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Boom or Bubble in the US Real Estate Market?*

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Abstract

This paper attempts to provide an answer to the question whether the recent surge in US real estate prices is fundamentally driven, or whether the current situation reflects bubble symptoms. This is a question of paramount importance since in the case of a bubble in real estate prices the question emerges if and how the Fed should react to it. Implicitly, also monetary policy in the euro area in these days is addressed as well with France and Spain experiencing exorbitant price increases of real estate during at least the last four years and the ECB trying to play down the dangers of this development for price stability.

Our aim is to divide the valuation of the US housing market into a “bubble” component and into a fundamentally justified component. For this purpose, the US real estate market and its peculiarities are described and empirical indications of a bubble are identified. We contrast the empirical results with the ongoing question whether asset prices and asset price bubbles are and should be a matter of attention to central bank authorities in the process of monetary policy making.

JEL Classifications: E52, G12.

Keywords: Asset prices, bubbles, Federal Reserve, real estate, monetary policy, inflation.

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1 Introduction

More than four years after the peak of the stock market boom, the US economy has regained its former status as the engine of economic growth in the world. Following GDP growth of just 0.5% in 2001, economic activity in the US has returned to rather strong, that is above long-term potential, growth rates, accompanied by fairly buoyant private consumer and corporate investment spending, both exerting a positive impact on employment. Moreover, stock markets have left their troughs, indicating market agents' improved economic expectations.

In particular rising real estate prices, though, are said to have contributed considerably to ongoing domestic demand and a high level of consumer confidence. However, house price increases have been exorbitant for the last eight years when put into historical perspective.¹ The increase in house prices has outpaced consumer price inflation by more than 45 percent, which appears, historically speaking, highly atypical. Therefore, the question was raised by various quarters, from journalists to economists to central bank officials, of whether the boom in the US real estate market has become a bubble and whether house prices have already reached unsustainable levels. This is a question of paramount importance since in the case of a bubble in real estate prices the question emerges if and how the Fed should react to it. Implicitly, also monetary policy in the euro area where France and Spain have experienced exorbitant price increases of real estate during the last four years is addressed as well. The question of bubbles in real estate prices is an increasingly hot topic on both sides of the Atlantic because markets for assets like real estate, stocks and bonds significantly gain importance in times of increasing wealth of the population far beyond the area of private old-age insurance

¹ All house price measures in this paper are from the Office of Federal Housing Enterprise Oversight's (OFHEO) weighted repeat-sales price index unless otherwise noted. The House Price Index (HPI) of the OFHEO shows the price change for the same home. Meaning, a rise in prices does not reflect better quality homes, but homes of the same quality becoming more expensive.

and pension schemes. Moreover, private wealth plays an increasingly large role in determining spending decisions of households. Finally, the liberalization of capital flows fosters price volatility on asset markets. Central banks should and can not ignore these developments. A correct analysis of real estate price developments (as ventured in this paper) and drawing conclusions for monetary policy decisions are nowadays among the most important challenges for monetary policy.

By now, experts unanimously acknowledge boom-and-bust cycles on asset markets. Speculation drives prices “excessively” upward until the bubble bursts and prices will plummet. There is also agreement on the fact that the bursting of the bubble can be extremely damaging for the economy. The most popular example is Japan. At the beginning of the nineties the dramatic plunge in real estate prices has contributed to the emergence of a deep crisis of which Japan has not recovered up to now. As expressed by the European Central Bank only recently, similar fears are relevant for the euro area, and especially so in the cases of Spain and France. In Spain, real estate prices have risen by more than 75 percent within the past four years, in France by more than 50 percent.

The last two decades of the 20th century marked the end of a long inflationary phase in the world economy. In this sense, policymakers successfully fought monetary instability. However, as price stability was assured, financial instability has increased and may well become the next major policy concern on the agenda. Financial instability has often been accompanied by swings in asset prices. However, asset prices and monetary policy are closely connected with each other. Certainly being a hot topic on the international agenda, it has been discussed at several conferences and many papers by leading economists have contributed to the discussion. However, up to now a consensus has not been reached as to how central banks should react in response to an asset price bubble.

Support in favor of the necessity to consider asset prices in monetary policy making is

steadily growing. However, opinions vary and currently central banks regard asset prices only to the extent they have an impact on future consumer price stability. Leading policy makers still view a strategy of wait and see and acting only once it becomes definitely clear that a bubble is bursting as the best response to asset price misalignments. This attitude was elucidated by Alan Greenspan, Chairman of the Board of Governors of the Federal Reserve System (Federal Reserve) in his mid 1999 congressional testimony, in which he stated that the policymakers duty is “to mitigate the fallout when it occurs and, hopefully, ease the transition to the next expansion” (Greenspan 1999, p. 7).

This, indeed, is what the Federal Reserve has been doing over the last four years in the aftermath of the tech stock bubble in order to take precautions against a crash of the US economy similar to that of Japan. With 12 rate cuts from 6.5 percent to one percent in 2003, and by keeping interest rates at such low levels for almost one year, the Federal Reserve provided markets with excess liquidity, supported the economy and helped to weaken the recession. Also the ECB cut back its main refinancing rate to a historically low level. Initially, this monetary policy stance initiated by the Federal Reserve and rising house prices appeared to have the same beneficial effect; both helped the economy to overcome the downturn.

However, over the next few years, the performance of the US economy will reveal whether or not the Federal Reserve’s risky strategy of a lax monetary policy will succeed. More and more critics accuse the central banks of the US and the euro area of having fostered new speculative bubbles by cheap money, especially on real estate markets. If the current situation in the real estate market represents a bubble, then also the eventual burst will be inevitable. In addition, history shows that once housing prices decline the economy is in for a bumpy road. Downward pressure on real estate prices would be highly problematic since many consumers have already spent the capital gains from the real estate market. If such gains will stay away in the future or will change into losses, consumers will have to cut down their

expenditures. In the end, this could let the economy slip into a recession. Hence, the question of whether or not the US is experiencing a bubble should be of deepest concern to the Federal Reserve. However, opinions diverge over the identification of the occurrence of a bubble. Economists worldwide are divided on the subject. So far, the Federal Reserve denies the occurrence of a real estate bubble and is not, at least officially, responding to it.

What to do then? In contrast to earlier statements, the ECB now is of the opinion that speculative exaggerations can be identified earlier than after the event. Recognizing a bubble in real-time becomes possible by historical comparisons of index numbers like, for instance, the relation between house prices and rents and/or between house prices and overall inflation. Important insights can also be won by a deeper analysis of the development of price-earnings ratios on stock markets and/or the degree of excess liquidity and of credit supply. Admittedly, no index number is a good and sufficient indicator on its own.² Instead, one needs a comprehensive analysis based on a number of indices as enacted in this paper.

The attempt to provide an answer to the question whether the recent surge in US real estate prices is fundamentally driven, or whether the current situation reflects bubble symptoms, is the main focus of this paper. In fact, the objective is to divide the valuation of the US housing market into a “bubble component” and into a fundamentally justified component. Given the theoretical and empirical difficulties in tackling such a question it does not come as a surprise that so far a final conclusion has not yet emerged in the literature. In light of this, the discussion in this contribution is organized as follows: First, the US real estate market and its peculiarities are described. Second, an overview is given on the areas in which economic

² In the case of Spain, for instance, parts of the increase in real estate prices can be attributed to the introduction of the euro which blessed the country with a significantly lower interest rate level than before. Problems of a single-focus analysis are also well-known from the analysis of statistically measured liquidity. For instance, the ECB (2005), p. 6, argues that the currently very low level of interest rates is also fueling private sector demand for credit. Growth in loans to non-financial corporations has picked up further around the turn-of-year 2004/05. Moreover, demand for loans for house purchase has continued to be robust, contributing to strong house price dynamics in several parts of the euro area. The combination of ample liquidity and strong credit growth could, at least, in some parts of the euro area, become a source of unsustainable price increases in property markets.

views, as expressed in the literature, diverge. Third, unambiguous bubble indications will be presented as well as other more fundamental reasons which speak against nominal declines in housing prices will be outlined. The analysis concludes again asking whether asset prices and asset price bubbles are and should be a matter of attention to central bank authorities in the process of monetary policy making.

2 Is the United States of America in the Midst of a Real Estate Bubble?

2.1 Asset Prices and Asset Price Bubbles: an Overview

Asset prices are still not well understood. Most of the literature includes stocks, bonds, commercial and residential real estate and the exchange rate among the most important assets (Mussa, 2003, p. 41).³ Assets are often bought to generate earnings (Bollard 2004, p. 1). They are all essential macroeconomic variables. However, their impact on the real economy differs. In addition, they are indicators of the issues that monetary policy is concerned with, largely, general price stability and economic growth.⁴ While both equities and real estate at least potentially have an impact on macroeconomic performance, we focus on the real estate market since effects of a housing bubble burst on the economy are stronger than those of rapid stock market declines. More specifically, movements in residential property prices have stronger effects on individual consumption behavior, credit cycles and output than stock price fluctuations.⁵ While boom phases of a bubble have short-term benefits for the economy, the risks are in long-term misallocation effects and the potential deflation of the bubble. Financial cycles that are driven by asset price movements are capable of creating real economic disturbances (BIS 2001, p. 123; Allen/Gale 2000, p. 236). As a result of the wealth effect, asset price

³ In contrast to asset prices, consumer prices include goods and services that are consumed for every-day living, such as food, gas or automobiles.

