The US Housing Recession is Still Far from Bottoming Out

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1. Introduction

A boom in the U.S. housing sector in the 2000-2005 period led to a housing bubble and excesses in the housing market that eventually triggered a housing bust and recession in 2006 that remain severe in 2007. The consensus view argues that this housing recession is bottoming out and that the housing sector may recover from its trough some time in 2007. But the view that the housing recession is close bottoming out is as flawed as it is widely presented.

Indeed, the analysis in this paper suggests that the current US housing recessions is one of the most severe in the last few decades and that the housing market is nowhere near its bottom. We first provide a comparative study of the current housing recession relative to the other seven US housing recessions and seven US economy-wide recessions since 1960. Next, our study provides evidence that, even if the economy were to achieve a soft landing and avoid a hard landing (a national recession) the current housing recession – given the excesses of the last few years – is likely to get much worse before it bottoms out some time in 2008. Moreover, if a US hard landing (recession) were to occur the housing recession could become even more severe than in a soft landing scenario for the economy. Either way – even in the best soft landing scenario for the US economy – the housing recession is bound to become much more severe before a bottom is reached: housing starts, completions (housing supply of new homes), new home sales (housing demand) are estimated to sharply fall further – even relative to their currently highly depressed levels – both in a soft landing and a hard landing scenario for the economy.

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The paper presents in detail the analysis behind this pessimistic outlook about the housing market. It does so by studying in detail medium and long-term trends in housing demand, supply and inventory conditions and then deriving implications for conditions the housing market in the 2007-2010 period.

In separate forthcoming papers we will consider what the analysis in this paper of the demand and supply of housing implies for the price of homes in the years ahead, considering especially the dynamics of demand, supply and housing overhang in 2007 and the following years. We will also consider how the likely significant fall in home prices in the 2007 and beyond, by determining the wealth effect of housing and the amount of home equity withdrawal, may be expected to affect private consumption in the 2007 and ahead. We will also present an estimate of how trends in housing starts and completions will affect housing and housing related employment in 2007 and beyond. We will separately analyze how the current developing credit crunch in the sub-prime segment of the mortgage market is spreading - to other parts of the mortgage and consumer credit market - and risking to trigger a generalized credit crunch that would exacerbate the real economic effect of the housing recession. All these feedback loops from the housing recession, studied in this paper, to housing mortgage finance and to the real economy – and back to the housing market – are not studied in this paper.

So, the results of this paper – that suggest a worsening of the housing recession even in a soft landing scenario for the economy – exclude a variety of financial and real channels of exacerbation of the housing recession – and contagion to other economic sectors. The current sub-prime meltdown, credit crunch and contagion to other near prime and risky mortgage is in full swing. The consequences of it will be considered in detail in the next installment of this ongoing study of the housing market.[2]

2. Supply Side of the Housing Market

2.1. How does the current housing recession compare with previous housing recessions?

It is now clear that housing is currently in a serious and severe recession. But how does this housing recession compare to other housing recessions? How likely is it that this housing recession is close to bottoming out? Also, are housing recessions usually associated with economy-wide recessions? And if they are, is the causality going from a housing recession to an economy-wide recession or is a national recession the trigger for the housing recession?

[2] For a detailed consideration of these other financial and economy-wide issue see also the series of recent and not recent blog items written by Nouriel Roubini in his blog at: http://www.rgemonitor.com/blog/roubini .

