



The End of the Great American Housing Boom

*What it Means for You, Me
and the U.S. Economy*

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Executive Summary

Few recent U.S. economic trends have fueled water cooler conversations as persistently as the housing boom across most of the country over the past decade. Millions of homeowners reside in houses today that are worth far more than when they were purchased. Millions more saw a jump in their perceived net worth, enticing them to buy, sell, and then buy new homes again amid the boom. Along the way, homeowners took advantage of low interest rates to boost their access to credit, borrowing against the seemingly ever rising value of their homes for home improvements, college tuition for their kids, a new car, and other items.

This debt-driven consumption helped spur the U.S. economy out of the recession of 2000 and then underpinned the steady economic growth since March 2001. So powerful were the effects of the great American housing boom that home prices swiftly outpaced the growth of rental prices across the country—a historic first—while boosting job growth in retail, construction, and other housing-related businesses. For a time, it seemed as though this Energizer Bunny of the current economic expansion would run forever, boosting housing wealth in unprecedented ways, and making construction and other housing-related jobs the backbone of job growth.

Yet recently released economic data paints a far different picture of the benefits of the six-year housing boom. Over this period homeownership growth dropped sharply for a significant number of Americans—Whites, Hispanics, and African Americans alike—while the equity share of homeowners' stakes in their own homes actually decreased as homeowners piled on new debt faster than their homes appreciated. What's worse, rising home prices led families to concentrate more and more of their wealth in their homes even as they expanded their credit lines to maintain their consumption.

These new sets of data from 2000 to 2005 allow for a detailed analysis of the housing boom in comparison to the slowdown in the housing market that began in 2006. Home price gains slowed across much of the country and in some cases, reversed direction over the course of the year. At the same time interest rates began to climb. So what does the cooling off of the once red hot U.S. housing market mean for homeowners, renters, and the overall national economy?

Housing markets by their very nature are local in scope and swayed by sentiment linked to the complexities of regional economic conditions. What's true for Boston isn't necessarily the case for Birmingham. The market drivers behind home sale trends in the Washington metropolitan area and the New York tri-state region are as different as they are between Dallas-Fort Worth, Greater Miami, and Silicon Valley. Yet several worrying national trends can be discerned about

the U.S. housing boom over the past six years and the current rolling home price downturn. Consider that between 2001 and 2005, when home values posted their sharpest gains:

- Homeownership growth rates slowed markedly amid steady economic expansion, leaving a large percentage of families without access to one of the key components of the American Dream—their own home.
- Homeowners' equity stakes in their own homes slipped even as homeowners' percentage of wealth tied up in their homes increased, exposing homeownership families to serious financial vulnerabilities in the event of a housing price downturn.
- Homeowners' overall exposure to variable interest-rate loans jumped sharply right before the Federal Reserve Board embarked on its recent interest rate hike campaign.

Then consider that beginning this year, when housing prices began to flatten or reverse course:

- Rising interest rates on adjustable rate mortgages and home equity lines of credit now leave a large share of homeowners exposed to larger debt payments just as opportunities to sell their homes become scarcer.
- Slowing home appreciation or contracting home prices in tandem with higher debt payments means that domestic consumption growth is now slowing, primarily because homeowners can no longer tap the equity in their homes for new lines of credit.
- Job growth in construction, housing-related industries, and the retail sector are also slowing due to homeowners' downturn in consumption.

The upshot? The sharp run-up in home prices, especially over the past six years, and the current flattening of home prices means that many American families may never take that first step towards homeownership due to still over-inflated housing prices and rising interest rates. Yet homeowners face the prospect of severe financial strains as interest rates rise and home sales slump amid a sharp slowdown in the ability of homeowners to sell their own homes and then buy newer, bigger ones. This means less economic activity in the important housing sector, less consumption as homeowners rein in their spending, and lower employment in key industrial and service sectors of the economy that thrived during the housing boom, which in turn points to slower economic growth.

Broadly speaking, for you, me, and the economy, that spells trouble. The detailed analysis that follows offers indications of just how serious it may become.



Introduction

Few recent U.S. economic trends have fueled water cooler conversations as persistently as the housing boom across most of the country over the past six years. Millions of homeowners reside in houses today that are worth far more than when they were purchased. Millions more saw a jump in their perceived net worth, enticing them to buy, sell, and then buy new homes again amid the boom. Along the way, homeowners took advantage of low interest rates to boost their access to credit, borrowing against the seemingly ever rising value of their homes for home improvements, college tuition for their kids, a new car, and other items.

This debt-driven consumption helped spur the U.S. economy out of the recession of 2000 and then underpinned the steady economic growth since March 2001. So powerful were the effects of the great American housing boom that home prices swiftly outpaced the growth of rental prices across the country—a historic first—while boosting job growth in retail, construction, and other housing-related businesses. For a time, it seemed as though this Energizer Bunny of the current economic expansion would run forever, boosting housing wealth in unprecedented ways, and making construction and other housing-related jobs the backbone of job growth.

Yet recently released economic data paints a far different picture of the benefits of the housing boom, especially the last six years. Over this period homeownership growth dropped sharply for a significant number of Americans—Whites, Hispanics, and African Americans alike—while the equity share of homeowners' stakes in their own homes actually decreased as homeowners piled on new debt faster than their homes appreciated. What's worse, rising home prices led families to concentrate more and more of their wealth in their homes even as they expanded their credit lines to maintain their consumption.

The new sets of data from 2000 to 2005 allow for a detailed analysis of the housing boom in comparison to the slowdown in the housing market beginning in 2006. Home price gains slowed across much of the country and in some cases, reversed direction over the course of the year. At the same time interest rates began to climb. So what does the cooling off of the once red hot U.S. housing market mean for homeowners, renters, and the overall national economy?

Housing markets by their very nature are local in scope and swayed by sentiment linked to the complexities of regional economic conditions. What's true for Boston isn't necessarily the case for Birmingham. The market drivers behind home sale trends in the Washington metropolitan area and the New York tri-state region are as different as they are between Dallas-Fort Worth, Greater Miami, and Silicon Valley. Yet several worrying national trends can be discerned about the U.S. housing boom over the past six years and the current rolling home price downturn.



Consider that between 2001 and 2005, when home values posted their sharpest gains:

- **Homeownership growth slowed markedly for new home buyers.** After 2000, increases in homeownership rates dropped by about three quarters for African Americans, by about half for whites and by about one quarter for Hispanics, compared to the late 1990s. Since the end of 2004, Census data shows that homeownership rates, particularly for African Americans, actually declined.
- **Homeowners' equity stakes in their homes declined even as homeowners' percentage of wealth tied up in their homes increased.** Because debt grew faster than housing values, homeowners' equity in their homes declined to 65 percent by the end of 2004 from 66 percent in 2001. That's only a one percentage point drop, yet it came amid soaring home valuations over the same period.
- **Greater asset concentration in homes leaves families more vulnerable to a housing market downturn.** More family wealth is now concentrated in homes. The share of all residential real estate out of families' total assets grew to 41 percent by the end of 2004 from 33 percent in 2001. This is especially true for low- and moderate-income families, minority families, and young families, since all of them have comparatively large shares of their assets tied up in their homes.

Then consider that beginning this year, when housing prices began to flatten or reverse course:

- **Rising interest rates on adjustable rate mortgages and home equity lines of credit now leave first-time home buyers and many homeowners exposed to larger debt payments.** To afford a home, many homeowners initially tapped adjustable rate mortgages and home equity lines of credit. The share of variable interest rate loans grew to 25 percent at the end of 2004, up from 16 percent in 2001. Because of the use of variable interest rate debt, debt payments could rise quickly if interest rates jump. A one percentage point increase in interest rates would mean a 0.25 percentage point rise in debt service relative to income for homeowners. White families, low income families, and families headed by 45-to-54 year olds would likely be more affected than their counterparts.
- **Close to half of all homeowners already exhibit some signs of financial vulnerability.** Just under 50 percent of all homeowners in 2004 met at least one of four possible vulnerability measures—mortgage payments of at least one-third of income, variable interest rate debt of at least 50 percent of income, home equity below 25 percent of their home's value, and homes accounting for at least 90 percent of families' total assets. This was up from 39 percent in 2001, and is likely higher than 50 percent today amid rising interest rates. Minority and low-income homeowners are more likely to be vulnerable than their counterparts.



- **Homeowners are over-exposed to the housing market as their principal store of assets.** With home values flat or heading south, homeownership families could lose large shares of their equity in their own homes. If home values had dropped by 10 percent between 2001 and 2005, for example, the median home equity-to-income ratio would have risen by only 0.7 percentage points annually over that same period, instead of the actual 9.5 percentage-point increase. Just a 10 percent drop would have resulted in a loss of 93 percent of those gains. The declines would have been especially pronounced for low income, African American, and homeowners 65 years of age and older.
- **Even a leveling of home prices has serious consequences.** Slower home appreciation would quickly reduce home sales and threaten the construction sector and other housing-related industries. Even if home prices stayed flat for the next 12 months and interest rates rose by only 0.5 percentage points, new home sales would decline by 23.4 percent during the same period. What's more, as home prices slip or remain stagnant, domestic consumption will slow. This recent engine of economic growth is now faltering. In the third quarter of 2006, a sharp decline in families' spending on their homes meant a drag of 1.2 percentage points on economic growth.
- **Families cash out less equity, leaving even fewer resources for consumption growth.** In the second quarter of 2006, families borrowed \$36 billion more than the spent on their homes. That sounds like an impressive figure, but it is about half the size of the home equity withdrawals in the first quarter of 2006, and less than one-third the home equity withdrawals at the end of 2005.
- **Employment in construction, other housing-related industries, and the retail sector has already taken a toll.** In the first five years of this business cycle, from March 2001 through March 2006 (before the housing market started to slow), job growth in construction and housing-related sectors accounted for 41.6 percent of all newly created jobs and for 69.1 percent of all new private sector jobs. Then between March 2006 and September 2006, job creation in these sectors averaged a little over 8,000 new jobs, down from more than 40,000 new jobs per month in the preceding six months. Similarly, retail sector employment declined in five out of six months from April to September 2006.

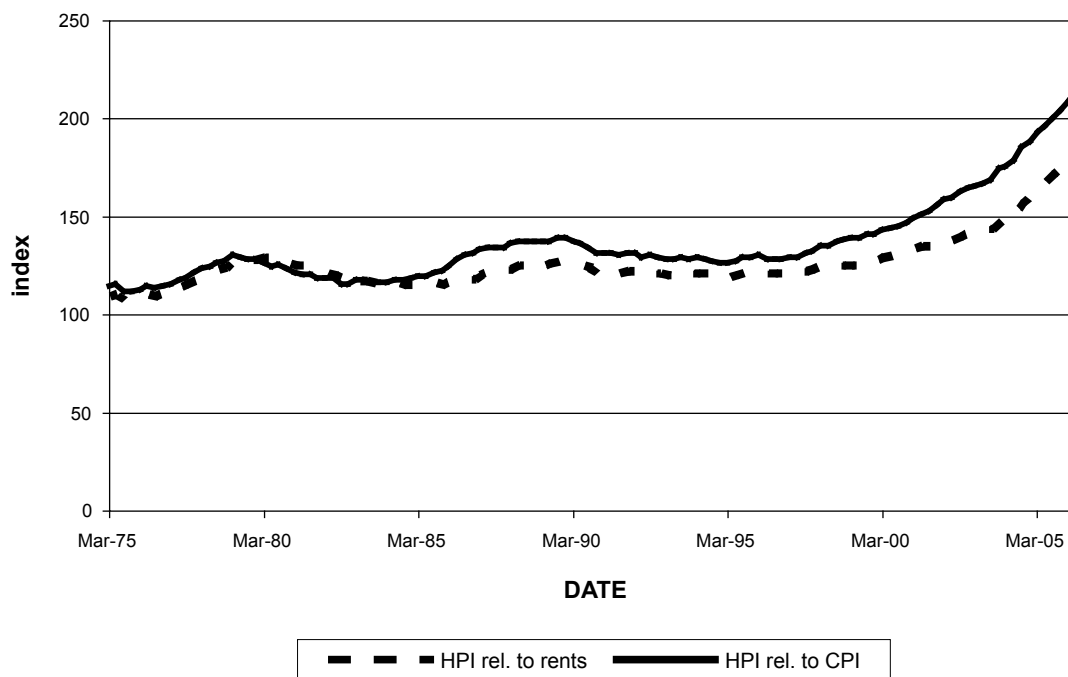
With the housing market slowing, the future economic outlook is decidedly less bright. Experts estimate that flat home prices could shave one percent off domestic economic growth in 2007. As the analysis that follows details, however, it could get even worse for those with or without homes as the great American housing boom comes to an end.