⁴ In contrast to small open economies, for a large and rather closed economy like the US, the exchange rate does not play as significant a role as other asset prices, i.e. mainly equities and real estate. For this reason, it is excluded from this discussion.

⁵ See Helbling/Terrones 2003, p. 68; BIS 2001, p. 127; Barata/Pacheco 2003, p. 11; Case/Quigley/Shiller 2001, p. 14; Detken/Smets 2004, p. 13; and Caruana 2003, p. 539.

swings also affect the real economy through the consumption channel (Just 2003, p. 4). In addition, investment behavior, through a change in external financing costs due to altering collateral and net asset values, is also impacted by the movements of asset prices (IMF 2000, p. 99; Detken/Masuch/Smets 2003, p. 2). Aside from these real transmission channels, the positive impact on consumer sentiment also influences spending decisions (Kent/Lowe 1997, p. 5).

One could point to positive effects that arise with a financial upturn and argue that in that phase of the cycle asset price rises are welcome. However, if changes in asset prices are not caused by changes in the expectations of developments in fundamentals, this increase is accompanied by bubble formations. The risk unfolds in the subsequent downturn. Once the constructive cycle of the upturn, boosted by rising demand and positive wealth effects, reverses, an economic downturn with severe reactions is the consequence. For example, the severity of the 1990 recession in the US is said to have been heightened by the preceding decrease in commercial real estate prices (Bernanke/Gertler 1999, p. 17). Asset prices can be harmful when they systematically deviate from their fundamental values and form positive or negative bubbles.

But what in the end is a bubble? Different definitions of bubbles are distinguished in the literature. According to Kroszner's (2003, p. 3) view, asset price bubbles "represent a mispricing of asset values by the market." This is in line with the definition put forward by Kindleberger (1987, p. 281) who states that one element of a bubble is that prices increase faster than can be explained by market fundamentals. The most difficult task is to identify whether asset price increases reflect economic fundamentals, or whether the rise is related to the "irrational" behavior of economic agents. Of course, not every fast rise in prices represents a bubble. For example, Meltzer (2003, p. 23) refers to the German Reichsbank's monetary acceleration and the people's rational expectation of rising prices. The difficulty in de-

termining asset price bubbles not only exists ex ante, but also ex post. This enhances the challenge for policy makers to deflate, i.e. to puncture, asset price bubbles. A convincing indication of a bubble is given if people purchase an asset solely because they believe that the asset will be priced higher tomorrow (Meltzer 2003, p. 23; Case/Shiller 2003, p. 16). This is consistent with Kindleberger's description of a bubble as "a sharp rise in the price of an asset or a range of assets in a continuous process, with the initial rise generating expectations of further rises and attracting new buyers – generally speculators interested in profits from trading in the asset rather than its use or earning capacity" (1987, p. 281). Such a situation is characterized by public expectations of exorbitant future prices which force current prices to rise even further (Case/Shiller 2003, p. 2). In such kind of situations, markets do not manage to get prices right. Such mispricing is sometimes aggravated by herding behavior and 'irrational exuberance.' Another element of a bubble is the eventual collapse that follows a reversal of expectations. When people buy solely with an eye on future price increases, and this motive diminishes in time, prices may fall drastically. This type of market correction is frequently accompanied by a disruption in financial and real activity, such as output reduction, deflationary pressures and sometimes banking crises (Bordo/Jeanne 2002, p. 4). Additionally, corrections may overshoot fundamental levels and create an inverse bubble.

A large body of economic analysis assumes that economic agents act on the basis of rational expectations. If this is taken for granted, the occurrence of asset price bubbles would be difficult to justify. The only explanation for prices rising for reasons except of movements in their fundamentals would be that people behave rationally if they believe that other people will buy their assets for a higher price at a later point in time. However, if all economic agents behaved entirely rationally, they would know that not everyone would be able to sell in the future. Thus, in this case no bubbles would emerge. With respect to the severe and increasing volatility of real and financial asset prices, rational behavior across the board is not a realistic

assumption.⁶ Hence, the existence of bubbles cannot be excluded ex ante. Even though theoretical views on the subject differ, the existence of bubbles is at least supported by empirical evidence.⁷

Over the last four years, the amount of real estate sold and its value have reached record levels in the US. This pattern has evolved notwithstanding difficult economic conditions, entailing phases of rising unemployment and insignificant or negative growth rates. Increased spending on housing and related items have prevented the economy from a ‘double dip’ recession or a more ruthless downturn. Housing wealth and record-high cash-out refinances have enabled consumers to continue reckless spending. The Cash-outs between 2001 and 2003 add up to \$333 billion, compared to \$114 billion in the next highest period, 1998-2000 (Joint Center for Housing Studies of Harvard University (JCHS) 2004, p. 7). The ongoing high levels of private consumption are extremely important for the economy of the US, because consumer spending accounts for more than two thirds of total demand. Over recent years, the average rise in real house prices across the country has been the fastest in US history (The Economist 2003a, p. 72). However, averages tend to hide exaggerations in regional markets where increases were even more dramatic.

2.2 Characteristics of the US Real Estate Market

Real estate markets around the world are still characterized by a lack of adequate information and insufficient market infrastructure (Renaud 2003, p. 239). Good quality and timely data is scarce. Transaction costs are high and prices are often determined on the basis of bilateral negotiations (Hilbers/Lei/Zacho 2001, p. 28). Low transparency and the absence of a central trading market complicate the purchase of homes. The traded objects are charac-

⁶ Further reasons for the difficulty of including rational expectations in bubble modeling are given in Kent and Lowe (1997, p. 17 et seq.).

⁷ This discussion is closely related to the question of whether or not the “efficient market hypothesis” reflects reality. A broad discussion of the “efficient market hypothesis” can be found in Malkiel (2003).

terized by ample heterogeneity. The supply side in real estate markets is very rigid. New land must be made available for new construction which can be a very time consuming task. Additionally, new buildings must be built to expand the supply. As a result of long construction lags, the supply side of the real estate market can not respond quickly to increasing demand. Hence, housing price booms may emerge due to a lack of supply in the beginning and may reverse due to excess supply once demand drops.

Another unique characteristic of real estate markets in comparison to financial markets is the fact that short-trading is impossible (Herring/Wachter 2002, p. 4). The investors' inability to imply 'negative feedback trading' strategies via short sales leads to a higher responsiveness of prices to optimism than to pessimism. In other markets sustained deviations from the fundamental value are thought to be reversed by sophisticated investors. If real estate prices are too low, sophisticated investors can enter the market on the buying side and earn profits. If prices are too high, no analogous action can be enacted, and hence, "[o]ptimists, those with reservation prices above the fundamental value, will determine the price in this kind of market with no short sales and fixed supply" (Herring/Wachter 2002, p. 4). As long as the market performance continues to rise and financing is available, optimistic investors will make profits independent of fundamental justifications and will remain the market movers.

2.3 Evidence for a Bubble in the US Real Estate Market – Stylized Facts

2.3.1 Does Recent Bank Lending Behavior Indicate a Bubble?

The reallocation of resources, usually defined as the transfer of capital from lenders with a lack of investment ideas to borrowers who require money to implement their ideas, is generally acknowledged as an indispensable ingredient for economic growth (Bollard 2004, p. 4). However, the positive effects of debt financing turn into negative ones in situations where a bubble exists. A boom in asset prices can have a particularly damaging impact on the economy when it is combined with a rapid increase in credit. Credit and asset price cycles corre-

