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A Soft Landing for the US Property Market?

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A Soft Landing for the US Property Market?[3]

By Philip Arestis and Elias Karakitsos

Abstract: This paper attempts to assess the importance of the US housing market and residential investment in view of current and future economic developments in this country. The housing market has been particularly emphasised as an important factor to the current economic climate. The boom of the housing market since the burst of the equity bubble has raised some concerns. Indeed, the rapid rise in home prices over the last ten years or so has produced arguments and raised concerns of a possible 'speculative bubble' in the housing market. The slowdown of the economy would force lower growth rate on real disposable income that would help to cool down the property market. The combination of slower growth in real disposable income with subdued long-term interest rates would enable a soft rather than a hard landing in the property market. If, however, both real disposable income growth was slowing and long-term interest rates were trending up, then it would be difficult to avoid pricking the property market. But it looks that this is not what is going to happen.

JEL Classification: R21, R31

Keywords: US housing market, demand for housing, supply of housing, soft landing

[3] We are extremely grateful to Warren Mosler for helpful and incisive comments.

1. Introduction

The importance of the housing market and residential investment was highlighted by OECD (2000b), suggesting that "In the United States … the contribution of real estate developments to the current economic expansion has been emphasised recently" (p. 169). In fact, it is argued that "Over the 1996-99 period, the growth of housing wealth in excess of income growth in the United States may have contributed 0.4 percentage point to the total drop of the household saving ratio of some 2.4 percentage points" (p. 179). The same OECD study concludes that "The link between house price developments and movements in aggregate demand suggests that monitoring developments in property markets can provide a useful input to the setting of economic policy" (OECD, 2000b, p. 181; see, also, Greenspan, 1999).[4] The boom of the housing market since the burst of the equity bubble has raised some concerns.[5] Greenspan (2004) emphasized the importance of "preventive actions", which "are required sooner rather than later" in order to "fend off possible future systemic difficulties, which we assess as likely if GSE expansion continues unabated" (p. 4).[6] Especially so, since "the existence, or even the perception, of government backing undermines the effectiveness of market discipline" (p. 4). It is, therefore, suggested that "the GSE regulator must have authority similar to that of the banking regulator", but also "GSEs need to be limited in the issuance of GSE debt and in the purchase of assets, both mortgages and nonmortgages, that they hold" (p. 5). Indeed, the rapid rise in home prices over the last ten years or so has produced arguments and raised concerns of a possible 'speculative bubble' in the housing market.[7] Recent contributions tend to support the argument that "market fundamentals are sufficiently strong to explain the recent path of home prices and support our view that a bubble does not exist" (McCarthy and Peach, 2004, p. 2; see, also Case and Shiller, 2003, for a similar conclusion; but see Baker, 2002, for a different view).

The threat to the sustainability of the current recovery from the personal sector imbalances that were created by the boom and bust of the equity bubble has been put at bay in 2004. The risk of a property market collapse has diminished because long-term interest rates have not risen to the critical level that would trigger a warning bell for the property market. The strong possibility that the US economy entered a slowdown phase in June 2004, which is likely to last until the second half of 2005, further enhances the probability that the property market will have a soft rather than a hard landing. Although at face value the twelve-month slowdown of the economy is undesirable, from a long-term perspective, it might enable the economy to grow again at a robust pace in 2006 and beyond. The slowdown would stem the yawning current account deficit and would keep long-term interest rates lower than otherwise.

The slowdown of the economy would force lower growth rate on real disposable income that would help to cool down the property market. The combination of slower growth in real disposable income with subdued long-term interest rates would enable a soft rather than a hard landing in the property market with relative house price inflation remaining in positive territory by the end of 2005. This compares favourably to the 6% fall in relative house price inflation in 1989 and 1991. The reversal of real disposable and long-term interest rates with the former recovering in 2006 and the latter trending up, would further help to cool down the property market, instead of pricking it. If both real disposable

[4] Another OECD study argues that since owner-occupation rates exceed 50 per cent in most OECD countries, a significant number of households is bound to be affected by changes in property prices (OECD, 2000a).
[5] Stiglitz (1990) define the term 'bubble' as follows: "If the reason the price is high today is *only* because investors believe that the selling price will be high tomorrow – when 'fundamental' factors do not seem to justify such a price – then a bubble exists' (p. 13).
[6] GSE stands for Government Sponsored Enterprises and refers specifically to Fannie Mae and Freddie Mac.
[7] Home prices in the US have actually risen by 36 per cent since 1995 (McCarthy and Peach, 2004, p. 1).

income growth was slowing and long-term interest rates were trending up, then it would be difficult to avoid pricking the property market. But it looks that this is not what is going to happen.

We begin by looking at some length into the current realities of the US housing market. This enables us to propose a theoretical construct for the US housing market, which is tested against US data. This is followed by a discussion of the likely future developments in this market. A final section summarises and concludes.

2. The Role of the Housing Market in the Recent Downturn

Table 1 shows the changes in personal sector wealth since the burst of the equity bubble. Net wealth, defined as assets less liabilities, peaked in March 2000 at $43.4 trillion or 615 percent of disposable income and bottomed at $38.7 trillion or 493 percent of disposable income in September 2002, as equity prices plunged. The loss in net wealth between the peak and the trough of the equity bubble is $4.7 trillion or 122 percent of disposable income. The equity market rally since the end of the Iraq war and the boom in property market has turned these losses into gains of the order of $3.3 trillion, but as a percent of disposable income it is still 74% lower than the peak of the bubble. These shifts in net wealth obscure the risk of replacing the equity by the property bubble.

Table 1: Personal Sector Balance Sheet

	Net Wealth	Net Wealth as % of Nominal Disposable income	Total Assets	Total Assets as % of Nominal Disposable income	Tangible Assets	Tangible Assets as % of Nominal Disposable income	Financial Assets	Financial Assets as % of Nominal Disposable income	Liabilities	Liabilities as % of Nominal Disposable income
Peak of Equity Bubble (March 2000)	43,428	615%	50,384	714%	14,558	206%	35,827	508%	6,956	99%
Bottom of Equity Bubble (Sep 2002)	38,705	493%	47,138	601%	17,876	228%	29,262	373%	8,433	107%
Latest Quarter (Sep 2004)	46,681	541%	56,975	660%	21,699	252%	35,276	409%	10,293	119%
Loss between Peak & Bottom of Bubble	**-4,723**	**-122%**	**-3,246**	**-113%**	3,318	22%	**-6,564**	**-135%**	1,477	9%
Latest Gain or Loss since Peak of Bubble	3,253	**-74%**	6,590	**-53%**	7,141	45%	**-551**	**-99%**	3,337	21%

Table 1 shows the breakdown of net wealth into its constituent components. By the end of the third quarter of 2004 the $3.2 trillion losses in total assets (defined as tangible and financial) between the peak and the trough of the bubble had been turned into gains of the order of $6.6 trillion. However, this is largely due to the gains in tangible assets (mainly property), which more than offset the losses in financial assets. The rally in equity prices since the end of the Iraq war has almost eliminated the losses in financial assets from $6.6 trillion to just $0.5 trillion. Households, though, have continued to borrow heavily in the last four years of the order of $3.3 trillion or 21 percent of disposable income. This accounts for the deterioration in net wealth. The rate of debt accumulation in the last four years is unprecedented. There is no other four-year period, since records began in 1952, in which debt increased at such frenetic pace. The second highest rate is just over 10% of disposable income that occurred between April and September 1987, after the peak of the property market in April 1987. The rate of debt accumulation fell rapidly after the equity market crash in October 1987.

Table 2 shows the role of the property market in supporting consumer expenditure and cushioning the economy in its recent downturn. The boom in the residential property market has resulted in capital gains of the order of $6.1 trillion for households between the peak of the equity bubble and the third quarter of 2004. However, households continuously borrowed against their property to finance

consumer expenditure in the recent downturn. Accordingly, the percentage of owner's equity in household real estate keeps falling. Between the peak of the equity bubble and the third quarter of 2004 the owner's equity in household real estate has fallen from 56.9% of disposable income to 56.2%. This represents $831 billion home equity extraction (i.e. realised capital gains), which accounts for 50% of the consumer expenditure in this period. The fiscal support to the personal sector in the form of tax cuts and other benefits account for an additional $163 billion during this period. Hence, taken together, the fiscal support and the home equity extraction account for 60% of consumer expenditure in the last four years. This explains why the consumer remained resilient throughout the recent downturn. This poses the question of what would happen if property prices were to fall. Would the consumer respond by saving more and cutting down on expenditure?

Table 2: Source and Uses of Housing Capital Gains (billions of dollars)

	Real Estate of Households	Percentage of Owner's Equity in Household Real Estate	Extracted Home Equity	Disposable Personal Income (Nominal)	Personal Income	Fiscal Support	Consumption (Nominal)
Peak of Equity Bubble (Mar 2000)	10,506	56.9%	4018	7059	8266	1207	6,614
Bottom of Equity Bubble (Sep 2002)	13,268	56.8%	4456	7849	8896	1047	7,428
Latest Quarter (Jun 2003)	16,583	56.2%	4849	8627	9672	1044	8,278
Difference between Peak & Bottom of Bubble	2,762	**-0.1%**	438	790	630	160	814
Difference since Peak of Bubble	6,077	**-0.7%**	831	1,568	1,406	163	1,664

