How Housing Booms Unwind:
Income Effects, Wealth Effects, and Sticky Prices

By

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I. Introduction

Property markets have always been cyclical, and many economists have explored the causes and consequences of cyclicality in housing and commercial real estate. Indeed, for more than a half century after the great depression, the National Bureau of Economic Research (NBER) regularly explored linkages among real estate investment, mortgage credit, and aggregate business cycles. (See, for example, NBER volumes by Wickens and Foster, 1937; Blank, 1954; Abramovitz, 1964; and Zarnowitz, 1992.) At the beginning of this new year, the U.S. housing market appears to be turning rapidly from a boom of historic proportions measured by prices, sales volumes, and new production, to a period of decline. The extent and character of this reversal will have important consequences for the American economy. It will determine the number of job losses and their distribution, the extent to which national income and aggregate output will fall (or grow more slowly), and the ultimate impact on financial institutions such as banks, mortgage lenders, the government-sponsored enterprises (GSEs) and investment firms. Housing market declines will also have significant effects on household and firm balance sheets. These traditional indicators have been dramatically distorted by recent increases in land values and the large volume of new residential construction. This construction boom has been supported by unprecedented liquidity in financial markets and a substantial increase in the availability of mortgage credit.

In this paper we analyze the way that booms in housing cycles end. We consider three related mechanisms: *wealth effects*, *income effects* and *financial market effects*, although our focus is clearly on wealth and income effects.

First, we explore what we know about *wealth effects*. When households accumulate assets, they can be expected to spend more than they otherwise would have, either by withdrawing equity from assets or by saving less in other forms. Similarly, when households' asset values fall, this may lead to a contraction in consumer spending. A growing literature documents the effects of home price appreciation and depreciation on personal expenditures and savings behavior.

Second, we evaluate *income effects*. When existing home sales decline or housing starts drop, the economy experiences a decline in aggregate expenditure and ultimately a reduction in employment. This occurs through several distinct channels. Fewer sales of existing homes means that brokers, building inspectors, appraisers, mortgage lenders, home appliance firms, and others in the real estate industry face a decline in demand and experience a direct loss of income. While the sale of an existing dwelling unit is simply a transfer or an exchange of assets (and thus is not a component of National Income), the transactions costs associated with the exchange are high. The transfer typically induces spending on furniture, appliances, decorating, and so forth, as well as fees paid to brokers, lenders, appraisers, and others. Without doubt, the biggest direct effect is likely to result from the decline in new housing construction. The construction industry itself employs 7.5 million workers, and in the beginning of 2006 new investment in residential structures was at an annual rate of over $800 billion dollars, or about 6.2 percent of GDP. (See U.S. Department of Commerce, Bureau of Economic Analysis, NIPA Accounts.)

By October 2006, housing starts had fallen to an annual rate of 1,486,000 from a peak of 2,265,000 in January. (U.S. Census Bureau, Construction Reports). This decline of 779,000 units suggests a substantial direct impact. Even with a rebound in November to 1,590,000 starts, the level remains 30 percent below the level of January 2006.

Finally, much of what happens in the next few years will be determined by *financial market effects* -- the potential impacts of the housing downturn arising from interactions with financial markets. U.S. mortgage markets have expanded and changed in character dramatically over the last dozen years. There has been a massive increase in liquidity, a large increase in the sub-prime mortgage market, a dramatic shift from traditional fixed-income mortgages to more complex and often exotic instruments as well as complex risk-sharing arrangements among GSEs, mortgage insurers, and Wall Street firms. This new credit environment has never been tested in a volatile real estate market. The magnitude of these financial effects will depend, to a large extent, on the potential decline in home prices and the consequent increase in mortgage defaults. We make no attempt in this paper to quantify the potential size of these unknown financial market effects.

II. Wealth Effects

Between 2000 and 2005, a period of low inflation, the total value of the residential real estate in the U.S. increased by $10 trillion, from roughly $15 trillion to $25 trillion. In contrast, total financial wealth held by U. S. households remained stagnant at about $40 trillion. (See Case 2006.) The bulk of the increase in home values was on the West Coast and in the North East. Seven states account for 47 percent of the total real estate

value and a larger percent of land value (Case, 2006). Housing wealth has grown enormously over the past decade, especially on the coasts.

It has been widely observed that changes in stock prices are associated with changes in aggregate consumption. In statistical models relating changes in log consumption to changes in log stock market wealth, the estimated relationship is generally positive and statistically meaningful.

There is every reason to expect that changes in *housing* wealth exert effects upon household behavior that are quite analogous to those found for stock market wealth, but until recently there was little comparative research on this issue. One might expect the housing wealth effect to have become more important in recent decades, as institutional innovations (such as second mortgages and other secured lines of credit) have made it as simple to extract cash from housing equity as it is to sell shares or to borrow on margin.

In recent research using quarterly data for US States during the 1982-1999 period, Case, *et al* (2005) reported a large and statistically significant relationship between log housing wealth and log consumption. The estimated elasticity, 0.034-0.054, suggests that a ten percent change in housing wealth is associated with a 0.3 to 0.5 percent change in aggregate consumption. (See Case, *et al*, 2005, Tables 3 and 4.) This suggests that the buoyancy of the housing market after the downturn in world stock markets in 2000-2003 helped avert a recession in the developed world.

Recent evidence also provides clear evidence, however, of an asymmetric response of consumption to changes in housing wealth. Case, *et al* report the results of a variety of statistical models which distinguish between the consumption response to increases in housing wealth and the consumption responses to decreases in wealth. (See Case, *et al*,

2005, Appendix Table 3.) In these statistical models, the estimated effect of a ten percent increase in housing wealth upon consumption is large and highly significant, increasing consumption by 0.6 to 1.1 percent. But the estimated effect of decreases in household wealth upon consumption is uniformly small and is insignificantly different from zero in all specifications. These results imply that reductions in housing prices and housing wealth are not likely to lead to a reduction in household consumption.

