

CURRENT ISSUES

IN ECONOMICS AND FINANCE

Second District highlights

January 1999

Second District House Prices: Why So Weak in the 1990s?

The 1990s have hardly been a boom period for house prices in the Second District. Between 1990 and 1997, the median real, or inflation-adjusted, price for a single-family home there dropped 20 percent. Within the District, prices in the New York metropolitan area declined 24 percent and those in upstate New York fell an average of 20 percent (Table 1).¹ Yet while Second District house prices fell during the period, real prices for the nation rose 5 percent overall.

In this edition of *Second District Highlights*, we investigate two possible explanations for the sharp disparity between national and local house-price trends during the 1990s. First, we consider the influence of

weaknesses in the economic “fundamentals” thought to determine prices, such as real personal income growth and unemployment. Second, we examine the possibility that Second District house-price growth was depressed by a prolonged, unpleasant hangover from the excessively rapid house-price growth enjoyed in the 1980s—growth that may have been caused by a speculative bubble.

We find that poor economic fundamentals explain about half of the relative weakness of house prices in the New York metropolitan area, while a post-boom hangover in house prices accounts for the remainder. The behavior of house prices in upstate New York, however, is less easily explained. Only about one-tenth of the relative weakness of upstate prices can be attributed to poor fundamentals and another third to the lingering effects of excessive price rises in the 1980s. Drawing on these findings, we also speculate on the reasons for the upturn in District house-price growth in 1998.

Table 1
Cumulative Real House-Price Growth in the Nation and the Second District

Fourth-Quarter 1989 to Fourth-Quarter 1997

Area	Percentage Change
United States	5.0
New York metro area	-24.2
Upstate New York	-20.1
Albany	-22.0
Buffalo-Niagara Falls	-17.5
Rochester	-17.2
Syracuse	-26.2
New York City suburbs ^a	-10.0
Bergen-Passaic, New Jersey	-4.5
Middlesex-Somerset-Hunterdon, New Jersey	-7.0
Monmouth-Ocean, New Jersey	-10.7
Nassau-Suffolk, New York	-15.3
Newark, New Jersey	-9.2

Notes: Nominal house-price data are from the National Association of Realtors. We deflated these figures by the corresponding state consumer price indexes.

^aFigures for the New York City suburbs begin in the fourth quarter of 1990.

THE ROLE OF ECONOMIC FUNDAMENTALS

A direct comparison of the nation and the Second District indicates that economic fundamentals could indeed have contributed to the poor performance of District house prices in the 1990s.² Both personal income growth and unemployment performed worse in the Second District than in the United States. Personal income in New York State grew 9 percent between 1990 and 1997, but the national increase was more than double that figure.³ Meanwhile, the state's unemployment rate rose 0.4 percentage point, even as the national unemployment rate declined 1.4 percentage points.

We can assess more formally the success of economic fundamentals in explaining the weakness of Second District house prices during the 1990s. Using a statistical model with 1982-97 data for fifty-two U.S.

metropolitan areas—including Albany, Buffalo, New York City, Rochester, and Syracuse—we estimate the contribution of fundamentals to house-price growth. The fundamental variables included in our model of real house prices are real personal income, the unemployment rate, real construction costs, real mortgage interest rates, and expected house-price growth.⁴ Increases in personal income, construction costs, and expected house-price growth would be expected to raise house prices; increases in unemployment and real mortgage interest rates would be expected to lower them.⁵

We also include in our model the lagged difference between actual house prices and the prices that would be assigned on the basis of economic fundamentals alone; we call this difference the house-price gap. Inclusion of this variable is consistent with a growing body of studies finding that house prices are affected by factors other than those normally considered fundamental.⁶ Furthermore, the influence of the house-price gap on house prices is straightforward: if prices become more expensive than justified by fundamentals, demand will dry up, forcing prices back down.⁷

The fundamental variables in our model are found to be important determinants of house prices (Table 2). All fundamental variables are estimated to affect house prices in the expected direction, and the magnitudes of the effects seem plausible.⁸ For example, a 1 percent increase in personal income is estimated to raise house prices roughly 0.5 percent, while an increase of 1 percentage point in the unemployment rate is estimated to lower prices 0.7 percent.