3. The Housing Market

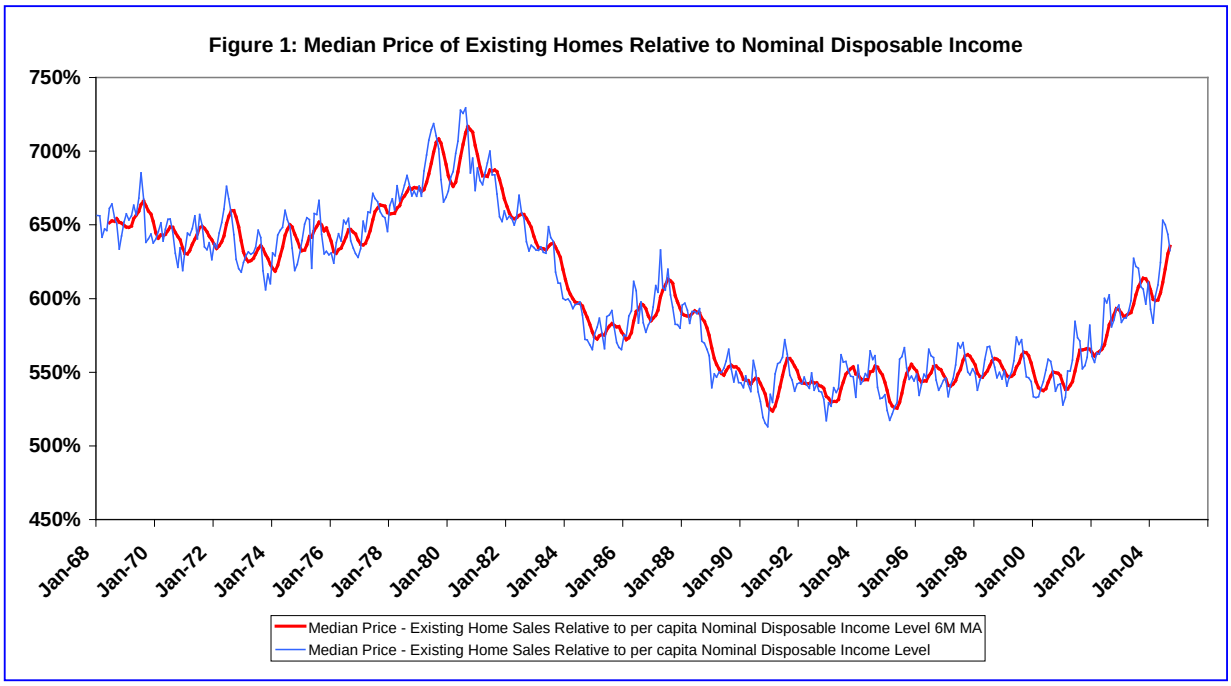
Although in the short run the ratio of house prices to disposable income can fluctuate widely, in the long run it should be trendless[8], as it shows the number of years it takes to buy a house, which can neither be on an up-trend nor on a downtrend in the long run. Figure 1 shows the median price of existing homes for sale relative to per capita nominal disposable income during the last thirty-five years. This peaked in August 1980 at 730% of disposable income and bottomed in December 1990 at 513%. It recovered ever since and at the end of September 2004 it stood at 632%. Compared to the 1970s house prices even now seem low, but this is not correct when account is taken of the low inflation and interest rate environment of today.

The long-term decline in the median house price relative to disposable income in the 1980s reflects the fall in inflation and interest rates that made houses more affordable and moderated their demand as a hedge against inflation. Figure 2 confirms this conclusion by comparing nominal with real (deflated by CPI) house price inflation.[9] Although nominal house price inflation was high in the 1970s and low

[8] A trendless variable is one that has neither an upward nor downward trend. It is more rigorously defined as a stationary variable, which means that its mean and standard deviation are not time varying. A stationary variable has the property that it reverts back to its mean.

[9] Constructing housing price measures is not a straightforward task. This is a complex exercise in view of the fact that home sales do not take place in centralized markets. McCarthy and Peach (2004) discuss four housing price series to conclude that 'quality' of housing should be accounted for when constructing housing price indexes. Consequently, a constant-quality

since the 1980s, in real terms (deflated by CPI) it has been the same in the two periods. Nominal house price inflation increased steadily in the 1970s, but declined in the early 1980s in line with inflation and interest rates. In September 2004 nominal house price inflation hit 8.5%, the highest since 1982, the period of low inflation. Real house price inflation does not suffer from the distortions of inflation and reflects more accurately the demand and supply forces of the housing market. In September 2004 real house price inflation hit nearly 5.5%, only 1.5% lower than the all time high in the last thirty-five years of nearly 7% reached in May1978.



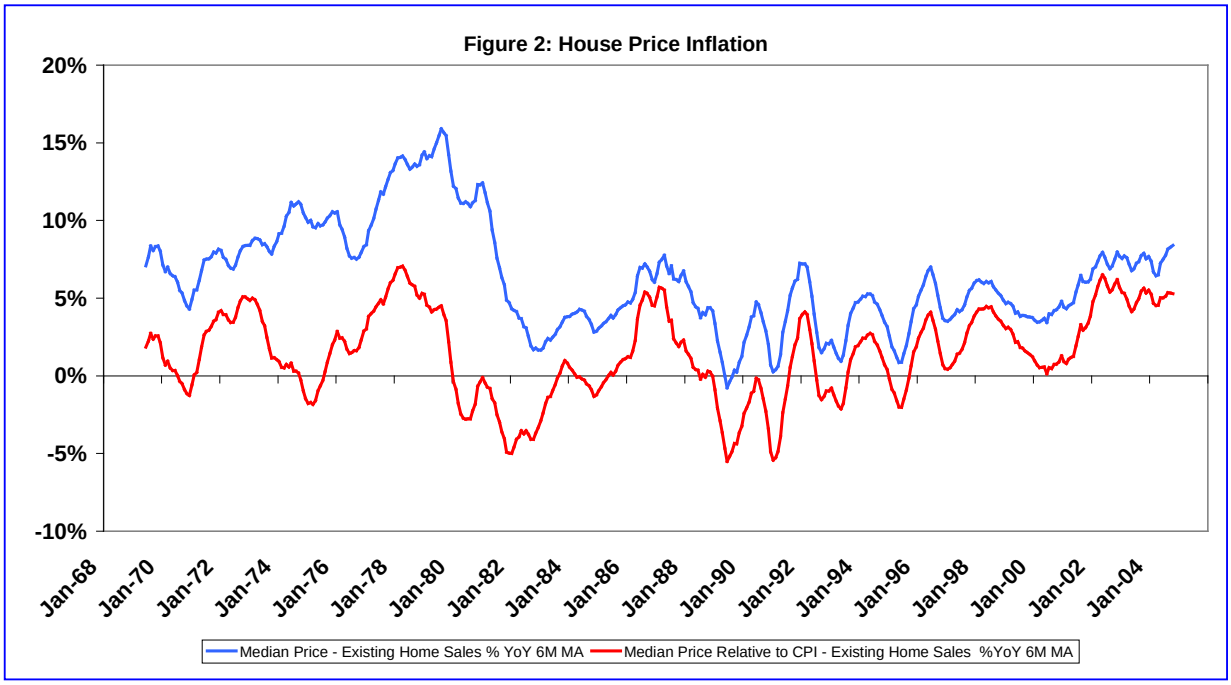
The housing market is not yet a bubble, but it has all the characteristics of becoming one. The boom is not nationwide, at least at its initial phase concentrated in the Northeast. However, there are tentative signs that house price inflation is easing in the Northeast, but it is rising sharply in the West (see, Figure 3). In the Northeast house price inflation soared to 17% in June 2004, which with the exception of the 1987 bubble when it reached 25.5%, was the highest in the last thirty-five years. The concentration of the housing boom in one area may be less worrisome than if it were nationwide, but it is still troublesome, since it is more vulnerable to a sudden collapse with possible chain reactions in the income and employment of the other regions.

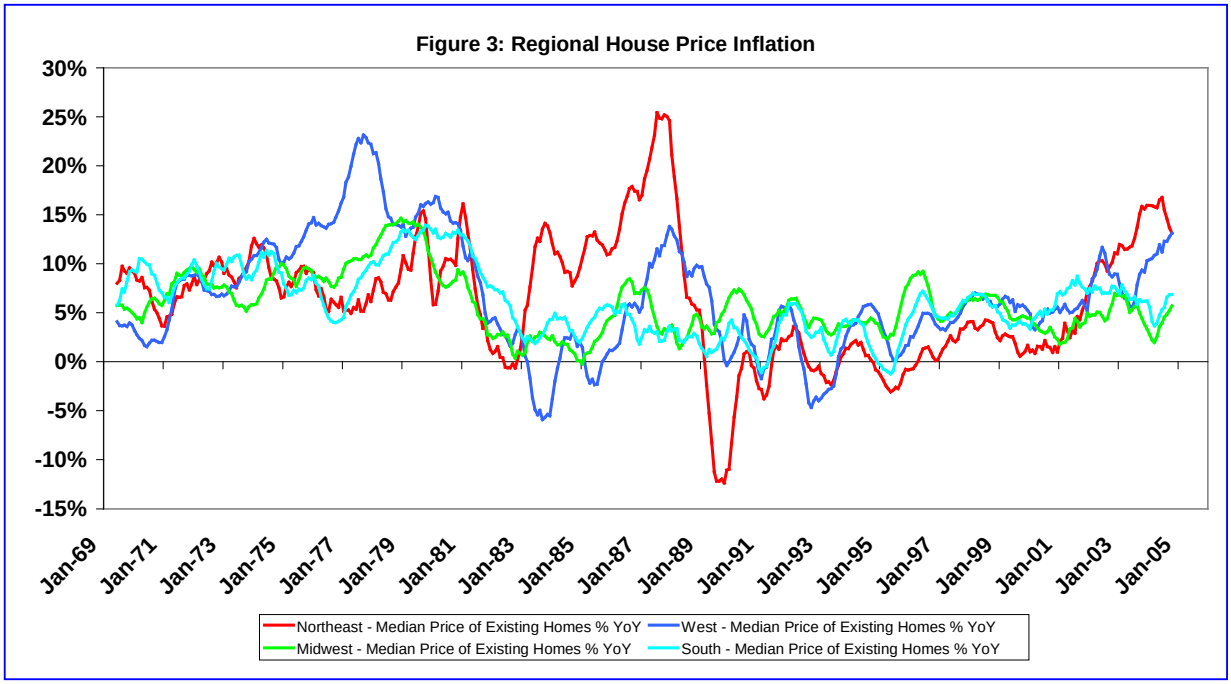
Changes in demand for housing are first reflected in the prices of existing homes, which then give the signal to developers to alter the supply of new houses. Because of gestation lags, the current supply of new homes reflects previous demand conditions. Hence, prices of new homes are more volatile than existing homes as they represent a small proportion of total homes for sale and reflect current demand conditions, but supply of previous demand. Hence, the prices of existing homes for sale are a better indicator of market conditions than new homes.

House prices at the top end of the market are more volatile to fluctuations in demand than the low end. The median price is not affected as much as the average price by the top end of the housing market. Hence, the median price of existing homes is a better indicator of market conditions than the average

housing price index is preferable. This is not without its problems, though, as the authors readily admit, and Hulten (2003) shows.

price, as it is both less volatile and it is, at worst, a coincident indicator and, more often, a leading indicator of the housing market.