The Intriguing Trajectory of the Recent Housing Boom

For the past decade, home prices in the U.S. could only go up at eye-popping speed. In fact, they quickly left comparable prices, particularly rents, in the dust, reaching never-before-seen heights. Traditionally, home prices tended to rise at the same pace as rents. After all, both reflect the price of a roof over one's head. In 1975, the home price index was equal to 108 percent of the rent index. By 1995, that difference had grown to 118 percent, but that was the same ratio as in 1978 and 1987, merely a fluctuation at the high end of a rather predictable correlation between rents and home prices.

But that changed in 2000, when the ratio of home prices to rents jumped above 130 percent for the first time. By the beginning of 2006, the ratio of home prices to rents had grown to a whopping 178 percent. Similarly, home prices compared to other prices remained relatively stable until 1999, when the ratio of home prices to other prices surpassed all previous ratios and grew to 208 percent at the beginning of 2006 (see figure 1 below).

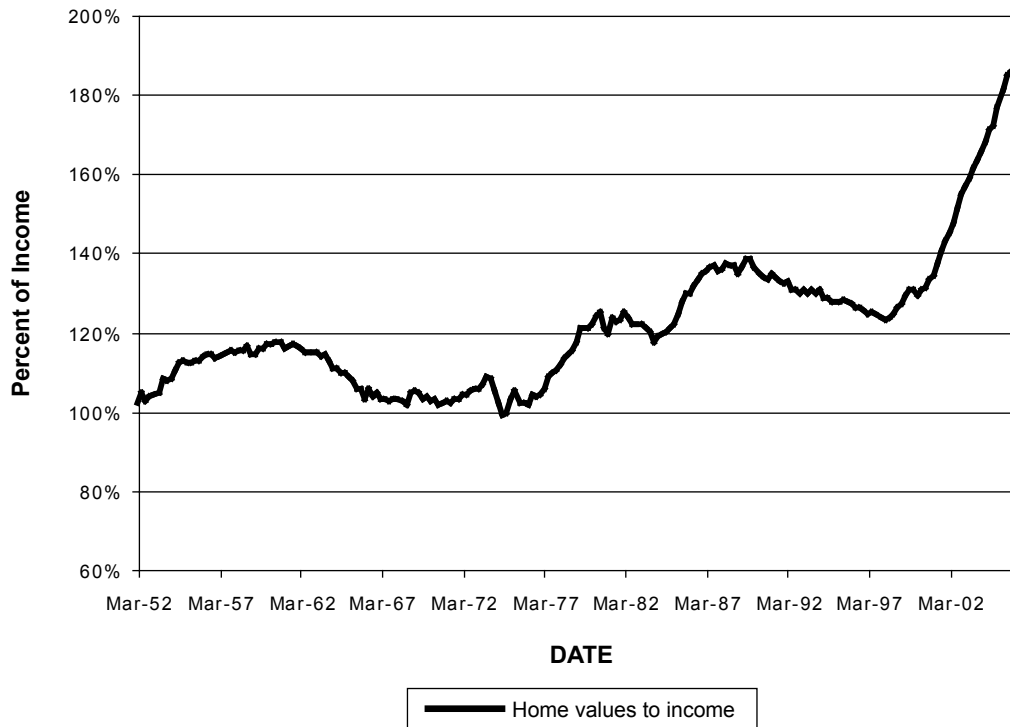
Figure 1—House Price Index (HPI) Relative to Rents and Other Prices



Notes: CPI stands for consumer price index and HPI denotes House Price Index. Author's calculations based on data from the BLS (2006a) and OFHEO (2006). The consumer price index for other goods refers to the non-shelter CPI.

This acceleration in home prices resulted in the value of homeowners' residences rapidly outpacing their incomes. For more than four decades, home values did not grow higher on average than 138 percent of income. This relationship changed in 2001, when home values relative to income broke all records, soaring to 186 percent in early 2006 (see figure 2, page 7).¹

Figure 2—Home Values Relative to Income



Notes: Calculations based on BOG (2006a).

It Wasn't a Home Ownership Boom

One clear effect of the rapid rise in home prices was that it made it harder, despite readily available credit, for families to become homeowners. Homeownership rates did continue to rise after 2001 as home prices rapidly accelerated, but homeownership rates grew much slower than in the late 1990s (see table 1, page 8). The second half of the 1990s witnessed an unprecedented boom in homeownership rates, particularly for racial minorities. Over this period, homeownership rates grew annually by 0.8 percentage points for African American families. After 2000, however, homeownership growth rates slowed markedly. For African Americans, homeownership grew by only 0.2 percentage points annually between 2000 and 2005—a 75 percent decline compared to the previous five years.

Moreover, for African Americans, this sharp slowdown in homeownership growth came at a time when they had disproportionately low homeownership rates compared to whites. By 2005, African American families still had home ownership rates below 50 percent.

Aspiring African American home buyers were not alone, however, in finding it more difficult to purchase their first home. Homeownership growth rates for whites and Hispanics also declined over this same period. For whites, homeownership growth rates were cut in half, and for Hispanics, by 25 percent. At a time of accelerated home prices, the opportunities to own your own home decreased across the board.

Table 1—Home Ownership Rates, 1995 to 2005, by Demographic Characteristics

	Total	Whites	Blacks	Hispanics	Less than 35 years old	55 to 64 years of age
1995	64.7	68.7	42.7	42.1	38.6	79.5
1996	65.4	69.1	44.1	42.8	39.1	80.0
1997	65.7	69.3	44.8	43.3	38.7	80.1
1998	66.3	70.0	45.6	44.7	39.3	80.9
1999	66.8	70.5	46.3	45.5	39.7	81.0
2000	67.4	71.1	47.2	46.3	40.8	80.3
2001	67.8	71.6	47.7	47.3	41.2	81.3
2002	67.9	71.8	47.4	47.0	41.3	81.1
2003	68.3	72.1	48.1	46.7	42.2	81.4
2004	69.0	72.8	49.1	48.1	43.1	81.7
2005	68.8	72.7	48.1	49.4	43.1	81.1
Annual pct. pt. change						
1995 to 2000	0.6	0.6	0.8	0.8	0.6	0.2
2000 to 2005	0.3	0.3	0.2	0.6	0.5	0.2

Notes: All figures are in percent. Changes are in percentage points. Sources are Census (2006a, 2006b).

Troublingly, the lackluster growth in homeownership rates leveled off after 2004 and began to decline for the population as a whole. The overall homeownership rate was 69.2 percent at the end of 2004, but by the second quarter of 2006 it had declined to 68.7 percent, according to the Census Bureau’s “Housing Vacancies and Homeownership” report.² If the home ownership rate had remained the same as at the end of 2004, there would have been 547,000 more homeowners by the second quarter of 2006. That hypothetical calculation illustrates a telling point: Homeownership became more difficult due to rapidly rising prices after 2001, yet a slowdown in the housing prices did not facilitate greater mobility into homeownership. That trend indicates that the end of the housing boom does not necessarily mean that aspiring first-time home buyers will find it any easier to purchase their first home, especially as interest rates climb.

Home Prices Don’t Have to Fall for the Boom to End

As the top right-hand corner of figure 2 on page 7 shows, home prices relative to income have recently flattened. Given the sharp rise in home prices relative to incomes and to other prices, a correction seems inevitable. Such a correction, however, could take two forms. One could result in prices declining quickly, erasing much of the overvaluation in the housing market, which by some estimates could mean a decline of as much as 49 percent from the values in the second quarter of 2006.³ In fact, recent numbers do suggest that home prices are falling. Median home prices of new homes sold or for sale fell by 9.2 percent between September and August of this year, and were 9.7 percent lower in September 2006 than in September 2005—the largest year-over-year decline since 1971 according to the U.S. Census Bureau’s “New Homes Sold” report.



Another possibility is a long decline in home values relative to income as prices either stay flat or at least rise less than incomes. The Office of Federal Housing Enterprise Oversight's 2006 House Price Index, which measures price changes for the same homes over time, showed a small decline by one percent in the third quarter of 2006, but a year-over-year increase of five percent. Still, this is a sharp drop compared to the 10 percent in the second quarter of this year, and the year-over-year increases of 13 percent to 14 percent recorded in 2005.

Slower home price growth could have serious ramifications for the economy. The reason: In the face of rising prices many families took on more debt because higher home prices provided them with more collateral to borrow against and because lower interest rates, which had dropped to the lowest level in four decades, eased the burden of assuming this debt. If instead home prices stagnate as interest rates rise, then many homeowners will be caught in a bind, unless they curtail their borrowing.

Here's why. The combination of these two trends—lower mortgage rates and housing price increases—can be expressed as the real mortgage rate, which is simply the difference between the two percentages. By subtracting changes in home price from mortgage rates, faster home price appreciation means lower real mortgage rates. Lower real mortgage rates in turn mean that it is easier for families to borrow money and buy a new home. These two variables—new home sales and the real mortgage rate—are highly, yet inversely correlated. To see this graphically, the inverse of the real mortgage rate is plotted together with new home sales in figure 3 on page 10.⁴

Even a slight moderation in housing prices can have serious effects on the sale of new homes. Consider the effects of slowing home price appreciation over the past year. By September 2006, home prices were 5.2 percent higher than a year earlier, but this compares to a year-over-year growth rate of 10.1 percent in the second quarter, and of 12.7 percent a year earlier. At the same time, mortgage rates grew by about 0.8 percent from September 2005 through September 2006. The upshot: real mortgage rates rose by 8.3 percentage points (7.5 percentage points because of slowing home price appreciation plus 0.8 percentage points from higher mortgage rates) from September 2005 to September 2006. At the same time, new home sales declined from a high of 323,000 on average for the past four quarters to 257,000 at the end of September this year—a drop of 20.3 percent over the course of one year (see figure 3, page 10).