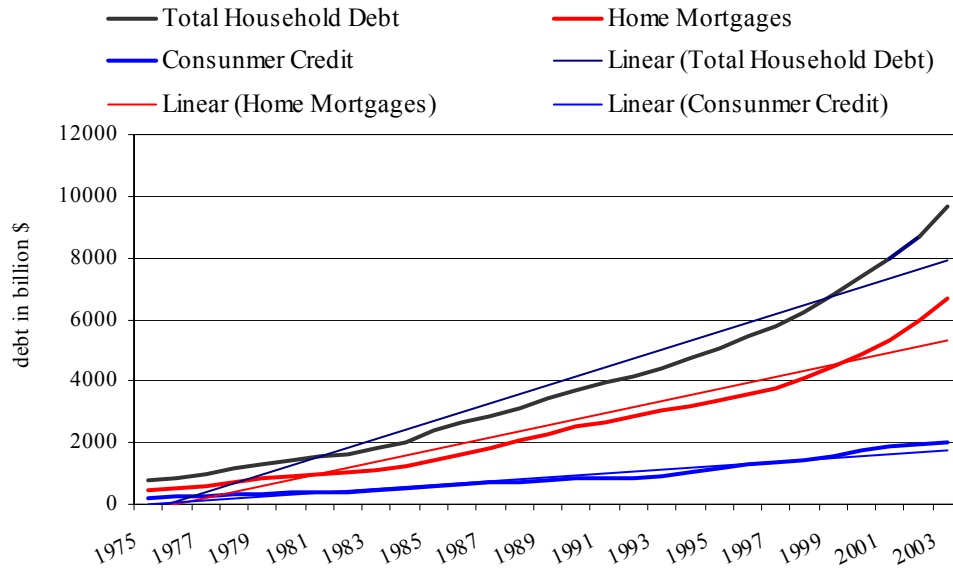
late and seem to feed one another (Schwartz 2003, p. 387, Caruana 2003, p. 537). Increasing asset prices stimulate the economy and reduce the cost of borrowing through higher collateral values (Bean 2003, p. 13). This leads to rapid credit expansion in the financial system, which is often a strong indicator of future distress.⁸

Hence, it seems fair to refer to credit growth as a major determinant of a bubble. Thus, whether or not credit growth has displayed abnormal behavior in recent years which could provide proof of a bubble scenario in the real estate market must be evaluated empirically. The recent stock market bubble can be traced back to an excessive lending spree, previously unseen in financial history (The Economist 2002a, p. 22). Private household debt surged to formerly unknown levels (Barnes/Young 2003, p. 11; see also Figure 1). The central bankers of the Federal Reserve do not explicitly look at credit expansion as long as inflation is under control.⁹ Hence, US monetary policy, focused among others on short-term inflation, intensifies the risk of stronger credit expansion and more severe build-ups in credit (Borio/Lowe 2002, p. 1). This increases the risk of asset price bubbles occurring.

⁸ The in-tandem behavior between credit and assets is even stronger once asset price values decline and the economic situation worsens. In periods of declining house prices, borrowers' down-payments diminish. As a result, homeowners might be confronted with debt surmounting their home equity. The rapid expansion of credit is a major source of developing imbalances. In their paper, Borio and Lowe (2002, p. 11) conclude that a strong and fast increase in both asset prices and credit is a significant warning sign of potential financial problems in the future (see also Allen/Gale 1999, p. 11). Obtaining a stable price level alone may not be enough to prevent these excesses (BIS 2001, p. 139). Thus, such a simultaneous increase should caution policy makers and fuel discussion about tighter monetary policy.

⁹ This is a main difference in the policy making process of the European Central Bank (ECB), where special attention is paid to monetary growth (pillar two, measured via M3). By looking at the money supply and thus to credit, the ECB has the potential to fight bubbles at an earlier point in time.

Figure 1: Credit Growth in the US, Annual Data from 1975 to 2003



Data sources: Federal Reserve (2004a-c, p. 54) and own calculations.

As can be seen in figure 1, household debt increased continuously over the last three decades. The consumer financial position significantly worsened. The alarming part of the general picture is the increase in credit growth rates that began around 1998. Debt levels took off, spurred largely by mortgage debt. To conclude, the growth spurt in credit increases the likelihood of a bubble in housing prices and has the potential to lead to future imbalances. Let us now search for traces of bubble triggers in the conduct of US monetary policy.

2.3.2 Monetary Policy of the Federal Reserve System

The monetary policy of the Federal Reserve in recent years has frequently been described as very expansionary by most financial market analysts, at least when it is compared to the more recent ECB policy. The Federal Reserve started its monetary easing cycle in the beginning of 2001, after the burst of the tech stock bubble and the general downturn in equities. Since then it has extraordinarily lowered interest rates from 6.5% to a 45-year low of one percent. By this, the markets were provided with ample liquidity to avoid a more severe

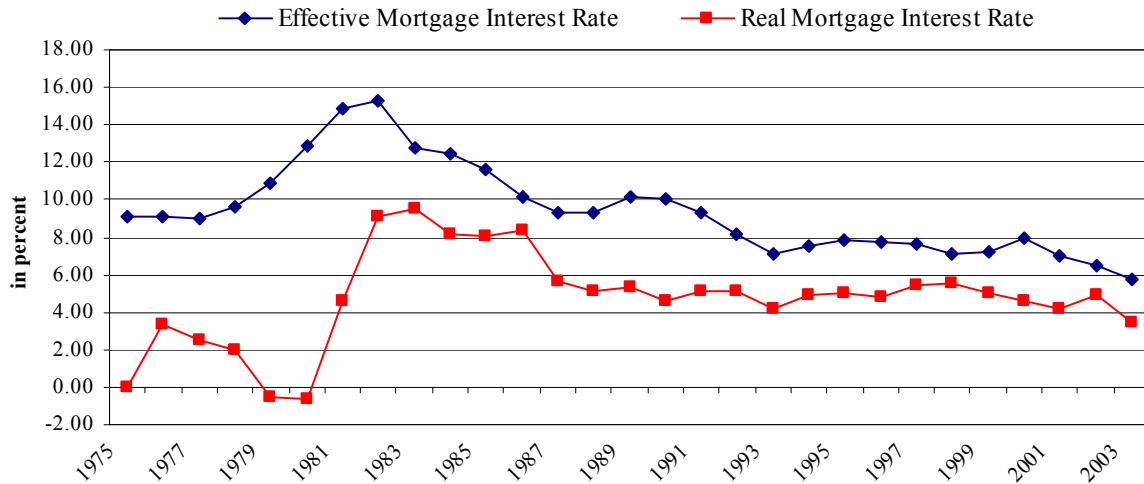
downturn and panic in the financial system. So far, the Federal Reserve has been successful in achieving its goals. The economy has recovered faster than expected and is still growing at a healthy pace, inflation being stable. In addition, employment figures have started to catch up. The question that remains is whether or not the Federal Reserve has increased the chances of a housing bubble by injecting too much liquidity into the financial system and by keeping nominal and real interest rates too low for too long.

Profits from buying homes for investment purposes are increasing, because real interest rates take values below zero. Additionally, reduced interest rates lower the discount rate on future cash flows and asset investments are becoming more profitable (IMF 2000, p. 90). Demand rises with profit increases. Rising liquidity in turn enhances the demand for assets (IMF 2000, p. 89). Excess liquidity increases the likelihood of a bubble. The growth in liquidity has led to portfolio shifts from equities to real estate. Thus, it seems likely that the policy of the Federal Reserve has furthered and fed the upward pressure on house prices. It can be concluded that the behavior of the Federal Reserve boosted rather than averted the potential for the formation of a real estate bubble. Let us now turn to the market for mortgage.

2.3.3 Mortgage Rates

Low interest rates in general, and joint with it also low mortgage interest rates, are seen as a major determinant of increasing real estate prices. Currently nominal mortgage rates take historically low levels. However, according to Baker (2002, p. 9), it is the real mortgage interest rates and not the nominal ones that determine housing prices, because lower real mortgage interest rates decrease the cost of buying a home. As can be seen in figure 2, real mortgage interest rates stayed more or less stable over the last 15 years. Even if the inflation rate is expected to be higher in the future, this should not greatly influence real mortgage interest rates in the long run. Therefore, the data indicates that real mortgage interest rates have not put upward pressure on housing prices.

Figure 2: Nominal and Real Mortgage Rates, Annual Data from 1975 to 2003



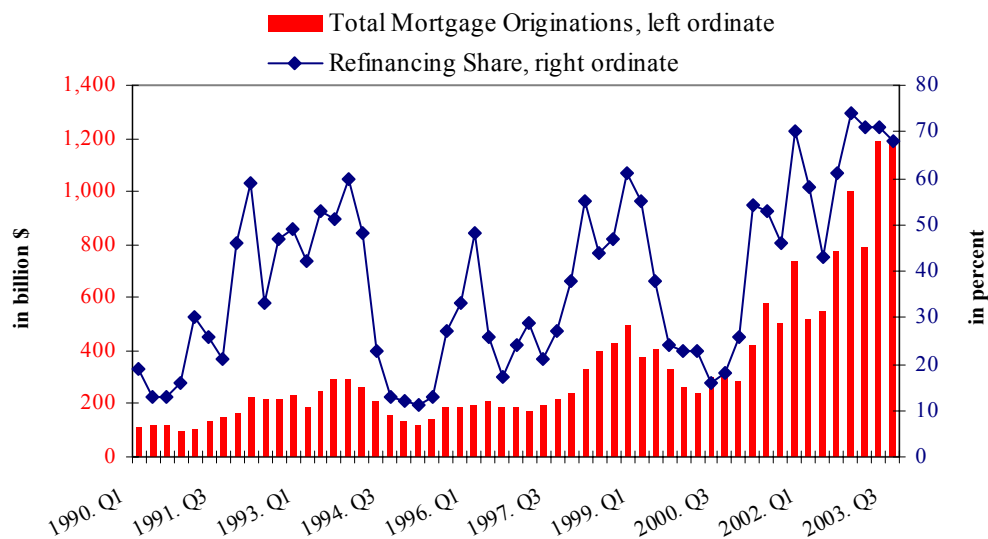
Data sources: Federal Housing Finance Board (2004, p. 1) and own calculations.