But there is a second and even more important reason to expect that the wealth effects from the current downturn in the housing market will be small. This arises from the price-equilibrating process in the housing market – namely the downward stickiness of prices.

Every housing downturn, national or regional, begins with an excess of supply of available dwellings, in most cases because demand has declined. Often downturns in the housing market are precipitated by rising interest rates, but demand can drop for other reasons as well: demographic pressures, a decline in the core economy with falling income or rising unemployment, or a change in market psychology. There are also clear instances where housing production simply gluts the market by increasing faster than household formation. Of course, more than one of these causal factors may be present, and several factors may interact. A decline in a regional economy, or simply a glut of condominiums, can lead to a marked increase in the number of listings, newspaper articles, and "for sale" signs. This, in turn, can trigger a shift in consumer psychology accelerating a demand decline.

In all cases, the market clearing process seems to be the same. Since housing is heterogeneous, and "comparable" sales are not sales of identical units, sellers are

uncertain of the actual worth of their properties. Indeed, the value of any dwelling is determined in a stochastic process in which buyers and sellers search for exchange terms that will lead to a sale. In most instances, the initial asking or offering price is set high for understandable reasons. (See Case, 1986.) Listing brokers want listings, and the likelihood of obtaining a listing is correlated with the asking prices posted. Also, sellers see the worth of their property as embodied in the comparable sales at the peak. "Sarah sold her house next door for $455,000 two years ago, and my house is identical except for the new kitchen I added. Mine must be worth at least as much as hers."

Anyone who has ever participated in the housing market knows that the clearing process is far from the traditional Marshallian auction. Without doubt, if all the houses for sale on a given day were auctioned by sunset the next day, housing prices would be less stable. But sellers hold out in most instances, refusing to lower their asking prices for some fairly prolonged period. This behavior has been rationalized by Genesove and Mayer (1997).

Figure 1 indicates what happens in a typical demand-driven downturn. First, demand drops (from D to D') as buyers stop looking and stop making offers. Sellers, on the other hand, hold out at the "sticky price." That increases the spread between bid and asked prices, and agreements are not reached. The result is a sharp drop in the number of units sold each period and an interval in which observed prices are simply flat. Notice that appraisers and listing agents still observe transactions at the sticky price, and must interpret them as "the market price." However these prices are no longer the prices that clear the market. These latter prices are not observed but can only be inferred.

Case and Shiller (1988, 2003) have surveyed home buyers for nearly two decades, and consistent evidence of this stickiness is found in buyers' responses to survey questions. Households who sold properties prior to buying in four metropolitan areas (Orange County and San Francisco in California, Boston and Milwaukee) were asked, "If you had been unable to sell your home for the price that you received, what would you have done?" The answers of the 254 respondents in the first survey have not materially changed over the years. Of the total, 37 percent said that they would have "left the price the same and waited for a buyer, knowing full well that it might take a long time." Another 28 percent answered that they would have taken the house off the market or rented it. In addition, 30 percent answered that they would have "lowered the price step by step hoping to find a buyer." Only 12 respondents, less than five percent, answered that they would have "lowered the price until they found a buyer."

Contemporaneous evidence on the downward stickiness of prices at the beginning of a downturn can be found in a stratified random sample of 628 houses that were listed by a major Boston multiple listing service in July 2006. Table 1 shows the disposition of those properties in November, four months later. Of the 628 properties listed, 436 (nearly 70 percent) had not been sold. They are listed as "expired," "cancelled" or still "active." Of the remaining July listings, only 192 are under agreement or have been sold. Despite the fact that these unsold properties are expanding the inventory available, their impact on prices seems to be modest. The mean decline in price from the asking price at the time of original listing was 3.4 percent. For properties that had actually sold, the mean price decline since first listing ranged from 3.4 percent in Ipswich to 11.1 percent in Concord. The average price decline was about 6.3 percent.

Downward stickiness is most evident when demand declines are triggered by increases in mortgage interest rates. A classic example was at the end of the first California boom, which lasted from mid-1975 to the third quarter of 1980. During this boom, house prices in the state nearly tripled, increasing 170 percent. But in 1980, mortgage interest rates increased steeply to as much as 18 percent. The recession itself dampened demand in the State, but the combination of high interest rates and the recession caused the housing market to contract sharply. However, average prices in California never fell in the ensuing period. Rather, average house prices and house price indexes were simply flat in nominal terms for four years from the third quarter of 1980.

The fact that, in 1981, the U.S. mortgage market was completely dominated by thirty-year fixed-rate self-amortizing mortgages added to the stickiness of prices. Those home owners who contemplated selling as rates rose found themselves facing enforceable due-on-sale clauses. Most potential sellers had mortgages written at low rates. With current interest rates above 15 percent, most sellers were required to liquidate cheap fixed rate loans at par. As a consequence, the supply of available homes on the market fell sharply and helped keep prices from falling.

The importance of the fixed rate mortgage in maintaining sticky prices can be inferred by observing the Canadian market. In Canada and most Commonwealth countries, the mortgage market is dominated by adjustable rate mortgages, and in Canada many had no caps. Thus, when rates rose, homeowners faced dramatically higher payments, and many had to sell or face default. Figure 2 compares the course of home prices measured by repeat sales indexes in Vancouver and San Francisco between 1975 and 1983. Between 1975 and 1981, nominal home prices increased 154 percent in San

Francisco and 214 percent in Vancouver. Both cities experienced rapidly rising interest rates and a recession. San Francisco saw practically no decline in prices. As noted above, prices in San Francisco stayed flat in nominal terms for 16 quarters until they resumed their rise in the second quarter of 1984. In sharp contrast, Vancouver saw a price drop of over 35 percent within a period of seven quarters.

