A Decade of Boom and Bust in the Prices of Single-Family Homes: Boston and Los Angeles, 1983 to 1993

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The 1980s and 1990s have been turbulent times in the U.S. market for single-family homes. For most of the previous two decades, housing prices across states and metropolitan areas moved together and increased slowly in real terms (Case 1994). Prior to the 1970s, house prices moved at about the rate of inflation, and regional differences were relatively modest. During the 1970s, house prices grew significantly faster than the rate of inflation; homeowners earned tax-sheltered imputed rents and capital gains on their leveraged assets, producing excess returns and very low user costs of capital (Case and Shiller 1990). Regional differences, except for the California boom of 1976 to 1980, remained small, however.

The 1980s and 1990s, in contrast, have seen increased price volatility and sharp differences in price behavior across regions. Substantial housing price booms have occurred in the Northeast, California, Hawaii, Seattle, and Washington, D.C., while major price declines took place in Alaska and in many parts of the Southwest. During the 1990s, the booms of the 1980s in California and the Northeast turned to busts.

Previous papers (Case 1991; Case and Cook 1989; Case and Shiller 1993) showed that these cycles had dramatic consequences for regional economies and national mortgage markets. Boom periods lead to increased spending, rising costs of doing business, and a deterioration in the distribution of income. In bust periods, falling home prices interact with contracting regional economies and serve to exacerbate the extent of declines. Housing price declines explain a significant part of the foreclosure risk borne by owners of mortgages and mortgage-backed securities. The extent of this risk has been of increasing concern as house prices continue to drop in California, where in excess of 25 percent of the nation's single-family mortgage collateral is located.

The most dramatic of the boom–bust cycles occurred in New England and in California. Public attention has focused on the fluctuations in Boston and Los Angeles, especially. The first part of this article

describes in some detail what has happened to prices of single-family homes in the Boston metropolitan area and in Los Angeles County since 1983. The second part of the article analyzes the reasons for the similarities and differences between the two areas, both on the way up and on the way down.

WRS Price Indexes by Submarket: Boston and Los Angeles

The indexes presented in this section were estimated using a variation on the Weighted Repeat Sales methodology first presented in Case and Shiller (1987). The method, described in some detail in the Appendix, uses arithmetic weighting (Shiller 1991) and is based on data on recorded sales of all properties that passed through the market more than once during the period under study. The Greater Boston file contains 102,674 pairs of sales between 1981 and June 1993, drawn from the five eastern counties of Massachusetts. The Los Angeles file contains 753,295 pairs of sales drawn from Los Angeles County during the period 1970 through June 1993.

First, an aggregate index is calculated based on all recorded sale pairs for each metro area. Submarket indexes are then calculated two different ways. First, the sale pairs are broken into "high," "middle," and "low" tiers and separate indexes are calculated for each. To calculate the tier indexes, all sales (not just repeat sales) in each quarter are broken into three equal groups ranked by price.

Next, indexes are calculated (one tier only) for separate Post Office zip codes or, where the number of transactions is insufficient to obtain accurate individual indexes, clusters of zip codes. Indexes were estimated for 75 separate geographical areas in Los Angeles County and 64 separate areas in Greater Boston.

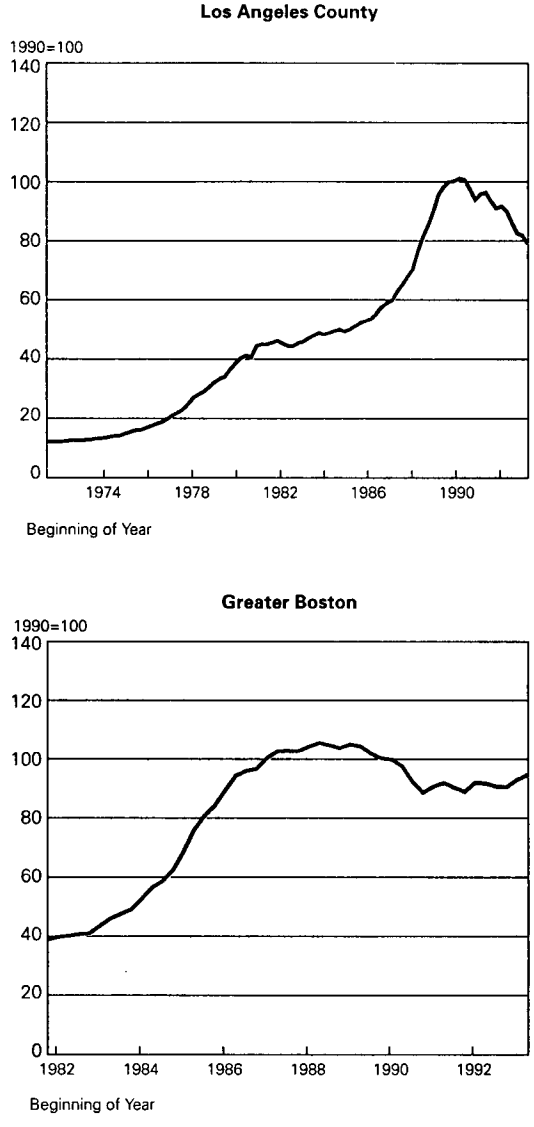
Aggregate Indexes

Aggregate indexes for Los Angeles and Greater Boston are presented in Figure 1. Both the 1976–80 boom and the 1985–90 boom can be seen in the Los Angeles panel. This paper will focus on the period after 1985 in Los Angeles and the period after 1983 in Boston.