However, homebuyers may tend to focus on nominal mortgage rates, because they are not as aware of inflation as economic analysts. Case and Shiller (2003, p. 21) find in their survey that interest rates are a dominant factor in the decision making process preceding the purchase of a home. It is reasonable to assume that private individuals will tend to disregard real mortgage interest rates in their decisions, especially now that inflation has been constant and low for two decades.¹⁰ Low nominal mortgage interest rates have enabled millions of homeowners in the US to refinance their mortgages over the last years and to fix them on low interest rate levels for the future (see Figure 3). This enables homeowners to move into bigger and more expensive homes while holding their monthly mortgage expenses constant. Thus, demand for homes has increased and low interest rates may be one explanation for the recent rise in housing prices. Even though low interest rates are a fundamental reason for the rise in national housing prices, variations between different states can not be explained (Case/Shiller 2003, p. 3, see section 2.6).

¹⁰ This is actually an award for a central bank, because the perfect inflation rate is one that does not effect investment decisions.

Figure 3: Total Mortgage Originations and Share of Refinancing Originations, Quarterly

Data from 1st Quarter 1990 to 3rd Quarter 2003



Data source: Mortgage Bankers Association (2004a, p. 1), figure created by authors.

Record levels of mortgage debt also bear risks. The number of borrowers with weak credit histories that are approved for mortgages is growing (JCHS 2003, p. 2). The risk associated with this increase is that foreclosures could force homeowners to sell, thereby initiating lower prices. Furthermore, in 2002 mortgage debt accounted for 43 percent of residential value, an increase of more than 11 percent over the last two decades (JCHS 2003, p. 17).¹¹

Another frequently stated argument is that low interest rates enable consumers to borrow more, thereby increasing their disposition to spend more on housing (The Economist 2003a, p. 72). Compared to historical standards, the affordability index (mortgage-interest payments on an average-priced home divided by average income) is still high (U.S. Department of Housing and Urban Development (2004, p. 65)). This enables low-income first-time buyers, who were unable to buy a home before, to bid for relatively cheap houses and to become homeowners. This increase in demand, together with the shift in the type of house de-

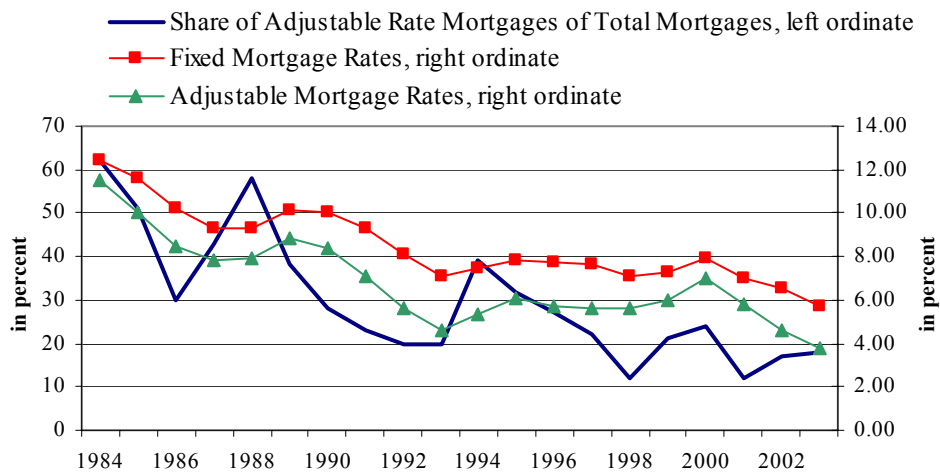
¹¹ Moreover, between 2001 and 2003 homeowners converted more than \$300 billion of their home equity into cash (Freddie Mac 2004, p. 1).

manded by the different income groups, can potentially push up house prices to a new equilibrium level (The Economist 2003c, p. 8). However, low-income households also have the highest debt-to-income levels (Barnes/Young 2003, p. 11). This increases the risks connected with falling house prices.

Some authors do not agree to this ‘low interest rates’ argument (e. g. Baker 2002, p. 10; CIBC 2004, p. 2). They claim that if low interest rates are the fundamental explanation for a bubble, then this should reverse once interest rates rise again. However, this would only be true for interest rate adjustable mortgage loans, not for the majority of fixed mortgage rate loans.¹² In his last speech in front of the banking committee of the congress on July 20, 2004, Alan Greenspan (2004, p. 5) pointed out how well-prepared homeowners as well as financial markets are for further interest rate changes. This should be a definite indication for homeowners to swap their adjustable rate mortgages for a fixed rate mortgage. Figure 4 shows that the share of variable rate mortgages declined strongly over the last twenty years. However, in recent years adjustable rate mortgages became more popular. As of April 2004, 50 percent of new mortgages were adjustable rate mortgages (CIBC 2004, p. 2). For owners of adjustable rate mortgages rising interest rates will lead to higher monthly payments. This will reduce their disposable income, decrease spending and force some homeowners to sell their homes. In sum, low mortgage rates can be seen as a demand driver because they enable homeowners to move into more expensive homes while their monthly mortgage payments remain stable. In addition, a high share of adjustable rate mortgages could be a trigger for falling prices once homeowners can no longer afford their monthly payments and have to sell their homes.

¹² The same is true for ‘home equity lines of credit’ (HELOC) for which residential property serves as the underlying collateral (CIBC World Markets 2004, p. 2). HELOCs usually carry variable rates.

Figure 4: Share of Adjustable Rate Mortgages of Total Mortgages, Fixed and Adjustable Mortgage Rates, Annual Data from 1984 to 2003

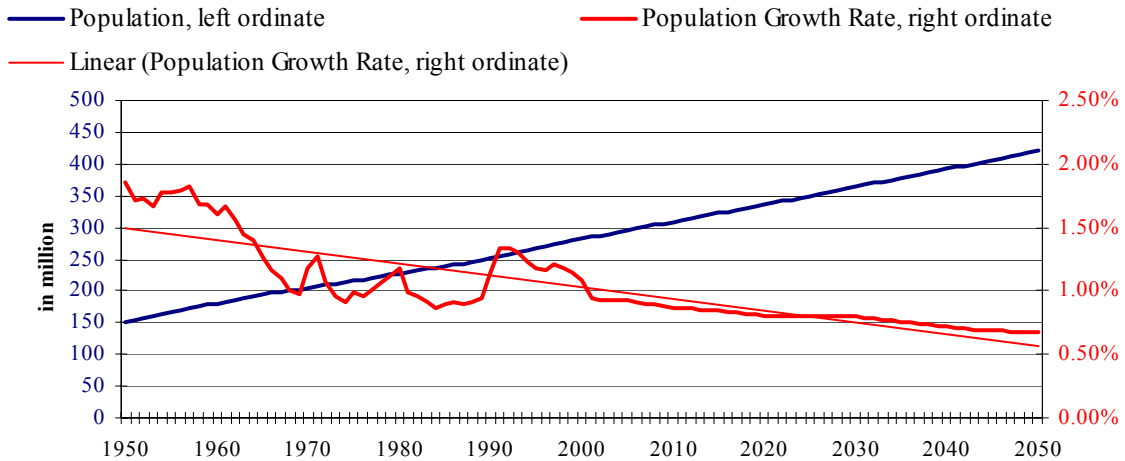


Data sources: Federal Housing Finance Board (2004, p. 1) and Mortgage Bankers Association (2004b, p. 1), figure created by authors.

2.3.4 Demographic Factors

Household growth is a major driver of real estate demand. An important determinant of household growth is population growth. The US birth rate, in addition to the continuing large stream of immigrants, can be seen as a demand driver for housing. The corresponding demographic pattern is shown in Figure 5 with the deterministic trend extrapolation line serving as a benchmark. Although growth rates are declining they will stay positive for a long time. Immigrants have been responsible for more than a third of household growth since the 1990s (JCHS 2004, p. 11). Minority shares of US households went up from 17 percent in 1980 to 26 percent in 2000. JCHS (2004, p. 13) estimates that this share will reach 34 percent by 2020. Thus, immigrants will continue to drive housing demand. Additionally, currently many immigrant households have below average incomes and rent their homes. Once this situation has changed, these households will try to enter the housing market as buyers. The increased availability of capital for low-income and minority communities makes this outcome even more likely (JCHS 2004, p. 4).