While prices held firm, San Francisco experienced a very sharp decrease in the volume of sales. Sales of existing homes fell by more than half. Housing starts for the Western Census region peaked in September 1979 at 645,000, and they fell by 77 percent to a low of 148,000 in February 1982.

It is clear that downwardly sticky house prices accompany almost every major regional slow down in the housing market. The extent of this resistant behavior ultimately affects the relative size of the income effect, the wealth effect, and the degree of financial market dislocation that is likely to result from the slow down.

But the net effect on the economy arising from wealth effects upon consumption is likely to be small. Sticky prices keep measured housing wealth, or at least perceived housing wealth, from declining very much, and asymmetric responses suggest that consumption may not be responsive to declines in general.

III. Income Effects

The magnitude of the income effect from a housing downturn depends on several factors. First, the direct impact of a slowdown in residential fixed investment affects developers, builders, and the construction industry. Second, a decline in sales of existing

homes reduces the incomes of brokers, mortgage originators, lenders, and others involved in the process. The drop in residential investment is likely to be much larger since a new house is generally produced in the 9 to 12 months directly before it is offered for sale; in contrast, the sale of an existing home represents an asset transfer, not new output. While this asset transfer will generate fees and increased income, the total is only a small fraction of the value of the asset.

Finally, there is a multiplier. The multiplier on fixed investment spending has been estimated to be about 1.4, although the actual effect will depend on the behavior of the rest of the economy. Roughly speaking, a 100 dollar drop in income from a decline in residential investment will reduce national income by about 140 dollars.

One way to gauge the potential size of the effect in the U.S. today is to compare the performance of housing investment and new home construction during past cycles. Figure 3 reports monthly housing starts between January 1973 and October 2006. Figure 4 indicates the pattern of real gross residential investment from the Flow of Funds data for the same period.

During the 33 year period reported in these figures, there have been four significant declines, which we refer to below as Cycles I-IV. The first three all contributed to recessions. The first was during the stagflation period leading up to the recession of 1975. The second was a long decline beginning in 1978 leading up to the recession of 1981-82. The third occurred as severe regional recessions led to a national recession in 1990. We are in the midst of the fourth, which began in early 2006 and so far has not led to a recession.

It is important to note that each of the first three down cycles arose, in some measure, in response to Federal Reserve interest rate policies in the face of inflationary pressures. In all three cases, but especially in 1974-75 and in 1980-82, interest rates rose substantially. Interest rates in the current downturn have risen only modestly, at least thus far.

Table 2 reports the essential facts of each the four down cycles on residential investment and housing starts. Note that starts are a leading indicator of gross investment. A start is recorded when investment in a new home begins. The investment itself continues for a period of up to ten months. Note the lags involved. To illustrate, the Census Bureau reported in October 2006, that new house completions were at an annual rate of 2 million, despite the fact that housing starts had fallen well below 2 million in March and had fallen steadily through October, to a rate below 1.5 million. (See U.S. Census, *New Residential Construction,* October 2006.)

Cycle I began with a downturn in both starts and residential investment. In the first quarter of 1973, housing starts were at an annual rate of 2.48 million -- the highest level recorded for any month between 1959 and 2006. Interestingly, in January 2006, annual starts were estimated to be 2.27 million -- the highest figure recorded for any month since April 1973. The drop in starts during Cycle I bottomed at a rate of 904,000 in February 1975. The decline lasted two years, during which housing starts fell by 1.58 million units or 63 percent.

During this cycle, the pattern of real gross residential investment lagged starts, but only modestly. Real residential fixed investment peaked in the first quarter of 1973 at

$310.6 billion and then fell to $189.2 billion, a decline of 39 percent. As a percent of GDP, gross residential investment fell from 5.7 percent to 3.6 percent.

In many respects, Cycle II was similar to Cycle I. The expansion following the end of the recession in 1975 began to engender inflation in 1977. The Federal Reserve increased interest rates in 1978 in anticipation of an acceleration of inflation, and the housing market began to cool. Housing starts began to decline in January 1978. From a peak of 2.14 million at the end of 1977, the number fell to 927,000 over the next three years.

Real gross fixed residential investment fell, this time from $356.6 billion in 1977 to $182.9 billion, a decline of almost half over a four-year period. As a percentage of GDP, residential investment dropped from 5.5 percent in 1978 to 3.5 percent at the end of 1982.

The relative magnitudes of the Cycle III downturn are clearly apparent in Table 2. The decline in housing starts occurred in February 1984, long before a recession was eminent. Starts dropped again from 2.26 million to below 798,000, a decline of over 65 percent, to a bottom in January 1991.

This time there was a considerable lag between the decline in housing starts and the ultimate reduction in real residential fixed investment, which began in the fourth quarter of 1986. In Cycle III, the decline was only 30 percent. Interestingly, the peak of residential fixed investment in real terms in 1986 was identical to the peak for residential fixed investment in 1978. Both were just 18 percent above the peak level in 1973. From the peak, residential fixed investment fell from $356 billion, or 5.6 percent of GDP, to $250 billion, or 3.5 percent of GDP in January of 1991.

The three previous downturns had some striking similarities despite rather different economic circumstances. In all three cases, housing starts fell by about 60-65 percent, while gross residential investment fell from about 5.5 percent to about 3.5 percent of GDP.

The current downturn appears to be different in some dimensions and similar in others. First, the peak in starts was again over 2 million. This time, however, gross residential investment in real dollars at the peak was almost twice as high as it had been during the last three peaks. This is clearly visible in Figure 3. In addition, the peak, as a percentage of GDP was 6.3 percent, substantially higher than it had been in the previous downturns. In large measure, this reflects the dramatic rise in the selling prices of new homes. The Bureau of the Census (2006) reports that the mean price of a new home is currently $295,000. Roughly 38 percent of that is land (see Case, 2006), so the rest is invested capital (and is thus a component of GDP).

