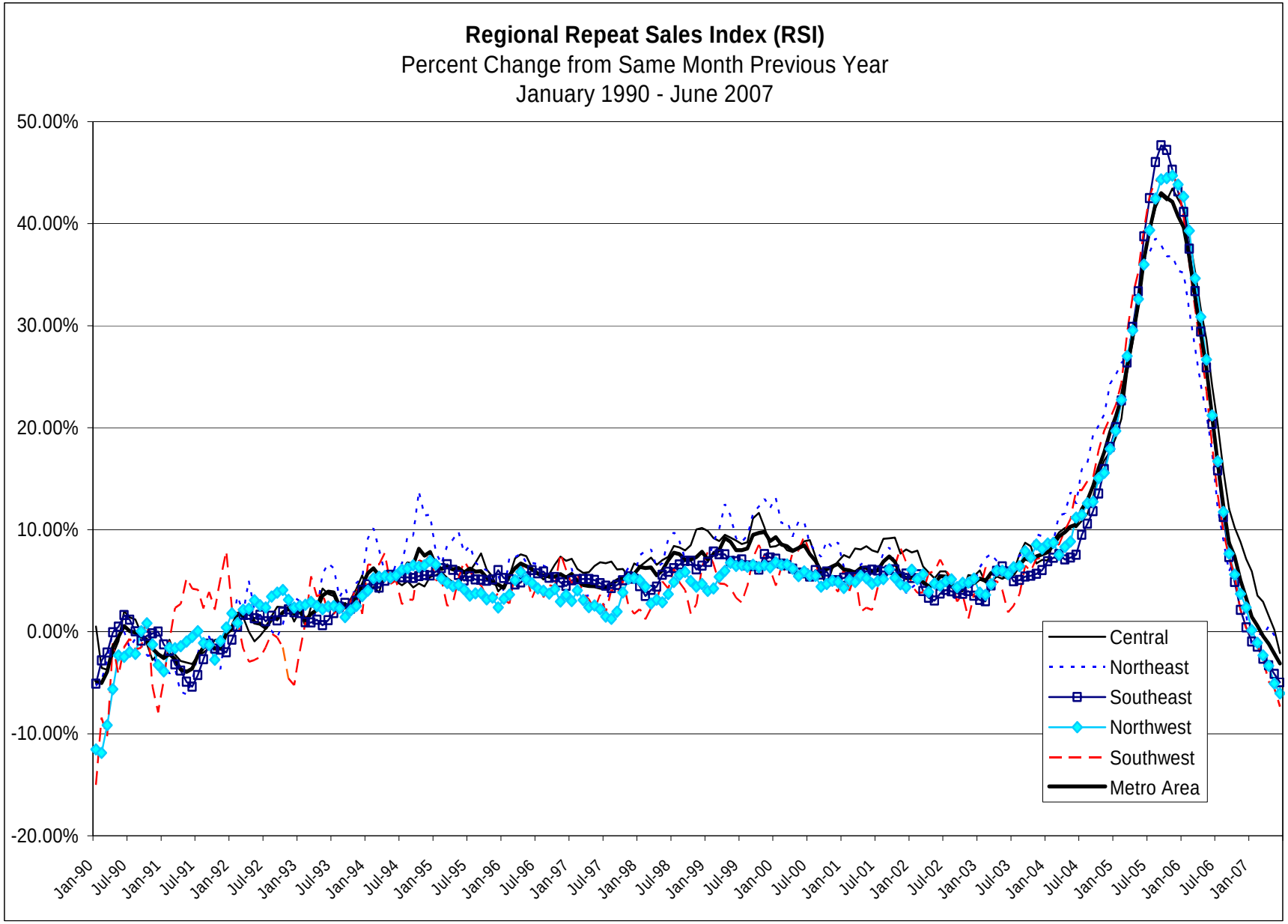

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