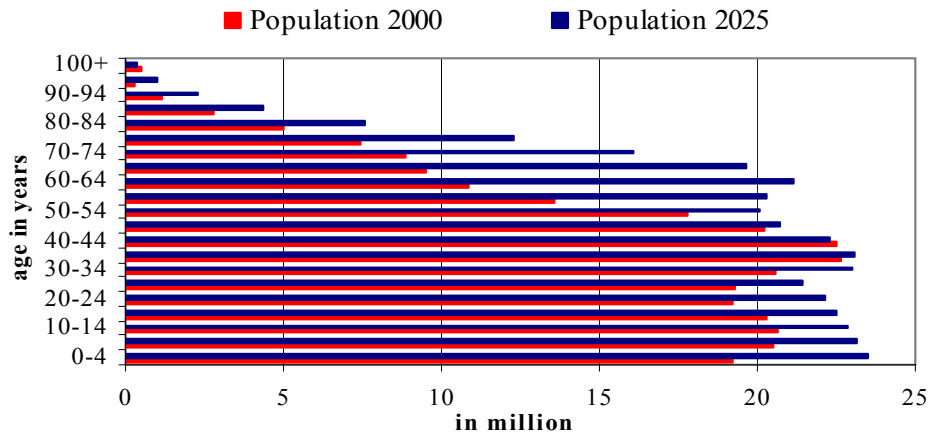
Figure 5: US Population and Growth Rates, Annual Data from 1950 to 2050



Data source: U.S. Census Bureau (2004a, p. 1) and own calculations.

Figure 6 shows the actual and forecasted distribution of population by age for the year 2000 and 2025 respectively. Like in other industrialized countries, the number of retirees will increase immensely during the next decades. However, in contrast to Europe and Japan, the aging of the American society is built on a sound foundation of the simultaneous increase in the number of young people. The increasing number of young adults and children will guarantee a constant demand for homes. Aside from immigrants, the baby-boomer generation will still play an important role in the demand for housing. In the coming years, older baby boomers will reach their peak wealth years and the younger ones will reach new earning highs (JCHS 2003, p. 3). In addition, the baby boomers will inherit record amounts over the next 20 years. They will enter phases where they can afford to buy second homes and support their children in starting new households, thereby sustaining demand at high levels. In short, demographic factors can be a demand driver for housing demand, in effect, increasing the chances that house prices will not decline nominally. However, demographics can only partly explain the recent surge in home prices.

Figure 6: Population by Age Groups in 2000 and 2025

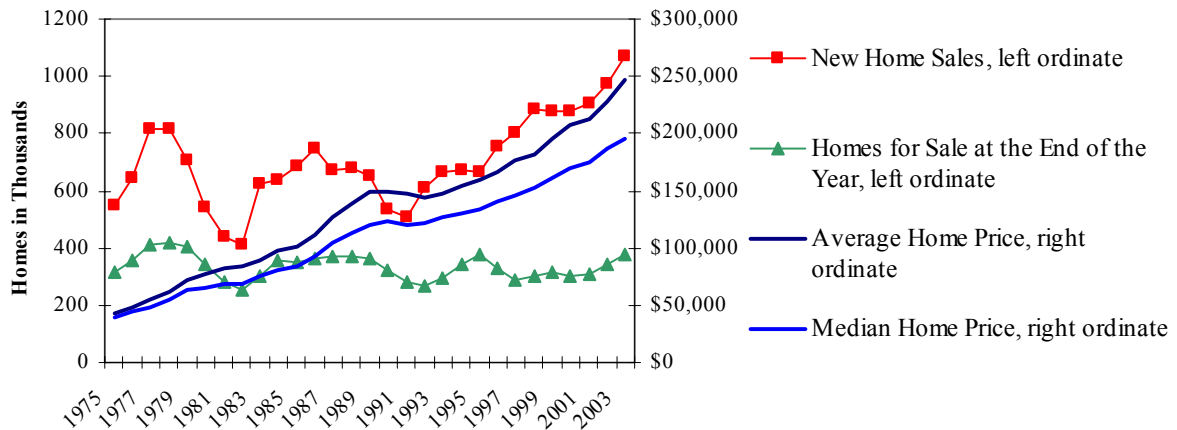


Data source: U.S. Census Bureau (2004b, p. 1) and own compilation.

2.3.5 Other Demand Factors

According to the US Census Bureau statistics, new home sales have increased constantly since the early 1990s (see figure 7). This is quite atypical as empirical data suggests that housing sales behave very pro-cyclically, with new home sales usually falling during recessions (Croke, 2003, p. 1; Helbling/Terrones 2003, p. 68). This could reflect a constant change in demand which would rationalize rising home prices. However, it might also be a sign of speculation. If houses are bought for speculative reasons, natural demand only plays a subordinate role. As a result, demand should not decrease during recessions. Hence, it is difficult to draw a conclusion on the existence of a real estate bubble merely based on the continuous increase in new home sales in isolation.

Figure 7: New Home Sales, Average and Median Prices, Annual Data from 1975 to 2003



Data sources: Mortgage Bankers Association (2004c, p. 1) and U.S. Census Bureau

(2004c, p. 1), figure created by authors.

Over the last decades, the US government has launched several programs to increase the number of home owners in the society. Two organizations, Fannie Mae and Freddie Mac, have been established for this purpose and favorable tax deductions on mortgages have been put in place (Croke 2003, p. 2).¹³ The private market has also supplemented public measures. The procurement of mortgages has grown and deepening competition has improved mortgage lending conditions.¹⁴ The success of these measures is evidenced by rising homeownership rates in general and by increased low-income homeownership in particular.¹⁵

In the past, income growth rates surpassed house price growth rates. However, the picture has reversed in recent years. Table 1 analyzes growth rates during different time periods over the last three decades. While income growth rates declined from long-term levels, house price increases accelerated over the last three and eight years respectively. This shows that on

¹³ In 2003, the government passed the American Dream Down Payment Act through which the Federal Housing Authority provides \$200 million annually to assist families in fulfilling their down payment obligations (Croke 2003, p. 2).

¹⁴ Asset-backed-security markets have become increasingly popular, with a large share being mortgage-backed-security (MBS) transactions. New ways of structuring MBS deals have also improved the lending possibilities of the big state mortgage agencies, such as Freddie Mac. Additionally, real estate investment trusts are growing in volume and number (National Association of Real Estate Investment Trusts 2004, p. 1). Thus, real estate as a financial investment now plays a stronger role in fundamental demand than it has before.

¹⁵ Please note that these statistics were arrived at by dividing the 'owner households' by the 'total occupied households'. No information is given about the number of people who occupy the individual households.

a national level the escalation of house prices can not be attributed to rising incomes.

Table 1: Income and House Price Changes and Annual Growth Rates over Different Periods of Time

	Percentage Change from			Annual Growth Rates		
	1975-Q1 to 2004-Q1	1996-Q1 to 2004-Q1	2001-Q1 to 2004-Q1	29 years	8 years	3 years
Income Growth	644%	49%	10%	7.2%	5.2%	3.2%
House Price Growth	400%	59%	23%	5.7%	6.0%	7.2%

Data sources: OFHEO (2004a, pp. 1), Bureau of Economic Analysis (2004a, pp. 1) and own calculations.

Two methods that are useful for determining the fair and sustainable value of house prices are the price-earnings ratio (see section 2.4.2) and the house-price-to-income ratio (The Economist 2003c, p. 8). The ratio of average house price to average disposable income provides an indication of the affordability of housing. According to The Economist (2003c, p. 9), this ratio is currently five percent above the average historic level. However, if one uses the median income instead of the average income,¹⁶ the ratio is at a record 14 percent above average. This supports the view that the drastic increase in house prices represents a bubble.

2.3.6 Indications from the Supply Side

Residential construction has remained strong since the beginning of the 1990s and is expected to perform even stronger in the following years (JCHS 2004, p. 2). However, available physical housing stock has declined constantly and has only stabilized on a low level in recent years (between four and six months) (Croke 2003, p. 2). In May 2004, the months supply of one-family homes averaged 4.2 months, this is down almost 20 percent compared to the previous year (National Association of Realtors 2004a, p.1). Inventory levels were far higher in the beginning of the 1980s (around 12 months). It is possible, especially in big cit-

¹⁶ This is supposedly a better reflection of the personal income of the average home buyer, because it excludes the few very rich people.

ies, that the supply is incapable of keeping up with demand, due to land shortages. This may explain the faster rise in prices in urban compared to rural areas, but not the indefinite rise in prices in general.¹⁷

A different supply related influence can be found in situations of excess supply. Prices tend to be sticky on the downside, i.e., even if people who bought houses for investment reasons face excess supply, they do not sell for a lower price to clear the market, but hang on to their homes (Case/Shiller 2003, p. 11). This lack of acceptance of prices below a certain minimum level is attributable to people's expectations of the impossibility of decreasing house prices. Stein (1995, p. 379 et seq.) confirms this view by observing that the trading volume is high during the upturn of the market and that it is low when prices go down. This kind of behavior is largely motivated by significant transaction costs. Hence, it can be concluded that the analysis of the supply side scenario provides no clear evidence of a bubble in the housing market. Let us now turn to further complementary pieces of evidence which might serve the identification of a bubble on the US real estate market.

