

# **Does a Rising Tide Raise All Ships? Single Family Housing Appreciation Across Omaha (2000 – 2005)**

**Nick Schmitz**

**Steven Shultz**

**Roger Sindt**

University of Nebraska at Omaha

**Abstract:** Using a 'Case-Shiller repeat-sale methodology', single-family house price appreciation across the Omaha Metropolitan Area averaged 3.71% per year from 2000 to 2005. However, appreciation rates were found to vary from 2.7% to 5.7% across nine different geographical regions indicating that appreciation should be reported and evaluated by regions or even smaller geographical boundaries rather than city-wide. Price appreciation was highest in three older and established regions (one wealthy and two lower income areas), all of which were located in the urban core of Omaha. Compared to newer suburban homes, the home styles in these high appreciation urban areas are relatively heterogeneous, older, and contain higher incidences of functional obsolescence. It is hypothesized that price appreciation in Omaha has been lower than national rates, and stronger in urban versus suburban areas of the community due to the highly elastic supply of land for development in the suburban-rural fringe of the community.

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## INTRODUCTION

Understanding variations in single-family housing value appreciation both over time and spatially is of interest to homeowners, realtors, lenders, state and local governments, and public policy practitioners. There exist numerous ways to measure price appreciation but the 'Case-Shiller Repeat Sales calculation has become the most widely used approach used for comparing appreciation rates nationally and across regions.

Previous literature has demonstrated that housing price appreciation depends upon a number of factors such as availability and cost of credit, trends in lifestyles, age, condition and location of the housing, general levels of employment and wage rates, among other economic variables. For that reason it should be expected that price appreciation is not constant or homogenous across different areas of a community which contain different mixes of the above conditions.

There are two primary objectives of this research. The first is to measure single-family appreciation in the Omaha market over the 2000 to 2005 period using a variation of the Case-Shiller-Repeat Sales calculation. This is considered relevant since the Case-Shiller approach has to date not been commonly utilized for reporting price trends in the Omaha market (others rely primarily on simple increases in mean and median prices), and because of our desire to compare Omaha single-family appreciation rates with national appreciation rates. The second objective involves evaluating whether price appreciation is constant across different areas of Omaha or if there are variations in appreciation that can be recognized and

possibly explained. Again this is considered highly relevant to real estate investment decisions of both individuals and professionals and for evaluating the effectiveness of community development and economic development related programs.

## PREVIOUS LITERATURE

### Alternative Approaches to Estimate Housing Price Appreciation

There exist numerous approaches for measuring single-family housing appreciation. The most simplistic approach (as used by the National Association of Realtors and professional real estate analysts) is to report price appreciation based on median values (or means) both with and without new housing included in the statistics. This approach uses the following formula:

$$Appreciation = \frac{P_t - P_{t^*}}{P_{t^*}}$$

where  $t^*$  is the first period in a sequence and  $t$  is the period immediately following  $t^*$ . There are a number of issues with this method. First and foremost is that the mix of sold homes may change over time i.e. cheaper homes may sell more in a given year resulting in a lower index.

An alternative and slightly more complex approach which has been adopted by several Federal agencies and in particular, the Office of Federal Housing Enterprise Oversight (OFHEO) is the repeat-sale methodology first developed by Bailey, Muth, and Norse (1963) and then refined and developed by Case and Shiller (1987) and others (Quercia et al. 2000; Shiller, 1991).

A generic specification of the Case-Shiller repeat-sale model is:

$$(\ln P_t - \ln P_t^*) = \sum_{i=1}^n \delta_i D_{it} + \varepsilon$$

which regresses the difference in logged prices of the second and first sales against a matrix of time variables equal to -1 if the home sold for the first time in that year, equal to 1 if the home sold for the second time in that year, and 0 otherwise. These dummy year coefficients are interpreted as the logged price index. A variation of this approach is to exclude quick turnover repeat sales which eliminate the possible inclusion of 'flipped' homes which are bought and renovated for a quick profit, and foreclosure sales which may be sold at a discount (Quercia et al. 2000). In other words this approach better accounts for non-constant housing quality and/or non-market sales such as foreclosures.

Numerous studies including Archer et al., (1996), Goetzman & Spiegel, (1997), Li and Rosenblatt, (1997), Crone and Voith, (1999), Quercia et al., (2000), McMillen, (2003), and Case et al., (2004) have noted appreciation rates tend to vary spatially which negates the reliance on single (city-wide) appreciation. They have also found that price appreciation in different areas depends on housing inventories and supply, the availability and cost of credit, trends in lifestyles, age, commuting times, general levels of employment and wealth.