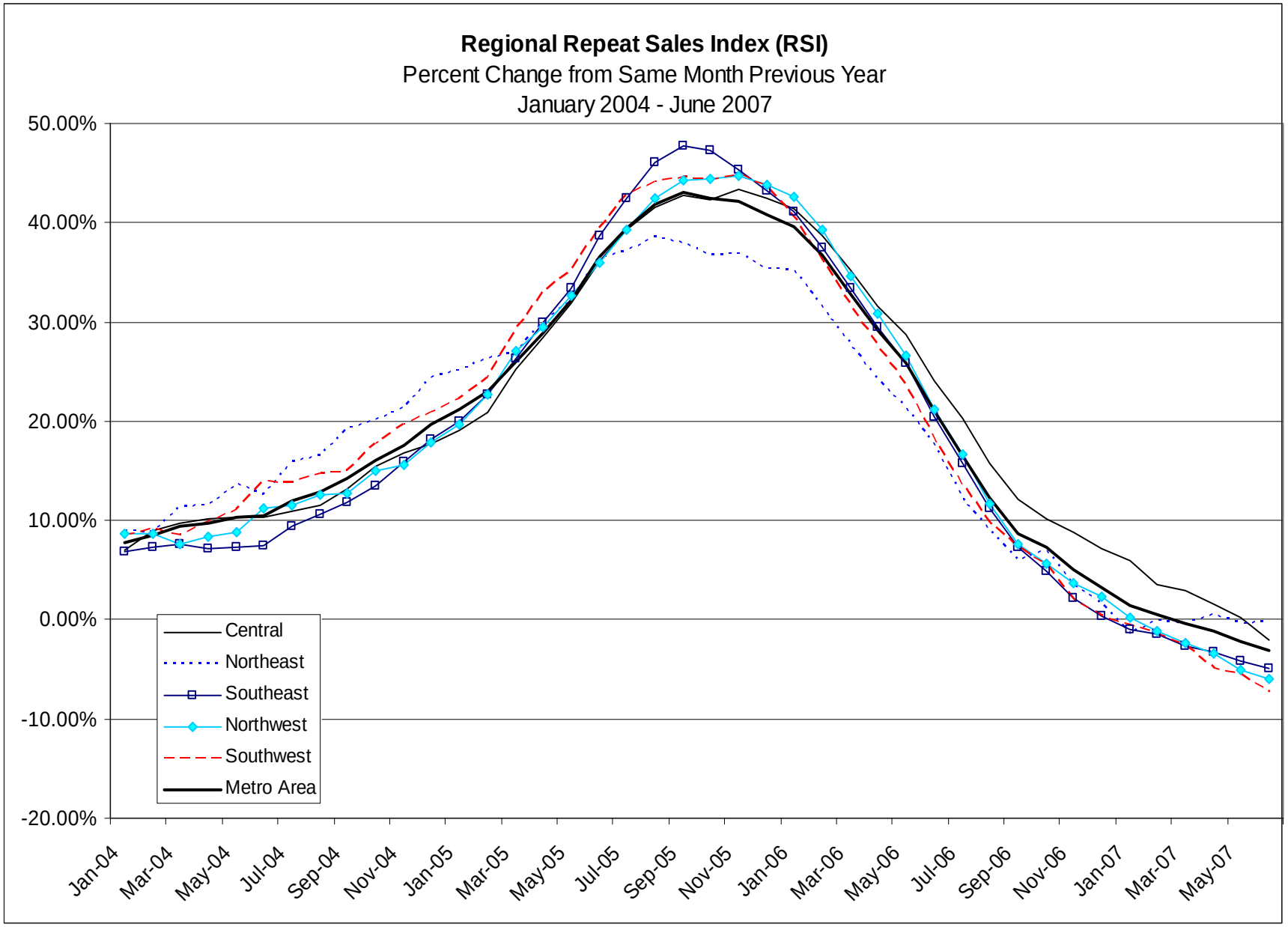

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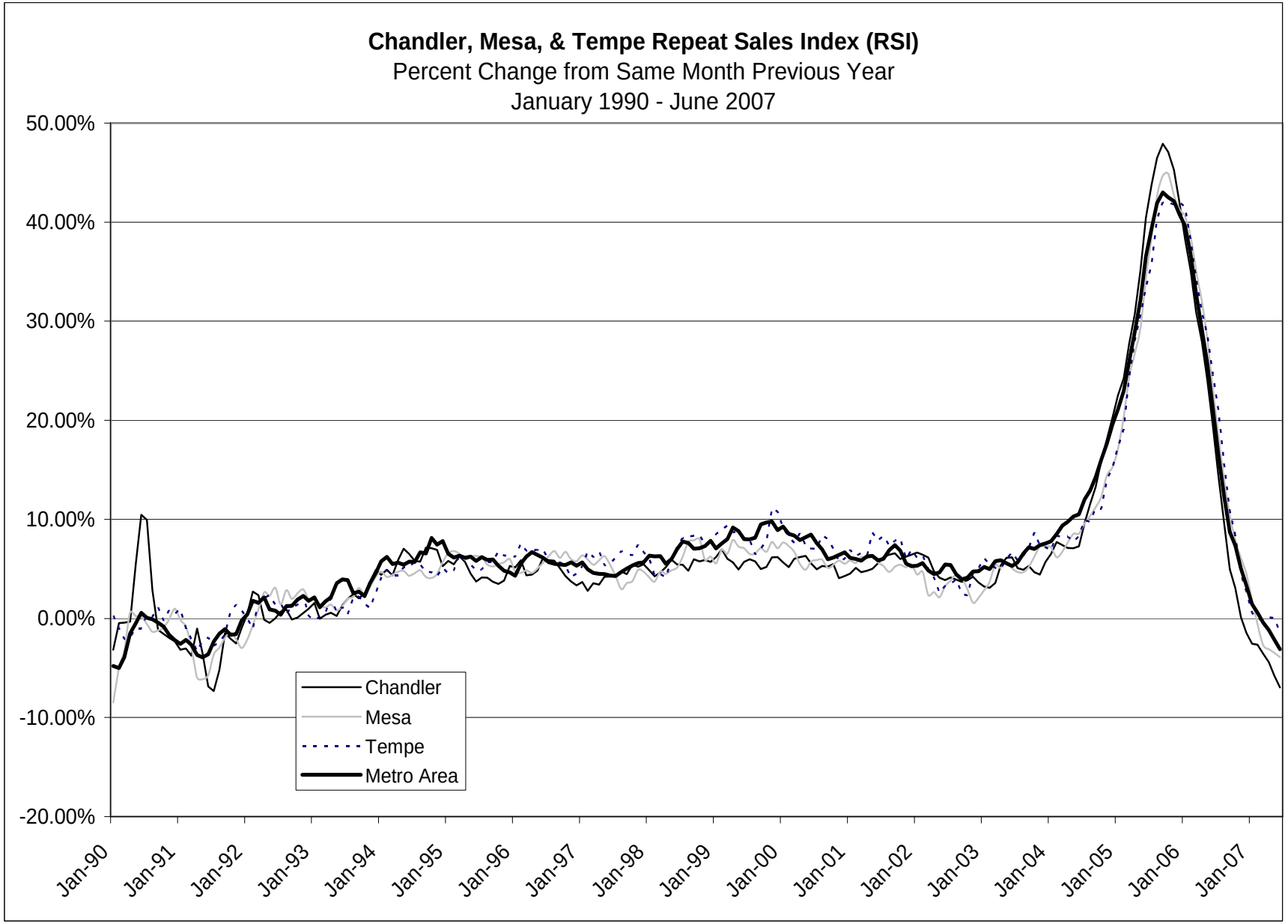