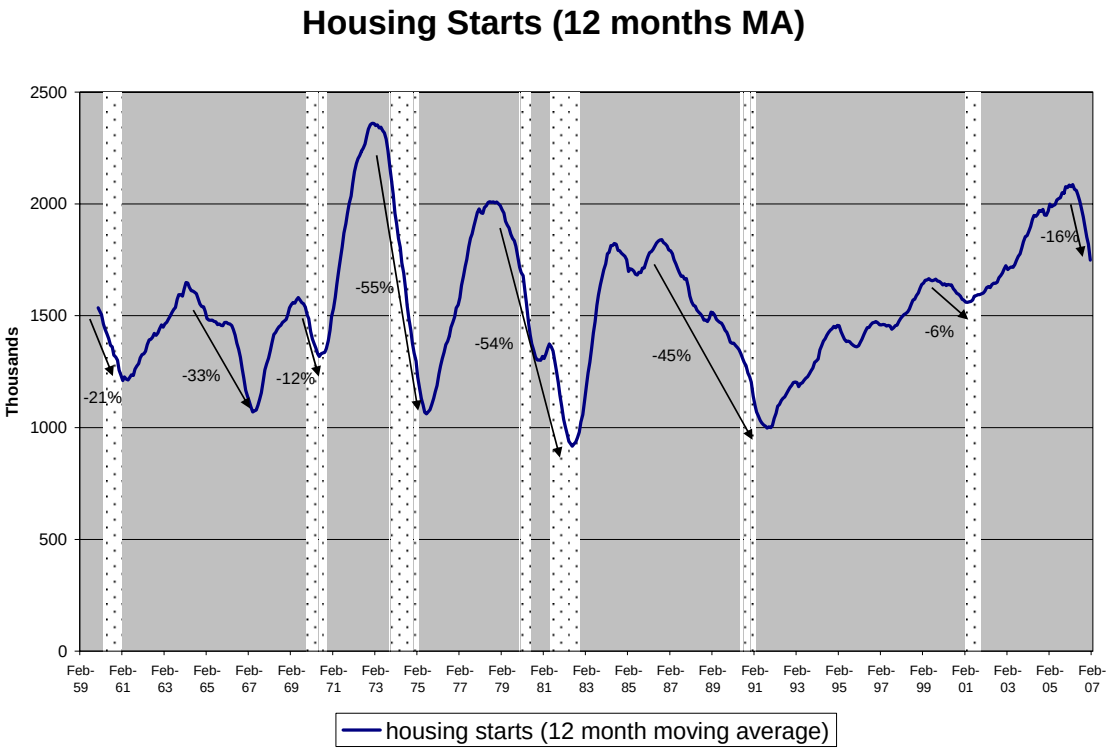
To consider these questions, we studied the US economy and the housing market from 1960 until the most recent times (our data are up to January 2007); this is a period of time during which the US experienced seven economy-wide recessions.

We begin by looking at the behavior of housing starts around the recession episodes. Housing starts are a good measure of the conditions of the housing market as housing recession are periods of time where there is a sharp fall in housing starts, followed by sharp fall in housing construction and, with a 2-3 quarters lag, a fall in home completions. Figures 1 and 2 and table 1 show the data for total housing starts since 1960. In Figure 2 the raw SAAR data for housing starts are shown. In Figure 1, in order to disregard seasonality and high frequency noise, we show a 12-month moving average for housing starts. Figures 1 and 2 show that the latest expansion in the housing sector has been the longest in the last fifty years. Previous housing expansions were much shorter.

Also, note that the housing downturns that followed such housing expansions preceded an economy-wide recession, although it did usually not trigger such a recession. In all of the last seven US recessions, a US recession was associated (for now we do not imply causality) with a housing recession. The only partial exception is that of the 2001 recession when the housing downturn was relatively mild. During that economic recession the moving average of housing starts fell only 6 percent.

Moreover, all but one housing recession have been associated with an economy-wide recession. The only exception is the serious housing recession of the mid 1960 when a sharp moving average fall in housing starts (-33 percent) did not trigger nor was associated with an economy-wide recession. During that period the economy experienced a significant growth slowdown but not an outright recession.

Figure 1



Source: US Census Bureau

The fact that each one of the seven US recessions since 1960 was accompanied by a housing recession does not imply causality from housing to the economy-wide recession.