### **Background on the Omaha Metropolitan Area**

The Omaha Metropolitan Area contains the City of Omaha and is located

on the eastern border of Nebraska alongside the Missouri River and for the purposes of our study includes parts of Douglas and Sarpy Counties. With a 2005 population estimate of about 807,000 the Omaha Metropolitan Area is the largest populated area in Nebraska, and the 43rd largest in the nation. The area included in the present housing appreciation study was limited to the most densely populated areas in Douglas and Sarpy Counties.

The Omaha Metropolitan Area economy is highly diversified and spread across insurance and financial industries, light industry and meat packing plants, and five 'Fortune-500' companies. Unemployment rates have historically been below the U.S. national average. The population is 85% white, while the two most prominent minority groups are Black (7.4%) and Hispanic (6.1%). Median household income is \$49,800 and the city has a poverty rate of 11%. Based on single-family construction permits, the housing supply has increased by around 7.9% per year between 2000 and 2006.

The central business district (CBD) in Omaha contains approximately 16% of the City's office employment base with the remaining employment centers being located in numerous medium to large sized office parks that are distributed throughout both urban and suburban sections of the City. The average single-family home in 2006 was 43 years old, had a median price of \$141,000 and had 1,500 square feet of finished living area. Much of the housing in the older parts of town (immediately adjacent to the downtown area) suffers from physical and functional obsolescence. Suburban sprawl has occurred primarily in a west, northwest and southwesterly direction from the CBD and more recently to the south, with the opening of the

Kennedy Freeway (Highway 75) into Sarpy County. However current (year 2007) commuting drive times from most of the new suburban residential developments to the downtown CBD still remain under 40 minutes.

## **METHODOLOGY AND DATA SOURCES**

Price appreciation over the 2000 to 2005 period is calculated using the 'Case-Shiller repeat sales method city-wide and for 9 market segments based on clustering homes on size and age in conjunction with roads and other geographical boundaries as shown in Figure 1.

All Omaha Area Board of Realtors Multiple Listing Service (MLS) transactions over the 2000 to 2005 period (approximately 34,000 sales) were geographically referenced based on parcel identification numbers, county parcel coverage, and in some cases, address matching. MLS regions and census tract boundaries were overlaid with sale parcels, and a variety of GIS distance measures were used to determine proximity and locational characteristics associated with sales. Housing sales data from the county tax assessor records covering the same time period was also obtained and integrated with the MLS sales data. This was intended to verify the accuracy of MLS data and to evaluate whether there were any statistical significant differences between MLS and non-MLS (i.e. for sale by owner homes). MLS and for sale by owner sales could not be combined because the sales from county tax assessor's records were missing key

housing variables which were deemed necessary to obtain accurate price appreciation estimates. Fortunately no significant differences in sample characteristics were found between MLS and non-MLS homes sold with respect to price appreciation over the 2000-2005 time period.

Repeat-sale models (based on equation 2) were estimated with the changes in logged prices being regressed against a matrix of dummy variables equal to -1 if the home was sold first in time period  $t$ ; equal to 1 if the home was sold for a second time in time period  $t$ , and 0 otherwise.

Many analysts report appreciation on a yearly percentage basis. Since percentage growth and index values are interchangeable, both indices and percentage changes were reported here to allow comparison to other empirical studies and other measures of price changes such as inflation.

After estimating both city-wide and neighborhood specific price appreciation values, comparisons are made to national appreciation rates, and a qualitative assessment is made regarding how appreciation varies across the 9 chosen geographic regions of Omaha (i.e. if any recognizable spatial patterns appear). Finally, the housing, economic and demographic characteristics of areas with high and low appreciation are discussed in order to identify possible factors that may be influencing appreciation in specific areas.

Figure 1. Comparisons of Housing Appreciation Indices among Study Indicators, OFHEO Indicators and Inflation