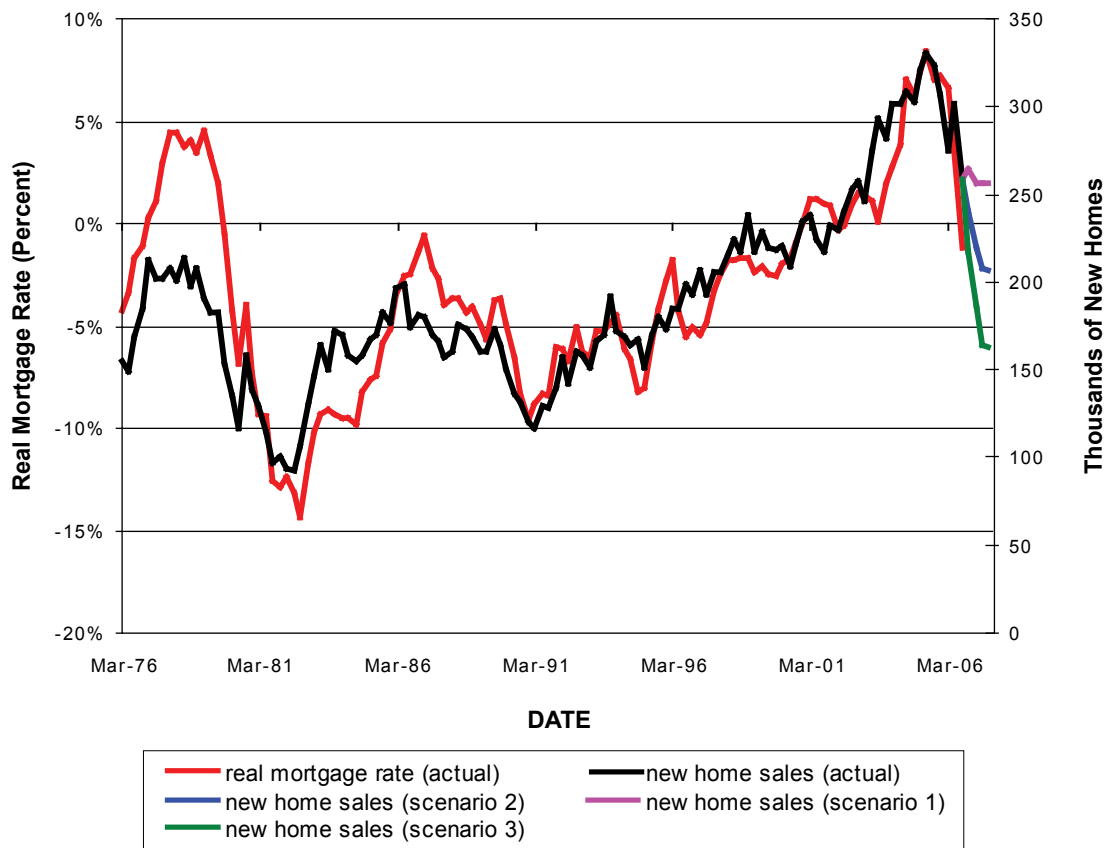
The future course of home prices is hard to predict, but given past trends, there are some reasonable estimates as to the effect of declining home price increases and rising mortgage rates. If we assume, for example, that home prices continue to increase by 5.0 percent year-over-year and that mortgage rates remain flat, then new home sales will decline by 9.0 percent over the period from September 2006 to September 2007. This possibility is charted in figure 3 on page 10 as scenario 1. If instead home prices stay flat and mortgage rates rise by 0.5 percentage points (scenario 2), then new home sales could drop by 23.4 percent. And finally, if home prices decline by 5.0 percent and mortgage rates rise by 0.5 percentage points (scenario 3), then new home sales would drop by 37.1 percent.

Moderate changes such as these could have direct dramatic effects on new home sales, which in turn could lead to less economic growth and employment. This direct effect would be in addition to the other more indirect effects of the end of the housing boom, which are discussed further below.

High Home Prices Fuelled Record Debt Levels and Higher Mortgage Payments

Record home price increases meant that those who became homeowners for the first time or who wanted to upgrade to a bigger home had to take on more debt than before. Household debt, especially in the form of mortgages, rose to record high levels. Data from the Federal Reserve Board’s “Flow of Funds Accounts” report shows that in 2001, total credit became larger than disposable income for the first time since this data was first collected in 1952. By the middle of 2006, total household credit was the equivalent of 129.3 percent of disposable income. Importantly, the increase in consumer credit relative to disposable income during the business cycle that started in March 2001 was more than four times faster than the increases in the 1990s.

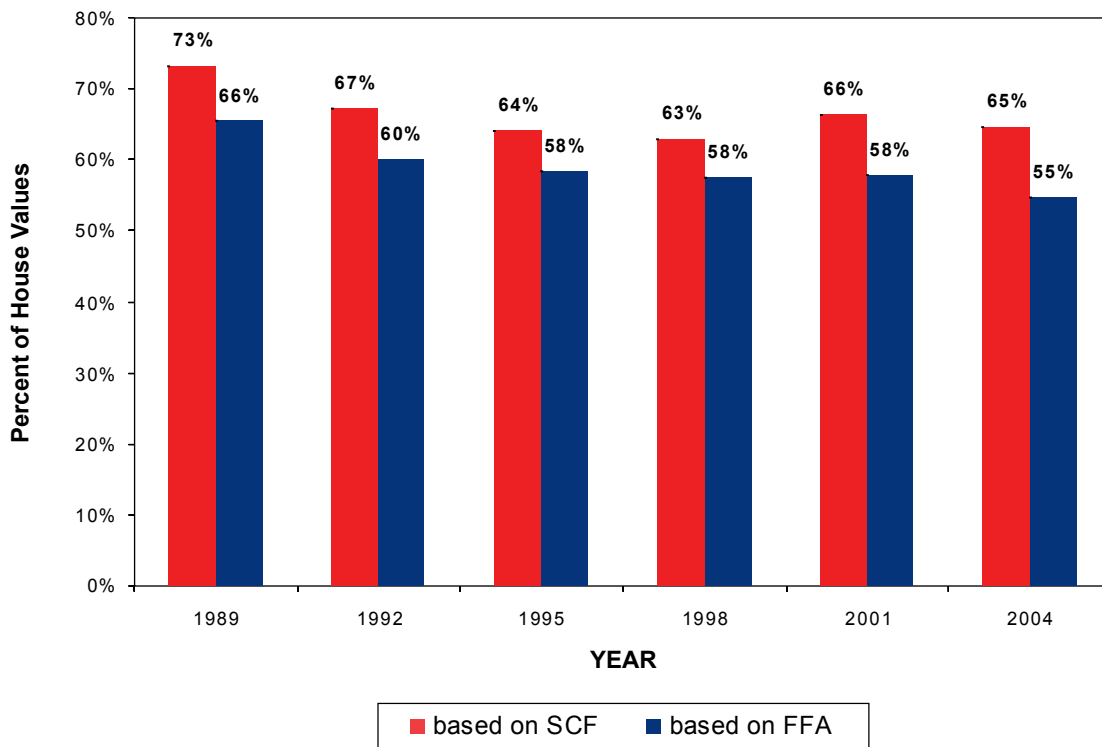
Figure 3—Home Values Relative to Income



Notes: The real mortgage rate is inverted, i.e. it is multiplied by minus one. New home sales are smoothed by taking the four quarter average. Scenario 1 assumes that home price appreciation is 5.0 percent for the next four quarters and that mortgage rates stay flat; scenario 2 assumes that home prices are flat and that mortgage rates rise by 0.5 percentage points; and scenario 3 assumes that home prices decline by 5.0 percent and that mortgage rates rise by 0.5 percentage points. The relationship between new home sales and the real mortgage rate is regression based, using OLS as the two series are cointegrated. Calculations based on BOG (2006d), Census (2006c), and OFHEO (2006).

Worse still, mortgage debt increased faster than home values. This is best reflected in the relative size of home equity to total home values, or the share of a home’s value that a family owns free and clear. Data from the Federal Reserve shows that the share of home values that was not serving as a security for mortgages declined from 2001 to 2005. Based on data in the Federal Reserves’ “Flow of Funds Accounts” report, the share of home equity in homes’ values dropped to 55 percent in 2004, the lowest level on record, from 58 percent in 2001.⁵ Based on another set of data, the Federal Reserves’ “Survey of Consumer Finances”, the home equity-to-home value ratio declined to 65 percent by the end of 2004 from 66 percent in 2001 (see figure 4 below).⁶ The small percentage point drops may seem insignificant except for the fact that over the same period, home prices were soaring.

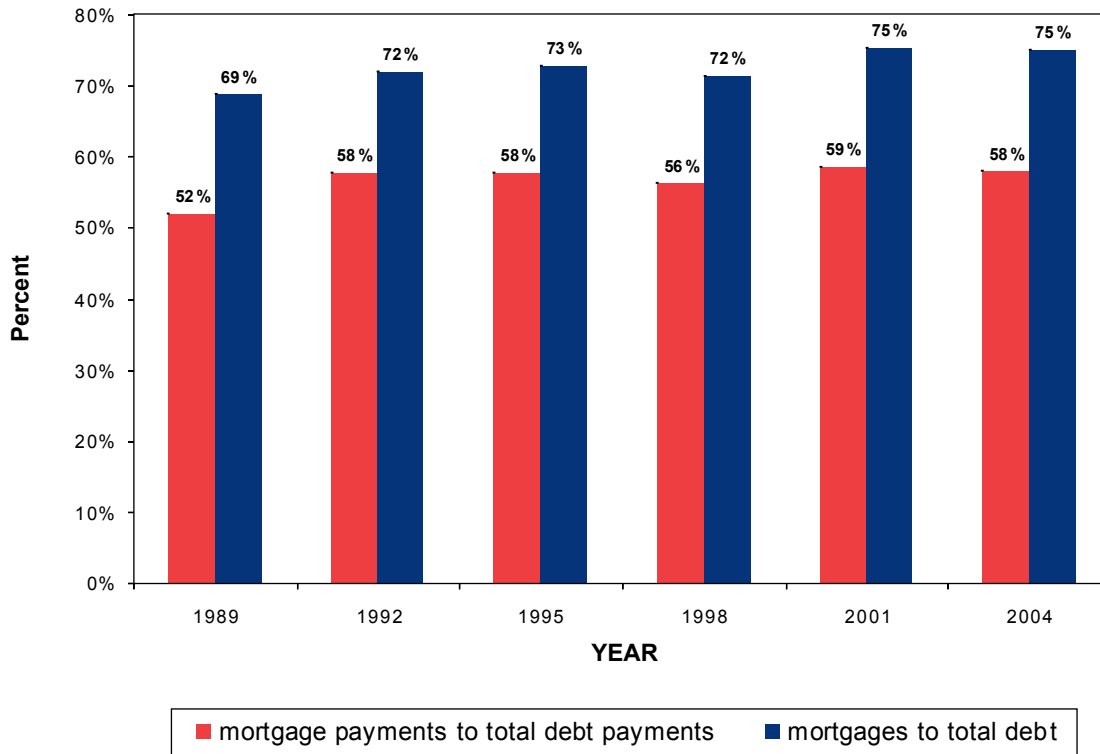
Figure 4—Home Equity as Share of Home Values



Notes: SCF denotes Survey of Consumer Finances (BOG, 2006b). FFA indicates Flow of Funds Accounts (BOG, 2006a). Calculations based on BOG (2006a, 2006b).

The primary reason why families could expand their credit faster than the value of their homes grew was lower interest rates. Interest rates declined after 2001, which eased the burden for borrowers. In fact, the share of total mortgage payments relative to total debt payments declined to 58 percent in 2004 from 59 percent in 2001 (see figure 5, page 12).

Figure 5—The Relative Size of Mortgages and Mortgage Payments



Notes: Calculations based on BOG (2006b).

At the same time, mortgages as share of total debt remained a comparatively high level of 75 percent. This only means that the relative burden of mortgages declined while other forms of credit became relatively more costly. Debt levels overall rose at accelerated rates. As a result, mortgage payments relative to income still rose after 2001. Specifically, for all families the increase in mortgage payments relative to income increased four times faster after 2001 than during the 1990s.⁷ For the typical family, the rise in debt levels offset the decrease in the cost of borrowing.

Data from the Federal Reserve’s “Debt Service Ratios and Financial Obligation Ratio” report shows that this trend continued after 2004. The average share of debt service—principal and interest payments—rose to 14.4 percent in June 2006, the highest level since the Federal Reserve started collecting this data in 1980, from 13.5 percent in the third quarter of 2004.