Instead one could well argue that, during economic recessions caused by other factors, housing also ends up in a recession as the fall in aggregate demand, supply and income pushes down the demand for housing. This point is well taken. Indeed in all of the post-1973 recessions, a combination of a spike in inflation initiated by an exogenous oil price shock - combined with a monetary tightening to control such stagflationary shock - were meaningful triggers of an economy wide recession that, then, brought down the housing sector. So the causality may go from economy-wide recession to housing recession rather than the other way round. However, a few caveats are necessary here.

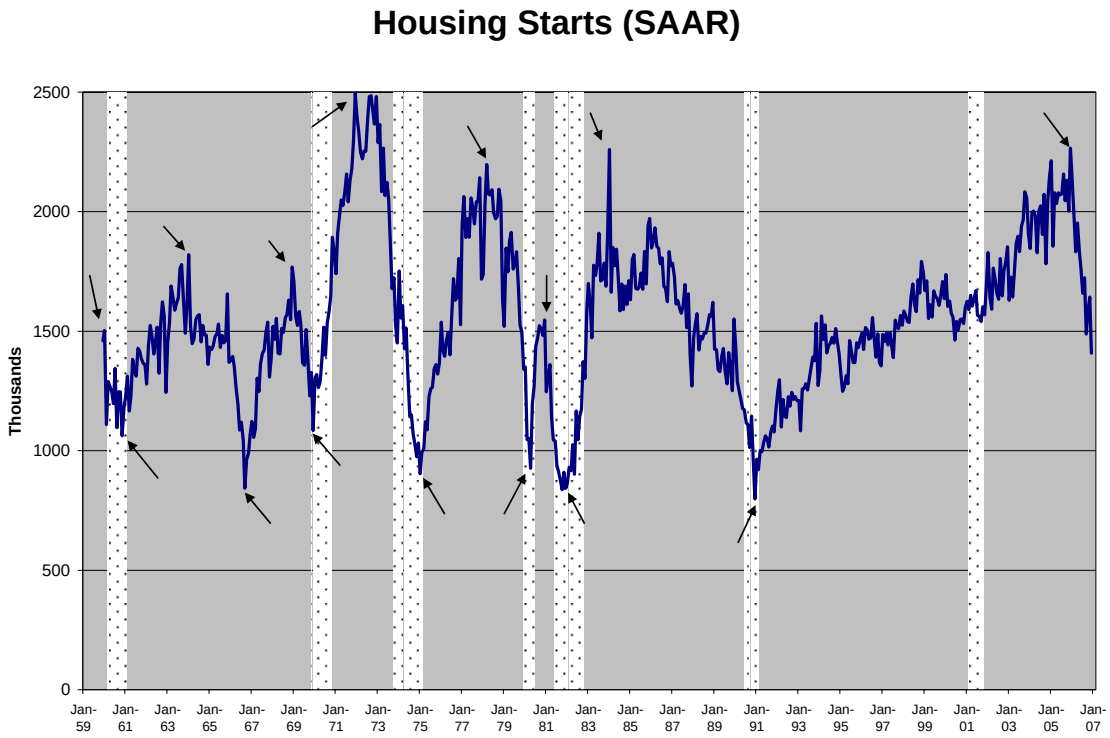
First, in each US recession episode, the housing sector reached its peak well before the peak of the economy business cycle and started its recession before the overall economy entered into a recession. Also, in each economy-wide and housing recession episodes, the housing sector appeared in a bubbly state of excess – in terms of prices and supply – before the housing and economic downturn occurred. Again, the main exception may be 2001 when the housing sector was not in an obvious state of excess capacity and supply at the time when the economy entered in a recession.

Second, it is not just oil shocks followed by inflation and ensuing monetary tightening that cause US recessions. In the 1990-91 recession a real estate boom and bust was a central element in causing such a recession. The commercial and residential real estate boom and bubble of the mid 1980s led to excesses - by the late 1980s – that triggered first sharp defaults in residential and commercial real estate especially in the US south. These defaults then triggered a credit crunch that turned into an economic recession that started in the spring of 1990. This is a clear episode where a boom and bust in housing and real estate did actually cause a recession.