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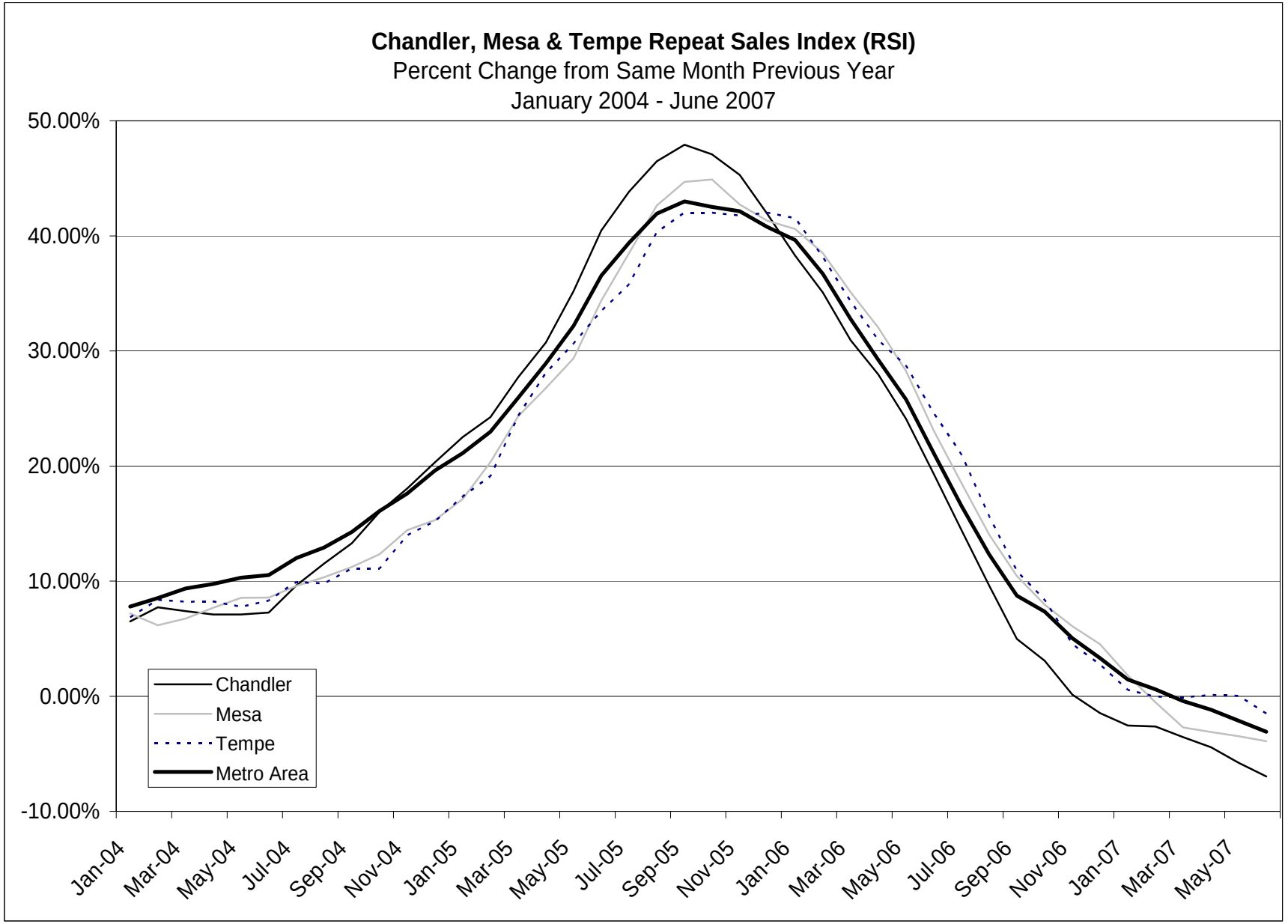