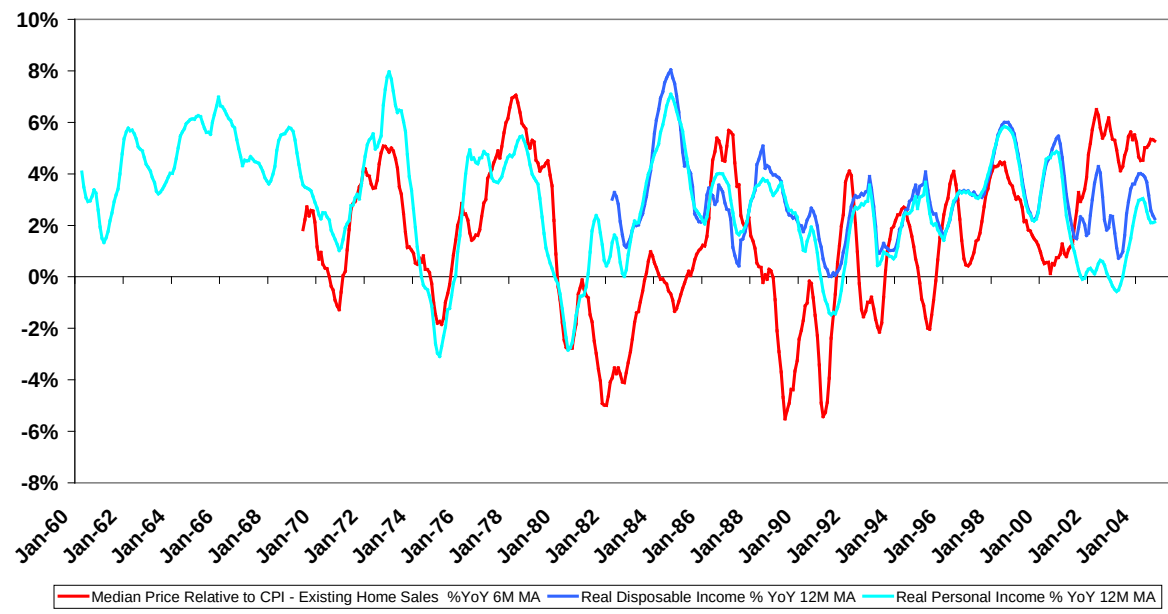




4. The Demand for Housing

The demand for housing depends on the real disposable income of households. This is a composite variable, as it is affected by both per capita real disposable income and population growth. On occasions, real personal income is a better proxy of income than real disposable income because the latter is affected by taxes and subsidies, which households may regard as temporary rather than permanent. Figure 4 shows the association of house prices with real personal and disposable income. An increase in income leads to higher demand for housing that pushes up house prices. The growth in disposable income, through the fiscal injections in the recent downturn, accounts, to some extent, for the recent housing boom.

Figure 4: House prices, Real Disposable Income & Real Personal Income



The demand for housing is greatly affected by the mortgage rate, which is closely associated with the 30-year Treasury yield (see, Figure 5). Higher bond yields lead to increases in the mortgage rate that diminishes the demand for housing and lowers house price inflation. The boom of the housing market since the burst of the equity bubble is due, apart from fiscal policy, to lower mortgage rates and thus to monetary policy. The risk to the housing market comes from this variable, which is affected by budget deficits, the dollar and economic growth. In fact, the more buoyant the recovery is, or the weaker the dollar is, or the higher the budget deficit, the bigger the increase in the mortgage rate and therefore the higher the probability that the property market will tumble. The mortgage rate fall from 6.3% in August 2003 to less than 5.5% by March 2004, and the increase in June 2004 to 6.3%, but then again standing at 5.75% in November 2004, implies that the mortgage rate has not yet reached the critical level that would trigger the alarm bell for the housing market.

The debt service burden measures the ratio of interest payments on consumer debt to nominal disposable income. It is influenced by the mortgage rate, the size of consumer debt and nominal disposable income. The higher the mortgage rate or consumer debt is, the bigger the debt service burden. On the other hand, the higher the nominal disposable income is, the lower the debt service burden. But households are willing to accumulate more debt and withstand a heavier debt service burden, if house prices are expected to rise. Hence, house prices tend to rise with increases in the debt

service burden, and vice-versa. This, of course, is destabilising in the short run, as it tends to fuel the boom or deepen the bust in the housing market. Confidence is driving these perverse expectations. In the upswing of the cycle confidence is rising and households are willing to accumulate more debt and withstand heavier debt service burdens. In the downswing of the cycle households are becoming increasingly scared and reduce their debts and its service burden. Figure 5 shows the positive correlation of house prices with the debt service burden and the negative correlation with the mortgage rate.

Figure 5: House prices, Interest rates and Debt Service

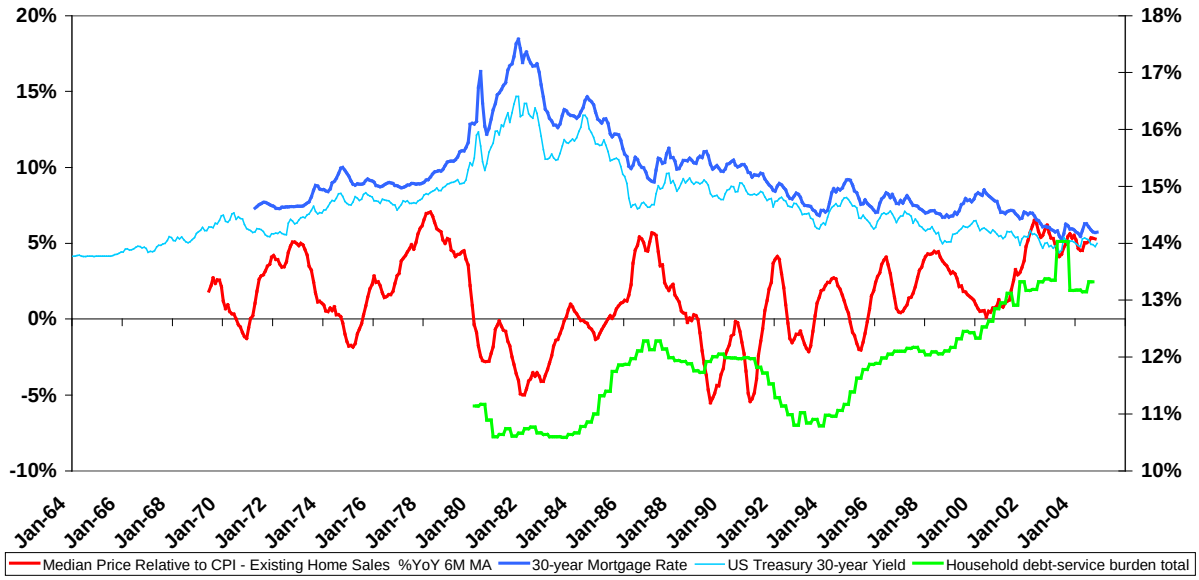
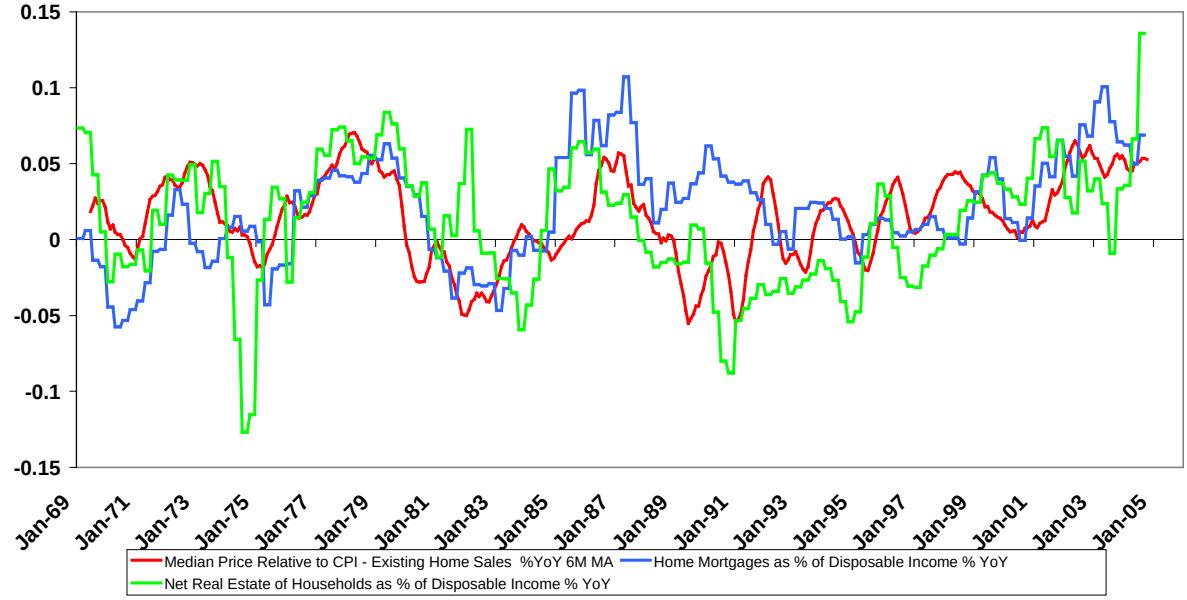


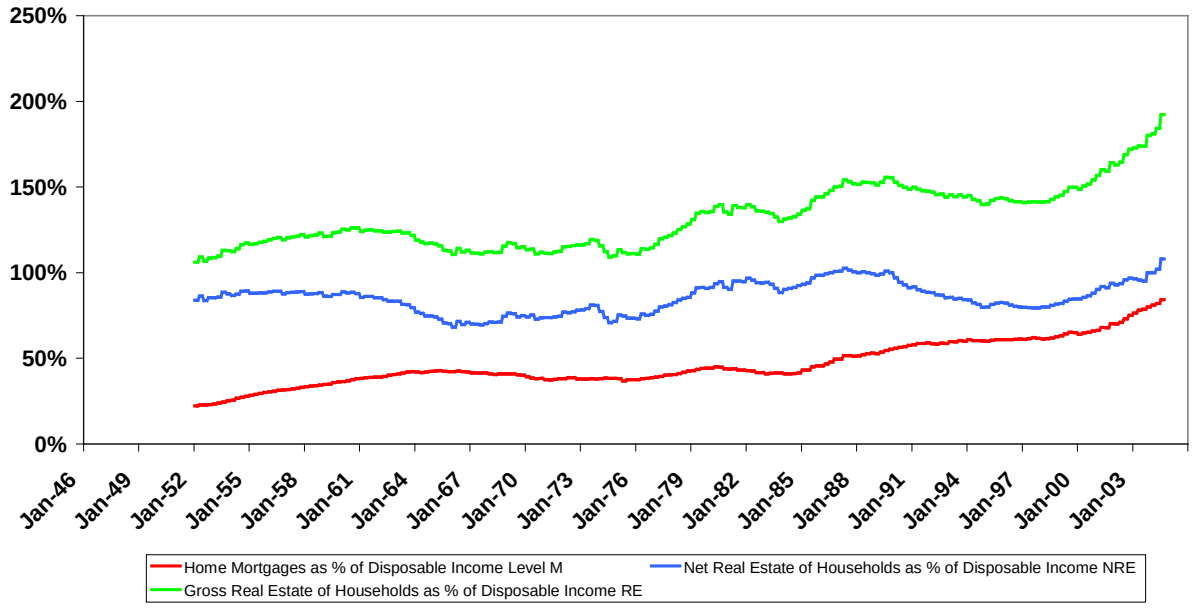
Figure 6: House Prices, Net Real Estate and Mortgage Debt



The net real estate of households measures the value of property less the mortgage obligations. Higher house prices lead to capital gains in the property market that boost the value of the real estate of

households. These capital gains and expectations that they will continue for some time lead households to accumulate more debt in the short run. Hence, there is a positive correlation between house prices and mortgage debt in the short run. However, at some point in time, the rate of debt accumulation exceeds the pace of house price increases and the net real estate of households begins to fall. This leads to lower demand for housing, other things being equal, since property is an asset and the net real estate of households measures the importance of the wealth effect in the demand for housing.