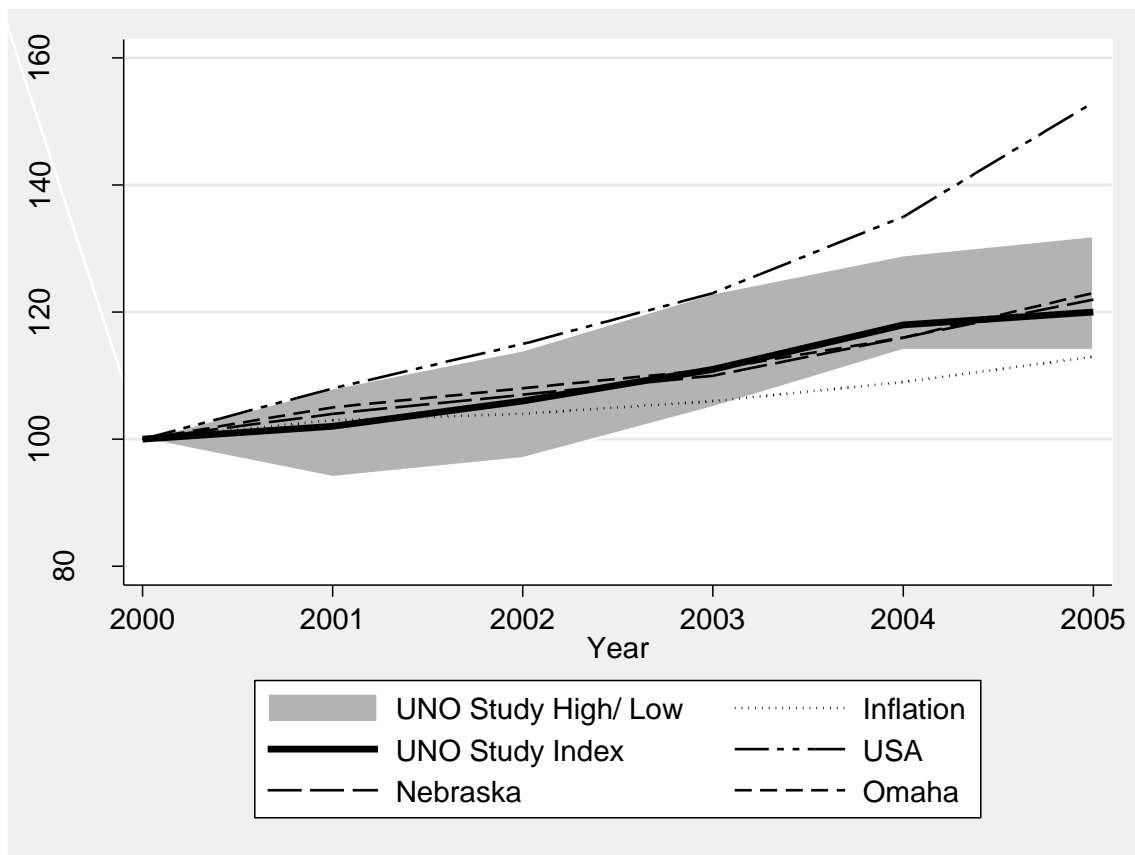


Table 1. Single-Family Home Price Appreciation Index Matrix from 2000-2005 for Select Regions in the Omaha Metropolitan Statistical Area

Select Region	2000 to					00-05**
	2001	2002	2003	2004	2005	
Omaha City-wide	1.02	1.06	1.11	1.18	1.20	3.70%
Memorial Park/District 66	1.07	1.14	1.16	1.29	1.32	5.71%
North Central	1.03*	1.08	1.14	1.21	1.24	4.40%
North Omaha	0.94*	0.97*	1.05*	1.27	1.14	2.66%
Northwest Suburb	1.04	1.07	1.11	1.14	1.18	3.37%
South Downtown/Midtown	1.03*	1.04*	1.14	1.23	1.24	4.40%
South Omaha	1.08	1.07*	1.23	1.24	1.32	5.71%
South Suburb	1.01*	1.10	1.11	1.17	1.15	2.83%
Southwest Suburb	1.03	1.08	1.11	1.15	1.19	3.54%
West Suburb	1.02*	1.08	1.11	1.15	1.18	3.37%

\*Not Significant at the 10% level

\*\* Average Annual on a percentage basis

## RESULTS

### Omaha Versus National Price Appreciation

The available sample size of repeat sale homes (after removing sales held for a period of less than two years) was 1,922. Statistically significant appreciation estimates were found in all but one of the neighborhoods (Bellevue, an area in southeastern Omaha). This area suffered from small sample sizes which lead to highly insignificant estimates and for this reason it was dropped from the study.

Table 1 contains appreciation rates for Omaha as a whole and across the 9 different regions over the 2000 to 2005 time-period (on average 3.7% per year across Omaha or a range of 2.7% to 5.7% in different areas. City-wide appreciation was relatively constant over the time period except for the 2003 to 2004 period which had higher than average appreciation (a jump of 7 index points).

Of particular interest is the 2005 index value which measures the average cumulative change in home prices that can be attributed to the five-year study period

(Table 2). As can be seen from Figure 1 which shows appreciation over time, Omaha appreciation rates have lagged substantially behind national rates as calculated by the Office of Federal Housing Enterprise Oversight (OFHEO).