Variable Interest Rates Eased, Leaving Some Vulnerable to Higher Interest Rates

One way in which families managed to take on more debt and reduce their initial loan payments was through the use of variable interest rate debt instead of fixed rate mortgages. Adjustable rate mortgages, or ARMs, offered lower interest rates as compared to 20-year or 30-year fixed rate mortgages. Variable interest rate products allow families to afford more home than they could with a fixed rate mortgage because the initial short-term interest rates are lower than the long-term rates. In exchange, borrowers accept the risk of interest rates rising in the future. With interest rates at or near historic lows in recent years, the expectation was that the costs of a mortgage will most likely increase in the future, at a time, when—hopefully—incomes have also increased.

A similar logic underlies another form of variable interest rate debt: home equity lines of credit. Many homeowners financed the purchase of their homes at least in part by borrowing against the equity they held in their homes. This helped to keep the costs of the first mortgage down since it could stay within certain size limits required for lower cost mortgages. In addition, many home equity lines also offered low rates that were initially lower than those of fixed rate mortgages.

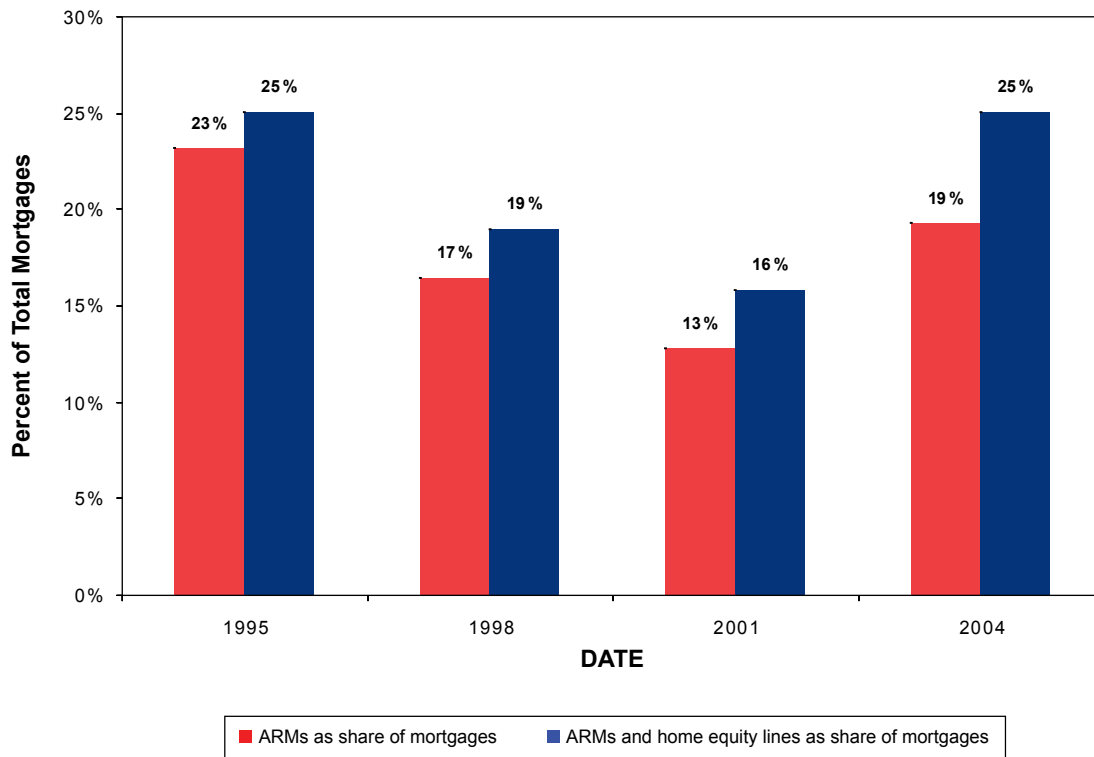
The importance of such variable rate mortgage products declined between 1989 and 2001, but since 2001 both ARMs and home equity lines have jumped as share of total mortgage debt (see figure 6, page 14). The share of ARMs out of total mortgage debt rose to 19 percent in 2004 from 13 percent in 2001, and the share of ARMs and home equity lines out of total mortgage debt grew to 25 percent of total mortgage debt from 16 percent over the same period.⁸

The growth in ARMs between 2001 and 2004 accounted for about two-thirds of the relative increase in variable interest debt, with the other one-third coming from home equity lines of credit. The fast growth of ARMs also meant that more borrowers relied on them in 2004 than in 2001. This is important since the interest rates on these ARMs are now adjusting upward according to the terms of the loans or will soon be adjusted—just as interest rates are edging higher.

In 2004, 16 percent of all families with a mortgage had an ARM, compared to 13 percent in 2001.⁹ But some types of homeowners found ARMs more attractive than others. The share of families with ARMs was higher at both ends of the nation's income distribution than in the middle,¹⁰ suggesting that possibly first-time homeowners were increasingly turning to ARMs for their first mortgage and potentially richer homeowners were opting more often for ARMs to purchase a second home. Yet ARMs were also tapped more often by non-union families than by union families, by white families more than by minority families, and by homeowners between the ages of 45 and 54 than by homeowners 65 and older. Still, the increase in the share of families with ARMs between 2001 and 2004 was almost across the board; it was particularly sharp among families at the very top of the income distribution, among union families, among white families, and among families 65 and older.

The same is true when comparing the average share of variable interest rate debt relative to total mortgage debt. Once again, the use of ARMs was higher at either end of the income distribution than in the middle. In 2004, 22 percent of families with incomes in the bottom fifth of income earners—less than \$19,104—turned to ARMs for their mortgage financing needs. Twenty-five percent of families with incomes in the next quintile—between \$19,104 and \$35,835—tapped ARMs. Families with incomes in the middle fifth of the income distribution with incomes between \$35,835 and \$57,077 opted for ARMs only 12 percent of the time and families in the fourth quintile, with incomes between \$57,077 and \$90,945, used them 15 percent of the time. And 22 percent of families with incomes in the top fifth of the income distribution with incomes above \$90,945 turned to ARMs for their mortgage finance needs.¹¹

Figure 6—The Relative Size of Variable Interest Rate Mortgages



Notes: Mortgage debt refers to mortgages and home equity lines. ARM stands for adjustable rate mortgage. Calculations based on BOG (2006b).



Clearly, homeowners' dependence on ARMs increased sharply after 2001.¹² While these variable interest rate mortgage instruments helped home buyers purchase a home in the middle of a housing boom, they also left them more vulnerable to interest rate increases when the rates on the loans are set to adjust. To see how vulnerable families are in 2006, consider the following calculation. Calculations based on data from the Federal Reserve's "Flow of Funds Accounts" report show that total mortgage debt in June 2006 amounted to 98 percent of disposable income. Let's assume that the share of variable interest rate debt to total mortgage debt remained steady at 25 percent after 2004 (the last year in which complete data was available).¹³ Then it's possible to calculate that if interest rates increased by one percentage point, the debt service burden relative to disposable income would rise on average by 0.25 percentage points.

To put this increase into perspective, consider the effect of higher gasoline prices on household expenditures. In the spring of 2006, gasoline prices rose sharply. As a result, the consumption of gasoline, fuels, and other energy goods rose by 0.4 percentage points relative to disposable income from March 2006 to June 2006. A one percentage point increase in interest rates would be similar to 61 percent of the effect of the gas price jump in the spring of 2006. The only difference is that families can and do make adjustments when gasoline prices rise by driving less, while such direct adjustments by families are not possible with adjustable rate mortgages that finance the house they occupy. What's more, the pain of higher gasoline prices come and go as prices fluctuate, whereas interest rate hikes on adjustable rate mortgages march more steadily in one direction or another over longer periods of time.

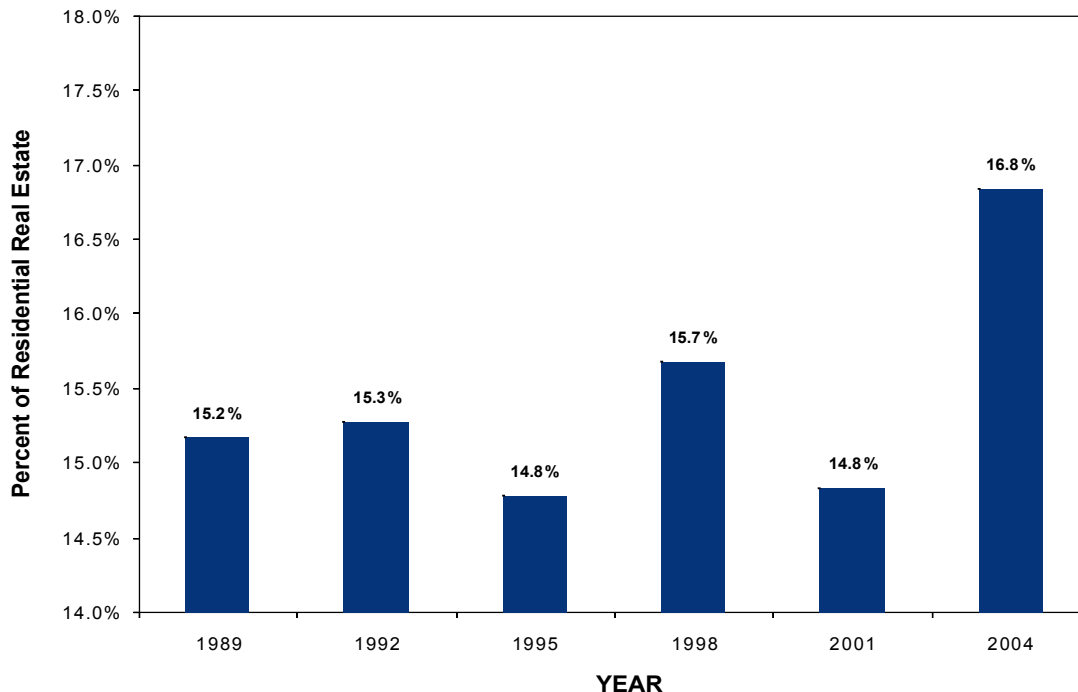
Housing Boom Is Not An Investment Phenomenon

Some economists argue that the debt boom that went along with the housing boom is not worrisome because families registered a bump in wealth alongside rising indebtedness. This argument sees housing as an investment—people borrow money to build wealth—rather than as a consumption item.

It is certainly true that some people borrow more to buy more investment properties and others borrow more to buy their own home in the hopes that it will appreciate. During the recent housing boom, investment properties appeared to play an increasing role in the rising housing market. The share of residential properties other than families' own homes out of total residential real estate grew to 17 percent in 2004 from 15 percent in 2001 (see figure 7, below).

Because the available data does not specifically allocate mortgages to specific property uses, let's assume that mortgage debt dedicated to these residential real estate investment properties grew at the same proportion as they grew relative to all residential real estate. That is, the share of the increase in mortgages that could be ascribed to investments in residential real estate other than families' own properties would be equal to 15 percent of the increase between 2001 and the end of 2004, plus the three percentage points of the final amount of mortgages relative to the total change in mortgage debt.

Figure 7—Other Residential Real Estate as Share of Total Residential Real Estate



Notes: Calculations based on BOG (2006b).



The calculations are detailed in table 2 on page 18. In 2004, total mortgage debt amounted to \$6.7 trillion, as compared \$4.4 trillion in 2001, based on the data from the Survey of Consumer Finances conducted by the Federal Reserve. The difference amounted to \$2.3 trillion over this three-year period. Had the share of other residential real estate not changed, \$350 billion of the increase would have been attributable to investment properties. Because the share of other residential real estate out of total residential real estate grew by two percentage points, an additional \$140 billion (equal to two percent of total mortgages in 2004) can be attributed to these investments.