Figure 7: Gross & Net Real Estate of Households and Mortgage Debt

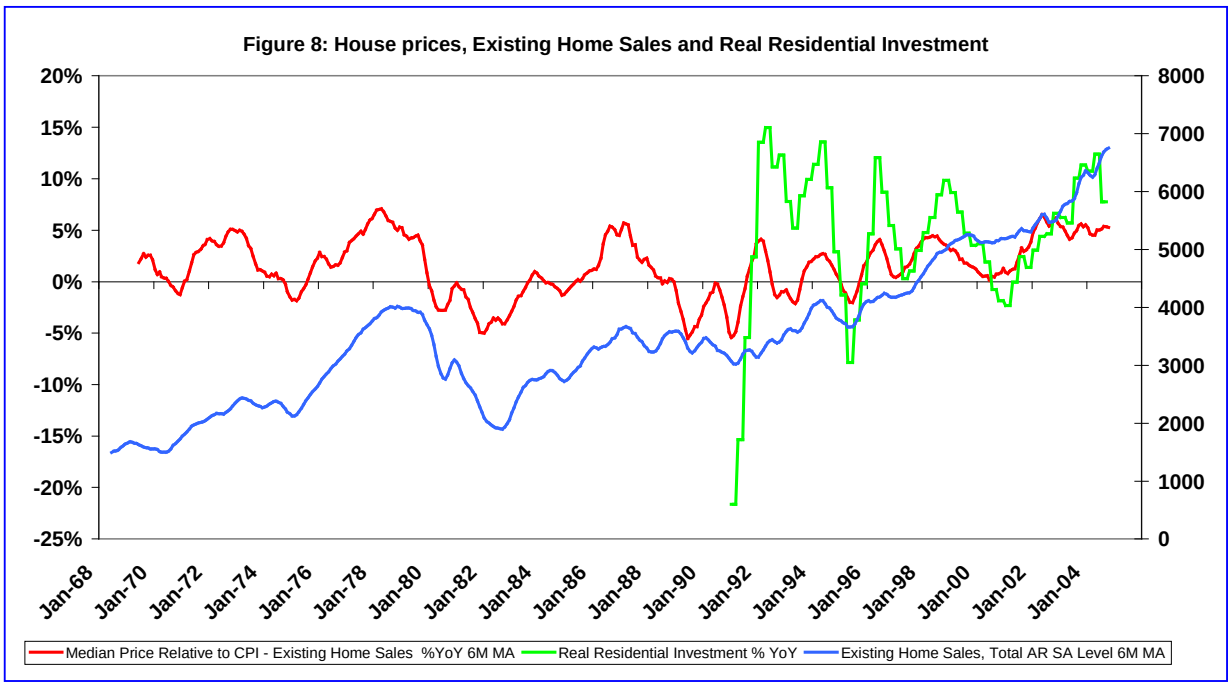


More often than not the net real estate is a leading rather than a co-incident indicator of the housing market. Figure 6 shows the positive correlation of house price inflation with both mortgage debt and net real estate growth. Figure 7 shows the gross and net real estate and mortgage debt as percent of disposable income. Mortgage debt fluctuated around 40% for twenty years until 1985, but doubled since then to nearly 85% of disposable income by the third quarter of 2004. Since the burst of the equity bubble in March 2000 mortgage debt has increased more than 20% of disposable income. Clearly, the rate of debt accumulation shows that households expect house prices to continue to rise for some time. Although the gross real estate of households is at an all time high at more than 190% of disposable income, the net real estate of households stands at less than 110% of disposable income, still an all time high, but just a whisker higher than the previous peak.

5. The Supply of Housing

The supply of houses is a positive function of house prices. Property developers and existing homeowners are willing to increase the supply of houses for sale, if house prices are rising. Figure 8 shows the positive correlation between house price inflation and existing homes for sale. The supply of new homes is closely associated with the supply of existing homes for sale. This means that property developers behave in much the same way as existing homeowners – they increase the supply as house prices rise. House price inflation precedes turning points of the supply of houses by, on average, six months (see, Figure 8). This implies that house price inflation provides the signal to property developers and existing homeowners to alter the supply. A rise in house price inflation leads after a few

months to increased supply of houses, and vice-versa. The supply of existing- and new-homes is at an all time high.



Once house price inflation begins to rise real residential investment picks up so that property developers can increase the supply of new homes. Although in the short run the correlation of house price inflation with real residential investment is positive, in the long run it is negative, as the higher supply leads, other things being equal, to lower prices. On the other hand, the positive correlation in the short run means that supply should increase with higher prices[10]. On some occasions, the reaction of real residential investment to changes in house price inflation is instantaneous, but most of the time it follows with a few months lag. This has been particularly true in the recent housing boom of the last five years (see, Figure 8). The increased lag between house price inflation and real residential investment means that property developers are becoming increasingly wary that the boom in the housing market may not last much longer.

A rise in house price inflation leads after a few months to increases in housing starts. The average lag is three months. Property developers regulate the pace of construction so that completions are in line with housing starts and the stock of houses for sale is close to the desired level. Hence, despite the strong housing boom, property developers have refrained from becoming overenthusiastic and oversupplying the market with new houses, as the stock of houses available for sale has been kept unchanged. But the same cannot be said about homebuyers. There has been a frenetic pace of house sales, which shows that new home buyers are purchasing property which has either not yet started or is under construction (see, Arestis and Karakitsos, 2004, for further details).

[10] In terms of textbook economics, in the short run we are moving up along the supply curve in response to a shift in the demand curve, while in the long run the supply curve shifts to the right because of higher residential investment.

6. A Model of the US Housing Market

6.1 Theoretical Model

The model of the US housing market put forward in this paper, captures the above-mentioned stylised facts through four equations. The first explains house prices through the forces of demand for and supply of houses. The second equation explains real residential investment. The third equation is concerned with the determination of the mortgage rate. The fourth equation explains gross real estate (the value of property) and an identity defines net real estate (the value of property net of mortgage debt).

In the steady state house prices are influenced by the following demand factors: (i) the level of real disposable income (RYD); (ii) the mortgage rate (MR); (iii) the debt service burden (DSB); and (iv) the net real estate of households (NREH). The first two variables reflect the short run factors that affect the demand for houses, while the last two variables are long-run factors, which are associated with personal sector imbalances. We may, therefore, express housing demand (HD) as:

$$\text{(i) } HD = H_1(\underset{-}{HP}, \underset{+}{RYD}, \underset{-}{MR}, \underset{+}{DSB}, \underset{+}{NREH})$$

with the sign below a variable denoting the partial derivative with respect to that variable.

For the reasons explained in section 4, the level of real disposable income, the debt service burden and the net real estate of households affect positively housing demand, while the mortgage rate and house prices affect housing demand negatively.

Housing supply is affected in the steady state by the following factors: (i) the level of housing starts (HST); and the level of real residential investment (RRI).

We may, therefore, stipulate the supply of housing as:

$$\text{(ii) } HS = H_2(\underset{+}{HP}, \underset{+}{HST}, \underset{+}{RRI})$$

Combining demand and supply factors we are able to represent the long-run relationship for house prices as:

$$\text{(1) } HP = H(\underset{+}{RYD}, \underset{-}{MR}, \underset{+}{DSB}, \underset{+}{NREH}, \underset{-}{HST}, \underset{-}{RRI})$$

It clearly follows from equations (i) and (ii) that the level of real disposable income, the debt service burden and the net real estate of households affect positively house prices, while the mortgage rate affects house prices negatively. Similarly, the level of housing starts affects house prices negatively, as is the level of real residential investment.

According to our estimated US housing model (sub-section 6b below), in the short run house price inflation responds negatively to previous disequilibria from the steady state. This implies that house

price inflation moves to bring the housing market back to equilibrium in the long run. It takes sixteen months to correct any given deviation from equilibrium. House price inflation responds with the same signs to the yearly rate of change of all aforementioned variables, with the exception of real residential investment. The rate of growth of real residential investment affects house price inflation positively in the short run, but the level of real residential investment affects the level of house prices negatively in the long run.

In the steady state the level of real residential investment depends on the following variables: (i) the year-on-year rate of growth of real disposable income (GRYD); (ii) the level of house prices (HP); (iii) the mortgage rate (MR); and (iv) the level of housing starts (HST). With the exception of the mortgage rate, all variables affect positively the level of real residential investment.[11] The mortgage rate affects it negatively. In the short run the rate of growth of real residential investment is affected by the yearly change in all aforementioned variables with the same signs as in the steady state.

The long-run RRI relationship may be expressed as follows:

(2) RRI = R(GRYD, HP, MR, HST)
+ + - +

We may treat the mortgage rate as endogenously determined as in equation (3):

(3) MR = M(TY)
+

where TY is the treasury yield on 30-year maturity government bonds, which affects MR positively
.
A further relationship completes the picture. This is the determination of GREH, gross real residential housing, as in equation (4):

(4) GREH = G(HP)
+

where GREH stands for gross real estate of households, which is the value of property. The value of gross real estate of households depends on house prices, as changes in prices cause capital gains or losses in the value of property.