Third, the idea that recessions occur only when there is an oil and inflation shock that forces the Fed to tighten is also denied by the case of the 2001 recession. In that episode – like in the real estate bubble and bust of the late 1980s – an investment bubble and then bust in tech goods was the trigger for the economic downturn of 2001. So, the main lesson of the last two US recessions – as opposed to the previous oil-shock induced ones – is that financial and real investment booms followed by bust – in real estate in the 1980s, in tech goods in the 1990s – can and do cause recessions even in the absence of a sharp monetary tightening by the Fed; and in the late 1980s a credit crunch caused by the real estate bust and the ensuing S&L crisis was an important factor in triggering the 1990 recession.

Of course, monetary tightening and oil shocks played a modest role in 1990 and 2000; but they were not central to those two recessions. Those two recessions were caused by a financial and investment bubble that went bust. This is important because the often heard argument that you need a sharp – possibly oil induced – shock to inflation followed by Fed tightening in order to cause a recession is not correct. Thus, in assessing whether the severe housing recession of 2006-2007 will lead to an economy-wide recession, the experience of the last two recessions suggest that a boom-bust cycle – followed by a credit crunch and/or crunch in the financing of investment - is enough to trigger such economy-wide recession. Moreover, as in the last two US recessions, oil shocks and monetary tightening are additional bearish factor that may contribute – on top of the investment boom-bust – to trigger a hard landing: oil rose since 2001 from about $30 a barrel to over $60; while, since 2004, the Fed increased the Fed Funds rate from 1 percent to 5.25 percent. And the incipient current credit crunch – that is spreading from sub-prime mortgages to other mortgages and overall consumer credit – is an important factor that – like in other recession – may contribute to a hard landing.

Figure 2



Source: US Census Bureau

Table 1

Housing Cycles	Peak (mil)	Trough (mil)	% change	Duration
January 1959 to December 1960	1.657	1.063	-36	23
February 1964 to October 1966	1.820	0.843	-54	32
January 1969 to January 1970	1.769	1.085	-39	12
January 1972 to February 1975	2.494	0.904	-64	38
April 1978 to May 1980	2.197	0.927	-58	26
January 1981 to November 1981	1.547	0.837	-46	11
February 1984 to January 1991	2.260	0.798	-65	84
Average	1.963	0.922	**-51**	**32**
January 2006 to …	2.265	…	**so far -38**	**so far 12**

Let us consider, next, in more detail the housing recessions since 1960. In the last fifty years, housing starts peaked in January 1972 with 2.5 million units; the bottom was touched in January 1982 with 798 thousand units. The average over the entire period was slightly above 1.5 million units, which is roughly close to current housing starts. This last point is often used to argue that the downturn is over and the sector has stabilized. If this were true, the bottom of this housing cycle would correspond with the long-term trend; but in each housing recession housing starts that rose during the boom well above the long-term average then fell in the bust well below the long-term average.