Based on these calculations, 20.6 percent of the increase in mortgages can be attributed to investment properties. The results are similar when data from the “Flow of Funds Accounts Report”, another of the Federal Reserve’s data sources, are used.

More than 20 percent growth in mortgages due to investments in real estate properties is significant, but what about the nearly 80 percent of the increase in mortgages that were not due to real estate investments? How many of those mortgages were taken out by traditional homeowners in the hopes of investing in their single home amid the housing boom? The growth of homeowners’ share of equity in their own home accelerated substantially after 2001. Between 1989 and 2001, home equity relative to income declined on average by 1.6 percentage points per year, but then grew at annual rate of 9.5 percentage points between 2001 and 2004—from 125 percent of income in 2001 to 153 percent of income in 2004 (see table 2, page 18). This increase in home equity relative to income was especially pronounced among minority families and middle income families.

Concentration of Wealth in Homes Leaves Families Vulnerable

That would seem to be good news, but simply looking at homeowners’ rising home equity relative to income ignores the fact that homeowners need to sell their homes to realize those profits, and then presumably have to reinvest those profits in another home that has also risen in value during the housing boom. Some homeowners no doubt timed their home sales well and then invested their profits in less expensive new homes. But far more homeowners “traded up” to a bigger, more expensive house, reinvesting their profits in the hopes of further home equity gains in a then rising housing market.

Again, for some that second bet on the property market might have paid off again, but many more homeowners today are living in the homes they purchased between 2001 and 2004 and are now facing the prospect that the value of these homes may not rise much more or perhaps fall in value. Certainly the acceleration in home equity values is more the result of faster growth in housing prices than seemed to be warranted by economic fundamentals. If home prices since the mid-1990s had increased at an annual rate similar to rents (the historic norm), then they would have been 20 percent lower in 2004 than they actually were.¹⁴



If home prices are adjusted for some of this overvaluation, most of the acceleration in home equity after 2001 disappears. If home values in 2004, for example, had declined by just 10 percent (less than half the estimated overvaluation) then the median home equity-to-income ratio would have risen by 0.7 percentage points per year from 2001 to 2004, instead of the 9.5 percentage points actual increases (see table 2 below). The growth rate would have been reduced by 93 percent as a result of this correction. If home values are adjusted down by the entire overvaluation of 20 percent, then home equity relative to income would have *dropped* by 8.3 percentage points each year—a swing of 187 percent compared to the actual growth.

Table 2—Changes in Mortgage Debt Attributable to Changes in Other Residential Real Estate, 2001 to 2004

	(1) 2001	(2) 2004	(3) Difference in mortgages ((2)-(1))	(4) Change in mortgages attributable to other real estate if share had remained constant (0.15*(3))	(5) Changes in mortgages attributable only to increase in other real estate (0.02*(2))	(6) Change in mortgages attributable to other residential real estate ((4)+(5))	(7) Share of change attributable to other real estate ((6)/(3))
	\$ trillion	\$ trillion	\$ trillion	\$ trillion	\$ trillion	\$ trillion	Percent
Total mortgages (based on SCF)	\$4.39	\$6.72	\$2.33	\$0.35	\$0.14	\$0.48	20.6
Total mortgages (based on FFA)	\$5.17	\$7.56	\$2.39	\$0.35	\$0.15	\$0.51	21.3

Notes: SCF stands for Survey of Consumer Finances. FFA stands for Flow of Funds Accounts. FFA data refer to September of the respective year. Calculations are based on BOG (2006a, 2006b). Sums do not add to totals due to rounding.

Table 3—Home Equity Relative to Income, With and Without Adjustments for Bubble, by Demographic Characteristics, 2001 to 2004

	2001	2004	Annual change, 1989 to 2001	Annual change, 2001 to 2004			Difference between actual and adjusted ratio in 2004			
				Actual	With 5 pct. adjustment	With 10 pct. adjustment	With 20 pct. adjustment	With 5 pct. adjustment	With 10 pct. adjustment	With 20 pct. adjustment
Total	125%	153%	-1.6	9.5	5.1	0.7	-8.3	-13	-26	-53
By income										
bottom quintile	449%	482%	7.1	10.8	2.8	-9.8	-33.3	-24	-62	-132
second quintile	232%	250%	-0.6	5.7	-0.4	-6.4	-15.9	-18	-36	-65
middle quintile	123%	156%	-2.1	11.1	6.2	1.9	-8.6	-15	-27	-59
fourth quintile	95%	127%	-0.3	10.7	5.4	1.4	-6.2	-16	-28	-51
top quintile	85%	110%	-1.4	8.3	4.7	1.2	-6.1	-11	-21	-43
By race/ethnicity										
white	133%	154%	-0.9	6.8	2.6	-1.5	-10.6	-13	-25	-52
black	69%	138%	-7.5	22.8	19.4	16.2	5.8	-10	-20	-51
hispanic	96%	152%	-2.3	18.9	15.8	8.9	-2.2	-9	-30	-63
By union membership										
union	89%	109%	-1.3	6.5	2.1	-1.5	-9.2	-13	-24	-47
non-union	95%	116%	-1.5	7.1	2.7	-1.4	-9.8	-13	-26	-51
By age										
25 to 34	46%	60%	-1.5	4.6	-0.5	-4.2	-11.1	-15	-26	-47
45 to 54	108%	131%	-2.1	7.8	2.7	-1.3	-9.5	-15	-27	-52
65 and older	345%	369%	4.7	8.1	1.9	-4.9	-17.5	-19	-39	-77

Notes: All figures are in percent. Changes are in percentage points. Calculations are based on BOG (2006b).



Now consider the high amounts of mortgage debt these homeowners piled onto their homes against the backdrop of 10-to-20 percent less appreciation in home prices. Homeowners today are highly leveraged and would be very vulnerable to moderate declines in home prices. That didn't happen between 2001 and 2004, but it's happening now. Comparatively modest drops in home values could quickly erase gains in home equity because families already spent gains in home values by borrowing substantially more.

Any losses in home equity relative to income would be the largest for those families who have large exposures to the real estate market relative to their income. This is especially true for low-income families, Hispanics, non-union members, and homeowners 65 years of age and older (see table 3, page 19). Had homeowners faced a 10 percent downward adjustment to home values in 2004, then America's least one-fifth of wealthy families would have seen a drop in their home equity relative to income by 62 percentage points, compared to a drop of only 21 percentage points for the wealthiest one-fifth of families.

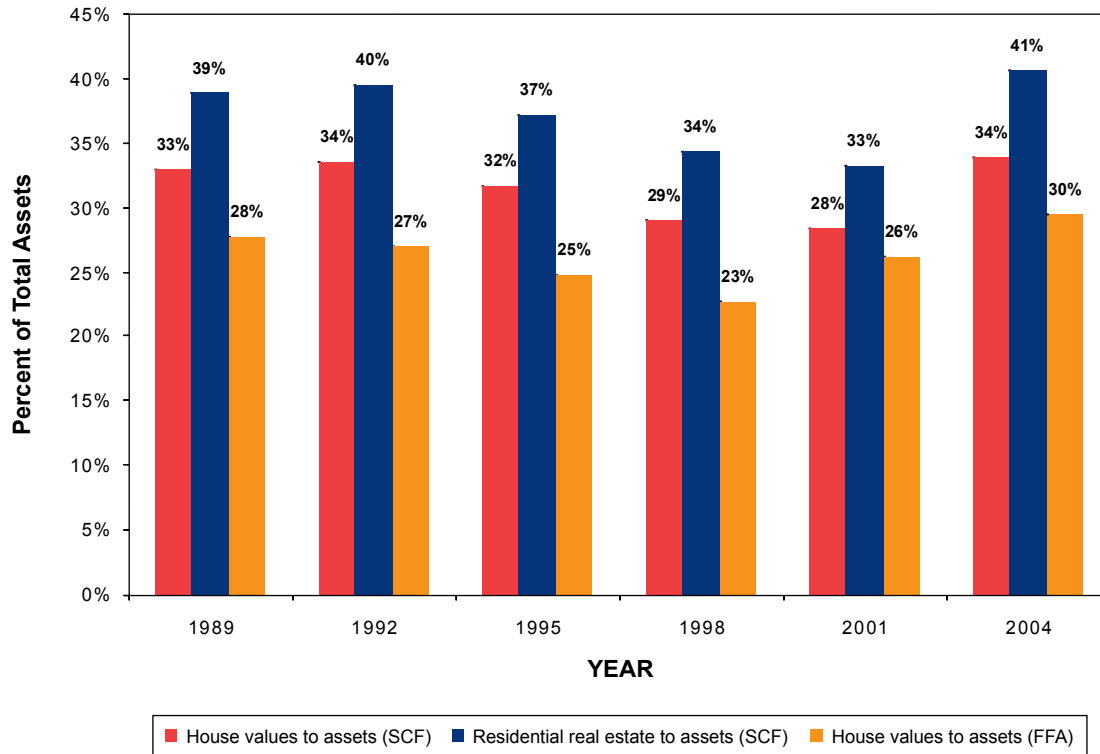
The recent housing boom did indeed result in a boost to home equity values, but the simultaneous and larger increase in mortgage debt means that families could lose large shares of their investment returns—the additional home equity—if their home values decline. After all, the drop in prices would be relative to the entire home's value, regardless of how much (or little) the home owner actually owns.

The smaller the share of the house that the homeowner actually owns, the larger the relative loss to the homeowner's equity will be. Because homeowners have already spent some of their equity by borrowing against it, they stand to lose more than they otherwise would have in case of a market correction. That's why moderate changes in home values can translate into large changes in home equity value relative to income.

Not only are homeowners particularly exposed to losses in their home equity if the housing market undergoes a substantial correction, but they also could lose larger shares of their total assets than would be the case—given that home values were a predominant share of total family assets. If houses are only 25 percent of a family's total assets, a 10 percent decline in home values translates into a 2.5 percent drop in total assets. However, if the share of houses in a family's portfolio is equal to 50 percent, the same 10 percent decline equals a five percent drop in total assets.

Alas, the most recent figures on families' total assets show that families have become substantially more exposed to the real estate market. In 2001, houses made up 28 percent of total assets and all residential real estate made up 33 percent of total assets, according to data from the Federal Reserve's "Survey of Consumer Finance." By 2004, the ratios had grown to 34 percent and 41 percent, respectively. These were the highest ratios since the Federal Reserve began to collect this data in 1989 (see figure 8, page 21).

Figure 8—The Relative Importance of Houses In Family Assets



Notes: SCF denotes Survey of Consumer Finances (BOG, 2006b). FFA indicates Flow of Funds Accounts (BOG, 2006a). Calculations based on BOG (2006a, 2006b).

The Federal Reserve’s “Flow of Funds Accounts” report shows a similar upward trend, from 26 percent in 2001 to 30 percent in 2004. In fact, calculations based on this data indicate that the share of home values to total assets never exceeded 29 percent before 2004 and that it continued to increase to 31 percent by June 2006.¹⁵ The share of houses out of total assets is largest for minorities, middle income families, young families, and union families.¹⁶ Moreover, the share of houses out of total assets grew faster for middle income families, white and Hispanic families, union families, and young families, leaving them especially vulnerable to corrections in the housing market.

Home Owners Are More Vulnerable at Peak of Housing Market Than Before

Clearly, many more homeowners are vulnerable to adverse changes in the housing market today than at the start of the real estate boom. And because of their higher mortgage debt-to-income ratio they are also more vulnerable to adverse trends in the economy. Mortgage payments have already gone up relative to incomes since 2004, making it harder for homeowners to save or pay for other consumption items. In addition, the share of families with variable interest rate debt has increased, leaving many exposed to interest rate increases, which would again make it harder to save or pay for other items.



Furthermore, families could experience substantial losses in their home equity and in their total assets if the housing market undergoes a correction. Their exposure to a decline in housing values has increased as the share of home equity out of total home values has declined and as the share of home values out of total assets has grown.