A simple identity completes the picture. This is:

(4a) NREH = GREH – MD

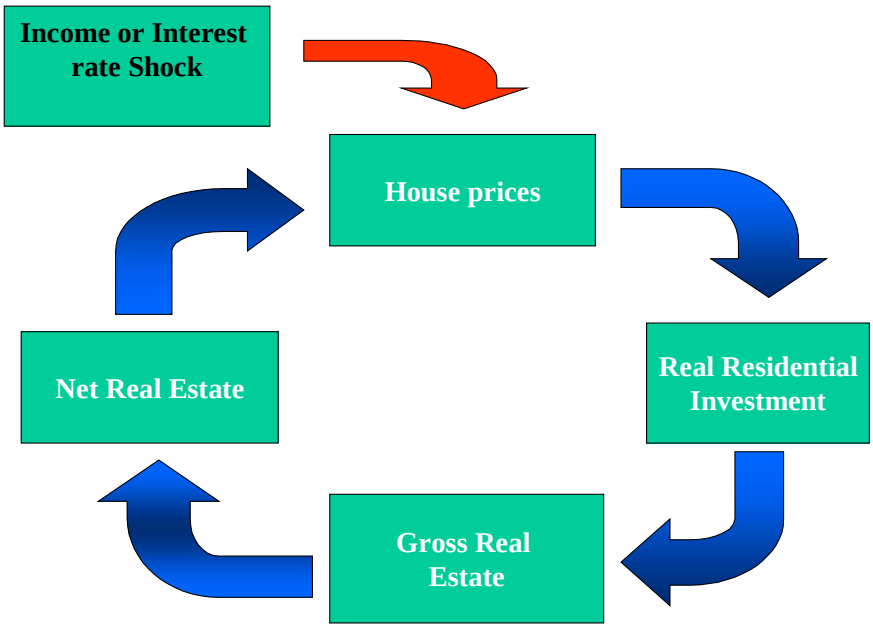
where MD is total mortgage debt.

Table 3 explains the rationale of the model for the housing market. A negative or positive shock in real disposable income or the mortgage rate affects the demand for houses and alters house prices, since the supply of houses is fixed at any point in time. This provides a signal to existing homeowners and property developers to alter the supply of houses. Accordingly, real residential investment is adjusted.

[11] The impact of HP on RRI has received renewed interest recently, where the relationship emanates through the impact of house prices on profitability; see, for example, OECD, 2000b.

The new balance of demand and supply of housing affects the capital gains (or losses) in the housing market and therefore the value of gross real estate. The new trend in house prices induces households to adjust their mortgages, which, in turn, affects the net real estate of households. The latter though affects the demand for housing and the cycle is repeated leading to a spiralling effect, as the stimulus from each cycle is getting bigger in the initial phase of the process. However, at some point in time, the rate of debt accumulation exceeds the rate of capital gains and the net real estate begins to fall. This puts a brake to the process of expanding house prices at infinitum.

Table 3: The Housing Market Loop



The housing boom of the last few years can be explained with the help of the model as follows. Rising real disposable income in the second half of the 1990s helped house price inflation to accelerate. But the tightening of monetary policy after the 1997-98 crisis reduced house price inflation to zero by June 2000. The easing of monetary policy in the aftermath of the burst of the equity bubble set up a spiral of house price inflation. Lower mortgage rates increased the demand for houses and spurred real residential investment. The new balance of demand and supply of housing led to capital gains in the property market that boosted the value of gross real estate. This induced households to borrow more and increase again the demand for houses. This cycle has been repeated several times in the last four years leading to accelerating house price inflation. The critical factor for the reversal of the spiral is that the pace of debt accumulation exceeds the rate of capital gains in the property market. This is the condition that ensures that net real estate stops rising and begins to fall. This has already happened and in time it will lead to lower demand for housing. The down-spiral process will accelerate if the recovery continues to be buoyant and long-term interest rise.

It is important to note that the model we have postulated, and tested in this paper, the mortgage rate is the most important factor of the housing market with real disposable income in the second place. In terms of the estimated model as reported in the Appendix, and discussed in sub-section 6.2, the first- and second-year multiplier with respect to the mortgage rate is over 2. This means that for every

percentage rate increase in the mortgage rate house prices would fall more than two percentage points. The increase in the mortgage rate sets in motion a spiral between four key variables: house prices, real residential investment, gross real estate (the value of property) and net real estate (the value of property net of mortgage debt). A rise in the mortgage rate or a fall in real disposable income growth lowers the demand for housing and triggers a fall in house prices, as the supply of houses is fixed in the very short run. In time, this lowers the supply of houses by reducing real residential investment and inducing households to keep their property instead of putting it in the market for sale. The new balance of demand and supply of houses causes capital losses in property and lowers the gross real estate of households. With time households are induced to repay their mortgage debt or, at least, to accumulate debt at a lesser pace. Either way the net real estate of households falls and this diminishes once again the demand for housing. Once this cycle is completed it triggers another one that is larger than the one before. The spiral of falling prices, residential investment, gross and net real estate goes on increasing in amplitude until the rate of debt repayment exceeds the rate of capital losses in property values. Net real estate stops falling, as households pay back their debt, and begins to rise and this, in time, will increase the demand for houses thereby putting an end to the free fall of house prices. In other words, a shock in the mortgage or real disposable income growth leads to a new steady state equilibrium with lower house prices, lower real residential investment and lower gross and net real estate.

It is now clear what explains the boom of the property market in the last four years.[12] The extremely low interest rates that the Federal Reserve System has set in place to combat the deflationary effects of the burst of the equity bubble, fuelled the housing boom. The risk that the property market will be pricked has abated somewhat in the last twelve months. Relative house price inflation is one percent lower than two years ago and the mortgage rate is back to the level that it was a year ago.[13] There may be a counter-argument here, which is that housing prices and mortgage rates do not always correlate all that well historically – witness the period 1988-93 in Figure 5. Other forces may be moving housing prices as shown above. However, the point of this paper is that the housing prices/mortgage rate relationship is particularly pertinent at this phase of the cycle. Indeed, in the aftermath of the burst of the equity bubble, 'sector rotation' has been at work, whereby surplus funds have channelled into the property rather than the equity market.

6.2 Empirical Model

The model put forward in sub-section 6.1 has been estimated using standard cointegration techniques, utilising Ordinary Least Squares, and employing the E-views econometric package (version 4.0); the results of this exercise are reportedin an Appendix to the paper. Four relationships have been estimated corresponding to the theoretical relationships as postulated in sub-section 6.1. The series used for estimating the four relationships postulated in sub-section 6.1 are tested using the usual Augmented Dicky-Fuller procedures for determining the degree of integration for each one of them. They are all found to be I(1) series. This allows us to proceed with the estimation of the long-run cointegrated relationships, once we have tested for them. In other words, we test for whether the long-run relationships are cointegrated through the residuals of the long-run relationships. The residuals are used in an Augmented Dickey Fuller regression to assess the null hypothesis of noncointegration. In all

[12] Two related variables have been used in the literature when studying US housing: housing prices relative to household income, and housing prices relative to rents. McCarthy and Peach (2004) discuss and criticize these two measures, essentially because neither of them accounts for interest rates (an important variable in our model as shown in the text).

[13] An interesting study that compares the US and the UK housing markets is Banks et al. (2003). This study compares households' decisions in buying houses at various stages of their lives in the two countries. The smaller volatility in the US in relation to the UK market is explained by resorting to the absence of hedging possibilities in the UK. This means that since no hedging against further increases in house prices exists, except of course to buy housing itself, forces people to buy houses sooner in their lives.

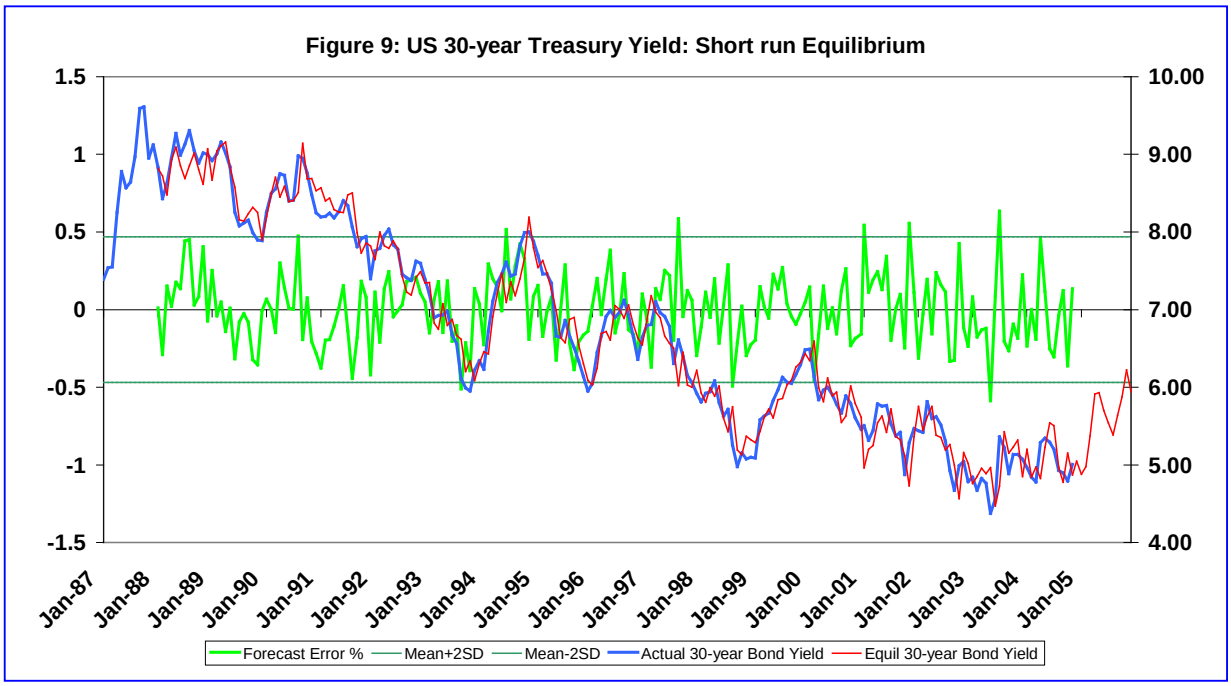
cases the results clearly indicate rejection of the null hypothesis, thereby demonstrating that the reported long-run relationships, as reported in the Appendix, are in fact cointegrated. Furthermore, this procedure enables us to derive corresponding short-run dynamic relationships that embed in them a relevant error-correction mechanism (this being the error term from the related long-run relationship). The resulting pair of estimated relationships for each postulated equation is reported in the Appendix along with the glossary of the variables utilized and relevant notes.[14]

It is clear from the estimates reported in the Appendix that they are all significant and with the right sign. Furthermore, the statistics/diagnostics that accompany each estimated relationship in the Appendix are all satisfactory, thereby providing further support to the soundness of the estimated relationships. We may, therefore, conclude that the model for the US housing market put forward in section 6.1 is a satisfactory representation and as such can be used for further experimentation of the type undertaken in section 7.