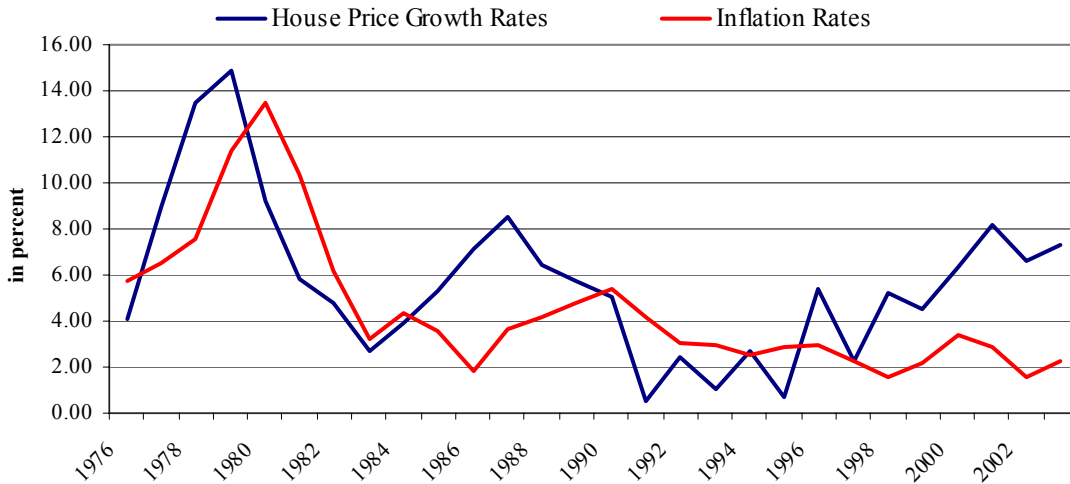
2.4 Further Evidence in Favor of the Bubble Case?

2.4.1 Housing Price Growth Rates and Inflation

History shows a relatively stable correlation between US house price increases and inflation. Both variables tend to move in parallel. In times of rising or high inflation, real estate is bought as a hedge against the real devaluation of money. Since 1995, however, home purchase prices have outpaced the inflation rate by more than 40 percent (Baker 2004, p. 1).

¹⁷ The Economist (2003c, p. 8) cites Hong Kong as an example, because house prices there fell by 65 percent even though supply is more limited than in most other big cities.

Figure 8: House Price Growth Rates and Inflation Rates



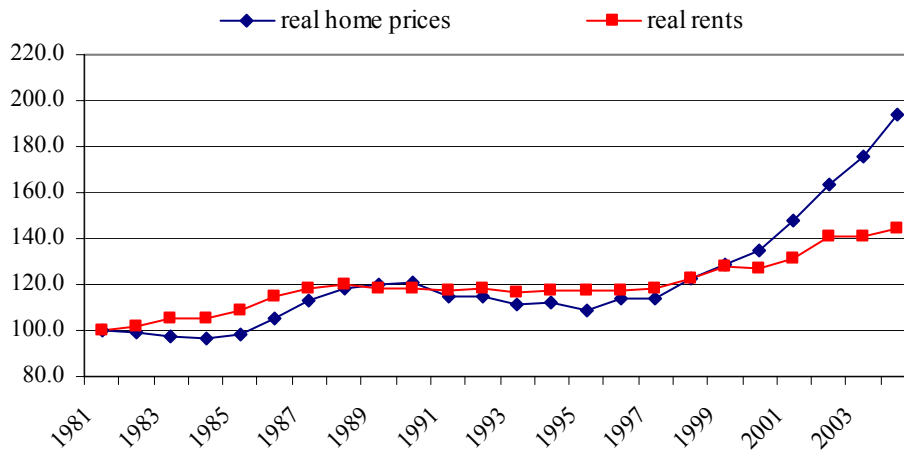
Data sources: OFHEO (2004a, pp. 1), Bureau of Labor Statistics (2004a, p. 1) and own calculations.

The last time house prices grew remarkably faster than overall prices was at the end of the 1980s. Figure 8 shows that, after the positive exaggeration, growth rates leveled out for several years. Growth rates sank below inflation levels, and thus inflation was able to catch up again to bring the relationship between house price and general inflation into balance again. This time however, the positive deviations are higher and more sustained and inflation rates take low and stable levels. Inflation declined worldwide over the last two decades. If inflation remains around two percent, house price growth rates will have to fall significantly or even to enter the negative (“undershooting”) to finally restore the equilibrium relationship between general inflation and housing price inflation. Negative growth rates on a national level would mean sharply declining prices in the most severe bubble areas. In sum, the gap between house price and general inflation appears to be an additional clear sign of fundamental misalignments in the US real estate market. We now focus on another market which is generally assumed to be closely related with real estate via arbitrage processes.

2.4.2 Developments in the Rental Market

It is intuitively clear that an increase in rental costs exerts pressure on home prices. If buying a home for dwelling purposes becomes relatively cheaper than renting it, prices for residential housing may rise. One method of comparing the real cost of owning and renting is jointly analyzing the inflation adjusted rent and the house price indexes (see Figure 9, following Baker 2002, p. 6).

Figure 9: The Real Cost of Owning and Renting,¹⁸ Annual Data from 1st Quarter 1981 to 1st Quarter 2004, 1981 = 100



Data sources: OFHEO (2004a, pp. 1), Bureau of Labor Statistics (2004b,c, pp. 1) and own calculations.

As the graph indicates, the costs of purchasing and of renting a home have moved in parallel to each other. This appears reasonable, given that these costs influence each other. Currently, however, there are sharp divergences between these costs, real home prices exceeding real rents. While the two indices are likely to re-converge, it is more likely that this happens via falling house prices than by means of a sharp rise in rental costs. After the housing boom in the late 1980s housing prices declined relative to the rent index. Already, rising va-

¹⁸ The cost of renting is measured by the rent index of the CPI (Bureau of Labor Statistics 2004b, p. 1); the House Price Index is from the OFHEO (2004a, p. 1). Both indexes are deflated by the CPI minus the shelter component (Bureau of Labor Statistics 2004c, p. 1) to show the real costs of buying a home compared to renting one.

cancy rates indicate a slow-down in rent increases (U.S. Census Bureau (2004d, p. 1). For the indexes to converge without house prices falling, rent growth rates would have to be higher than house price growth rates for many years.¹⁹

A drop in nominal house prices is not necessarily a prerequisite for re-establishing the relationship between the time series realizations of house prices and rents. However, with inflation at a low and constant level, it would take a long time to bring the ratio back to the long-term averages without nominal house price decreases. Hence, from this point of view, lower nominal house price increases or even declines in the future, at least in regional markets, appear to be more likely than before. The specific age distribution of the US population is an argument in favor of rents catching up with house prices, absent a decline in house prices (JCHS 2004, p. 24). Due to immigration, the share of young adults will increase. In addition, the baby-boomers' children will enter phases of starting households themselves. It is more likely that they and the immigrants will start-out renting, hence pushing rental demand upwards over the following decade.

The lack of understanding or indifference of homebuyers with respect to the connection between future income streams (rents) and asset prices (housing) is reminiscent of the stock market boom in the late 1990s (Leamer 2002, p. 1). At that time, analysts, fund managers and private investors ignored the historically well-observed price-earnings-ratios. Instead, they came up with new evaluation models and searched for reasons why the disconnection between corporate earnings and stock prices had lost importance. History proved them all wrong. Once an asset is bought solely for the purpose of reselling it for a higher price to someone else, the market is confronted with speculation and loses contact with its funda-

¹⁹ An explanation for the recent divergence between renting and buying could be a mixture of the incentives of homeownership, the ease of receiving credit and historically low interest rates. Another influence may emerge from individuals buying homes for speculative reasons. In such case individuals do not base their investment decisions on future income streams from rents but on a higher resale price at a future date. All this has decreased the attractiveness of renting and has increased rental vacancy rates in recent years (Croke 2003, p. 4; U.S. Census Bureau 2004d, p. 1).

mentally justified level. The rise in the price-earnings-ratio for houses also puts into question whether the real estate market is driven by fundamentals. The increasing population and supply rigidities should affect rents in the same way as they affect house prices. In sum, the price of real property should thus also reflect the future rental prices (The Economist 2003b, p. 4). For all these reasons, the divergence of rents and house prices is a strong sign of a housing price bubble, rather than an economic occurrence justified by fundamentals.