How vulnerable are homeowners? Consider the following four measures and then glance at table 4 on page 23, which gauges the percentage of homeowners who could be exposed to each of these four vulnerability measures.

The first measure: Mortgage payments have gone up both on average and for the median household. Vulnerability can thus be expressed as the share of families with particularly high mortgage payments. Here, mortgage payments in excess of one-third of income are defined as particularly high.

The second measure: Greater use of variable rate interest instruments has left many families more exposed than in the past to interest rate increases. Adjustable rate mortgages and home equity lines in excess of 50 percent of income are defined as particularly high.

The third measure: Homeowners' share of home equity relative to a home's value. The lower the share of home equity, the more exposed homeowners are to declines in home values. Here, homeowners are considered vulnerable if their home equity is less than 25 percent of the house's value.

The fourth measure: The larger the share of a family's home equity to total assets, the more exposed a family is to losses in the real estate market. Here, the threshold for a home's share out of total assets is set for 75 percent.

Table 4 on page 23 provides several summary statistics of these vulnerability measures. It first shows the total share of homeowners for whom the respective vulnerability measures apply. Then, it shows the share of homeowners for whom *exactly* one measure, *exactly* two measures, *exactly* three measures, and all four measures apply. The final line shows the share of homeowners for whom *at least one* vulnerability measure applies.

All these sets of data show that homeowners became more vulnerable after 2001. In the cases of exposure to variable interest debt and the share of houses as a percentage of total assets, the shares rose to the highest levels on record. The share of home owners with at least 90 percent of their assets tied up in their homes grew to 29.8 percent in 2004, up from 22.1 percent and higher than even in the early 1990s.

Table 4—Summary of Home Owner Vulnerability Measures, 1989 to 2004

Share of families with...	1989	1992	1995	1998	2001	2004	Annual pct. pt. change, 1989 to 2001	Annual pct. pt. change, 2001 to 2004
mortgage payments in excess of one third of income	5.5%	7.9%	7.5%	9.2%	7.1%	8.1%	0.1	0.3
adjustable rate mortgages and home equity lines in excess of 50% of income	n.a.	n.a.	10.8%	9.7%	8.0%	12.3%	0.7	1.4
home equity less than 25% of home value	10.4%	14.1%	18.0%	19.5%	17.9%	19.1%	0.6	0.4
houses greater than 90% of assets	27.4%	29.6%	28.3%	21.4%	22.1%	29.8%	-0.4	2.6
exactly one vulnerability measure	n.a.	n.a.	32.7%	30.6%	27.2%	32.4%	n.a.	1.8
exactly two vulnerability measures	n.a.	n.a.	10.5%	10.6%	9.5%	12.4%	n.a.	1.0
exactly three vulnerability measures	n.a.	n.a.	3.7%	3.0%	2.4%	4.0%	n.a.	0.6
all four vulnerability measures	n.a.	n.a.	0.3%	0.2%	0.4%	0.3%	n.a.	0.0
at least one vulnerability measure applies	n.a.	n.a.	47.3%	44.3%	39.4%	49.1%	n.a.	3.2

Notes: All figures are in percent. Changes are in percentage points. Calculations based on BOG (2006b).

In the remaining two instances of vulnerability, the increases after 2001 erased much of the improvements from 1998 to 2001. For instance, the share of homeowners who owned less than one-fourth of their homes declined from 19.5 percent in 1998 to 17.9 percent in 2001 before increasing again to 19.1 percent in 2004. Almost all combined measures of vulnerability show a rise to unprecedented levels by 2004.

Consequently, the share of homeowners with at least one indicator of vulnerability increased to its highest level since 1995, with close to half of all homeowners exposed to at least one of the measures of vulnerability. The upshot: Many homeowners found themselves in a more precarious situation in 2004 than at any point in the previous nine years. This is particularly important since all signs indicate that the trends in vulnerability have increased since then.



End of Housing Boom Spells Slower Economic Growth

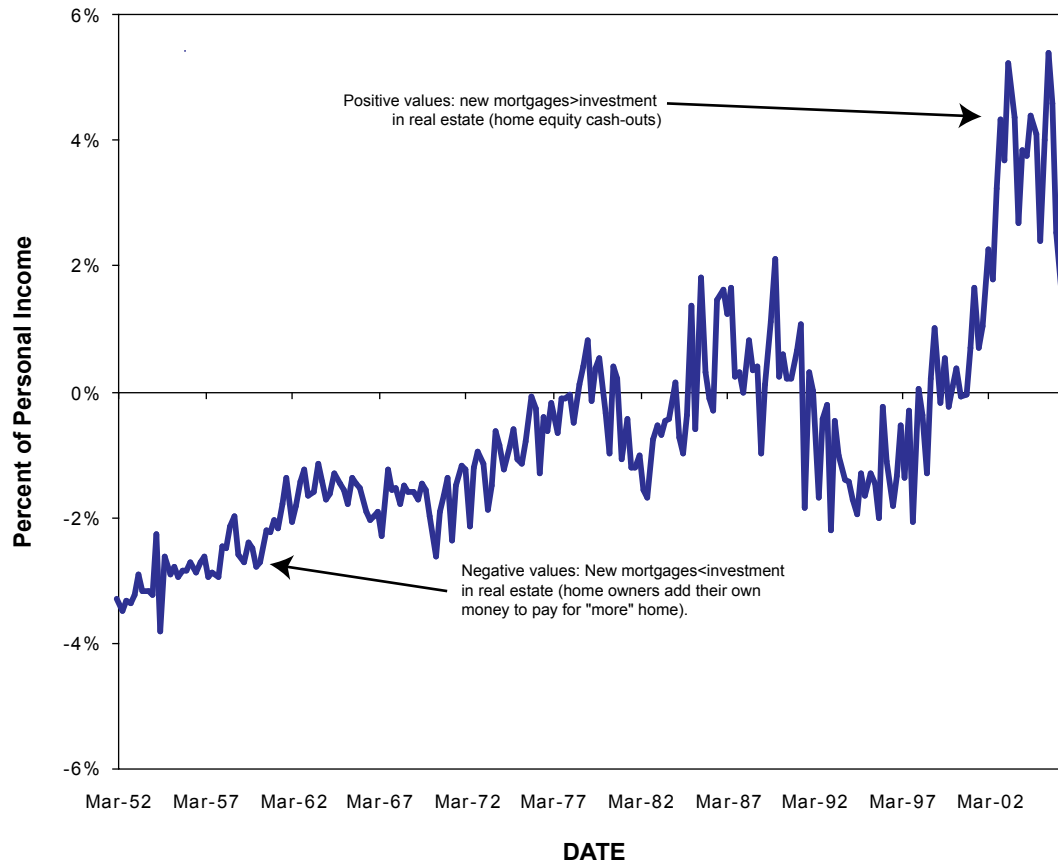
Homeowners, however, are not the only ones exposed to the dangers at the end of the Great American housing boom. Construction and construction-related employment, such as building materials and real estate finance, and housing-related industries such as furniture manufacturing and retail sales, all registered strong growth during the housing boom. In the current business cycle that began in March 2001, construction and other housing-related sectors were responsible for most jobs created in the private sector. In the first five years of this business cycle, from March 2001 through March 2006 (before the housing market started to slow) job growth in construction and related sectors accounted for 41.6 percent of all newly created jobs and for 69.1 percent of all new private sector jobs.¹⁷ All these newly hired employees spent most of their money on a broad range of consumption items, thereby boosting consumption everywhere.

Another contributing factor to economic growth over this period was homeowners cashing out the equity in their homes and spending that additional money on consumption outside of their homes. Throughout the most recent business cycle, homeowners regularly took out more mortgage and home equity debt than they reinvested in bigger homes and in home renovations (see figure 9, page 25). These home equity “cash outs,” which are also often referred to as “mortgage equity withdrawals,” or MEWs, were augmenting homeowners’ total income by more than five percent by late 2005. On an annual basis, these families had an additional \$416 billion to spend in 2005 due to these MEWs.

By June 2006, however, the rate of MEWs had dropped to its lowest level since the end of 2001. In particular, the rate of MEWs in the second quarter of 2006 was 1.3 percent of personal income (or \$36 billion), down from 5.4 percent in the third quarter of 2005 (\$137 billion) and almost half of the 2.5 percent in the first quarter of 2006 (\$67 billion). With fewer MEWs, families also have less money for consumption.

To understand the effect of home equity cash-outs on consumption it is instructive to consider the relationship between MEWs and consumption over the past few years. From March 2001 through June 2006, personal consumption expenditures increased by \$2.3 trillion. Over the same period, personal disposable income grew by \$2.1 trillion. That is, additional disposable income covered 94 percent of the increase in consumption. Lower personal savings, which reflect, but are not identical to MEWs, covered an additional 8.5 percent of that increase.¹⁸

Figure 9—Difference Between Mortgages and Real Estate Investment Relative to Income



Notes: Calculations based on BOG (2006a).

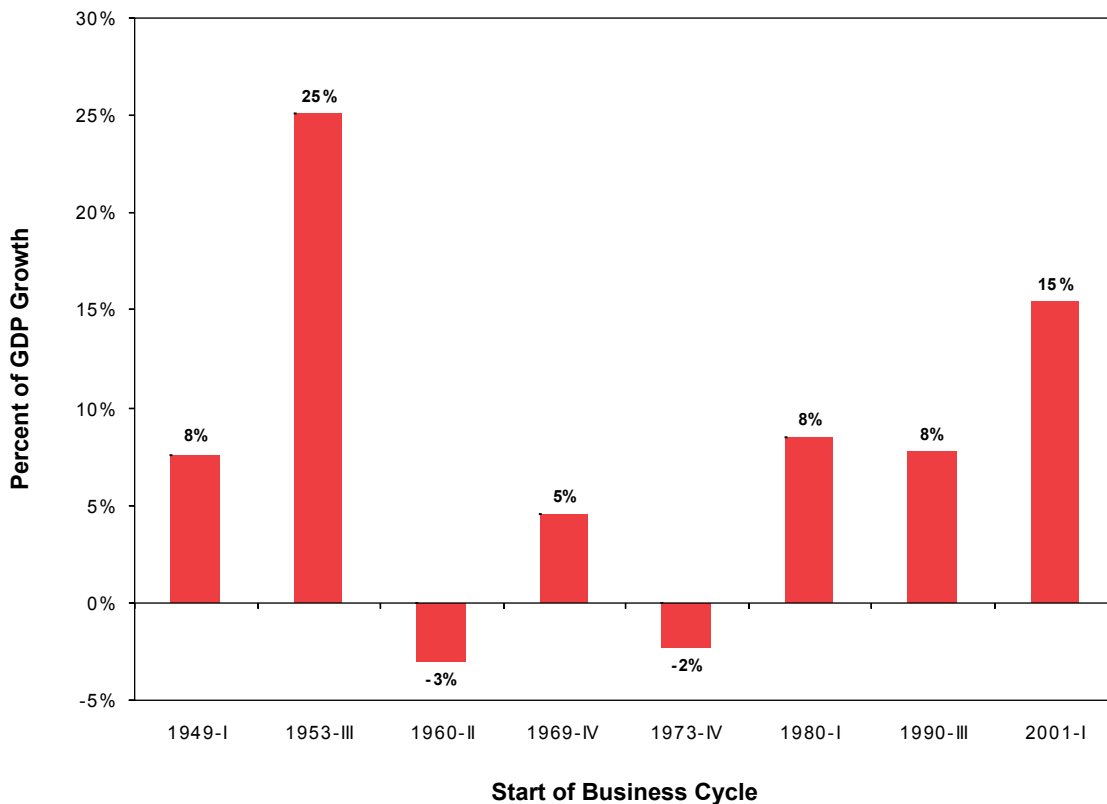
Because of the decline in personal saving, consumption was \$785 billion larger than it otherwise would have been in June 2006. That is a difference of 5.9 percentage points of Gross Domestic Product. Had consumption (and thus activity in the economy) not increased by this amount, at least the past two years of economic expansion would have disappeared and the economy, in inflation-adjusted terms, would have been as large in September 2006 as in September 2004.^{19,20}

A broader way to think about the link between rising home values and consumption is the so-called wealth effect. This phenomenon basically posits that the growing value of assets—in this case, homes—beyond people’s expectations leads to fewer savings and more consumption because people can more easily meet their savings goals via the growing value of their assets. They are richer and thus consume more by saving less.