7. A Quantitative Assessment of the Risk in the Housing Market

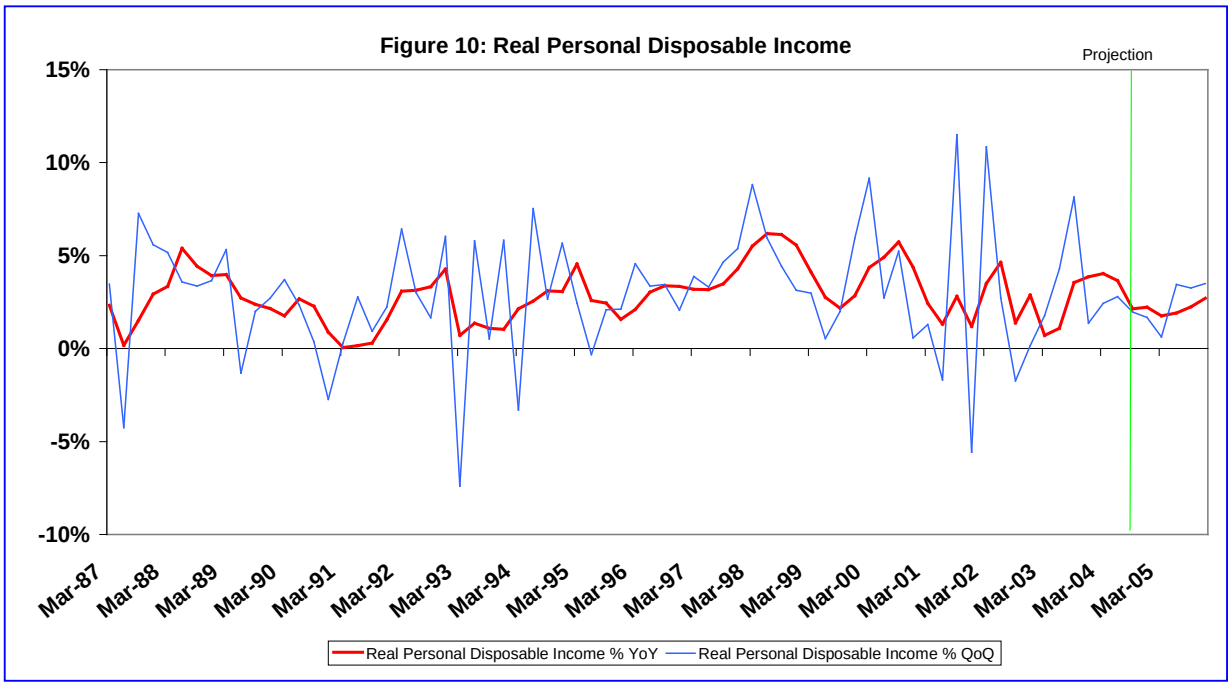
The estimated relationships reported in the Appendix are utilized in this section to throw further light on the current state of the US housing market. This is undertaken with the help of simulations that are conducted within the confines of a macroeconometric model that contains the US housing market loop as put forward and tested in section 6. The macroeconometric model in question is explained and reported at length in a different study recently published (see Arestis and Karakitsos, 2004); this macroeconometric model contains a real sector of the economy fully linked to the financial sector and to the foreign sector. It is, therefore, an open economy model and perfectly amenable to simulation exercises. The focus in this section is to throw further light on the risk of the US housing market. We conduct simulations within the constraints of the following scenario: What would happen to the housing market if the slowdown of the economy were to last for some time?

[14] The results for integration/cointegration are not reported in the paper but can be obtained from the authors upon request.



The economy entered a deceleration phase in June 2004 that is likely to last for at least twelve-months. This view is supported by both cyclical factors, such as the index of leading indicators, and consumer and business confidence, as well as economic fundamentals. Not only cyclical indicators for the economy as a whole, but also the various cyclical indicators of the determinants of aggregate demand point to a slowdown. For example, the OECD leading indicators, durable goods orders and retail sales suggest that exports, investment and consumption would continue to slow.

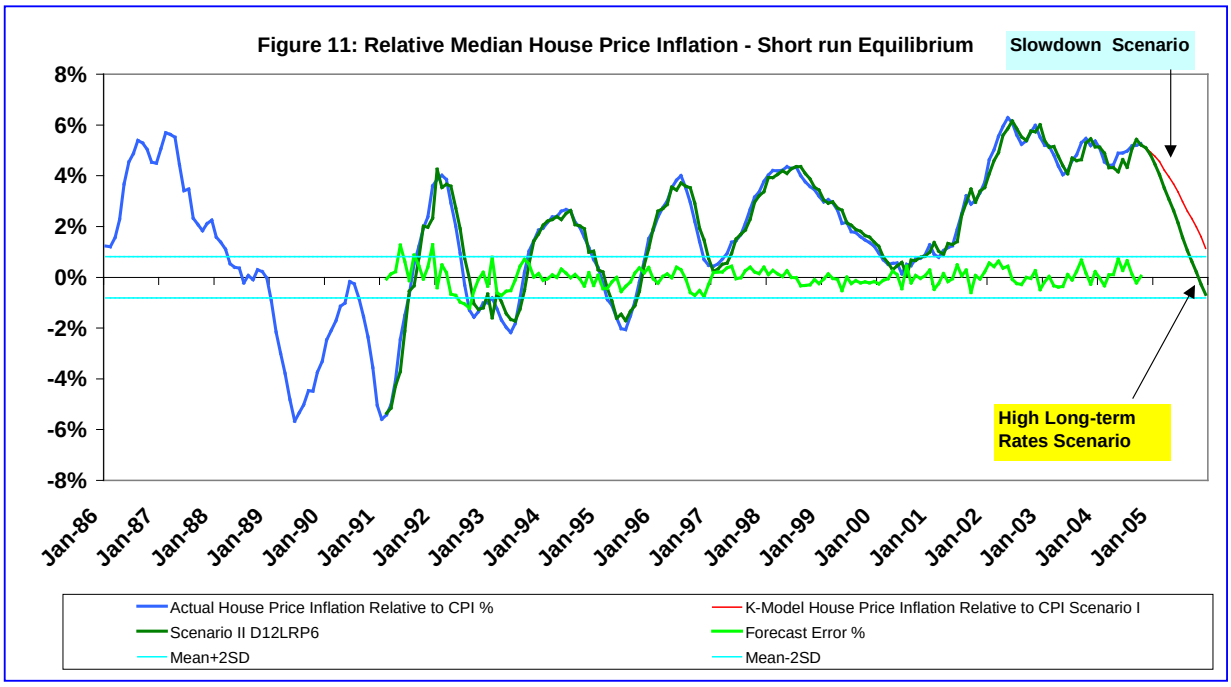
Furthermore, economic fundamentals point to the same conclusion. Tight fiscal policy, a progressive move towards a neutral stance in monetary policy, the surge in the price of oil and lower gains in financial assets and the housing market should combine to decelerate the economy. The restoration of profit margins and corporate profitability after the slowdown has run its course will drive the economy up again. Once profit margins and corporate profitability is restored, industrial production would begin to recover and the pace of job creation would re-accelerate. Exports would be the first component of aggregate demand that would start to recover, followed by consumption and investment.

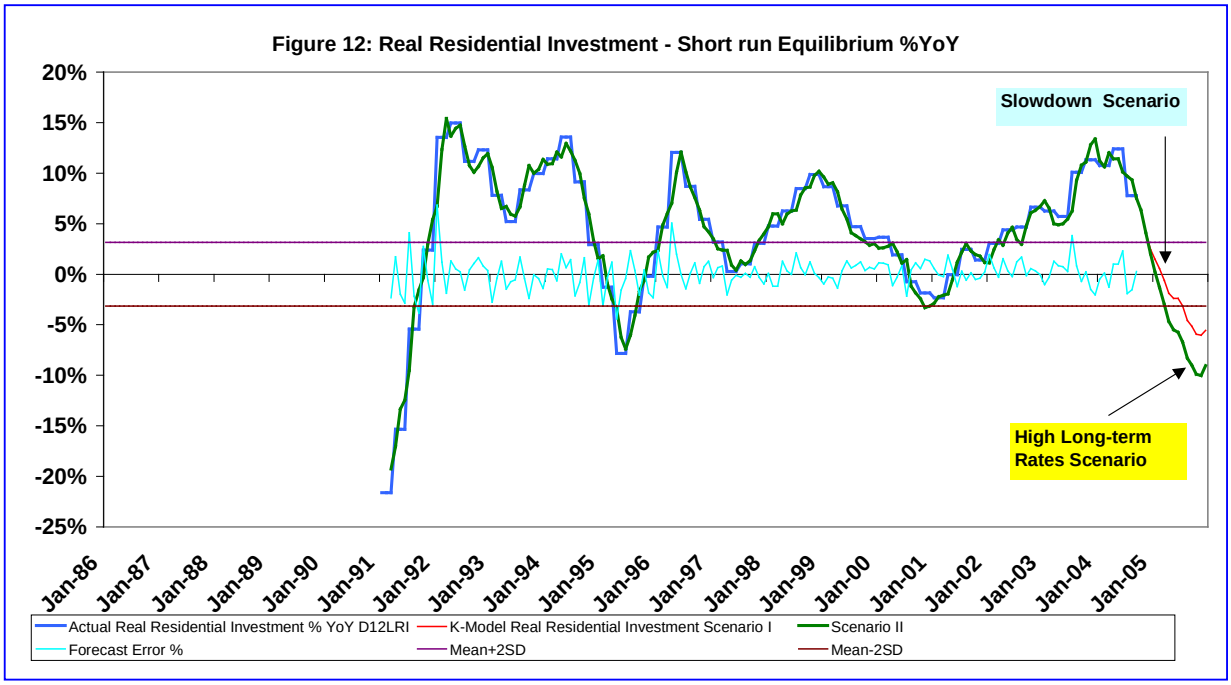


Although at face value the slowdown of the economy is undesirable, from a long-term perspective it would enable the economy to grow again at a robust pace. To begin with, the slowdown would keep long-term interest rates lower than otherwise.[15] Figure 9 shows the projection of the 30-year Treasury yield, which is kept below 6%. This implies that the 30-year mortgage rate will remain below 7%. The slowdown of the economy would force lower growth rate on real disposable income that would help to cool down the property market. Figure 10 shows that real disposable income growth peaked relative to the previous quarter (q-o-q) in the third quarter of 2003 once the last tax cuts were implemented, although the (y-o-y) growth peaked six months later, in the first quarter of 2004. The slowdown in real disposable income is expected to last until the end of March 2005, followed by a hesitant recovery (see Figure 9). The combination of slower growth in real disposable income with subdued long-term interest rates would enable a soft rather than a hard landing in the property market. Relative house price inflation (i.e. adjusted for CPI-inflation) would abate from 5.3% in October 2003 to 1.2% by the end of the simulation period (see Figure 11). This compares favourably to the 6% fall in relative house price inflation in 1989 and 1991. The reversal of real disposable and long-term interest rates with the former recovering subsequently and the latter trending up, would further help to cool down the property market, instead of pricking it. If both real disposable income growth was slowing and long-term interest rates were trending up, then it would have been difficult to avoid pricking the property market.