Over the five-year study period the OFHEO index of national single family housing appreciation based upon repeat sales data advanced by some 53%. During the same period housing in Omaha appreciated by 20% overall according to this study's analysis. Furthermore the local appreciation rate as estimated by the OFHEO was substantially below the national indicator. There are many reasons for these differences with slow growth in population, employment and wage rates in the Omaha MSA frequently advanced as the variables having the most significant impact on housing values. It is likely that the availability of land for development around Omaha within a commutable distance to the CBD facilitates the development of new homes thereby lowering the demand for existing residences. The overall increase in housing prices at the local level lagged the

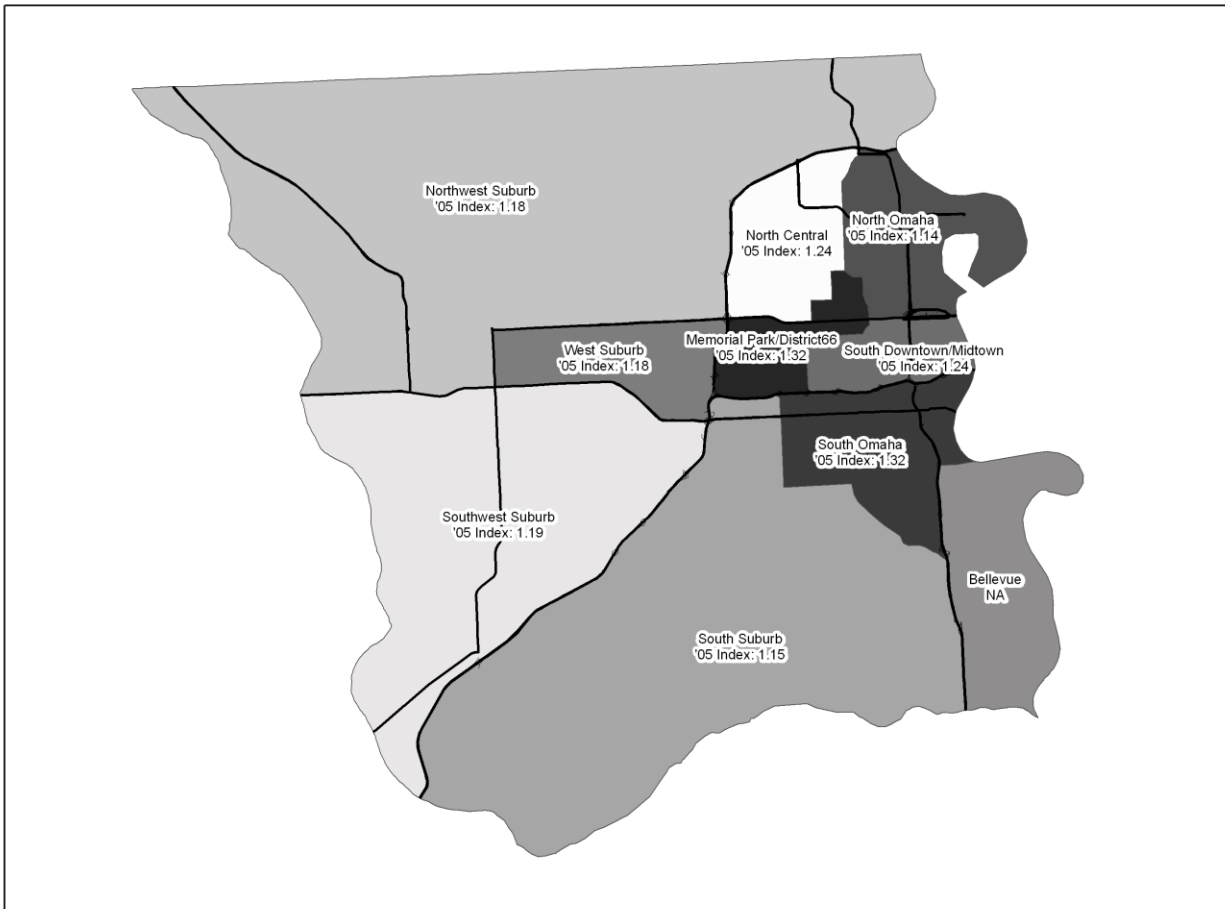
**Table 2. Comparison of Housing Price Appreciation Indices between UNO Study Indicators and OFHEO Indicators with an Inflation Index Comparison**

Year	UNO Study	OFHEO Indexes*			Inflation**
		Omaha	NE	US	
2000	100	100	100	100	100
2001	102	105	104	108	103
2002	106	108	107	115	104
2003	111	111	110	123	106
2004	118	116	116	135	109
2005	120	123	122	153	113

\* Office of Housing Enterprise and Oversight data at [http://www.ofheo.gov/hpi\\_download.aspx](http://www.ofheo.gov/hpi_download.aspx) these indices were generated from repeat sales data.