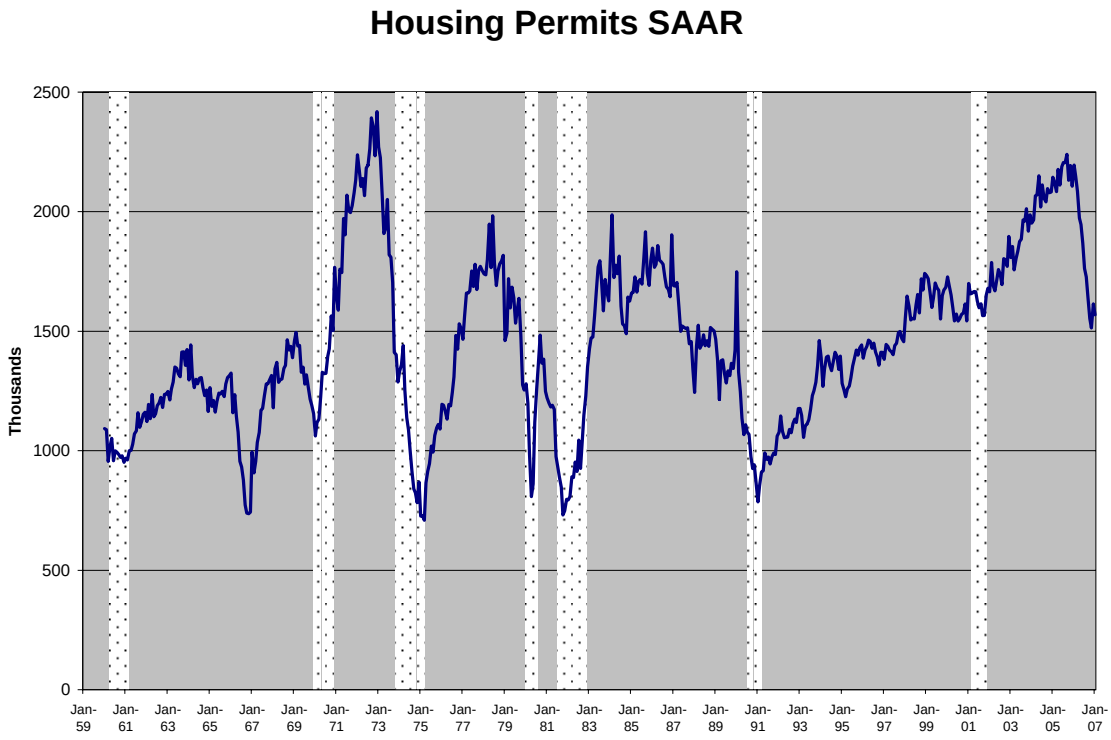
This last housing recession lasted 12 months so far. The average duration of the previous seven housing recessions was 32 months. Housing starts are down (as of January 2007) 38 percent from the January 2006 peak, but only 16 percent from their moving average peak. In past housing recessions starts bottomed, on average, after a 51 percent drop form the peak, and after a 37 percent drop from the moving-average peak.[3] Thus, the past housing recession episodes tell us that housing starts could fall another 13 percent from their actual peak (or another 21 percent from their moving average peak) and that it could take another 21 months to reach that bottom. The current bust cycle could last even longer given the unprecedented length of both the latest upturn (15 years) and downturn (7 years).

It seems very hard to conclude that the housing market has stabilized. If this were true this would be registered as the shortest and shallowest downturn of the last fifty years. Note also that the average trough of housing starts in the last seven housing recessions has been at 922 thousand starts while currently starts are still above 1.4 million. One could argue that housing starts may have a positive long-run trend given demographics and incomes; but figure 2 suggest that there is not clear long-run trend in the data. And even accounting for a potential trend growth for starts, housing starts may have to follow much more before they reach a bottom. For example if one were to very generously assume that starts have – by now – a 20 percent increase relative to their long-term average, adding 20 percent to a trough of 922 thousand gives you a trough of starts at 1.1 million, a figure that is still 300 million units below the January 2007 level of 1.4 million starts; i.e. housing starts could fall another 22 percent relative to the January 2007 before they bottom out.[4]

[3] Note also that in several housing recessions starts fell – relative to peak – much more than 51 percent. The fall was 54 percent in the 1964-66 housing recession; 64 percent in the 1972-75 housing recession; 58 percent in the 1978-80 housing recession; 65 percent in the 1984-1991 housing recession. In each of these episodes the overshoot of starts in the boom phase was extreme and well above long run housing demand – with starts going well above 2 million units per year. Thus the bust was also very sharp and sharper than a typical housing recession. Note that, again, in the last housing boom and bust, starts peaked at 2.2 million in early 2006 at a level well above the long run demand for housing (that we estimate below to be about 1.7 million units per year). Thus, the current bust may be more similar to some of the most severe recessions of the last 50 years, those where the total fall in housing starts was well above the 51 percent average of a typical housing recession. And even if the current downturn were to be close to that average the housing recession has still a long way to go.