The Federal Reserve in 2004 estimated in a commissioned report titled “Housing Consumption and Credit Constraints” that consumption increases by 0.04 percent to 0.05 percent for each one percent increase in home values. From March 2001 to June 2006, housing values grew by 54 percent in inflation-adjusted terms. This would mean an increase in inflation-adjusted consumption of two percent to three percent. The actual increase in consumption was 18 percent, which means that the wealth effect explains between 13 percent and 15 percent of the increase in real consumption during the current business cycle.

The MEW boom resulting from the wealth effect is obviously not the only way in which the housing market can affect the economy. Importantly, spending on new homes and home renovations contributed relatively more to economic growth than at any point since the 1950s (see figure 10 below). In this business cycle, household spending on new homes and improvements to existing homes explained 15 percent of economic growth, second only to 25 percent in the 1950s.

Figure 10—Quarterly Growth Contribution from Residential Real Estate, Business Cycle Averages



Notes: Calculations based on BOG (2006a).



Other more sophisticated analyses of the total impact of the housing market on the economy are even more telling. According to David Rosenberg, Merrill Lynch & Co.'s chief economist, housing accounted for 55 percent of the rise in gross domestic product in 2005. Indeed, with home price increases slowing, the housing market is already taking a toll on the economy. Less employment growth and fewer MEWs meant less momentum for consumption growth. The economic growth contribution from increased consumption was a relatively low 2.1 percentage points in the third quarter 2006, following a meager 1.8 percentage points on an annualized basis in the second quarter, and down from a more typical 3.4 percentage points in the first quarter.

Because of a slowdown in consumption, the economy would have had to find 1.3 percentage points of economic growth in the third quarter outside of consumption just to grow at the same rate as in the first quarter. It did not, which led to a substantial slowdown in economic growth, from 5.6 percent in the first quarter to 2.2 percent in the third quarter. In addition, the economic growth contribution from residential real estate was negative 0.7 percentage points in the second quarter and a negative 1.2 percentage points in the third quarter. The reason: Spending by families on their homes declined by 11.1 percent in inflation-adjusted terms on an annualized basis in the second quarter and by 18.0 percent in the third quarter of 2006, according to the Bureau of Economic Analysis's "National Income and Product Accounts" report earlier this year.

A slowing housing sector and less consumption growth also began to take a toll on job creation in the summer of 2006. According to data from the Bureau of Labor Statistics's Current Employment Survey, retail sector employment, which directly reflects changes in consumption, declined in five out of six months from April to September 2006.²¹ Moreover, construction and construction-related sectors saw sharply lower job creation in 2006. Between March 2006 and September 2006, job creation in these sectors averaged a little over 8,000 new jobs, down from more than 40,000 new jobs per month in the preceding six months.

With a flat to retreating housing market now apparent, the future outlook for the economy seems less bright. A flattening of prices could reduce consumer spending growth by as much as one percentage point in 2006. And according to Goldman Sachs & Co., the housing slowdown could subtract 1.5 percentage points from GDP growth in 2007. Half of that predicted drag on economic growth comes from a slowdown in residential construction and investment, and half from a slowdown in consumer spending due to less mortgage equity withdrawals.



The available data, however, offers indications that the housing slowdown could toss the economy into a more vicious downward cycle. Less housing activity means less employment in construction and housing-related sectors and less consumption growth, which in turn means less economic growth and declining employment in other sectors. As employment and economic growth decelerates, the housing market may slow further as people become more reluctant to take on additional debt to purchase or renovate a home or to finance other consumption.

Conclusion

The housing boom, particularly in the past six years, has had serious implications for American families and the economy. Specifically, the run-up in home prices made it harder for lower income families to become homeowners. At the same time, those who were homeowners had to take on more debt, often in the form of variable interest rate debt, to finance their homes. The result: Families paid higher shares of their income in debt service, which in turn leaves them more vulnerable than ever before to interest rate increases as well as to declines in home prices. Because the sharp rise in home prices has allowed families to borrow record amounts of money that often was not spent on their homes, a decline in home values could also spell an end to mortgage equity withdrawals and thus less consumption growth. In addition, lower home prices will likely mean fewer home sales, which can lead to less construction activity and thus fewer jobs in this and related sectors.



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Appendix

A-1 Detailed Tables

Table A-1—Median Home values Relative to Income, by Demographic Characteristics, 1989 to 2004

Year	1989	1992	1995	1998	2001	2004	Annual pct. pt. change, 1989 to 2001	Annual pct. pt. change, 2001 to 2004
Total	213%	222%	220%	224%	231%	281%	1.5	16.7
By income								
bottom quintile	412%	569%	577%	557%	572%	591%	13.3	6.2
second quintile	300%	293%	330%	329%	327%	376%	2.3	16.5
middle quintile	220%	244%	222%	226%	236%	304%	1.4	22.7
fourth quintile	173%	182%	193%	191%	203%	253%	2.5	16.6
top quintile	168%	156%	152%	156%	166%	209%	-0.2	14.1
By race/ethnicity								
white	210%	222%	220%	222%	233%	277%	2.0	14.5
black	215%	213%	217%	223%	209%	271%	-0.5	21.0
hispanic	240%	251%	244%	247%	216%	349%	-2.0	44.4
By union membership								
union	179%	176%	186%	195%	195%	251%	1.3	18.7
non-union	190%	189%	203%	202%	212%	254%	1.8	14.3
By age								
25 to 34	180%	176%	191%	187%	195%	246%	1.2	17.2
45 to 54	188%	183%	191%	200%	205%	253%	1.4	16.1
65 and older	314%	346%	374%	376%	389%	405%	6.3	5.2

Notes: All figures are in percent. Changes are in percentage points. Calculations are based on BOG (2006b).

Table A-2—Median Mortgage Payments Relative to Income, by Demographic Characteristics, 1989 to 2004

Year	1989	1992	1995	1998	2001	2004	Annual pct. pt. change, 1989 to 2001	Annual pct. pt. change, 2001 to 2004
Total	13%	16%	16%	16%	15%	16%	0.1%	0.4%
By income								
bottom quintile	30%	371%	43%	47%	41%	38%	0.9%	-0.9%
second quintile	18%	21%	23%	27%	22%	25%	0.3%	1.0%
middle quintile	15%	19%	18%	18%	18%	20%	0.3%	0.4%
fourth quintile	13%	16%	15%	15%	14%	16%	0.1%	0.7%
top quintile	10%	11%	11%	12%	11%	12%	0.1%	0.3%
By race/ethnicity								
white	13%	16%	15%	16%	14%	16%	0.1%	0.4%
black	14%	15%	18%	19%	16%	20%	0.1%	1.4%
hispanic	17%	21%	23%	22%	20%	22%	0.3%	0.4%
By union membership								
union	12%	14%	15%	15%	14%	16%	0.1%	0.8%
non-union	14%	16%	16%	16%	15%	16%	0.1%	0.3%
By age								
25 to 34	17%	18%	18%	18%	16%	18%	-0.1%	0.7%
45 to 54	11%	14%	13%	16%	14%	15%	0.3%	0.3%
65 and older	14%	16%	17%	17%	18%	17%	0.3%	-0.5%

Notes: All figures are in percent. Changes are in percentage points. Calculations are based on BOG (2006b).

Table A-3—Share of Families with Adjustable Rate Mortgages (ARMs), by Demographic Characteristics, 1995 to 2004

Year	1995	1998	2001	2004	Annual pct. pt. change, 1989 to 2001	Annual pct. pt. change, 2001 to 2004
Total	20%	15%	13%	16%	-1.3	1.2
By income						
bottom quintile	30%	12%	18%	18%	-1.9	-0.2
second quintile	17%	17%	17%	19%	0.0	0.4
middle quintile	22%	16%	12%	12%	-1.6	0.1
fourth quintile	22%	16%	12%	15%	-1.6	1.0
top quintile	18%	15%	11%	19%	-1.1	2.7
By race/ethnicity						
white	20%	16%	12%	17%	-1.3	1.6
black	20%	13%	13%	14%	-1.1	0.3
hispanic	24%	6%	18%	16%	-1.1	-0.6
By union membership						
union	18%	12%	11%	15%	-1.3	1.4
non-union	20%	17%	13%	17%	-1.2	1.1
By age						
45 to 54	20%	15%	18%	19%	-0.4	0.4
65 and older	24%	16%	11%	15%	-2.1	1.2

Notes: All figures are in percent. Changes are in percentage points. Calculations are based on BOG (2006b).

Table A-4—Share of Adjustable Rate Mortgages (ARMs) out of Mortgage Debt, by Demographic Characteristics, 1995 to 2004

Year	1995	1998	2001	2004	Annual pct. pt. change, 1989 to 2001	Annual pct. pt. change, 2001 to 2004
Total	23%	17%	13%	19%	-1.7	2.2
By income						
bottom quintile	42%	19%	25%	22%	-2.8	-0.9
second quintile	21%	18%	19%	25%	-0.3	2.0
middle quintile	24%	17%	10%	11%	-2.3	0.2
fourth quintile	25%	15%	12%	17%	-2.1	1.7
top quintile	21%	17%	12%	22%	-1.5	3.2
By race/ethnicity						
white	22%	18%	12%	20%	-1.7	2.6
black	27%	16%	11%	15%	-2.8	1.4
hispanic	26%	9%	15%	20%	-1.9	1.6
By union membership						
union	20%	13%	8%	19%	-2.1	3.5
non-union	24%	18%	13%	19%	-1.7	1.7
By age						
45 to 54	23%	15%	16%	24%	-1.2	2.8
65 and older	19%	16%	11%	19%	-1.4	2.9

Notes: All figures are in percent. Changes are in percentage points. Calculations are based on BOG (2006b).