Our results also enable us to investigate whether weak fundamentals explain why house prices in the Second District have lagged those of the nation. To do this, we calculate the difference between actual house-price growth in the Second District and the United States as a whole. We compare this figure with the corresponding difference in house-price growth that would have been predicted by the five fundamental variables alone.⁹

Our comparison reveals that weak fundamentals accounted for roughly half of the 29 percent difference between house-price growth in the New York metro area and the nation between 1990 and 1997 (Table 3). However, in upstate New York, fundamentals were apparently much less important. In fact, fundamentals alone implied modest real house-price *increases*, other things equal, rather than the substantial declines

actually observed.¹⁰ Moreover, fundamentals upstate accounted for only 3 of the 25 percentage points separating local and national real house-price growth between 1990 and 1997.

The inability of fundamentals to account for the relative weakness of upstate house prices is most pronounced in Buffalo. There, price growth lagged the nation's by 22 percent, yet fundamentals would actually have caused prices to rise 3 percent more than those nationwide. Conversely, fundamentals were best able to explain the relative house-price weakness in Albany, where price growth trailed the nation's by 27 percent. Of this gap, roughly one-quarter—about 7 percentage points—is explained by the fundamentals in our model.

Economic fundamentals such as personal income growth and the unemployment rate evidently fail to explain fully the relative weakness of Second District house prices during the 1990s. Accordingly, we ask whether this weakness might be explained in part by a hangover from excessive price rises in the 1980s.

Table 2

Determinants of House-Price Growth in U.S. Metropolitan Areas, 1979-97

A change of this amount:	Alters real house-price growth by this amount (percent):
Fundamental variable	
1 percent rise in real personal income	0.52
1-percentage-point rise in unemployment	-0.70
1 percent rise in real construction costs	0.49
1-percentage-point rise in real mortgage interest rates	-1.12
1 percent rise in expected house-price growth	1.08
Nonfundamental variable	
1-percentage-point rise in house-price gap	-0.09

Notes: The table reports the results of a panel regression using data from fifty-two U.S. metropolitan areas. Fourth-quarter data were used where possible (for all variables except personal income). The house-price gap is defined as actual house prices minus the houses' fundamental-consistent value. All coefficients are statistically significant at the 1 percent level. The adjusted R-squared for this regression is 0.27, meaning that about one-quarter of the variation in annual real house-price growth is accounted for by the variables in the table. The Durbin-Watson statistic is 2.08, meaning that there is very little correlation between concurrent and lagged regression residuals.

Table 3

Explaining the Differences in Real House-Price Growth in Second District Metropolitan Areas and the Nation, 1990-97

Percent

Area	House-Price Growth, Difference with Nation (1)	Effect of Fundamentals, Difference with Nation (2)	Effect of House-Price Gap, Difference with Nation (3)	Explained Difference (4)
New York metro area	-29.0	-15.9	-13.0	-28.9
Upstate New York	-24.9	-2.8	-8.1	-10.9
Albany	-26.8	-6.5	-13.2	-19.7
Buffalo	-22.3	3.0	-8.1	-5.1
Rochester	-22.0	-3.5	-3.8	-7.3
Syracuse	-31.0	-6.1	-9.7	-15.8

Notes: The table reports the contribution of two factors to the observed difference between house-price growth in Second District urban regions and house-price growth in the nation. The first factor (column 2) is the difference between fundamentally determined house-price growth in the nation and fundamentally determined house-price growth within the Second District. The second factor (column 3) is the difference between the house-price growth in the nation that is attributable to the deviation of the actual price of houses from their fundamental value (as estimated for the fourth quarter of 1989) and the corresponding house-price growth for Second District urban regions. The figures in column 4 reflect the sum of values in the previous two columns.