\*\* From the Gross Domestic Product (GDP) Implicit Price Deflator second quarter values available through the St. Louis Federal Reserve Bank.

Figure 2. Appreciation Rates for Single-Family Housing, from 2000-2005 for Select Regions in the Omaha Metropolitan Statistical Area



national index but the increase was higher than the national inflation rate for the same period and therefore has been a good storehouse of value during this study period.

#### Variations in Appreciation across Omaha

In Omaha the index ranges from 1.14 to 1.32 (2.7% to 5.7) indicating that total growth in prices for certain neighborhoods is markedly different from the city-wide estimate calculated here, the growth estimate often quoted in the press of 26% (based on 4% per year growth

rates), and the estimates given by Table 1. These variations in appreciation are mapped in Figure 2. Generally there are no clearly recognizable spatial patterns in appreciation except that 3 areas of the highest relative appreciation Memorial Park/District 66 and North and South Omaha are in the traditional urban core of Omaha rather than in the outlying suburbs.

The housing characteristics of the different Omaha study areas are summarized along with 5-year appreciation rates in Table 3. From this it can be seen that some of the highest appreciation rates

**Table 3. Characteristics of the Repeat Sales Housing in Selected Omaha Metropolitan Area Regions**

Select Region	Adjusted Sale Price*	Finished Square Feet	Bathrooms	Age	Garage Spaces	Count	Average Annual Appreciation
All of Omaha	\$158,404	1931	2.42	38	1.77	1877	3.70%
Memorial/D66	\$180,432	1990	2.24	59	1.47	139	5.71%
North Central	\$113,598	1525	1.90	41	1.34	228	4.40%
North Omaha	\$75,096	1374	1.56	69	1.02	133	2.66%
Northwest Suburban	\$197,914	2256	2.88	9	2.26	435	3.37%
South	\$108,517	1371	1.71	66	1.01	177	4.40%
South Omaha	\$95,775	1331	1.71	58	1.10	113	5.71%
South Suburban	\$142,268	1820	2.55	22	1.88	40	2.83%
Southwest Suburban	\$186,077	2183	2.79	11	2.22	380	3.54%
West Suburban	\$202,237	2448	3.10	20	2.22	177	3.37%

\*Based on the second sale.

occurred in older areas of the city which have a relatively higher heterogeneous housing stock, little land available for new development (at least in contrast to the suburban areas) and examples of functional obsolescence. However these urban core areas of high appreciation contain a mix of both high and low value housing stock.

### Summary, Conclusions and Limiting Conditions

This is the first known study to estimate appreciation rates of single-family housing across different areas of the Omaha market using the widely accepted Case-Shiller Repeat sale measure. It therefore appears that Omaha is not a single homogenous housing market and the use of a single, city-wide estimate of single-family housing appreciation may not provide accurate assessment of the dynamics of this market. Appraisers, investors, homebuyers, and tax assessors should take note that a rising (or falling) tide of housing price appreciation does not

appear to impact all areas of the community equally.

These study results are subject to the following caveats or limiting conditions. First the repeat sales samples may not be a representative sample of the rest of the housing stock in the designated neighborhoods and the sample, therefore, may vary in appreciation rates from other housing in the neighborhood. Variations in concentrations of owner-occupied housing versus investor-owned renter-occupied single family housing may also contribute to differences in appreciation rates and may be more concentrated in some regions than others. Also, it is likely that all of the effects of externalities may not be fully captured by the data. For example, public incentives in the form of subsidized financing, grants, tax incentives, and quality of public infrastructure among others, may affect the appreciation rates over time. Another potential limitation with this study is that it relies solely on multiple listing service (MLS) sales data and may not be reflective of entire market of single-family



housing sales if for sale by owner (FSBO) homes were inherently different from MLS homes and/or the if the FSBO sold for different prices and appreciated differently.

Finally, it is recommended that future research utilize neighborhood specific price appreciation measures to quantify how public and/or private investments or other changes to particular areas impact price appreciation which in itself can be a measure of wealth creation. Such information could hopefully be then be used to target specific economic and community development programs to the unique characteristics of particular geographical areas rather than relying on a 'one size fits all' approach.

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