Table 1 summarizes the movements of the indexes charted in Figure 1. Between the first quarter of 1982 and the first quarter of 1983, house prices rose by 5.7 percent in both Boston and Los Angeles.

Figure 1

Aggregate Price Indexes for Single-Family Homes



Consumer prices were rising at about the same rate, making real home prices flat. Real prices stayed flat and nominal price increases slowed in Los Angeles through the first quarter of 1985. But Boston prices had already begun to accelerate rapidly and were up 20 percent by the first quarter of 1984.

Table 1
Changes in Prices of Single-Family Homes: Boston and Los Angeles
Percent

Period	Boston	Los Angeles
82:I–83:I	+5.7	+5.7
83:I–84:I	+20.0	+4.0
84:I–85:I	+27.2	+2.3
85:I–86:I	+35.3	+6.8
86:I–87:I	+14.8	+11.9
87:I–88:I	+6.2	+17.7
88:I–89:I	+1.0	+27.9
89:I–90:I	−3.3	+11.5
90:I–91:I	−8.8	−6.3
91:I–92:I	+.3	−3.1
92:I–93:I	+1.9	−9.3
Overall Increase		
Boston		
83:I–88:III	+158.8	
Los Angeles		
85:I–90:II		+102.4
Overall Decrease		
Boston		
88:III–91:I	−15.9	
88:III–93:II	−12.6	
Los Angeles		
90:II–93:II		−19.0

Prices in Boston continued to accelerate for three full years. The highest rate of increase occurred between 1985:I and 1986:I. Three years of acceleration were then followed by three years of deceleration, with inertia keeping sales prices rising (but at a far slower pace) to a peak in the third quarter of 1988. The overall increase during the boom was 158.8 percent.

Prices in Los Angeles began accelerating two years after the boom began in Boston. The pattern was similar, with a steady four-year acceleration of prices followed by deceleration. The peak in Los Angeles occurred during the second quarter of 1990, with prices up 102.4 percent over the first quarter of 1985.

One significant difference between the Los Angeles and Boston booms was the length of the peak period. In Boston, prices remained essentially unchanged at or near the peak from the second quarter of 1987 through first quarter 1990, nearly three years. In Los Angeles, prices peaked sharply in the second quarter of 1990 and almost immediately began to fall, dropping over 7 percent within three quarters of the peak.

Prices in both cities dropped significantly between 1990:I and 1991:I. At the same time a pattern of seasonality, not at all visible during the boom, appeared in house prices. Boston prices hit a first trough in the first quarter of 1991, rebounded during the second and third quarters and then dropped again to the same level by the first quarter of 1992. Another rebound during the second and third quarters of 1992 was followed by a slight dip to the first quarter of 1993. Again, the second quarter saw a bit of a rebound, and preliminary data for the third quarter show the rebound continuing.

A similar pattern of seasonality can be seen in the index for Los Angeles shown in Figure 1, but the trend is still sharply down through the second quarter of 1993. A slight uptick appears in the second quarter of both 1991 and 1992, but the second quarter of 1993 saw a continued slide.

Overall, the peak-to-trough decline in Boston was just under 16 percent, with a slight rebound to 12.6 percent below peak by 1993:II. Los Angeles is now down 19 percent and falling, as of 1993:II. Preliminary figures put the third quarter of 1993 down another 3.5 percent, making the overall drop in Los Angeles 21.9 percent.

Before turning to the three-tier indexes, Table 2 presents data on the *level* of prices in Boston and Los Angeles, relative to prices for the United States as a whole. In 1983, the Los Angeles median sales price was 60 percent above the U.S. median, while Boston's was only 17 percent above. Within three years, however, Boston's median sales price was nearly twice as high as the U.S. median and 18 percent above the median in Los Angeles. The second California boom propelled Los Angeles prices to more than 131 percent above the U.S. median and 18 percent above the Boston median. As of the second quarter of 1993, both the Boston and Los Angeles medians were far above the U.S. median.

Three-Tier Price Indexes

Figure 2 presents indexes for three housing price tiers for the Greater Boston area since 1982; Figure 3 presents indexes for three price tiers for Los Angeles County since 1971. The data from Figures 2 and 3 are summarized in Table 3.