THE IMPACT OF THE 1980s BOOM

During the 1980s, Second District house prices exhibited none of the relative weakness of the 1990s. In fact, District house prices rose spectacularly from 1983 to 1989, while prices nationwide rose only modestly. In the New York metro area, real house prices rose 63 percent between 1983 and their 1987 peak—56 percentage points more than national prices. Upstate, real house prices rose 29 percent between 1983 and their 1989 peak—20 percentage points more than national prices.

Much like the 1990s bust, the 1980s boom in Second District house prices is not easily explained by economic fundamentals. In the New York metro area, personal income growth and the unemployment rate tracked the national averages.¹¹ Similarly, the decline in upstate New York's unemployment rate during the 1983-89 boom, while significant, was no larger than the nationwide drop. Meanwhile, personal income grew *less* rapidly upstate than it did in the nation.¹² Results from our model support this conclusion. Taken together, our five fundamental variables explain only 9 percentage points of the 56 percent rise in real New York metro area house prices relative to national prices from 1983 to 1987. Much the same is true upstate: real house prices rose 20 percent more than national prices between 1983 and 1989, but measured fundamentals actually implied that real prices should have risen 1 percent less than national prices. Because fundamentals cannot explain the rapid run-up in Second District house prices during the 1980s, we refer to the price rises as “excessive.”

Were There House-Price Bubbles during the 1980s?

The sheer magnitude of the Second District's boom, combined with the inability of economic fundamentals to explain the boom, has led many observers to conclude that 1980s house-price growth in the District was inflated by a speculative bubble. In a speculative bubble, asset prices rise beyond levels consistent with economic fundamentals because of widespread expectations of further price rises. Although it is not possible to prove that such speculative forces had a major impact on the behavior of house prices in the last decade, there is statistical evidence consistent with the more general argument that speculative bubbles could arise in U.S. house prices.¹³ For example, Case and Shiller (1991), who surveyed home buyers in California and Massachusetts in 1988, determined that buyers were willing to pay very high prices because they expected prices to rise still further: “Investors in house markets do not know fundamentals. . . . [Their] expectations do not make sense except as extrapolations of past price changes” (p. 398).

In our model, the fact that house prices are estimated to fall when they exceed fundamental-consistent values—that is, when the house-price gap is positive—also supports the argument that speculative bubbles could arise in U.S. house markets. In particular, according to our estimates, a house-price gap of 1.0 percent is associated with a 0.09 percent house-price decline during the following year, all else equal (Table 2). Note that this result implies that house prices return to their fundamental values very slowly: half the gap between prices

and the value implied by fundamentals remains after seven years, and one-third remains after twelve years.

Our results provide further insight into the possibility that Second District house prices experienced a speculative bubble during the late 1980s. To test this hypothesis, we draw on an important attribute of these bubbles: prices that rise the farthest above economic fundamentals as the bubble inflates have the farthest to fall after it bursts. Thus, if there was indeed a speculative bubble, areas where house-price growth was most excessive relative to fundamental values during the boom should, during the bust, be the same areas where house-price growth fell the most relative to fundamental values. If we refer to the portion of house-price growth not explained by fundamentals as “nonfundamental” house-price growth, we can say that there should be a negative relationship between nonfundamental house-price growth during the boom and the bust.