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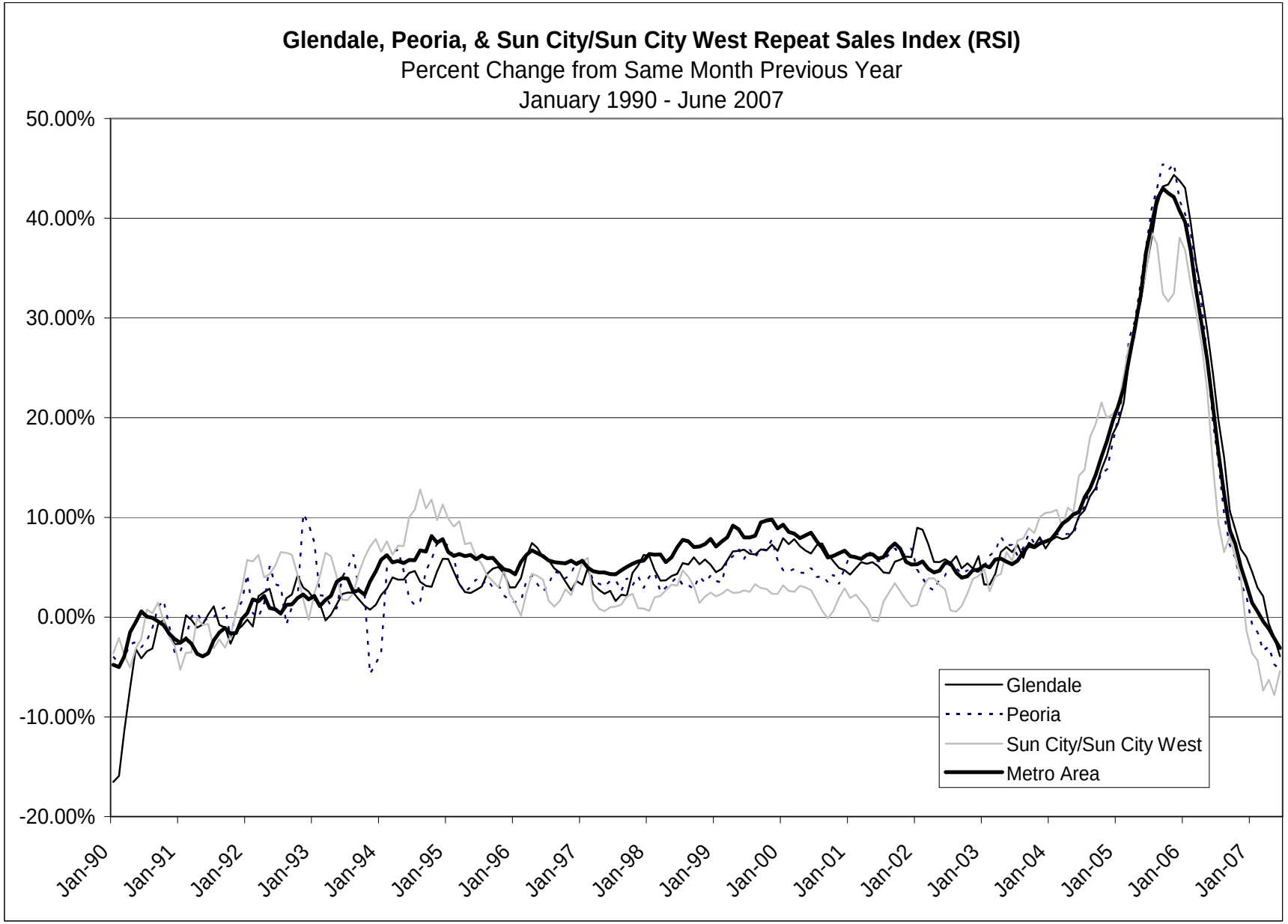