Starting from a lower level during the first quar-

Table 2
Median Sales Price of Existing Single-Family Homes
Thousands of Dollars

Year	Boston	Los Angeles	United States	Boston/ U.S.	L.A./ U.S.	L.A./ Boston
1983	82.3	112.6	70.3	1.17	1.60	1.37
1986	158.1	133.6	80.3	1.97	1.66	.85
1989	181.9	214.8	93.1	1.95	2.31	1.18
1992	171.1	213.2	103.7	1.65	2.06	1.24
1993:II	175.6	202.3	109.3	1.61	1.85	1.15

Source: National Association of Realtors, *Home Sales*, monthly, various issues.

ter of 1983, the lowest price tier in Boston appreciated at about the same rate as the higher tiers until 1987.[1] As the middle and upper tiers begin to flatten in 1987, the lower tier continued to increase. The lower tier increased for more than a year after the upper tiers peaked in the third quarter of 1988. The prices of single-family homes in the bottom tier had tripled by the peak at the end of 1989, while middle- and upper-tier properties went up about 2.5 times.

Prices in Boston's highest tier initially fell more rapidly than prices in the lower tiers, but they bottomed out earlier. After dropping 18.5 percent to a trough in the first quarter of 1991, upper-tier properties have recovered 8.5 percent of their lost value, and as of 1993:II they stood only 11.5 percent below peak. Middle-tier properties did not bottom until 1992:I and have recovered only 1.9 percent of their lost value, standing 12.7 percent below peak as of 1993:II. Lower-tier prices continued to fall through the first quarter of 1993, flattening at 17.8 percent below peak in the second quarter of 1993.

The behavior of the price tiers was different in California. All three tiers appreciated at virtually identical rates, doubling between the first quarter of 1985 and the peak (Figure 3). As in Boston, the lower tier peaked later, but only by two quarters. Despite the uniform increases in price across the tiers on the way up, the price tiers behaved very differently on the way down. The highest tier has declined the most; as of the third quarter of 1993, the top tier was down 25.3 percent and still falling. The lower and middle tiers were also falling, the middle tier down 18.2 percent and the lowest tier down only 9.3 percent.

[1] The fact that the lower tier index begins at a lower level in 1983 is an artifact of the choice of 1990 as the base year for all indexes.

Zip-Code Clusters

The patterns of price increases and decreases by price tier in both Boston and Los Angeles show that prices seem to stay closer together as they move up than when they move down. The pattern of price "spreading" on the way down can be seen most clearly in Figure 3.

When increases and decreases are calculated for separate geographical areas, a similar pattern emerges.

Figure 2

Index of Prices of Single-Family Homes in Greater Boston

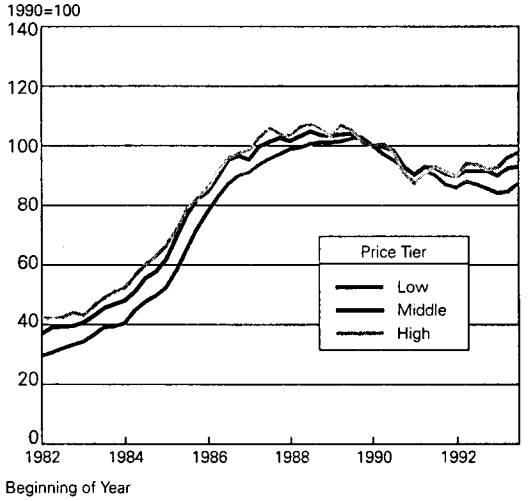


Table 3
Changes in Prices of Single-Family Homes by Price Tier: Boston and Los Angeles
Percent

Tier	Peak	Change 1983:I to Peak	Trough	Change Peak to Trough	Change Trough to 1993:II	Change Peak to 1993:II
Boston						
Low	89:IV	+201.6	93:I	−17.9	+.1	−17.8
Mid	88:III	+157.0	92:I	−14.3	+1.9	−12.7
High	88:III	+148.8	91:I	−18.5	+8.5	−11.5

Tier	Peak	Change 1985:I to Peak	Trough	Change Peak to 1993:III
Los Angeles				
Low	90:IV	+103.2	93:III	−9.3
Mid	90:II	+97.8	93:III	−18.2
High	90:II	+105.7	93:III	−25.3

Table 4 presents descriptive statistics on Weighted Repeat Sales (WRS) indexes for 139 separate areas within the two cities. In Boston, the average index increased 170 percent from 1983:I to the peak, with a standard deviation of 21 percent; the coefficient of variation was 0.12. On the way down, the average index dropped 17 percent with a standard deviation of 8 percent; the coefficient of variation was 0.50.

In Los Angeles, the average index increased 100 percent from 1985:I to the peak, with a standard deviation of 14 percent; the coefficient of variation was 0.15. On the way down, the average index dropped 18 percent with a standard deviation of 7 percent; the coefficient of variation was 0.40.