A simple statistical analysis of our house-price data provides results consistent with this hypothesis. We compare cumulative nonfundamental real house-price growth for 1983 through 1989 with corresponding nonfundamental real house-price growth over 1990-97. As predicted by the bubble hypothesis, prices that soared the farthest above fundamentals during the 1980s boom did fall the farthest during the subsequent bust: a 10 percent nonfundamental price increase during the boom was associated, on average, with a 5 percent nonfundamental decline during the bust.¹⁴

How Did the 1980s Boom Affect House Prices in the 1990s? Whether or not one agrees with the conclusion that speculative forces contributed significantly to the excessive price rises of the 1980s, one could still argue that the lingering effects of those rises compounded the relative weakness of Second District house prices during the 1990s: that is, if houses became unreasonably expensive, demand would dry up, forcing prices down again. Prices in the District peaked far above fundamental values in the 1980s: At their 1987 peak, New York metro area prices were almost 40 percent above estimated fundamental values (Table 4). Similarly, when prices upstate peaked in 1989, they exceeded estimated fundamental values by 17 percent. Meanwhile, prices nationwide rose only a little more than 2 percent above estimated fundamental values during the decade.

These findings lead us to ask, How much of the Second District house-price weakness during the 1990s can be explained by the late-1980s gap between actual house prices and their fundamental-consistent values?

Table 4

House-Price Gaps in the Nation and the Second District in the 1980s

Area	Maximum Gap	Year of Maximum Gap	1989 Gap
Nation (forty-three cities)	2.2	1987	1.4
New York metro area	38.5	1987	20.2
Upstate New York	18.7	1988	17.4
Albany	31.1	1987	25.2
Buffalo	20.6	1989	20.6
Rochester	11.4	1987	7.4
Syracuse	19.4	1988	17.5

Notes: The house-price gap represents the difference between the price of houses and their estimated fundamental value. Fundamental values are calculated based on the estimated coefficients in Table 2. House-price gaps are estimated for the fourth quarter of the indicated year.

To answer this question, we calculate the size of these gaps at the end of 1989, just prior to the opening of the “bust” decade (Table 4). In the New York metro area, the house-price gap stood above 20 percent; in upstate New York, gaps ranged from 7 percent in Rochester to 25 percent in Albany. (Given our earlier finding that prices revert only slowly to their fundamental values, it is not surprising that the gaps remained quite large in 1989—generally well over 15 percent—even though house prices in the area had begun to decline.)

The 1980s boom in Second District house prices evidently left its mark on 1990s prices. Our estimates indicate that the excessive price rises of the 1980s accounted for about half (13 percentage points) of the 29 percent decline in New York metro area prices relative to the nation’s prices between 1990 and 1997 (Table 3). Upstate New York also felt the effects, with about a third (8 percentage points) of the 25 percent relative fall in house prices linked to the excessive price rises of the 1980s.¹⁵ Among cities upstate, the apparent excesses of house prices relative to fundamental values had the largest depressing effect on prices in Albany, at 13 percent, and the smallest effect in Rochester, at 4 percent.

RECENT DEVELOPMENTS

The relative weakness of Second District house prices continued unabated in 1997. Over the four quarters of the year, the median inflation-adjusted price of an existing single-family home rose 4 percent nationwide. Meanwhile, house prices remained unchanged in the New York metro area and fell 3 percent upstate.

Early in 1998, however, reports of rising home sales and fast price growth in the New York City condominium market appeared to signal a turnaround in metro area price trends.¹⁶ Shortly thereafter, prices for single-family homes in the metro area began to show strength. By the end of the third quarter, real house prices in the area had grown 5.4 percent from a year earlier, compared with 3.3 percent growth for the nation as a whole. Some of the relative improvement can be attributed to stronger economic fundamentals. The metro area's unemployment rate fell more than 1 percentage point, while the fall nationwide came to less than ½ percent. Similarly, early estimates indicate that personal income grew ½ percent faster in the metro area than it did in the nation.

The picture was different upstate, however. Although house-price growth there also accelerated early in 1998, it still lagged growth nationwide. Here again, the difference can be attributed to the behavior of fundamentals, which continued to be relatively weak upstate. Unemployment did fall upstate, but only by 0.2 percent; this fall was less than half of the decline nationwide. Likewise, estimated personal income growth upstate fell short of national growth by more than ½ percent.