Can we estimate the order of magnitude of the income effect of the current downturn? Clearly the housing decline will be a drag on the U.S. economy in 2007 and 2008. But how much of a drag?

If we begin with what we know, starts were down to 1.49 million in October 2006, an annual drop of 779,000 since January, or 34 percent. If starts had bottomed in October and declined no further, annual production of housing would have declined by 779,000 units. At a mean price of $295,000, this represents a decline in final demand of roughly $184,000 per unit (i.e., 62 percent of $295,000), or $143.3 billion, or about 0.9 percent of GDP.

Thus, ignoring any decline in the sales of existing homes, the decline in housing starts observed through October 2006 if it is sustained for a year has already reduced the GDP growth rate in 2007 by one percent.

This ignores the multiplier, and it leaves residential fixed investment at about 5.6 percent of GDP -- roughly the same as it had been at the peaks of the last three cycles. If we assume instead that real residential fixed investment will fall by two percent of GDP (as it has in the three down cycles described above), then the initial shock is 81 percent higher, or about $260 billion. This still leaves gross residential investment at 4.3 percent, substantially above its level in past troughs.

Other direct effects on income from a decline include loss of brokerage commissions, fees from mortgage originations, and those items which are reckoned as "closing costs" (including appraisal fees, building inspections, title insurance, and so forth). Existing home sales were lower by 810,000 in October 2006 from their level a year earlier, and they are likely to decline further. If the decline is sales were ultimately to total one million, then the loss of annual brokerage fees would be about $9.6 billion. (This assumes average sales prices of $250,000, an average commission of 5.5 percent, and that 70 percent of sales include brokers' participation). Closing costs currently average about $1,700 per sale; with a million sales, that is $1.7 billion in lost income. A reasonable decline in mortgage originations would be about 600,000. Those mortgages would have generated about 300 basis points in total fees at origination. If the mean mortgage were $200,000, then a total of about $3.6 billion in fee income would be lost. Together, these three items yield a total of $14.9 billion in lost income. While this is a substantial loss of income, it is dwarfed by direct spending on residential construction.

IV. Some Simulations

To estimate the magnitude of the impacts of a downturn in housing production on the national economy, we simulated the effects of a substantial decline in housing investment on real GDP using the Fair Model, a well known macro econometric forecasting model (See Fair, 2004). This model, consisting of 30 stochastic equations and about 100 identities, has been used extensively in evaluating potential economic shocks and policy options for over three decades. The remarkable track record of the model is reported in Fair (2004).

The latest baseline forecast available utilizes data through the third quarter of 2006. We conduct a simulation based on an assumed exogenous decline in real gross residential investment. Recall that during the three previous housing downturns, real gross residential investment fell by between 30 and 50 percent; this was, on average, about approximately 2 percent of GDP. Real GDP in 2006:III was $11.43 trillion. The simulation exercise, reported in Figure 5, contemplates a decline in residential investment of $220 billion, starting at the peak of $534.7 billion in 2005:IV, and bottoming out at $314.3 billion in 2007:IV. This is a decline of 1.9 percent of GDP. A rebound begins in 2008:II. Of this simulated decline, a drop of $47 billion in residential investment had already been observed by 2006:III. That leaves $173 billion to be experienced between 2006:IV and 2008:II. This is fully consistent with the sharp decline in housing starts in October 2006, which implies that a substantial drop in residential investment will be

observed in the spring of 2007. The baseline forecast published by FairModel in December builds in a significantly smaller decline of about only $77 billion.

Table 3 presents the aggregate impact of the simulated shock to residential investment on economic growth and employment. A shock of this magnitude would clearly have a significant impact on the performance of the core economy -- as early as the beginning of 2007. The real growth rate is forecast to be 2.7 percent from the second quarter of 2007 through mid-2008. Adding a quite plausible shock to new housing construction lowers the growth rate to 1 percent by 2007:II, where it remains until housing production is restored. Thus, even a conservative estimate of the effect of a decline in new construction of residential fixed assets produces a substantial reduction in GDP growth, significantly higher than the figures that were quoted in the press in December 2006. The same shock produces job losses of about 1.4 million by the end of 2008 and a rise in the unemployment rate to 5.8 percent from the baseline simulation of 5.0 percent. This simulation does not contemplate any decline in sales of existing homes or in mortgage originations.

V. Conclusion

On the current trajectory, the fading boom in the U. S. housing market will lead to: reductions in consumer spending; declines in housing starts, completions and gross residential investment; and to reductions in housing transactions volumes and the associated fee income from these activities. It will also lead to repercussions through financial markets. This paper provides an order-of-magnitude estimate of these effects

using the history of the past three downturns in the housing market as a backdrop. We estimate small consequences for the economy from the wealth effect, but quite large consequences arising from the income effect associated with a decline in the housing sector. We do not attempt to estimate the impact of the decline on financial markets. It is clear, however, that both wealth effects and financial market effects will be higher if prices fall rapidly and substantially reduce housing wealth. A more rapid decline in home values on the other hand could help restore sales volumes and could reduce the size of the income effect.

We estimate that a decline in the housing market commensurate with the past three cyclical downturns would have large income effects on the U. S. economy. The direct effect of the decline in final demand for housing which has already occurred during the first three quarters of 2006 is estimated to be more than $140 billion, or about 0.9 percent of GDP. If residential fixed investment ultimately falls by two percent of GDP (as it has in the three previous cycles described in this paper), then the initial shock is much larger -- about $260 billion instead. Other direct effects, from declines in fee and transactions income, are estimated to be about $15 billion.