Figure 3

Index of Prices of Single-Family Homes in Los Angeles County

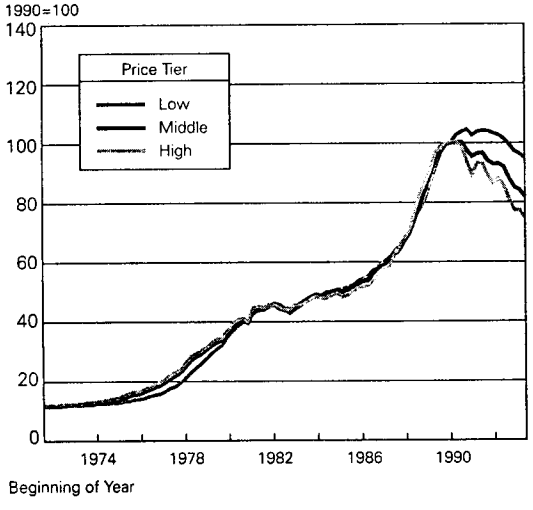


Table 4
Changes in Prices of Single-Family Homes by Zip-Code Clusters: Boston and Los Angeles
Percent (except for Coefficients of Variation)

	1983:I-Peak	Peak-1993:II
BOSTON: 64 Areas		
Minimum	136	−2
Maximum	235	−56
Mean	170	−17
Standard Deviation	21	8
Coefficient of Variation	.12	.50
1st Quartile	156	−.13
3rd Quartile	182	−.19
	1985:I-Peak	Peak-1993:II
LOS ANGELES: 75 Areas		
Minimum	51	−3
Maximum	133	−34
Mean	100	−18
Standard Deviation	14	7
Coefficient of Variation	.15	.40
1st Quartile	92	−.13
3rd Quartile	109	−.24

The Nature of the Cycle: The Booms

When housing prices rise as rapidly as they did during the booms described above, the first place economists turn for an explanation is to the fundamentals of supply and demand. It is highly unlikely that such booms could have occurred without strong basic economic forces driving the demand for housing. It is equally unlikely that such booms could have occurred with a highly elastic supply of housing. For example, Phoenix, Arizona, has experienced the fastest growth in population of any major American metropolitan area for more than two decades, yet a rapidly expanding supply of housing has held real housing prices to only modest increases over the period.

Table 5 presents data on three fundamental economic variables for Massachusetts, California, and the United States for the years between 1985 and 1993. As measured by these variables, the economies of both states were significantly stronger than the U.S. economy as a whole prior to 1989. For the four years 1985 through 1988, nominal personal income rose an average of 8.7 percent annually in Massachusetts and 8.2 percent annually in California, compared to 6.5 percent in the United States. Employment growth in California averaged 3.3 percent during the same period compared to 2.8 percent for the nation. In Massachusetts, employment growth was slower than in the nation as a whole, but since the state's labor force was growing slowly, the effect on its unemployment rate was dramatic. The Massachusetts unemployment rate hit 3.2 percent in 1987 (2.4 percent in July), nearly 50 percent below the national rate of 6.2 percent.

Both California and Massachusetts had strict zoning rules that made the supply of housing less responsive to demand shifts than might otherwise have been the case. Fischel (1993) presents compelling evidence that "growth control zoning" played a big role in the California experience. While no studies have isolated the effect in Massachusetts, anyone who lives in the state knows that zoning rules are controlled by 351 fiercely independent cities and towns, and that during the early years of the boom, the housing supply was relatively inelastic.

While fundamentals played a role in both housing booms, increasing evidence suggests that expectations and implicit "speculation" played a role as well. The argument is that fundamentals were insufficient to explain the extent of the price increases and that inertia, driven by adaptive expectations, pushed prices well above what could be justified by fundamentals. Greedy land speculators did not rush in, buying property to roll over into short-term gains. Rather, most home buyers, in anticipation of capital gains in the future, were willing to pay significantly higher prices as a result of those expectations.

Abraham and Hendershott show that fundamentals are insufficient to explain observed changes in

Table 5
Growth in Income and Employment: Massachusetts, California, and United States, 1985 to 1993
Percent

	Employment Growth			Unemployment Rate			Nominal Personal Income Growth		
Year	Mass.	Calif.	U.S.	Mass.	Calif.	U.S.	Mass.	Calif.	U.S.
1985	2.6	3.8	3.2	4.0	7.2	7.2	7.6	8.6	7.2
1986	2.0	2.5	2.1	3.9	6.7	7.0	8.3	7.2	7.0
1987	2.6	3.7	2.7	3.2	5.8	6.2	9.1	8.2	6.2
1988	2.1	3.6	3.3	3.3	5.3	5.5	9.9	8.6	5.5
1989	−.7	3.9	2.6	4.0	5.1	5.3	6.7	8.3	5.3
1990	−4.0	2.1	1.3	6.0	5.6	5.5	3.3	5.4	5.5
1991	−5.4	−3.4	−1.3	9.0	7.6	6.8	1.0	−.5	6.8
1992	−1.5	−1.9	.1	8.5	9.2	7.4	4.4	1.5	7.4
Sept. 1993	—	—	—	7.2	9.4	6.7	—	—	—

Source: Federal Reserve Bank of Boston, *New England Economic Indicators*, various issues; John E. Anderson Graduate School of Management at UCLA, *The UCLA Business Forecast for California*, Sept. 1992; U.S. Bureau of Labor Statistics, "The Employment Situation," Release, various dates.