2.4.3 Speculation

Another sign of a bubble in the real estate market may be conveyed by an increasing frequency and volume of real estate trading (Renaud 2003, p. 240). Existing single-family home sales increased by 22.4 % between the end of 2001 and March 2004 (National Association of Realtors 2004a, p. 1). Increasing turnover often indicates speculation. Speculators can take advantage of the low interest rate situation and decrease their opportunity costs. If house price growth rates remain higher than interest rates, speculators can earn profits through buying and selling homes. In addition, they can receive rents as extra profits for the time they hold the property.

There were about 6.6 million second homes in the US at the end of 2003. Generally, second homes are used as vacation residences. However, a recent analysis by the National Association of Realtors (2004b, p. 1) shows that buying second homes for investment purposes has increased. According to their data, the share of second homes as an investment rose from 20 percent in 1999 to 37 percent in 2002. The number of second home sales in general increased from 288,000 in 1989 to approximately 445,000 units in 2003. In addition to private second home sales, the increasing number of real estate investment trusts adds to the number of houses being bought for investment purposes (National Association of Real Estate Invest-

ment Trusts 2004, p. 1).²⁰ Even though speculative transactions are still limited compared to other transactions in the overall housing market, they could play an essential role once prices decline. If there is an expectation of lower prices in the market, investments will turn sour and be sold. In such case, the homeowner/resident might keep his home and prefer to follow a wait-and-see strategy. However, the homeowner/speculator has to sell to avoid larger losses and to pay for his refinancing.

“A tendency to view housing as an investment is a defining characteristic of a housing bubble” (Case/Shiller 2003, p. 16). With a higher future resale price in mind, home buyers tend to pay less attention to the actual price. The aforementioned fact that housing prices are rising much faster than rents suggests that homes are being bought in the expectation of capital appreciation.²¹ According to Case and Shiller (2003, pp. 16), the motive to buy because of price increases is a the roots of the danger of the emergence of a bubble. Once the motive weakens, sales increase and prices have the tendency to crash. The results of the authors’ questionnaire are that investment was a major consideration in the decision process preceding the purchase of a new home. The interviewees expect an average annual growth rate in home prices of between 11.7% (Milwaukee) and 15.7% (San Francisco) over the next ten years, while they have a very low risk perception. These are incredibly high figures and clearly show the individuals misperceptions of future prices. “Eventually, unrealistic expectations of future earnings will be proven wrong” (Greenspan 2002, p. 4). In the current case, expectations about future growth rates will not last indefinitely. Once expectations change, real estate prices will rebound to more sustainable levels, which are in line with future earnings. Therefore, buying homes for investment purposes poses a threat to the real estate market and has the potential to worsen the downturn.

²⁰ Although real estate investment trusts invest largely in commercial real estate, they also participate in the residential real estate market, albeit mainly in metro areas.

²¹ However, some economists point out that speculation as observed in the stock market rarely happens in residential housing, because transaction costs are much higher (McCarthy/Peach 2004, p. 12).

2.5 Arguments against Declining Nominal House Prices

In contrast to shares, nominal house prices rarely decline and almost never fall on a national level. Over the last two decades, average nominal national house prices in the US have never fallen for a full year (Krainer 2003, p. 2). Home owners tend to delay sales because they do not want to accept a capital loss. The belief that declining house prices are (if they exist at all) a temporary phenomena tends to lead to a breakdown in the volume of real estate trading, but not necessarily to a decline in prices. Additional reasons for the downward nominal house price stickiness are high transaction costs, which are an inherent part of house sales, and the fact that housing is regarded as a *conditio sine-qua-non*, and thus people try to pay their mortgages even in times of economic difficulty. This argument however becomes less convincing if one takes into account that a lot of houses are bought for investment reasons. People might not be able to afford mortgage payments if prices and thus rents decline.

The strongest factor speaking against a collapse in housing prices is the strong American and world economy, at least in 2004. Growth rates of the world economy have been on a thirty year high and US growth has been pushed further due to strong domestic demand. The Purchasing Manager Index of the national Institute for supply management has reached old highs and investments are strong. These investments will eventually lead to a rise in employment. This tendency is already apparent; over one million new jobs were already created in the first six months of 2004. In the past, concentrated job losses were a prerequisite for declining home prices (JCHS 2003, p. 8). The opposite is true of the current situation. Thus, the potential for declining home prices – even after the burst of a potential bubble - is lower.

2.6 Differences within the United States of America – The Regional Perspective

The task to puncture asset price bubbles is especially difficult for a monetary policy which is common for all US regions if these bubbles bear a distinct regional or local character. In this respect, it is important to note that the potential housing bubble does not encom-

pass the entire US. Instead, real estate price movements within the US diverge from each other. On the one hand, areas with moderate growth rates which are totally in line with inflation and other fundamentals can be found. However, history tells us that housing bubbles have almost never been a nationwide occurrence. On the other hand, at present, many regional markets have experienced strong and persistent price increases. These areas include the coastal areas, with the most extreme housing price growth in the New England area and California. So far, the analysis has been limited to national data. This enables one to view the situation in the US in general. This is necessary as the Federal Reserve works to find responses that serve the country as a whole, rather than the individual states. However, real estate markets bear a regional rather than a national character (Baker/Baribeau 2003, p. 4; Greenspan 2003, p. 3). Hence, it is of great importance also to assess whether regional exaggerations pose a threat to the economy as a whole. Table 2 lists the 15 states with the top housing price increases over the last three years, as well as the increases that occurred in the US as a whole.²² In addition, it provides data on three time periods to closely follow the pattern of the increase of growth rates over recent years.

²² While the District of Columbia is not a state, it is looked at separately.

Table 2: Housing Price Changes and Annual Growth Rates

Rank	State	Percentage Change from			Annual Growth Rates		
		1975-Q1 to 2004-Q1	1996-Q1 to 2004-Q1	2001-Q1 to 2004-Q1	29 years	8 years	3 years
1	Rhode Island	639%	88%	51%	7.1%	8.2%	14.7%
2	District of Columbia	853%	107%	50%	8.1%	9.5%	14.4%
3	California	893%	104%	41%	8.2%	9.3%	12.0%
4	New Jersey	554%	74%	37%	6.7%	7.2%	11.1%
5	Maryland	462%	60%	36%	6.1%	6.0%	10.9%
6	Massachusetts	794%	107%	36%	7.8%	9.5%	10.7%
7	Florida	321%	71%	35%	5.1%	6.9%	10.6%
8	New Hampshire	582%	98%	35%	6.8%	8.9%	10.5%
9	New York	542%	75%	35%	6.6%	7.2%	10.4%
10	Hawaii	499%	29%	35%	6.4%	3.2%	10.4%
11	Maine	748%	72%	32%	7.7%	7.0%	9.7%
12	Nevada	398%	49%	31%	5.7%	5.1%	9.3%
13	Connecticut	489%	62%	30%	6.3%	6.3%	9.0%
14	Virginia	357%	59%	30%	5.4%	6.0%	9.0%
15	Delaware	375%	54%	28%	5.5%	5.5%	8.7%
18	USA	400%	59%	23%	5.7%	6.0%	7.2%

Data sources: OFHEO (2004a-b, pp. 1) and own calculations.

Ten of the 15 states lead the ranks in each of the three analyzed time periods. Growth rates in general are accelerating. As mentioned above, these states also have a higher housing price volatility. Growth rates which exceed ten percent are generally regarded as clearly unsustainable. Beyond doubt, the consensus view among analysts is that the exorbitant real estate price increases in cities like Boston, Los Angeles, San Diego and Miami are excessive. Hence, in these cases declines in growth rates are unavoidable and decreasing nominal house prices on regional levels are quite likely. Hence, significant parts of the US real estate market will probably get under massive downward price pressure. It has to be noted that many states with high housing price increases are at the lower ranks of income increases (see Table 3). In other words, the excessive growth rates are not justified by a rising income in the respective area.

Table 3: Population, Gross State Product and Income Ranks of 15 States with Highest Three-Year Percentage Change in House Prices

	Population in 2000	Percentage of USA	Gross State Product in million \$, 2001	Percentage of USA	Income Rank	
					<i>3-year- average</i>	<i>8-year- average</i>
Rhode Island	1,048,319	0.4%	36,939	0.4%	19	29
District of Columbia	572,059	0.2%	64,459	0.6%	34	23
California	33,871,648	12.0%	1,359,265	13.4%	45	8
New Jersey	8,414,350	3.0%	365,388	3.6%	43	27
Maryland	5,296,486	1.9%	195,007	1.9%	9	12
Massachusetts	6,349,097	2.3%	287,802	2.8%	51	19
Florida	15,982,378	5.7%	491,488	4.8%	11	9
New Hampshire	1,235,786	0.4%	47,183	0.5%	46	16
New York	18,976,457	6.7%	826,488	8.2%	48	46
Hawaii	1,211,537	0.4%	43,710	0.4%	5	52
Maine	1,274,923	0.5%	37,449	0.4%	12	18
Nevada	1,998,257	0.7%	79,220	0.8%	1	1
Connecticut	3,405,565	1.2%	166,165	1.6%	52	36
Virginia	7,078,515	2.5%	273,070	2.7%	13	7
Delaware	783,600	0.3%	40,509	0.4%	10	22
Sum (15)	107,498,977	38.2%	4,314,142	42.6%		
USA	281,421,906		10,137,190		35	25

Data sources: OFHEO (2004a-b, pp. 1), Bureau of Economic Analysis (2004a, pp. 1; 2004b, p. 1), US Census Bureau (2004e, pp. 1) and own calculations.