Table A-5—Houses as Share of Total Assets, by Demographic Characteristics, 1989 to 2004

Year	1989	1992	1995	1998	2001	2004	Annual pct. pt. change, 1989 to 2001	Annual pct. pt. change, 2001 to 2004
Total	33%	34%	32%	29%	28%	34%	-0.6	1.8
By income								
bottom quintile	51%	58%	49%	52%	54%	52%	0.2	-0.8
second quintile	50%	51%	51%	46%	50%	53%	0.0	1.2
middle quintile	45%	44%	46%	45%	41%	53%	-0.4	4.1
fourth quintile	44%	46%	43%	40%	40%	46%	-0.4	1.8
top quintile	25%	24%	22%	19%	21%	26%	-0.4	1.7
By race/ethnicity								
white	31%	33%	30%	28%	27%	32%	-0.4	1.7
black	55%	50%	54%	47%	57%	49%	0.2	-2.4
hispanic	57%	48%	55%	45%	48%	53%	-0.8	1.7
By union membership								
union	55%	48%	46%	42%	40%	47%	-1.3	2.5
non-union	29%	30%	29%	27%	27%	32%	-0.2	1.6
By age								
25 to 34	48%	51%	51%	42%	46%	59%	-0.2	4.4
45 to 54	33%	32%	30%	28%	29%	33%	-0.4	1.6
65 and older	25%	29%	26%	26%	24%	30%	-0.1	1.8

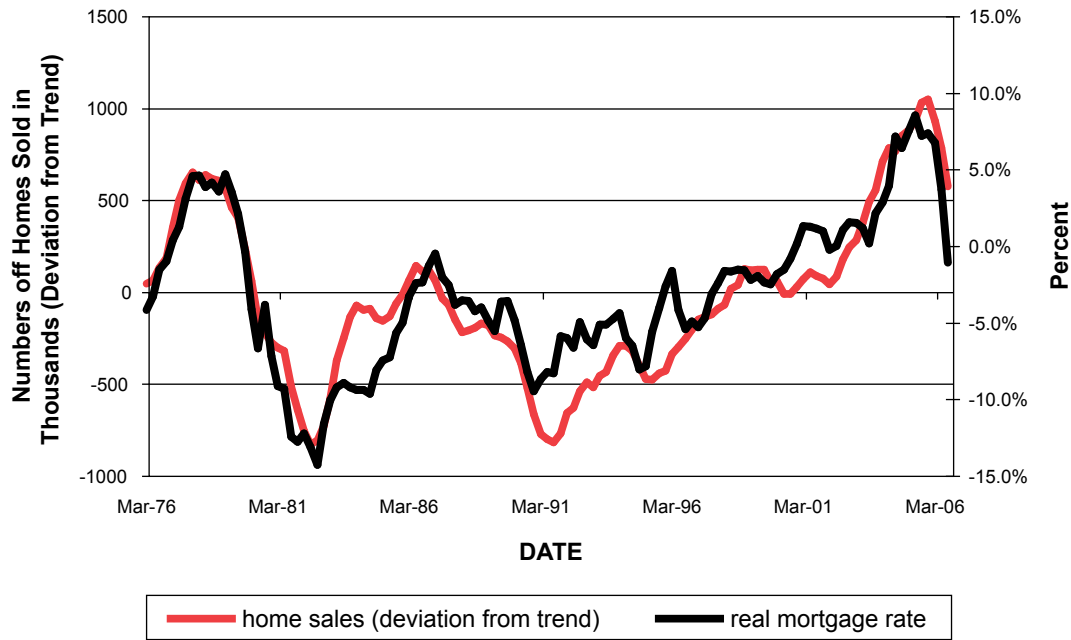
Notes: All figures are in percent. Changes are in percentage points. Calculations are based on BOG (2006b).

A-2 The Relationship between the Real Mortgage Rate and Houses Sold

The text discussed the statistical relationship between the real mortgage rate and new home sales. This focus was chosen since new home sales affect economic growth, while existing home sales do not. However, the relationship established in the main part of the text exists also between real mortgage rates and total home sales. Again, the real mortgage rate is defined as the difference between the actual mortgage rate and home price appreciation, based on the Office of Federal Housing Enterprise Oversight's 2006 House Price Index. For the purpose of the graphic display, the real mortgage rate is inverted, since there is an inverse relationship between the real mortgage rate and home sales. A higher real mortgage rate leads to fewer sales and vice versa. Since the absolute number of existing home sales presumably increases with population, which grows over time, the trend growth of homes sold is taken out of the actual series, so that only the changes above and below the trend are considered. Figure A-1 shows the relationship between the real mortgage rate and the movements of home sales around the trend. As with new home sales, the two series track each other very closely.

So what effects will a change in the real mortgage rate have on all home sales? For instance, if home price appreciation grows at a year-over-year rate of five percent and the mortgage rate stays flat, then the trend deviation declines by 41 percent over the next year. Since home sales in

Figure A-1—Real Mortgage Rates and Houses Sold, 1975 to 2006



Notes: The real mortgage rate is inverted, i.e. it is multiplied by minus one. Home sales are first detrended and then smoothed by taking the four quarter average. Calculations based on BOG (2006d), Census (2006c), and OFHEO (2006).

the last quarter were on average 8.2 percent above trend, this would mean a reduction in total sales by 3.4 percent. If instead prices stayed flat and the mortgage rate rose by 0.5 percentage points, sales above trend would decline by 103 percent. That is, total sales would drop by 8.2 percent. Finally, if home prices dropped by five percent and mortgage rates rose by 0.5 percentage points, the deviation from trend would decline by 155 percent. That is, total home sales would decline by 12.7 percent from their level in the third quarter of 2006. In all cases, moderate changes would continue the sharp decline in above-trend home sales that started at the end of 2005.

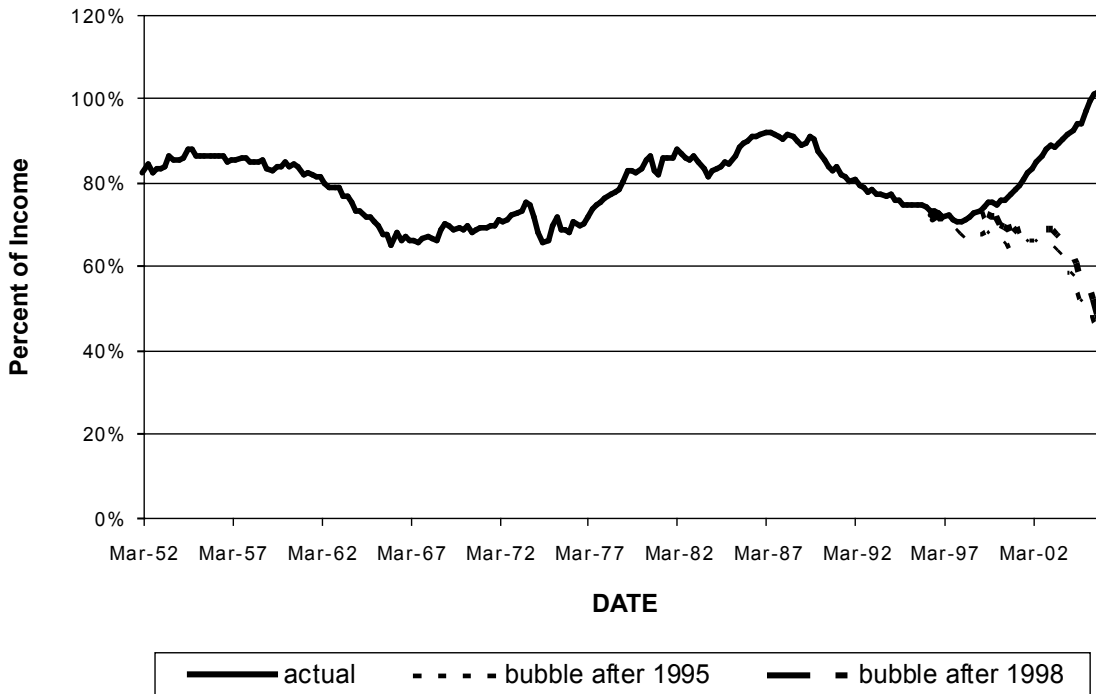
A-3 Adjusting for the home price overvaluations

Traditionally home prices have risen in line with rental prices. This relationship can be used to adjust home equity values for the overvaluation in the housing market. Specifically, home prices are deflated by the difference between the 2006 House Price Index from the Office of Federal Housing Enterprise Oversight and the 2006 Consumer Price Index for rental properties from the Bureau of Labor Statistics. The only decision to consider is when the housing bubble really started. Housing values started to outpace rents in 1995. However, it was not until 1998 that home price values had recovered the losses suffered in the early 1990s.²² Consequently, both

starting points—1995 and 1998—are used here. If adjustments are made starting in 1995, home equity values relative to income would have stayed flat through 1999 and then would have declined, first gradually and then at an accelerated rate after 2003 (see figure A-2). Similarly, if adjustments are made starting in 1998, home equity values relative to income would have fallen after 2003. By September 2004, the ratio of home equity to income would have averaged 52 percent with adjustments since 1995 and 56 percent with adjustments after 1998, instead of the actual ratio of 93 percent.

The underlying calculation can be used to arrive at an approximate estimate of the overvaluation in home values. If home values are deflated by the difference between home prices and rents after 1995, they would have been 24 percent lower in September 2004 than they actually were. If home values are deflated starting in 1998, they would have been 22 percent lower. This adjustment process suggests an overvaluation of more than 20 percent in 2004. Other observers have either put the overvaluation even higher, based, for instance, on the difference between home prices and rents (see Bibliography: Baker, 2006, 2003, 2002) or implied stronger gains based on accelerated median price increases (See Bibliography: Chen, 2004; Zandi, 2002).

Figure A-2—Home Equity Relative to Income, With and Without Adjustments for Real Estate Bubble, 1952 to 2006



Notes: Calculations are based on BOG (2006a), BLS (2006a), and OFHEO (2006).



Endnotes:

- ¹ The same acceleration after 2001 is noticeable for the median family, instead of the average family. Also, it holds for almost all demographic groups, except low income families, and families 65 years of age and older. The sharpest acceleration in home values relative to income came for middle income families, union families, young families, and Hispanic families. See table A-1 in the appendix for more details.
- ² See the appendix for a complete list of references cited in this report.
- ³ See appendix A.2 for one possible calculation of the overvaluation in the housing market.
- ⁴ Similar graphs can be plotted for the trend deviation of all home sales. See the appendix for a discussion of the link between the real mortgage rate and all home sales. New home sales are chosen here since those are the ones that are impacting economic growth and employment in construction.
- ⁵ Since then the ratio has decline to 54 percent in the second quarter of 2006 (BOG, 2006a).
- ⁶ The difference in levels stems from several factors. The FFA data includes non-profits, while the SCF does not. The FFA data refers to values at the end of September, while SCF data is collected in the latter part of the year, spanning several quarters. The original sources differ between the two data sets. The SCF is a household survey. The FFA is a secondary data source that incorporates data from several primary data sources. Home values in the SCF refer to owner occupied housing, while home values in the FFA can cover both owner occupied and investment properties. Both sources are used here to show the robustness of the trend between 2001 and 2004 and between 1989 and 2004.
- ⁷ See table A-2 in the appendix for more details.
- ⁸ More recent figures suggest that the growth in variable interest rate instruments continued after 2004 (GAO, 2006).
- ⁹ See table A-3 in the appendix for more details.
- ¹⁰ It is worth noting that low income and minority families are more likely than their counterparts to obtain non-traditional mortgage products in the subprime market with higher costs (Calhoun, 2006; CRL, 2006)
- ¹¹ See table A-4 in the appendix for more details.
- ¹² The trends are similar when ARMs and home equity lines are considered. Details are available from the author.
- ¹³ Given continued growth in variable interest products after 2004, this assumption likely understates the size of the effect of higher interest rates on debt payments.
- ¹⁴ See the appendix for a detailed discussion of the underlying figures.
- ¹⁵ Even though the levels differ between SCF and FFA values, the FFA data is reported here to show for the robustness of the trends and to allow for a discussion of trends longer than what would be possible solely with SCF data.
- ¹⁶ See table A-5 in the appendix for more details.
- ¹⁷ Calculations based on BLS (2006b).
- ¹⁸ The discrepancy is explained by faster growth in other forms of spending, such as transfer payments to the rest of the world and interest payments. That is, because families sent more money abroad and spent more on interest payments, they needed to increase their resources even faster to maintain their consumption levels.
- ¹⁹ These calculations ignore any ripple effects from higher employment in the retail sector that resulted from more consumption spending.
- ²⁰ This calculation excludes any multiplier effects over time.
- ²¹ Part of this decline may be attributable to industry restructuring, which appears to recur on a regular basis. A decline in retail of this magnitude, though, has not happened since 2003, i.e. economic factors may be at work in addition to industry restructuring.
- ²² Alan Greenspan put the start of the housing market run-up, to which he referred to as “froth,” in 2001 based on accelerated price increases since then (Greenspan, 2005).



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