The close link between Second District fundamentals and house-price growth during the past year suggests that the hangover from excessive price rises in the 1980s may be coming to an end. This conclusion is based on the fact that the behavior of economic fundamentals will more easily dominate the pattern of house-price developments as the depressing effect of the 1980s boom on subsequent price growth diminishes over time. The close link between fundamentals and house-price growth is consistent with the model developed earlier, which implies that, more than ten years after the peak of the 1980s boom, the depressing effects of the boom should have faded substantially.

CONCLUSION

Following the boom period of the 1980s, house prices in the Second District took a turn for the worse. Between 1990 and 1997, prices in the New York metropolitan area declined 29 percent relative to prices in the nation, while upstate New York saw relative prices fall 25 percent. Weak economic fundamentals and the effects of excessive house-price rises in the 1980s accounted in roughly equal measure for the metro area's disparity with the nation. By contrast, these factors played considerably smaller roles in explaining the relative weakness of house prices upstate. In 1998, the improvement in relative price performance in the New York metro area

can be traced to a concurrent improvement in the relative performance of fundamentals.

—*Matthew Higgins, Carol Osler, and Anjali Sridhar*

NOTES

1. The Second District officially refers to New York State and certain New York City suburbs in Connecticut and New Jersey. However, for statistical purposes, we use the term Second District to refer to the New York metropolitan area and four major cities in upstate New York. We define the New York metro area as New York City, Nassau and Suffolk Counties, and four areas of New Jersey: Bergen-Passaic, Middlesex-Somerset-Hunterdon, Monmouth-Ocean, and Newark. Our definition excludes Connecticut and most small cities and rural areas.

2. Another potential fundamental is the actual supply of single-family homes. Unfortunately, useful data are not available at the metropolitan level.

3. We focus here on New York State, rather than the Second District, because details of personal income by city are not available for 1997.

4. The unemployment rate and personal income are measured as differences from city-specific averages. House-price expectations are measured as the fitted values from a regression of house-price growth on its own first two lags. Real personal income data come from the U.S. Department of Commerce's Bureau of Economic Analysis. Unemployment rate data come from the U.S. Department of Labor. Construction costs are measured as the national construction cost index produced by McGraw-Hill, Inc., deflated by state consumer price indexes from Data Resources International. Real mortgage interest rates are calculated using regional thirty-year fixed rates from the Freddie Mac Primary Mortgage Market Survey. These are deflated by expected inflation, which in turn is calculated as the fitted value from a regression of current inflation on two years of lagged inflation.

5. More formally, the inclusion of these variables can be justified by the dividend discount model of asset prices (see Higgins and Osler [1998]) or by the Capozza and Helsley (1989, 1990) models of urban expansion (see Abraham and Hendershott [1996]). For technical reasons, all variables in our model except the unemployment rate and the house-price gap are expressed as growth rates or, in the case of interest rates, as simple changes.

6. See, for example, Linneman (1986), Case and Shiller (1991), and Abraham and Hendershott (1996).

7. Drawing on Abraham and Hendershott (1996), we used the following two-step estimation procedure: First, the model was estimated without the house-price gap. The estimated coefficients were then used to estimate a preliminary value of the gap, taking 1983 as a base year during which the gap was assumed to be zero. Second, we included the first estimate of the gap in the next round of estimates, on the basis of which a more refined estimate of the gap was calculated. The second step was repeated until the estimated house-price gap stabilized.

8. If no relationship existed between fundamentals and house prices, there would be less than a 1 percent chance of observing values as large as those estimated.

9. To estimate the portion of house-price growth consistent with fundamentals, we first calculate house-price growth predicted by the model for each metro area. From this result, we subtract the portion of house-price growth consistent with the house-price gap. Note that, for this exercise, fundamental variables include a modified version of house-price expectations in which lagged fundamental price appreciation replaces lagged actual appreciation.