The 15 states with the biggest bubble potential, listed in Table 3, represent 38.2 percent of the population and 42.6 percent of the gross domestic product of the US. Additionally, they encompass important business areas. As a result, economic disturbances provoked by bursting regional real estate market bubbles have the capacity to damage the economy as a whole. Moreover, consumer confidence will fall jointly with house prices. Contagion effects to other regional real estate markets may occur as well. However, for individual markets some justification for growing home prices might be found. For example, Nevada ranks number one in income growth for the last eight and three years respectively. Hawaii and Florida are famous for vacation homes. However, it is quite obvious that home prices have reached unsustainable growth rates in most of the East and West Coast states, but not in the Central and

Mountain states. Coastal states have the greatest economic significance. Hence, it can be inferred that bursting real estate bubbles on regional levels pose a threat to the American economy.

3 Conclusions

Seen on the whole, our analysis has shown that the question of whether the rapid increase in real estate prices reflects a bubble or is rather based on fundamentals does not have a clear-cut answer. However, it seems fair to say that bubble symptoms clearly dominate evidence of fundamentals. Expansionary monetary policy appears to have flooded the markets with liquidity and provided the preconditions for the bubble. The increasing amount of credit is a well-known and econometrically robust indication of future difficulties with inflation. The divergence of housing price time series from those of the inflation rate and from the developments of rents is a clear indication of misalignments in the real estate market and a bubble component contained in the recent US boom. In addition, private sector expectations about future price increases are highly unrealistic, because double-digit growth rates are neither sustainable nor observed in history. If one additionally considers the fact that short sales are impossible, and regards the resulting price setting as by far too optimistic, a quite explosive mixture emerges.

Low short-term interest rates, low fixed mortgage interest rates and even lower adjustable-rate-mortgage interest rates are the most important fundamental reasons for the increase in house prices. Low interest rates have enabled low-income households to become first-time buyers. Thus, housing demand was shifted towards more expensive homes, while monthly mortgage payments stayed constant. However, they do not explain price growth differences between the individual states. Another important fundamental factor that speaks in favor of rising house prices is the demographic pattern of the U.S. population. High birth rates and the continuous stream of immigrants have endorsed rising prices in the past and increase the pos-

sibility of maintaining prices on a high level in the future. Government actions have also supported access to housing. However, the scale of this support has been rather limited.

In contrast, the strong recovery of the economy does not appear to be a fundamental reason for the rapid increase in house prices, but it may help to prevent nominal prices from falling in the future. The result of the analysis of the supply side of real estate is ambiguous. While real estate bubbles can only be found in some specific regional markets, the extent of the economic importance of these ‘bubble’ states is large. This pushes the problematic developments in the regional real estate markets up to a national level with economy-wide implications.

We see two possibilities for the burst of the bubble. First, due to the currently observed misalignment of house price and general inflation, prices will either decline in real or, worse, in nominal values. To restrict the necessary price declines to real values, inflation rates have to pick up and have to exceed two percent for the next few years. Only in such case can major misalignments be eased without a nominal drop in housing prices. The general probability of an increase in inflation rates is currently quite high due to comparatively low interest rates worldwide. Second, nominal price declines may be avoided through economic growth. As long as the employment situation improves, individuals will not be put under pressure to sell their homes. However, if inflation remains on low levels or sentiment over future house price developments changes, nominal house price declines become more likely. Nominal price declines, even if limited to the US states with the biggest increases in home prices, would have damaging effects on the real economy. In addition, the danger in the present situation has been increased because rising house prices are accompanied by a proportionately larger rise in household debt.

For these reasons, the Federal Reserve is urged to respond to the real estate price bubble which has been established, for instance, by the analysis in this paper. Above all, the tenor

of our paper is that it should do so by informing the public that house price growth rates are unsustainable and that there is a high risk of a future fall in these prices. It should not stick to vague insinuations but, instead, should disclose the main reasons (as derived in this paper) for its assessment. Which markets are concerned? Which numbers give reason for worries? Only if implemented in this way, the warnings will reach the consumers and, hence, clarification is a strong weapon. In general, central banks are in a comfortable position and can take the relaxed role of a neutral observer. They are not part of the market, are not driven by special interests and do not find themselves under pressure to act immediately. And they can convey a signal that, e.g., a price-earnings ratio on a certain asset market is high as compared to a long-run average. In this case, it is private investors who have to draw the correct conclusions from it.

Only if there is no effect of information policy and if there are significant medium run dangers for stability which clearly emerge from the asset markets, the central bank should raise interest rates – however, this time not merely by a warning shot of a small and cautious small-scale increase but with determination. However, this would only represent a stopgap solution. In a more general context, a strategy of puncturing a real estate price bubble by raising short-term interest rates would bear high risks as frequently stressed by the ECB chief economist Otmar Issing. On the one hand, a strong interest rate increase might lower investment in physical capital and, by this, hamper economic growth. On the other hand, a strategy of “leaning against the wind”, i.e. a pre-emptive little bit more restrictive monetary policy than usual if a bubble is identified and a slightly more expansionary policy if prices plummet, also does not appear to be feasible since especially price bubbles which are in the process of manifesting themselves are extremely difficult to identify. In this phase, the probability of a wrong diagnosis is tremendously high. In addition, a slight increase of interest rates would probably not be sufficient to end speculation. Finally, as shown in this paper regional real es-

tate price movements within the US diverge from each other which makes the task to puncture bubbles even more difficult for a monetary policy which is common for all US regions.²³

This again shows the important role of a sound central bank information policy when fighting asset price bubbles.

Mervyn King, the Governor of the Bank of England, recently started to explicitly warn the public that property prices in the UK had reached unsustainable levels. In the ideal case, this example of a sound information policy should be followed by Federal Reserve officials. However, until the end of 2004 the Federal Reserve has denied the existence of a bubble. Furthermore, the Federal Reserve even questioned the ability of a central bank to recognize bubbles. Revealingly, a study recently published by the Federal Reserve Bank of New York (McCarthy/Peach 2004) concludes that there is no bubble in the housing market. But how can it be impossible to realize bubbles, but at the same time, possible to realize the nonexistence of a bubble?²⁴ In the same vein, Fed chairman Alan Greenspan did not see any parallels between the current state of the real estate market and the performance of the stock market more than four years ago. He thinks nothing of talking from both sides of his mouth about whether he can identify a bubble. He blows the biggest one in history, but claims he did not know it was happening. And then he bails it out with a housing bubble that he says cannot exist because real estate cannot experience a bubble.

Ironically, Greenspan was even right in principle. The fall in housing prices will not be as extreme as the fall in stock prices was. However, it has to be taken into account that a

²³ The ECB is confronted with a similar situation of steeply increasing real estate prices in France and Spain whereas house prices in the largest euro area country Germany tend to fall since a couple of years.

²⁴ By the way, this view is even corroborated by a Fed transcript. Today's housing bubble in the US is a consequence of policies designed to ameliorate the effects of the bursting of the stock-market bubble. All in all, it does not seem to be too far-fetched to place the blame for the stock and real-estate bubbles squarely on Alan Greenspan and his easy-money colleagues at the Fed. Consequently, it was with interest that one could read "Fed Officials Worried in 1999 About Managing Stock 'Bubble'" in the Wall Street Journal of March 7th, 2005. The article discusses the fact that in 1999, Fed officials were *aware* of the stock-market bubble, even though they claimed before and after not to have known. See explicitly the just released revealing December 1999 Federal Open Market Committee minutes (Federal Reserve, 2005).

much smaller drop in housing prices has the capacity to harm the economy a good deal more. Some analysts argue that if there were a bubble in the real estate market, it should have burst already. However, one should be careful with premature conclusions with an eye on the fact that the boom in US equities at the end of the 1990s also lasted much longer than expected by many market participants. In addition, the subsequent downturn in financial markets was also larger.

In sum, the dangers of a continuous inflation of the housing bubble are too large not to respond at all. The Federal Reserve at least implicitly reacted in 2004 by enacting several consecutive steps of raising interest rates. However, a sound information policy might have been the better alternative. Hopefully, the ECB will stick to a communication strategy superior to that of the Fed in these days and does not play down the dangers of a real estate price bubble in the euro area.

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