The aggregate effects upon the economy, estimated through simulation, are quite large. Adding a shock to new residential construction consistent with the unwinding of previous post-war housing booms lowers the real growth rate in the U. S. economy from 2.7 percent to about 1.0 percent. The same shock leads to estimated job losses of 1,400,000 and to an increase in the unemployment rate of 0.8 percentage points. Thus the end of the thirteen-year boom in the housing market is likely to exert important effects on the economy during the next several years.

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Figure 1
The Market for Existing Homes

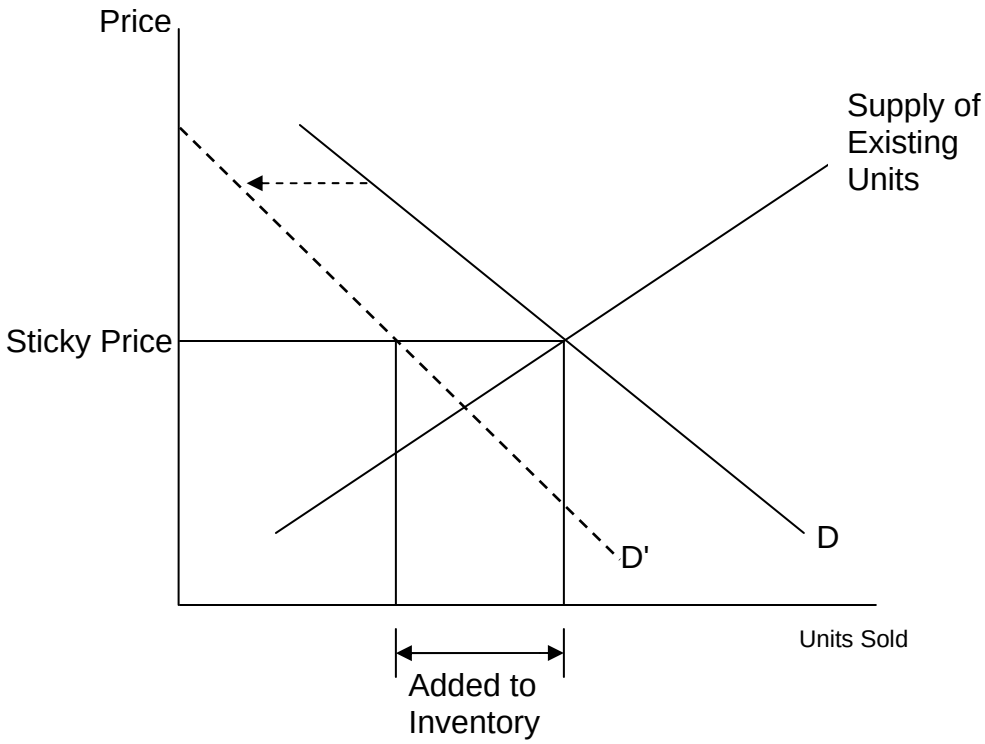

Figure 2