Freddie Mac price indexes for the Northeast in the mid-1980s and for California in the late 1980s (1992, pp. 39–40):

> The equations also pick up the mid 1980s bounce in California, but miss totally the surge in the late 1980s. . . . The inability to explain the sharp price movements in the Northeast . . . is especially troublesome. Only one-third of the extraordinary run-up in the Northeast in the middle 1980s is explained. . . . Part of this seems to be a speculative bubble; using the observed, rather than the simulated, lagged appreciation rate explains another quarter of the increase.

Case has a similar result for Boston (1986, p. 47):

> While the economy is healthy and income is growing, market "fundamentals" do not seem to offer an adequate explanation for the very rapid increase in home prices in the Boston area since 1983. Recent economic theories of asset price behavior previously used to explain price "bubbles" in financial markets and foreign exchange markets seem to fit the housing market very well.

Case and Shiller (1988) surveyed those who purchased homes in four cities during May of 1988: Anaheim, Boston, Milwaukee, and San Francisco. Extensive questionnaires completed by nearly 1,000 respondents leave little doubt that expectations of continued price increases in California and Boston played a significant role in driving the demand for housing.

The patterns of the price movements in California and Boston themselves present significant evidence of an expectations-driven run-up (Figure 1). An efficient asset market should behave like a random walk, reacting instantaneously to new information. The picture of asset prices smoothly accelerating and decelerating over a four-year period is exactly the opposite of what efficient markets theory suggests. When prices were rising rapidly, everyone "knew" that owning was a smart move; and all homeowners earned extraordinary returns except, of course, those who bought at or near the peak.

The fact that prices have since collapsed in both Boston and Los Angeles adds weight to the argument that part of the explanation for the booms lies outside the fundamentals. It is true that the fundamentals deteriorated after 1988 in both cities. This can be seen in Table 5. Employment declines in Massachusetts began in 1989 and became severe in 1990 and 1991. Serious employment decline began in California two years later. But notice that the economic fundamentals deteriorated *after* the housing market had turned, not before. Case (1991) presents evidence that the economy of Massachusetts was driven on the way up and on the way down by the real estate cycle itself, not vice versa.

Finally, the fact that the price increases across jurisdictions were similar on the way up but the declines were uneven on the way down in both cities (Table 4 and Figures 2 and 3) provides additional evidence that fundamentals were not the only forces driving the market on the way up. As long as those seeking housing shop across sub-markets, a regional gain in employment and income combined with a sluggish supply response would likely lead to broad-based price increases, even in housing sub-markets with less favorable characteristics. But price increases during the boom periods in both states were virtually identical in areas that were very different in terms of their fundamentals. For example, when unemployment hit its lowest point in Massachusetts in 1987, the unemployment rate in Fitchburg and Lawrence was 30 percent higher than the statewide average, and in New Bedford and Fall River it was more than 60 percent higher. Yet, during the housing price boom, all these areas experienced nearly identical increases. On the way down, however, it was precisely the areas with high unemployment and low income growth that experienced the biggest drops in housing prices.[2]

The economic fundamentals deteriorated after the housing market had turned in Massachusetts and California, not before.

If demand were driven largely by anticipated capital gains, however, and expectations were similar across the region, one would predict uniformity on the way up and dispersion on the way down; those areas where home prices departed most from fundamentals would experience the biggest declines. This is precisely what happened in both California and Massachusetts.

A similar pattern has been observed by technical analysts of stock prices after a boom. That is, during

[2] The pattern of decline will be discussed later in more detail. See Table 7.

boom periods, stock prices tend to rise together, but on the way down in bear markets, price decreases are largest in stocks with weak underlying fundamentals.[3]

The Pattern of Decline: A Return to Fundamentals

Regardless of the extent to which the economies of Massachusetts and California were driven by the real estate cycle, the dramatic economic decline in the two states has hurt their housing markets. While the nation as a whole lost less than 2 percent of its jobs during the 1990–91 recession, Massachusetts lost an incredible 11.6 percent of payroll employment and California lost 5.3 percent. The unemployment rate has dropped recently in Massachusetts, but it continues to rise in California.

While economic decline and the speculative nature of the housing boom together explain why house prices as a whole have fallen in both metropolitan areas, they do not explain the pattern of those declines. Recall that in Los Angeles, the upper tier of property values has fallen over 25 percent and continues to fall, while the lower tier has fallen less than 10 percent. The opposite is true in Boston. While all three tiers initially fell at about the same rates, the bottom tier is currently down 17.8 percent while the top tier has fallen only 11.5 percent (Table 3).

Smith and Tesarek (1991) show that the pattern of declines in Houston during the 1985–87 bust was very similar to the declines in California. In Houston, "high-quality" houses lost nearly 30 percent of their value. Houses in the middle-quality tier lost 24 percent of their value, and houses in the lower tier lost only 18 percent of their value. Smith and Tesarek suggest several reasons for the pattern in Houston. First, the upper end of the market experienced the greatest appreciation during the boom. Second, building was concentrated at the upper end of the quality range, glutting the market. Third, sharp reductions in "entrepreneurial and professional income" led to steeper declines in demand at the top (p. 412). Smith and Tesarek also find that "shifts in demand toward the upper-scale market led to a faster recovery in this portion of the residential market" (p. 413); this also appears to be happening in Boston.