10. For the upstate region as a whole, fundamentals would have been associated with a 4.2 percent increase in real house prices. For Albany, the associated rise would have been 0.5 percent; for Buffalo, 10.0 percent; for Rochester, 3.5 percent; and for Syracuse, 0.9 percent.

11. From 1983 to 1987, unemployment fell by 2.7 percent nationwide and by 2.5 percent in the New York metro area. During the same period, real personal income grew by 17.5 percent nationwide and by 15.8 percent in the metro area.

12. Between 1983 and 1989, unemployment fell by 3.1 percent in both the nation and upstate New York. Over the same period, real personal income grew by 25.7 percent nationwide and by 15.3 percent in upstate New York.

13. The fact that one can never prove that a given boom-bust was truly a speculative bubble was demonstrated by Hamilton and Whiteman (1985). Many economists agree that even the most extreme price rise followed by a precipitous decline could instead have been driven by some unobserved fundamental factor.

14. The statistical test is a simple ordinary least squares regression of the later price movements on the earlier ones. The t-statistic of the primary regression coefficient, at 4.30, is significant at the 1 percent level. The adjusted R-squared for this regression is 0.35. Thirty-four cities are included in this sample.

15. We estimate the contribution of the 1980s price disequilibrium to 1990s price growth by using the following procedure. First, we calculate the house-price gap for 1989, and then use this result to calculate the associated price decline in 1990, ΔP^p . Next, we calculate an adjusted house-price gap for 1990, which differs from the actual house-price gap for that year in two ways. First, actual house prices are replaced by a measure of the house prices that would have been observed if the only influence on them over the past year had

been the previous year's gap. More specifically, they are replaced by the previous year's price adjusted for the predicted change, ΔP^p . Second, the fundamental value for house prices that year is adjusted slightly, so that expected house-price growth reflects the simulated house-price level rather than the actual one. The procedure is then repeated for each year from 1991 through 1997.

16. For example, see *New York Times* (1997, 1998a, 1998b).

REFERENCES

- Abraham, Jesse M., and Patric H. Hendershott. 1996. "Bubbles in Metropolitan Housing Markets." *Journal of House Research* 7: 191-207.
- Capozza, Dennis, and Robert Helsley. 1989. "The Fundamentals of Land Prices and Urban Growth." *Journal of Urban Economics* 26: 295-306.
- . 1990. "The Stochastic City." *Journal of Urban Economics* 28: 187-203.
- Case, Karl E., and Robert Shiller. 1991. "The Behavior of Home Buyers in Boom and Post-Boom Markets." In Robert Shiller, *Market Volatility*, 403-30. Cambridge: Massachusetts Institute of Technology. Reprinted with minor editing from the Federal Reserve Bank of Boston *New England Economic Review*, 1988: 29-46.
- Hamilton, James D., and Charles H. Whiteman. 1985. "The Observable Implications of Self-Fulfilling Expectations." *Journal of Monetary Economics* 16 (November): 353-74.
- Higgins, Matthew, and Carol Osler. 1998. "Asset Market Hangovers and Economic Growth: U.S. House Markets." In *The Role of Asset Prices in the Formulation of Monetary Policy*. Bank for International Settlements Conference Paper Series, vol. 5: 220-38.
- Linneman, Peter. 1986. "An Empirical Test of the Efficiency of the House Market." *Journal of Urban Economics* 29: 140-54.
- New York Times*. 1997. "Market's Strong—but for How Long?" December 7.
- . 1998a. "Demand for Town Houses Sends People Far Afield." January 2.
- . 1998b. "For Region's Housing Markets, a Solid '96." March 22.

The views expressed in this article are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

Second District Highlights, a supplement to *Current Issues in Economics and Finance*, is published by the Research and Market Analysis Group of the Federal Reserve Bank of New York. Dorothy Meadow Sobol is the editor. *Second District Highlights* is available at the Research and Market Analysis Group's web site: http://www.ny.frb.org/rmaghome/curr_iss/sec_dis.