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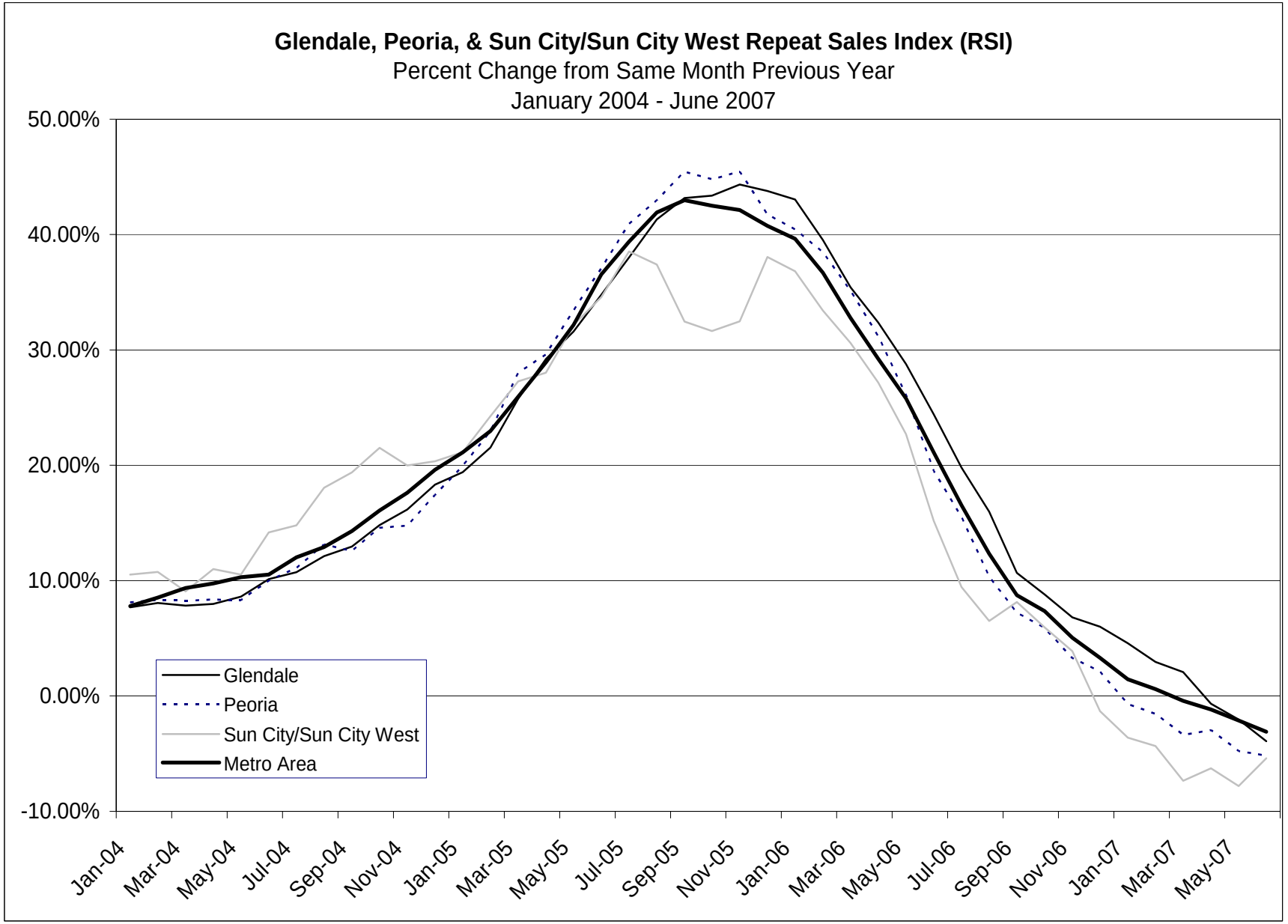