Nominal House Prices in Vancouver and San Francisco: 1975-1983

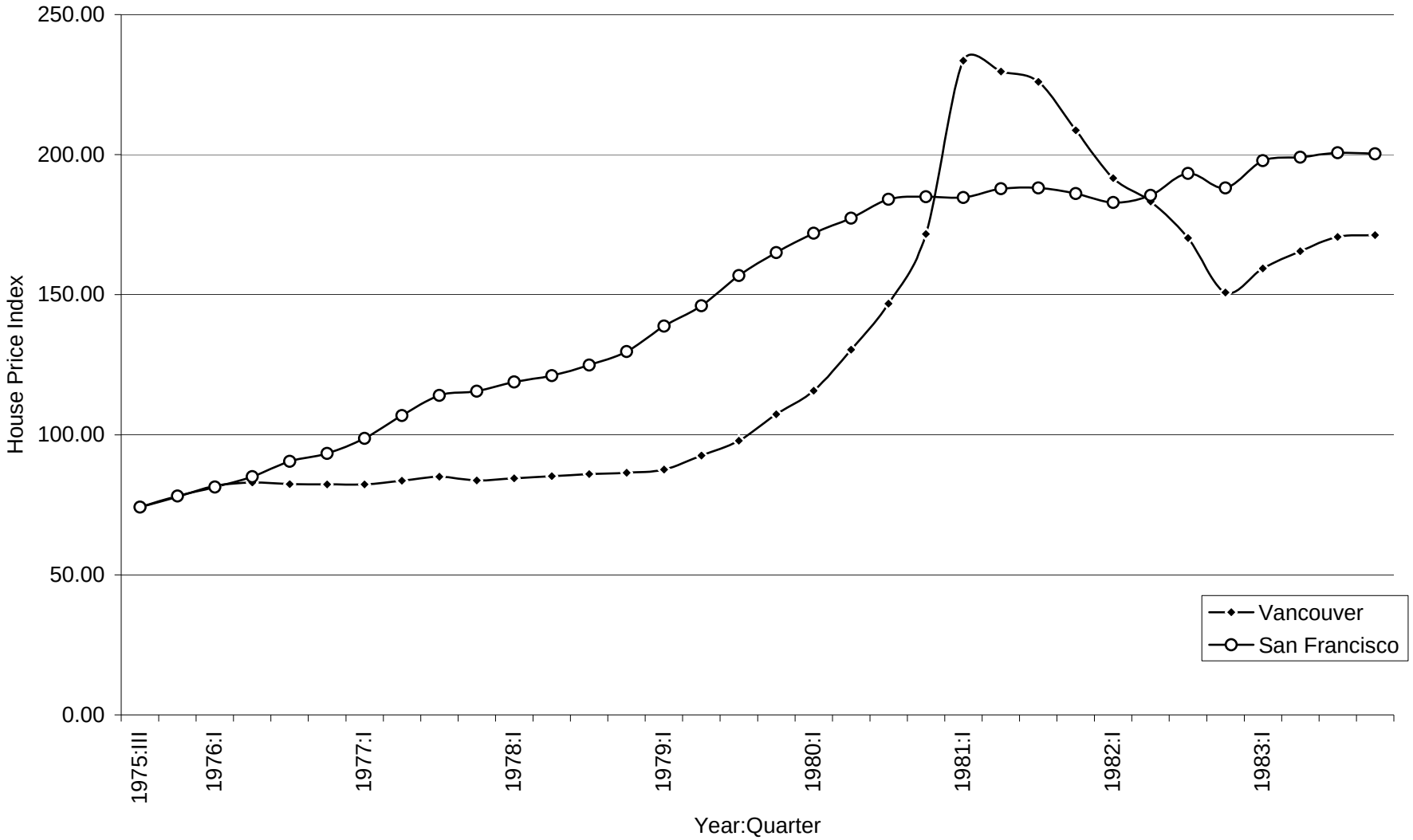

Figure 3
Annualized Housing Starts

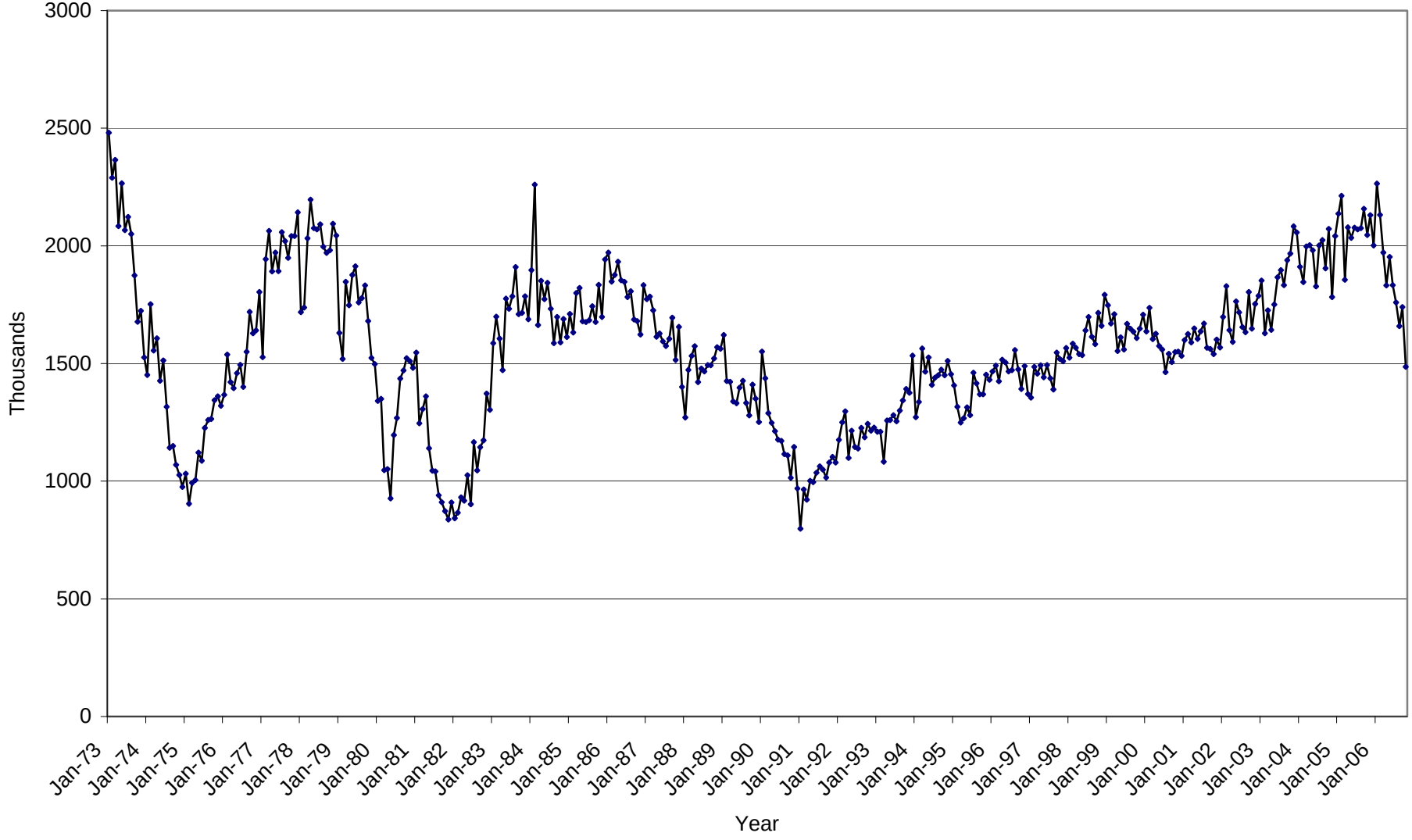

Figure 4
Annualized Real Gross Residential Fixed Investment Seasonally Adjusted

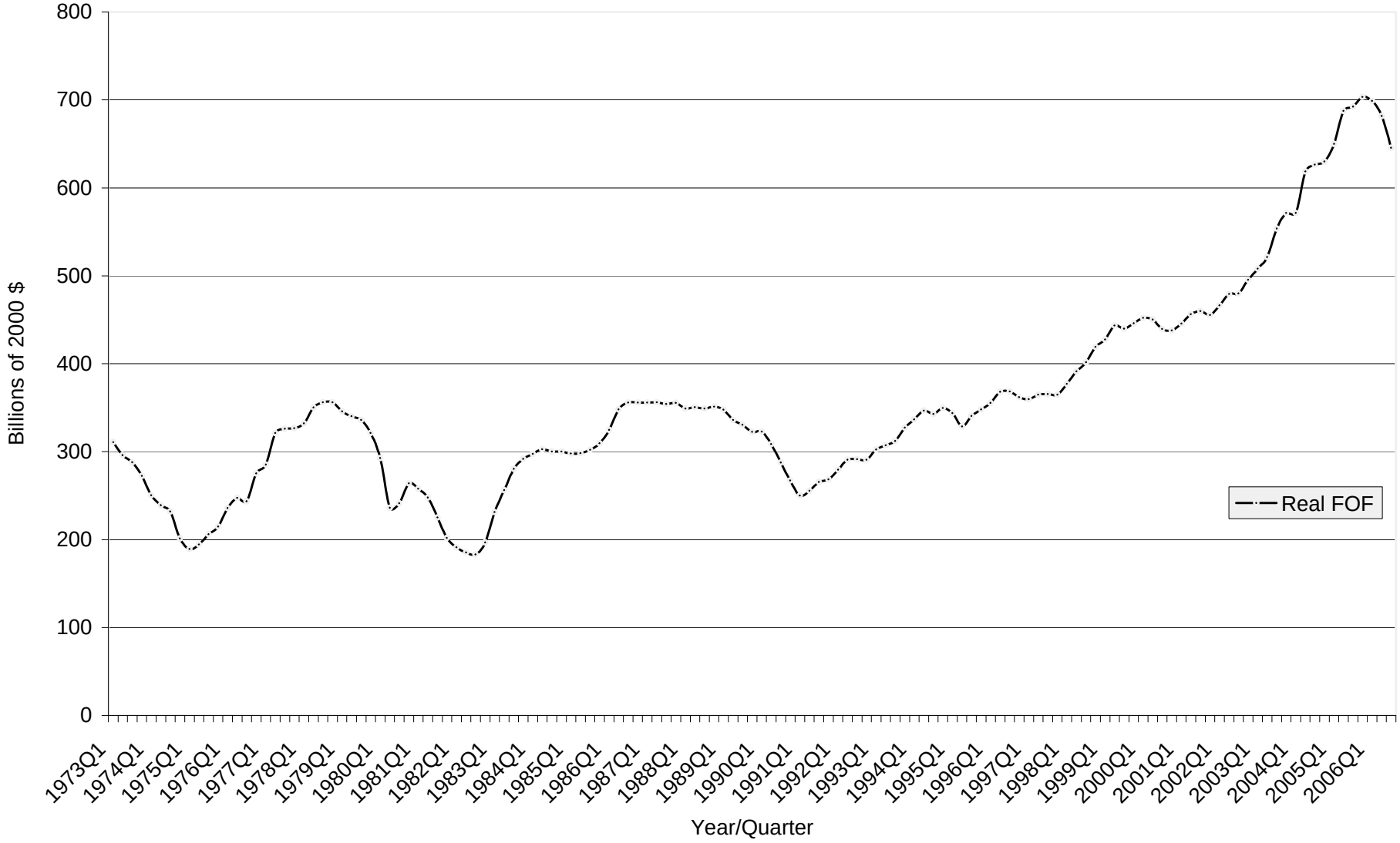

Figure 5
Real Residential Investment, Annualized
(Billions of 2000 Dollars)