Poterba (1991) and Mayer (1993) also analyze the behavior of home prices by price tier. Using data from 1970 to 1986 on four cities (Atlanta, Chicago, Dallas, and Oakland) taken from Case and Shiller (1989), Poterba shows that properties in the upper tier appreciated faster than properties in the lower tier. He attributes the pattern to high marginal tax rates and expectations of rising inflation. Mayer, using the same data, argues that Poterba's focus is too narrow and looks at several other explanations for the observed patterns. Finding that prices in the upper tier in the four cities are more volatile than prices in the lower tier, he focuses on changes in user costs and other cyclical factors.

In Los Angeles and Boston, however, the pattern of change across tiers is reversed. What explains the differences? The data below suggest several explanations: (1) Prices in the lower tier of housing in Boston rose more rapidly during the boom because housing prices initially were lower than in California. In addition, the economic boom reached farther down into the income distribution as unemployment dropped much more sharply in Boston than in California. As a result, first-time home buyers entered the market, driving up ownership rates among lower-income households in Boston. (2) Lower-tier prices have since fallen more sharply in Boston because this sector experienced the greatest increase during the boom and because lower-income areas in Boston have experienced the greatest economic problems. (3) In addition, the lower end of the housing market in Boston was glutted with condominium conversions while the bulk of the building in Los Angeles was in the upper tier of housing. (4) The demand side for the lower tier in California has been supported by pent-up demand for ownership and very high levels of immigration.

Between 1983 and the peak in 1989, the lower tier in Boston experienced a 200 percent increase in value, while the lower and middle tiers together increased about 150 percent (Table 3). Recall that in 1983, housing prices in Boston were only 17 percent above the U.S. median. With rising incomes and low unemployment, the bottom tier of properties was affordable to many. This was not the case in California where, even at the beginning of the boom, housing prices were nearly 70 percent above the U.S. median (Table 2). Moreover, the unemployment rate in Boston dropped to much lower levels than it did in California (Table 5). As first-time buyers came into the market, the ownership rate increased.

As Table 6 shows, in 1980, 55.4 percent of house-

[1] Wall Street technical analysts describe this phenomenon as a "well-known fact" among traders. We could, however, find no published empirical research either to document it or to refute it.

Table 6
Ownership Rates by Income: Boston and Los Angeles, 1985 and 1989
Percent

	1980		1985		1989	
Income	Boston	Los Angeles	Boston	Los Angeles	Boston	Los Angeles
0–$19,999			34.9	29.5	33.6	29.7
$20,000–$49,999			61.0	50.3	54.9	44.1
$50,000 +			85.9	78.5	82.3	74.4
All Households	55.4	53.8	58.1	47.9	59.4	48.9

Source: U.S. Bureau of the Census, *State and Metropolitan Area Data Book*, 1991, Table A, pp. 5 and 33; *American Housing Survey*, Volumes H170-85-3, 85-7, 89-3 and 89-7, Tables 2-1 and 2-12.

holds owned their units in Boston while 53.8 percent owned in Los Angeles. By 1985, the second year of the Boston boom, home ownership rates had jumped to 58.1 percent in Boston while the rate had dropped to 47.9 percent in Los Angeles. More importantly, the ownership rates jumped most significantly in the middle-income category. In 1985, homeownership among households with incomes between $20,000 and $50,000 reached 61 percent in Boston while remaining at 50.3 percent in Los Angeles.

On the way down, housing prices in the lower category fell the most in Boston and the least in Los Angeles. In Boston, the economic downturn hit the lowest-income areas the hardest. Table 7 shows the unemployment rate and declines in house prices in six labor market areas in and around metropolitan Boston. These are among the lowest-income areas in Massachusetts, and they have experienced the highest incidence of unemployment. It is precisely in these areas that property values have fallen most. Single-family homes are down in value more than 50 percent in Lowell and 44 percent in Brockton, while for the Boston metropolitan area as a whole, values are down only 16 percent. To the extent that implicit speculation by home buyers during the boom drove prices substantially above their fundamental values, the downward spiral has been exacerbated for the lower tier.

Table 7
Unemployment Rates and House Prices: Selected Labor Market Areas in Massachusetts

Labor Market Area	1992 Unemployment Rate[a]	Single-Family Home Price Decline since Peak[b] (Percent)
Brockton	10.2	−44
Fitchburg	9.7	−24
Lawrence/Haverhill	9.9	−33
Lowell	8.9	−56
Worcester	8.9	−23
Boston Metropolitan	8.5	−16

Source: [a]Unemployment rate is the yearly average for 1992. Federal Reserve Bank of Boston, *New England Economic Indicators*, May 1993, p. 13. [b]WRS indexes: see the Appendix.

Another explanation for the different behavior of prices by tier in Los Angeles and Boston can be found on the supply side of the market. Specifically, the Boston market became glutted with condominiums between 1985 and 1989. Many condos were conversions of low-end properties in places like West Roxbury, Brighton/Allston, South Boston, and East Boston, as owners moved to take advantage of very low rent-price ratios. Condominium conversions were not an important factor in the Los Angeles market, and condominiums in California are more upscale, on average.