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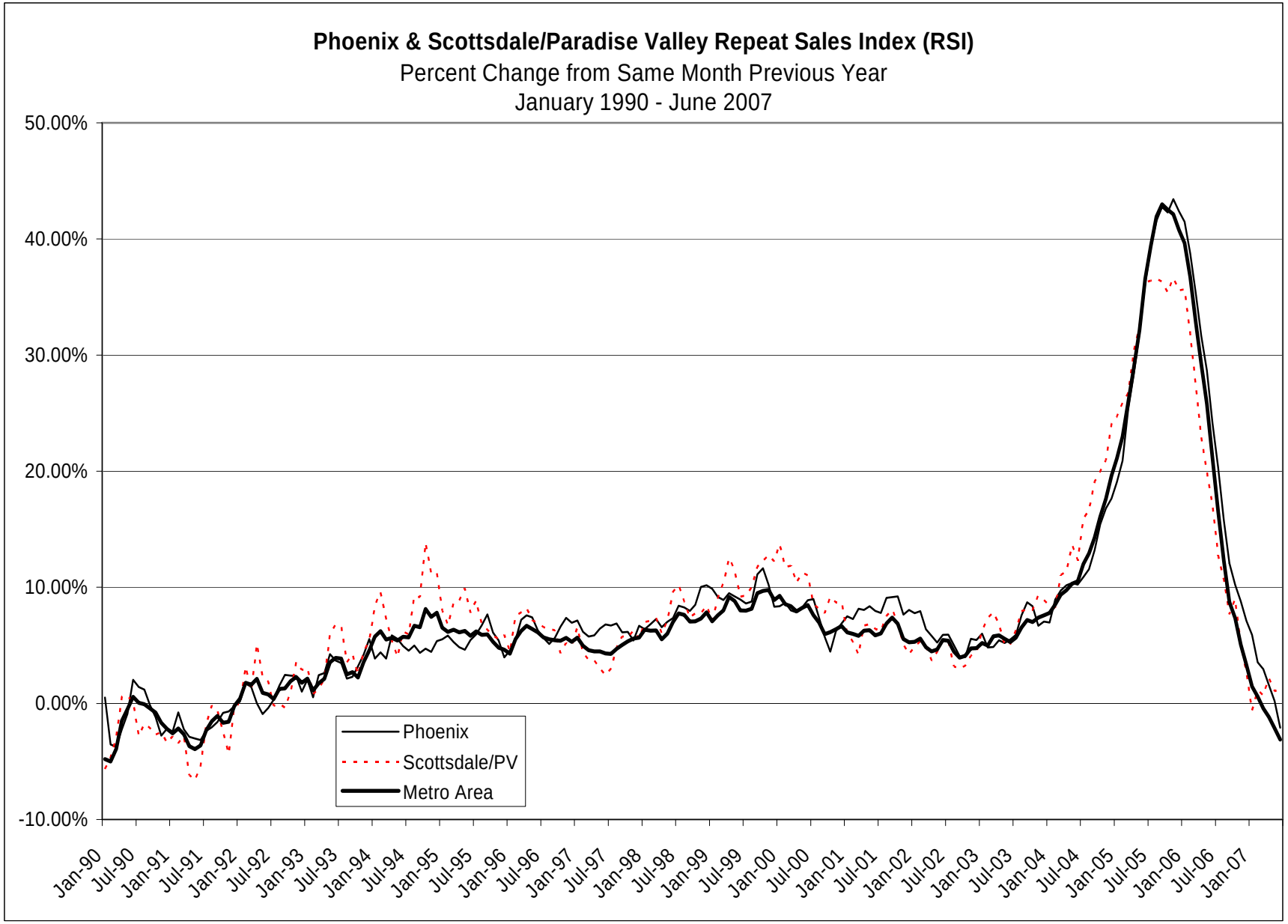

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