Real residential investment peaked in the second quarter of 2004 and this trend is set to continue until the end of the end of the simulation period (see Figure 12). The recovery in real residential investment would begin at the end of the simulation period and would gather pace beyond it. The gross real estate of households would oscillate until the end of the end of the simulation period, but would decline subsequently (see Figure 13).

[15] It should also be remembered that interest rates are due to policy response, and are, presumably, countercyclical. Interest rates go up during expansion, when the Federal Reserve System attempts to prevent overexpansion, and go down during contraction to avoid deflation

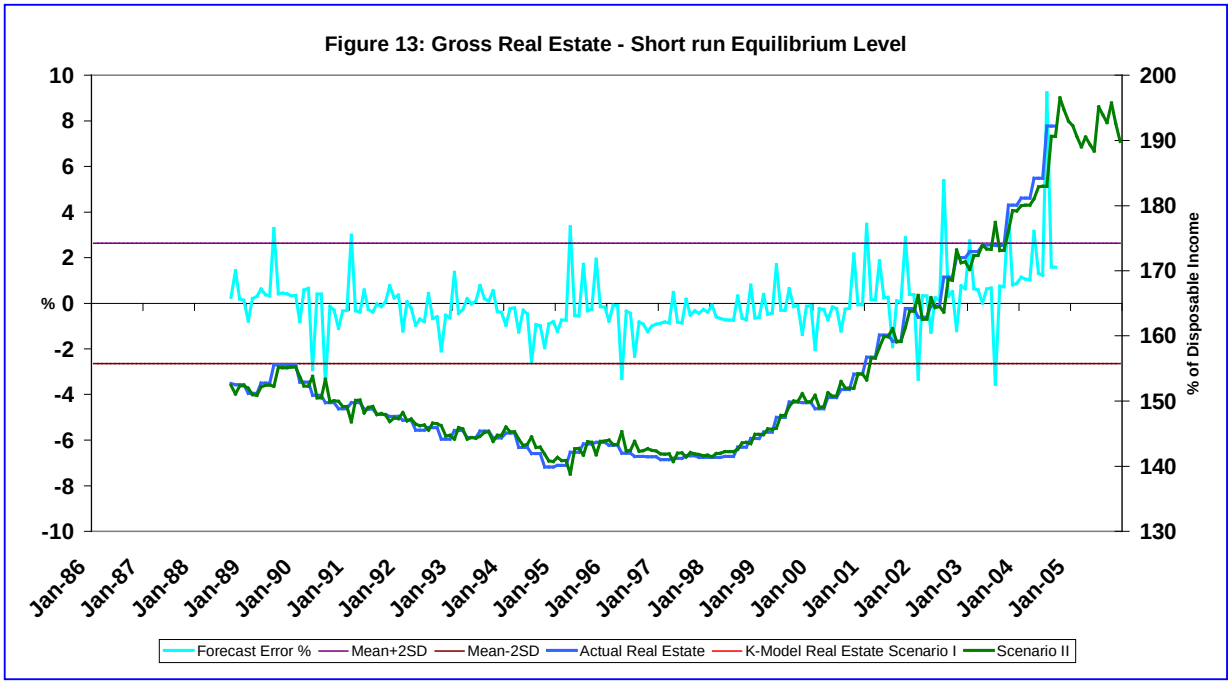




To summarise, the slowdown in the economy, although undesirable in itself, will deter the collapse of the housing market. Tepid growth will prevent the surge in long-term interest rates and will curb the appetite of households in accumulating debt and tolerate ever-increasing debt service burdens in the hope of rising incomes. There is always the possibility here that the forces behind the slowdown might overpower lower interest rates thereby creating a hard rather than a soft landing for the property market. In the past there were incidents when the US housing market was the strongest when interest rates were at 15% and climbing, while Japan still had deflation with rates below 3.5% for many years. It could then be that there are cases when stronger forces might be at work than just interest rates.

Currently, forces that may produce contraction in the US housing market could be the following: sector rotation has largely run out of steam; budget deficits may still go up; commodity prices, especially that of oil, are draining funds available for debt service; and housing may have appreciated sufficiently to have simply reached 'replacement' cost. While we do not exclude at all this possibility, it is the case that the simulation properties of our model suggest that this scenario is rather unlikely to materialize at this stage of the business cycle.

Finally, we simulate the model by superimposing on the assumption that the 30-year Treasury yield is 1.5% higher than in the main simulation. Under this assumption the 30-year mortgage rate exceeds 8% fairly fast and remains above that level throughout the simulation period. Under these assumptions relative house price inflation (i.e. adjusted for CPI) falls faster and by the end of the simulation it is 2% lower than in the main scenario (see Figure 11). Real residential investment also falls faster and by the end of the simulation period the growth rate is 4% lower than in the main scenario (see Figure 12). The gross real estate of households is affected beyond the projection horizon.



8. Summary and Conclusions

The housing market boom of the last four-year has been fuelled partly by easy fiscal policy, but mainly by the low interest rates that the Federal Reserve System set in place to deter the burst of the equity bubble from becoming a Japan-style asset and debt deflation spiral.

The buoyancy of the housing market has been at the root of the resilience of the consumer throughout the bear market of 2000-03 and has even contributed to the 2003-04 boom of the economy. The capital gains from the property market have more than offset the losses from financial markets, and home equity extraction (i.e. realised capital gains) account for 50% of consumer expenditure in the last four years. The tax cuts and other fiscal support to the personal sector account for another 10% of consumer expenditure in the four years following the burst of the equity bubble.

Despite these capital gains the net wealth of the personal sector as a percent of disposable income has not fully recovered. It is still 74% of disposable income less compared to the level of net wealth at the peak of the equity bubble in March 2000. This loss in net wealth is largely due to the surge in household debt, which is equal to 21% of disposable income in the four years after the burst of the bubble[16]. This is unprecedented! There is no other four-year period, since records began in 1952, in which debt increased at such frenetic pace. The second highest rate is just over 10% of disposable income that occurred between April and September 1987, after the peak of the property market in April 1987. The rate of debt accumulation fell rapidly after the equity market crash in October 1987. At nearly 120% of disposable income, debt may become unsustainable, if house prices were to fall and long-term interest rates were to rise. In the latter case, the risk is high that house prices and residential investment will fall. Would this have a spiralling effect on consumer expenditure and prompt households to save more?

The answer depends on the extent to which house prices would fall in the next two years. House prices rose nearly 8.5% in October 2004, the highest since 1982. Although the highest house price inflation occurred in September 1979, at nearly 16%, CPI-inflation was also high at the time. If house price inflation is expressed relative to CPI, then it has abated somewhat in the last two years. In October 2004 it stood at 5.3%, down from 6.3% two years ago, which was a whisker lower from the all time high of 6.8% reached in April 1978. The risk of a property market collapse has abated in the last two years, although house price inflation is not uniform across geographical regions. At its initial phase it concentrated in the Northeast. However, there are tentative signs that house price inflation is easing in the Northeast, but it is rising sharply in the West. In the Northeast house price inflation soared to 17% in June 2004, which with the exception of the 1987 bubble when it reached more than 25%, was the highest in the last thirty-five years. However, it is now rising dangerously in the West. The concentration of the housing boom in one area may be less worrisome than if it were nationwide, but it is still troublesome, since it is more vulnerable to a sudden collapse with possible chain reactions in the income and employment of the other regions.

In order to quantitatively assess the risk of the housing market we have simulated our model under the scenario that the economy entered a slowdown phase in the second quarter of 2004, which is likely to last for some time. Both cyclical factors, such as the index of leading indicators, and consumer and business confidence, as well as economic fundamentals point to the slowdown of the economy. Tight fiscal policy, a progressive move towards a neutral stance in monetary policy, the surge in the price of oil and lower gains in financial assets and the housing market should combine to decelerate the economy. The 30-year mortgage rate will remain below 7%, a rate that is unlikely to trigger the collapse of the property market.

The slowdown of the economy would force lower growth rate on real disposable income that would help to cool down the property market. The combination of slower growth in real disposable income with subdued long-term interest rates would enable a soft rather than a hard landing in the property market with relative house price inflation remaining in positive territory by the end of the simulation period. This compares favourably to the 6% fall in relative house price inflation in 1989 and 1991. The reversal of real disposable and long-term interest rates with the former recovering and the latter trending up, would further help to cool down the property market, instead of pricking it. If both real disposable income growth was slowing and long-term interest rates were trending up, as captured in the

[16] Currently, the US budget deficit runs at 3% of GDP, while the current account deficit at 6% of GDP. The domestic sector must therefore increase its debt at 3% of GDP if current rates of growth are to be sustained. It would appear that this is the case currently.

sensitivity analysis, then it would be difficult to avoid pricking the property market. But between the two scenarios we believe that the main scenario is the one most likely to occur.