Table 8 compares the *American Housing Survey* inventories of housing units and condominiums for both cities in 1985 and again in 1989. Boston experienced a net increase of 73,800 housing units between 1985 and 1989. During the same period, condominium units increased by 52,100, accounting for 70.6 percent of the total. In Los Angeles, condominium units increased by only 20,600 while total units increased by 148,900; condominiums accounted for only 13.8 percent of the total.

The vacancy rate for condominium units shot up from 12.7 percent to 15.6 percent in Boston while in Los Angeles it was cut to 5.9 percent, lower than the overall vacancy rate. Condominiums were a smaller

Table 8
Housing Units and Condominiums in Boston and Los Angeles, 1985 and 1989
Thousands of Units

	Boston			Los Angeles		
	1985	1989	Change	1985	1989	Change
Housing Units	1594.6	1668.4	73.8	3030.8	3179.7	148.9
Vacant	106.7	129.0	22.3	172.6	201.0	28.4
Vacancy Rate (%)	6.7%	7.7%		5.7%	6.3%	
Condominium Units	66.1	118.2	52.1	155.9	176.5	20.6
Vacant	8.4	18.4	10.0	16.4	10.5	−5.9
Vacancy Rate (%)	12.7%	15.6%		10.5%	5.9%	
Condominium as % of Total Units	4.1%	7.1%	70.6%	5.1%	5.6%	13.8%

Source: U.S. Bureau of the Census, *American Housing Survey*, Volumes H170-85-1, 85-7, 89-3 and 89-7, Tables 1-1 and 2-1.

proportion of total units in Boston than in Los Angeles before the boom; by the end, however, condominiums as a fraction of total units was 27 percent higher in Boston.

In all cities, condominiums on average serve a lower-income population of owners than single-family detached units. As Table 9 shows, the differences between Boston and Los Angeles were dramatic. In 1985 the median condominium in Boston was worth less than $100,000, which was 74 percent of the value of the median detached house. In Los Angeles, the median condominium was worth $116,000, which was 92 percent of the value of the median detached house. By 1989, the median condominium in Los Angeles was selling for $173,700, or 30 percent more than the average condominium in Boston.

On the supply side, the size of the new units provides another indicator that new supply in Boston was concentrated more than in Los Angeles on the lower end of the market (Table 10). In Boston, 46 percent of the net new units had six rooms or fewer, while in Los Angeles the corresponding figure was only 32 percent.

Yet another explanation of why the lower end of the housing market in California has fared better than the middle and upper segments lies on the demand side of the market. Table 11 presents population and immigration statistics for the Greater Los Angeles area and for Greater Boston, compiled by the Joint Center for Housing Studies at Harvard.

First of all, the population of Los Angeles grew by more than 25 percent between 1980 and 1990 while Boston's population grew by only 5 percent. Second, Los Angeles experienced an inflow of over 2 million immigrants while the flow into the Boston area was only one-tenth as large. Not all immigrants are poor, but a lot of them are. Immigration clearly puts pressure on the lower end of the housing market.

Finally, look back at Table 6. Recall that some of the strength in the lower end of the Boston market during the boom was attributed to lower- and middle-income households that were able to become homeowners. Boston was an affordable city when the boom began, and economic growth pushed benefits

Table 9
Median Value of Occupied Housing Units: Boston and Los Angeles, 1985 and 1989
Thousands of Dollars

	1985	1989
Los Angeles		
Single-Family Detached	126.6	234.6
Condominium	116.4	173.7
Condo./Single-Family	.92	.74
Boston		
Single-Family Detached	133.6	197.2
Condominium	98.9	133.6
Condo./Single-Family	.74	.68
Los Angeles/Boston		
Single-Family	.94	1.19
Condominium	1.18	1.30

Source: U.S. Bureau of the Census, *American Housing Survey*, Volumes H170-85-3, 85-7, 89-3, and 89-7, Table 2-19.

Table 10
Net New Housing Units by Number of Rooms: Boston and Los Angeles, 1985 to 1989
Thousands of Units

	Boston	Los Angeles
6 or Fewer Rooms	34.0	48.3
Percent of Total Units	46	32
More than 6 Rooms	39.9	100.5
Percent of Total Units	54	68

Source: U.S. Bureau of the Census, *American Housing Survey*, Volumes H170-85-3, 85-7, 89-3, and 89-7, Table 1-2.

Table 11
Total Population and Immigration: Boston and Los Angeles
Thousands

	Total Population	New Immigrants 1980–1990	Percent of 1980 Total
Boston			
1980	3,974		
		187	4.7
1990	4,172		
Change 1980 to 1990	198		
Percent Change	+5.0		
Los Angeles			
1980	11,498		
		2,061	17.9
1990	14,531		
Change 1980 to 1990	3,033		
Percent 1980–90	+26.3		

Source: Joint Center for Housing Studies of Harvard University, *The State of the Nation's Housing, 1993*, Table A-9, pg. 30.

to lower economic levels than was the case in California. Homeownership rates jumped in Boston but did not in California. In fact, homeownership rates remained low in Los Angeles right through 1989 when, in the $20,000 to $50,000 income range, the rate was 44.1 percent compared to 54.9 percent for Boston. This suggests that more pent-up demand existed in Los Angeles, and as prices and interest rates dropped after 1990, a population of potential buyers was ready to move. Once again, this segment of first-time buyers is concentrated at the middle and the lower end of the income spectrum.