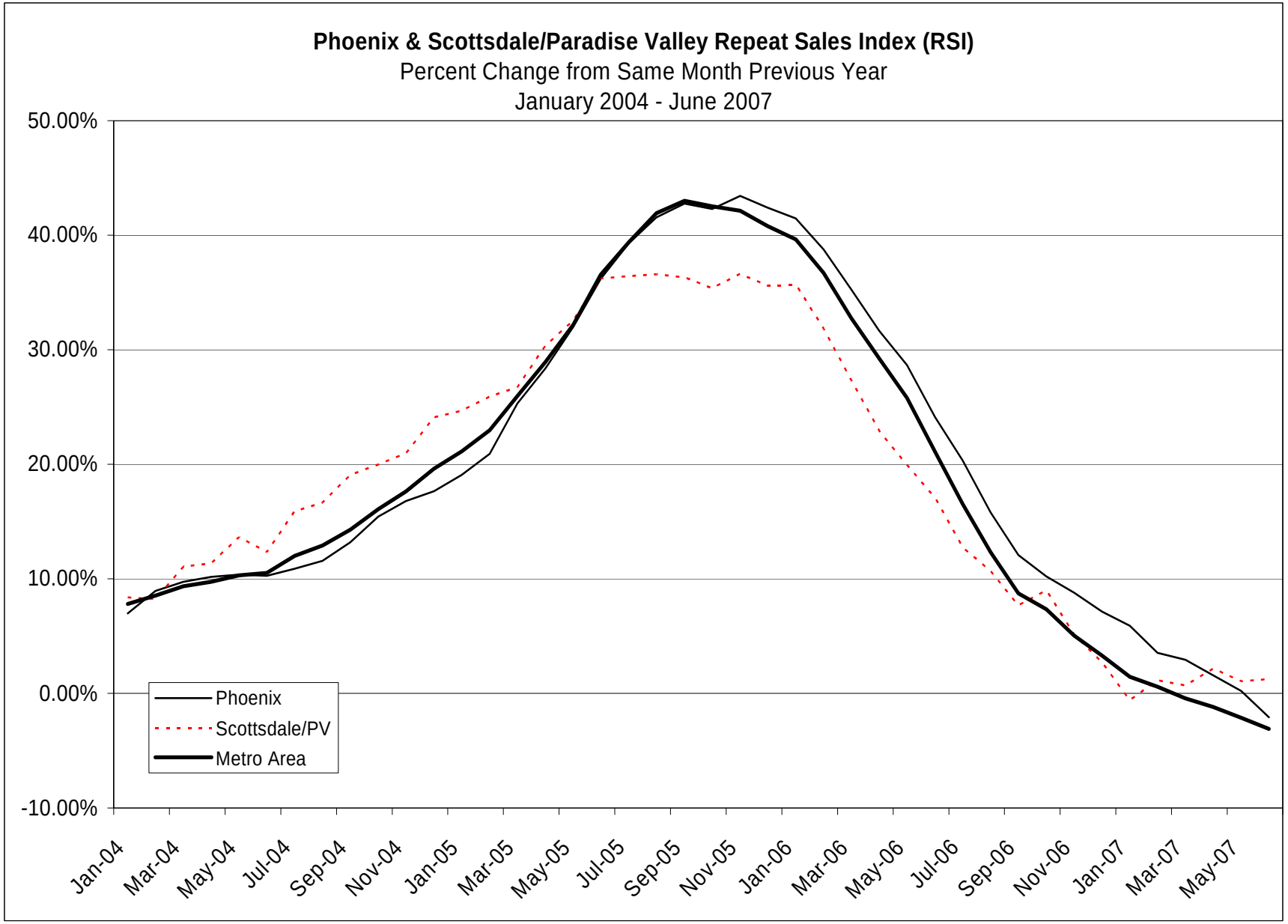

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