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APPENDIX

Dependent Variable: LP6 HPR
Method: Least Squares

Sample(adjusted): 1990:04 2004:05
Included observations: 170 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.253441	0.288714	4.341456	0
MR	-0.007456	0.001787	-4.173246	0
LRYD	0.435247	0.052047	8.362599	0
DSB	0.008952	0.003725	2.403266	0.0174
HST	0.000211	2.68E-05	7.841408	0
LRRI(-3)	-0.232136	0.051398	-4.516418	0
NREH	0.00341	0.000317	10.76692	0

R-squared	0.969936	Mean dependent var	4.342971
Adjusted R-squared	0.968829	S.D. dependent var	0.087147
S.E. of regression	0.015386	Akaike info criterion	-5.470399
Sum squared resid	0.038587	Schwarz criterion	-5.341278
Log likelihood	471.984	F-statistic	876.4503
Durbin-Watson stat	0.334638	Prob(F-statistic)	0

Dependent Variable: D12LP6 D12HPR
Method: Least Squares

Sample(adjusted): 1991:02 2004:05
Included observations: 160 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000987	0.00048	2.055028	0.0416
D12LHPR(-1)	0.953856	0.015572	61.25279	0
RHPR1(-6)	-0.058297	0.021858	-2.667126	0.0085
D12MR	-0.001092	0.000398	-2.74684	0.0067
DD12LRYD	0.086132	0.039113	2.202105	0.0292
D12HST(-12)	3.39E-06	2.58E-06	1.312217	0.1914
DD12LRRI	0.073291	0.016245	4.511537	0
D12NREH(-1)	9.33E-05	0.000132	0.705043	0.4819

R-squared	0.971614	Mean dependent var	0.020336
Adjusted R-squared	0.970307	S.D. dependent var	0.023683
S.E. of regression	0.004081	Akaike info criterion	-8.116218
Sum squared resid	0.002532	Schwarz criterion	-7.96246
Log likelihood	657.2975	F-statistic	743.2535
Durbin-Watson stat	1.117002	Prob(F-statistic)	0

Dependent Variable: LRI LRRI
Method: Least Squares

Sample(adjusted): 1990:01 2004:05
Included observations: 173 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.736543	0.28098	13.29826	0
LHPR	0.372233	0.068846	5.406738	0
HST	0.000545	2.91E-05	18.70344	0
MR(-3)	-0.027327	0.003887	-7.030297	0
D12LRYD(-5)	0.508625	0.204022	2.492997	0.0136

R-squared	0.966564	Mean dependent var	5.954
Adjusted R-squared	0.965768	S.D. dependent var	0.189366
S.E. of regression	0.035036	Akaike info criterion	-3.83638
Sum squared resid	0.206229	Schwarz criterion	-3.745244
Log likelihood	336.8468	F-statistic	1214.123
Durbin-Watson stat	0.185198	Prob(F-statistic)	0

Dependent Variable: D12LRI D12LRRI
Method: Least Squares

Sample(adjusted): 1991:03 2004:05
Included observations: 159 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004905	0.001897	2.585998	0.0107
D12LRRI(-1)	0.49588	0.074411	6.664088	0
D12LRRI(-2)	0.260067	0.076633	3.393663	0.0009
RRR1(-12)	-0.210908	0.044183	-4.773541	0
DD12LHPR	0.816811	0.367315	2.223735	0.0277
D12HST	0.000252	3.62E-05	6.965481	0
D12HST(-2)	-0.00015	3.22E-05	-4.655392	0
D12MR	-0.006006	0.001583	-3.794212	0.0002
DD12LRDY	0.13845	0.153958	0.899272	0.3699

R-squared	0.935447	Mean dependent var	0.045227
Adjusted R-squared	0.932004	S.D. dependent var	0.060443
S.E. of regression	0.015761	Akaike info criterion	-5.407586
Sum squared resid	0.037263	Schwarz criterion	-5.233874
Log likelihood	438.9031	F-statistic	271.7071
Durbin-Watson stat	2.095159	Prob(F-statistic)	0

Dependent Variable: MR
Method: Least Squares

Sample(adjusted): 1971:04 2004:10
Included observations: 403 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.206067	0.105701	1.949524	0.0519
TY	1.16538	0.012769	91.26902	0

R-squared	0.954072	Mean dependent var	9.479777
Adjusted R-squared	0.953957	S.D. dependent var	2.725147
S.E. of regression	0.58475	Akaike info criterion	1.769685
Sum squared resid	137.1149	Schwarz criterion	1.789531
Log likelihood	-354.5916	F-statistic	8330.034
Durbin-Watson stat	0.308527	Prob(F-statistic)	0

Dependent Variable: DMR
Method: Least Squares

Sample(adjusted): 1971:06 2004:10
Included observations: 401 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001442	0.009317	-0.154717	0.8771
DMR(-1)	0.178824	0.035738	5.003742	0
RMR1(-1)	-0.075885	0.017402	-4.360679	0
DTY	0.407299	0.033426	12.18501	0
DTY(-1)	0.474849	0.042101	11.27874	0

R-squared	0.652265	Mean dependent var	-0.004264
Adjusted R-squared	0.648753	S.D. dependent var	0.314776
S.E. of regression	0.186556	Akaike info criterion	-0.507785
Sum squared resid	13.78198	Schwarz criterion	-0.457985
Log likelihood	106.8108	F-statistic	185.6998
Durbin-Watson stat	1.858188	Prob(F-statistic)	0

Dependent Variable: RE GREH
Method: Least Squares

Sample: 1968:01 2003:08
Included observations: 428

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	39.79635	2.136332	18.62836	0
LHPL	23.75246	0.502748	47.24526	0

R-squared	0.839736	Mean dependent var	139.6797
Adjusted R-squared	0.83936	S.D. dependent var	15.85122
S.E. of regression	6.353159	Akaike info criterion	6.540443
Sum squared resid	17194.48	Schwarz criterion	6.559411
Log likelihood	-1397.655	F-statistic	2232.115
Durbin-Watson stat	0.031577	Prob(F-statistic)	0

Dependent Variable: D12RE D12GREH
Method: Least Squares

Sample(adjusted): 1970:09 2003:08
Included observations: 396 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.105898	0.071242	1.486443	0.138
D12GREH(-1)	0.930082	0.016025	58.03972	0
RGREH4(-12)	-0.045011	0.011328	-3.973548	0.0001
D12LHPR(-12)	16.00215	6.270368	2.552027	0.0111

R-squared	0.903864	Mean dependent var	1.695202
Adjusted R-squared	0.903128	S.D. dependent var	4.231863
S.E. of regression	1.317135	Akaike info criterion	3.398844
Sum squared resid	680.059	Schwarz criterion	3.439061
Log likelihood	-668.9712	F-statistic	1228.518
Durbin-Watson stat	1.97691	Prob(F-statistic)	0

Dependent Variable: U30Y TY
Method: Least Squares

Sample(adjusted): 1987:01 2004:06
Included observations: 210 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.026914	0.10456	28.94898	0
FFR	0.217444	0.032476	6.695451	0
D12LCPI	70.31704	7.195217	9.772747	0
D12LFX	-1.276822	0.508939	-2.508792	0.0129
DLENFP	169.3491	25.96937	6.521109	0
GS	-16.66283	3.020968	-5.515725	0

R-squared	0.886578	Mean dependent var	6.850439
Adjusted R-squared	0.883798	S.D. dependent var	1.346272
S.E. of regression	0.458922	Akaike info criterion	1.308282
Sum squared resid	42.9643	Schwarz criterion	1.403913
Log likelihood	-131.3696	F-statistic	318.9198
Durbin-Watson stat	0.533447	Prob(F-statistic)	0

Dependent Variable: D12U30Y D12TY
Method: Least Squares

Sample(adjusted): 1988:01 2004:06
Included observations: 198 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.043532	0.018142	-2.399471	0.0174
D12TY(-1)	0.578382	0.034389	16.81861	0
DTY(-1)	0.283759	0.077815	3.646561	0.0003
RTY1(-12)	-0.655552	0.053969	-12.14674	0
D12FFR	0.342334	0.057829	5.919808	0
D12FFR(-1)	-0.255374	0.057249	-4.460794	0
D12LCPI	8.852937	3.664834	2.415645	0.0167
DD12DLENFP	24.91831	10.04991	2.479457	0.014
D12GS	-5.192748	2.059833	-2.520956	0.0125

R-squared	0.907536	Mean dependent var	-0.210326
Adjusted R-squared	0.903622	S.D. dependent var	0.754943
S.E. of regression	0.23437	Akaike info criterion	-0.019441
Sum squared resid	10.38165	Schwarz criterion	0.130026
Log likelihood	10.92466	F-statistic	231.88
Durbin-Watson stat	1.844216	Prob(F-statistic)	0

	DEFINITION	NOTES
CPIL	Consumer Price Index	ENDOGENOUS THROUGH WAGE-PRICES MODEL
DS	Household debt-service burden total	EXOGENOUS
DYL	Real Disposable Income - Level	ENDOGENOUS THROUGH CONSUMPTION MODEL
ELP601	Residuals from Co-integrating vector of LP6	
ELRI01	Residuals from Co-integrating vector of LRI	
EMR01	Residuals from Co-integrating vector of MR	
ERE04	Residuals from Co-integrating vector of RE	
EU30Y01	Residuals from Co-integrating vector of U30Y	
FFR	Federal Funds Rate	EXOGENOUS
FXL	Dollar Trade Weighted Index	ENDOGENOUS THROUGH EXCHANGE RATE EQUATION
GS	Federal Government Surplus as % of GDP	EXOGENOUS
HS6	Housing Starts, Total, AR SA, 6M MA	ENDOGENOUS THROUGH AR(2)
L	Employment Non-Farm Payrolls	ENDOGENOUS THROUGH WAGE-PRICES MODEL
M	Mortgage Debt as % of Disposable Income	EXOGENOUS
MR	30-year Mortgage Rate	ENDOGENOUS THROUGH CURRENT MODEL
NRE	Net Real Estate of Households as % of Disposable Income	ENDOGENOUS THROUGH IDENTITY: NRE=RE-M
PHL	Actual Median House Price - Existing Homes	ENDOGENOUS THROUGH IDENTITY: PL = PH/CPI
PL6	Median Price - Existing Home Sales Relative to CPI, 6M MA	ENDOGENOUS THROUGH CURRENT MODEL
RE	Gross Real Estate of Households as % of Disposable Income	ENDOGENOUS THROUGH CURRENT MODEL
RIL	Real Residential Investment - Level	ENDOGENOUS THROUGH CURRENT MODEL
U30Y	30-Year Treasury Yield	ENDOGENOUS THROUGH CURRENT MODEL

CODES:

LX = log (X)
D(X) = 1st difference of x
DD(X) = acceleration = 2nd difference of x
D12(X)= 12th difference of x