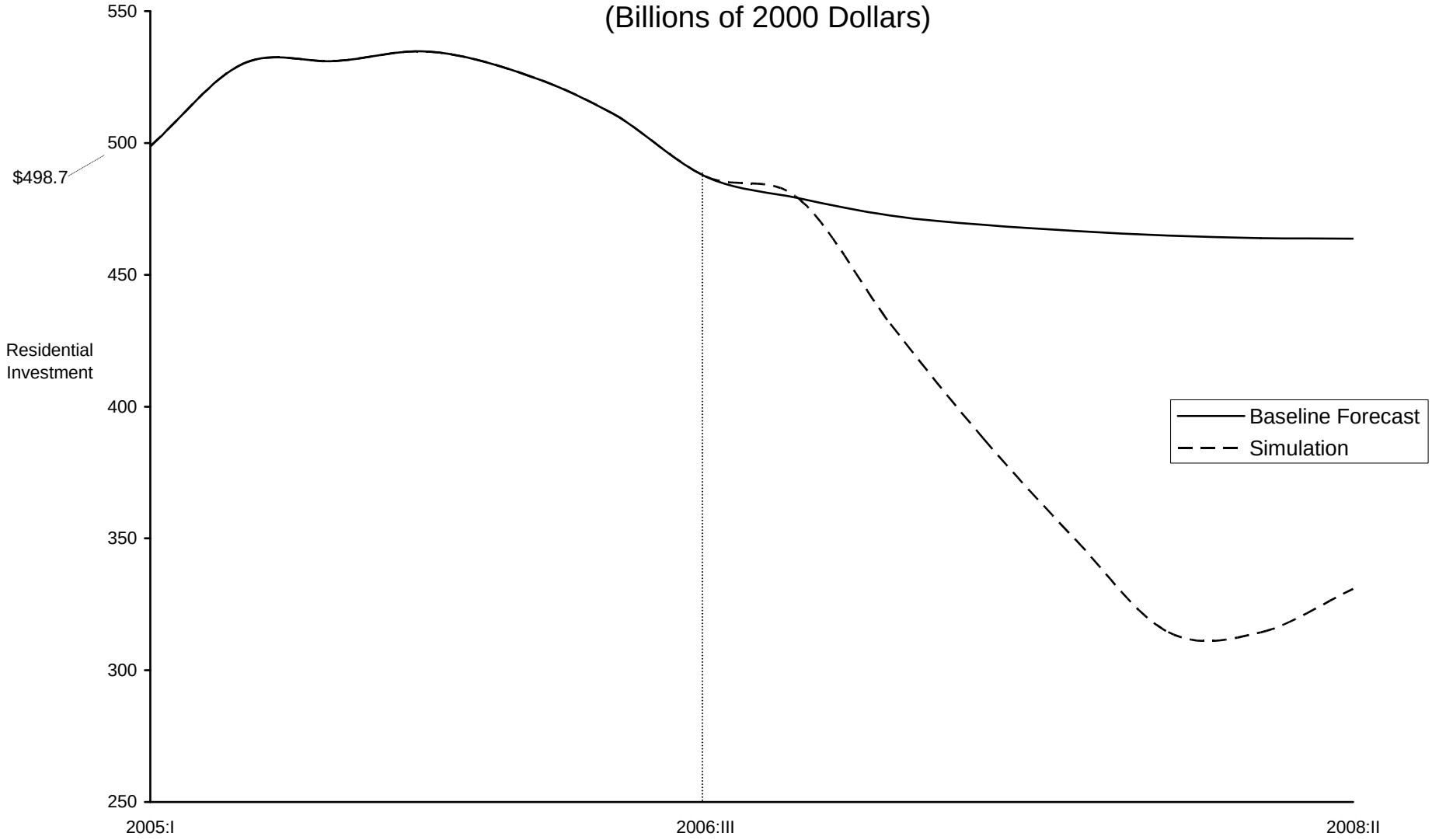

Table 1
Disposition of Houses Listed for Sale in July 2006, as of November 2006
Suburban Boston MLS Listings (628 Observations)

	Disposition of Listing						Percent Decrease	
Town	**Active**	**Expired**	**Cancelled**	**Pending**	**Sold**		**in Asking Price**	**in Selling Price**
Acton	17	3	2	2	6		4.0%	5.4%
Andover	10	5	6	2	7		4.0%	4.7%
Braintree	11	8	3	2	6		4.2%	5.4%
Concord	13	5	4	1	7		5.9%	11.1%
Essex	9	7	2	5	5		6.1%	6.4%
Foxboro	10	1	8	0	11		4.9%	7.4%
Hamilton	10	8	3	4	5		4.9%	9.3%
Hull	9	6	4	2	9		5.5%	5.4%
Ipswich	10	10	4	1	5		3.2%	3.4%
Lexington	10	5	4	4	7		4.7%	6.0%
Needham	12	3	10	3	2		4.9%	3.9%
Quincy	9	8	5	3	5		4.6%	10.6%
Reading	5	8	4	5	8		5.9%	7.2%
Sharon	7	10	3	2	8		3.0%	5.8%
Stoneham	7	7	3	4	9		4.3%	6.2%
Wakefield	9	7	1	1	12		4.8%	4.0%
Walpole	6	6	6	4	8		4.0%	7.3%
Wayland	10	8	4	3	5		4.0%	4.7%
Wellesley	15	3	4	4	4		1.9%	7.0%
Weymouth	14	3	6	0	7		3.8%	4.5%
Winchester	10	12	4	0	4		2.5%	5.9%
Listing Totals	**213**	**133**	**90**	**52**	**140**	**Average Decreases**	**4.3%**	**6.3%**

Note: All towns have sample size of 30, except for Essex (28 observations).

Table 2
Gross Residential Investment and Housing Starts in Down Cycles
1973-2006

Cycle I*	Peak 1973:1	Trough 1975:1	Percent Change
Gross Residential Investment (billions of $ 2000)	$310.6	$189.2	-39%
Percent of GDP	5.7%	3.6%	
Housing Starts (millions of units)	2.481	0.904	-63%

Cycle II*	Peak 1978:3	Trough 1982:3	Percent Change
Gross Residential Investment (billions of $ 2000)	$356.6	$182.9	-49%
Percent of GDP	5.5%	3.5%	
Housing Starts (millions of units)	2.141	0.927	-61%

Cycle III*	Peak 1986:4	Trough 1991:1	Percent Change
Gross Residential Investment (billions of $ 2000)	$355.9	$250.0	-30%
Percent of GDP	5.6%	3.5%	
Housing Starts (millions of units)	2.260	0.798	-65%

Cycle IV*	Peak 2006:1	2006:3	Percent Change
Gross Residential Investment (billions of $ 2000)	$703.0	$645.0	-8%
Percent of GDP	6.3%	5.6%	
Housing Starts (millions of units)	2.265	1.486	-34%

*Peak and trough dates are for gross residential investment. For housing starts, peak and trough dates are:
Cycle I: January 1973 – February 1975
Cycle II: December 1977 – August 1981
Cycle III: February 1984 – January 1991
Cycle IV: January 2006 – October 2006
Source: US Bureau of the Census Construction Reports; Board of Governors of the Federal Reserve System, Flow of Funds Data, Table F10, Line 19

Table 3

Effects of Reduction in Real Residential Investment on National Income and Employment

	Real GNP Growth (Annual Percent Change)			Employment (Millions)			Unemployment Rate (Percent)		
Quarter	Baseline	Simulation	Difference	Baseline	Simulation	Difference	Baseline	Simulation	Difference
2006:IV	2.13	2.01	-0.1	146.2	146.2	0.0	4.8	4.8	0.0
2007:I	2.57	1.25	-1.3	146.5	146.4	-0.1	4.9	5.0	0.1
2007:II	2.71	1.00	-1.7	146.9	146.5	-0.4	4.9	5.2	0.3
2007:III	2.73	1.08	-1.6	147.3	146.6	-0.7	4.9	5.4	0.5
2007:IV	2.74	1.29	-1.5	147.8	146.7	-1.1	4.9	5.6	0.7
2008:I	2.74	2.42	-0.3	148.2	146.9	-1.3	5.0	5.7	0.7
2008:II	2.74	2.34	0.6	148.6	147.2	-1.4	5.0	5.8	0.8

Source: Fair Model Simulation, December 2006.