Conclusion

This article has compared two dramatic boom/bust cycles in single-family home prices: Boston and Los Angeles. Overall, between the end of 1982 and the peak of the cycle in 1988 and 1989, home prices in Boston increased more than 150 percent. The overall price increase in Los Angeles was just over 100 percent and occurred between 1985 and 1989. All three price tiers in Los Angeles rose at very similar rates during the boom. In Boston, while the price tiers initially rose together, the lowest tier continued to increase for a year after prices in the upper tiers had stalled.

On the way down, the price tiers behaved quite differently in the two cities. In Boston, the three tiers fell together until the spring of 1991. Since then, the upper tier in Boston has recovered somewhat and as of the second quarter of 1993 was down only 11.5 percent. Preliminary data for 1993:III put the decline from peak at only 9.1 percent. The lowest tier has fallen the most, down nearly 18 percent as of the second quarter of 1993 and 15 percent as of the third quarter.

One cannot explain the pattern and extent of the Boston and Los Angeles booms solely with fundamental economic variables. While prices do not boom as they did in these cities unless market fundamentals are positive, evidence is mounting that at least part of the increase in both metro areas can be attributed to speculative behavior on the part of buyers and sellers.

Finally, the article set out to explain why the price tiers in Boston and Los Angeles behaved differently over the cycle. Evidence was presented that suggests several explanations: (1) The lowest tier in Boston rose more rapidly during the boom because housing prices were initially lower; the economic boom reached farther down into the income distribution as unemployment dropped more sharply than in California; and first-time home buyers entered the market, driving up ownership rates among lower-income households. (2) The lowest tier has fallen more sharply in Boston because this sector experienced the greatest increase during the boom and because lower-income areas in Boston have experienced the greatest economic problems. (3) In addition, the lower end of the housing market in Boston was glutted with condominium conversions, while the bulk of the building in Los Angeles was in the upper tier. (4) The demand side of the lower tier in California has been supported by pent-up demand for ownership and dramatic levels of immigration.

Appendix A

The WRS Index

The biggest problem faced by analysts of the residential real estate market is the lack of good time series on house prices. The most commonly used series is the National Association of Realtors' "median price of existing single-family homes." The NAR generates this series for a large number of metropolitan areas quarterly and for the United States as a whole monthly, but they were not useful for this study. First, they are available only since 1981. Second, changes in the median home price in an area depend both on changes in house prices and on changes in the mix of homes that happen to sell.

An earlier study (Case and Shiller 1987) discussed the problems associated with the NAR data and constructed an alternative based on microdata using a technique called the Weighted Repeat Sales (WRS) method, a modification of one first proposed by Bailey, Muth, and Nourse (1963). The method uses observations on individual houses that sold more than once during the sample period. Specifically, the change in log price for each observation is regressed on a set of simple dummy variables. The dummys are set to -1 for the period of the first sale and to $+1$ for the period of the second sale and to 0 otherwise. The resulting coefficients are the values of the log price index (WRS_t). Bailey, Muth, and Nourse argued that if individual house log price changes differed from the citywide house log price changes by an independent, identically distributed noise term, their method produces the best linear unbiased estimate of the citywide log price index.

In the earlier study (Case and Shiller 1987) it was argued that the house-specific component of the change in log price is not likely to be homoscedastic, but that the variance of the error is likely to increase with the interval between sales. Specifically, it was assumed that the log price P_{it} of the ith house at time t is:

$$(1) \qquad P_{it} = C_t + H_{it} + N_{it}$$

where C_t is the log of the citywide level of housing prices at time t, H_{it} is a Gaussian random walk (where ΔH_{it} has zero mean and variance σ_h^2) that is uncorrelated with C_T and H_{jT} for all T and $i \neq j$, and N_{it} is an identically distributed normal noise term (which has zero mean and variance σ_N^2) and is uncorrelated with C_T and H_{jT} for all j and T and with N_{jT} unless $i = j$ and $t = T$.

In equation (1) N_{it} represents the truly random component of sales prices around true value resulting from random events in the search process, the behavior of real estate agents, and other imperfections. H_{it} represents the individual drift in house value through time.

These assumptions led to a three-step weighted (generalized) least squares procedure. The Weighted Repeat Sales (WRS) method effectively downweights observations whose error variance is larger, and the error variance is assumed to be linear in the time interval between sales. The linear function has an intercept equal to twice the estimate of σ_N^2, and a slope equal to an estimate of σ_N^2. The intercept is very important; otherwise, houses that turned around very quickly would be given substantially more weight than other houses, and this would add noise to the resulting index.

The original WRS method was modified to make the index linear rather than loglinear in price (Shiller 1991). The linear formulation results in an index that is more closely analogous to the value of a portfolio of real estate.

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