[4] In the next section we present a more analytical assessment of long-run demand and supply of housing that provides a formal analysis that starts have still a long way to go before they reach their bottom.

Figure 3

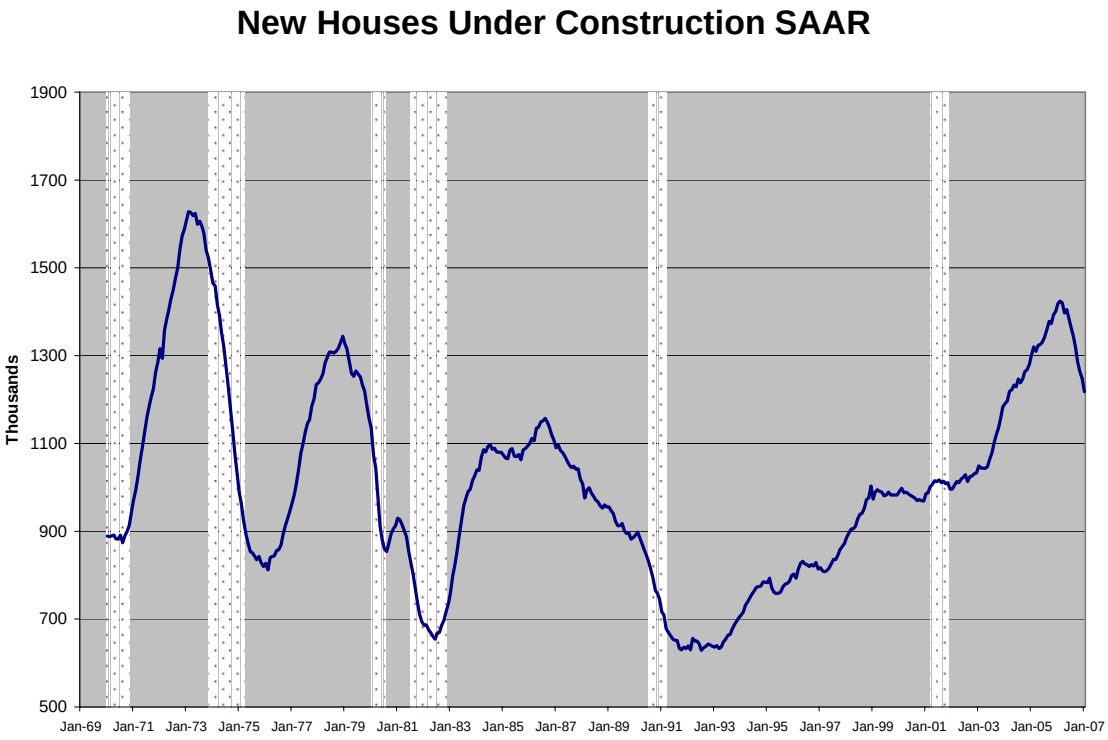


Source: St. Louis Fed: Economic Data - FRED

The considerations just made on the pattern of housing starts can be repeated for housing permits (Figure 3) and other crucial variables in the housing market. Note that the housing production cycle has the following sequence: building permits (Figure 3) lead housing starts (Figure 2) by about one month; then housing starts lead to housing construction (Figure 4); and finally, given average construction times, housing completions (Figure 8) tend to lag starts by about three quarters or nine months (see Figure 9 for the starts and completions lag sequence).

The analysis we made above for starts can be repeated for permits, construction and completions. Building permits have fallen so far by 30 percent relative to peak. Given lags in construction, housing completions are still very high and they have only recently started to fall. Completions peaked at 2.2 million in March 2006 and by January 2007 (the latest data) that are still very high at 1.88 million. Of course, as starts have fallen much more (to 1.4 million in January 2007) and lead completions by about three quarters, one can logically expect that completions will reach an annual rate of about 1.5 million by late 2007 (while still being higher than that figure for the average of 2007 given that average starts in 2006 were close to 1.862 million.

Figure 4

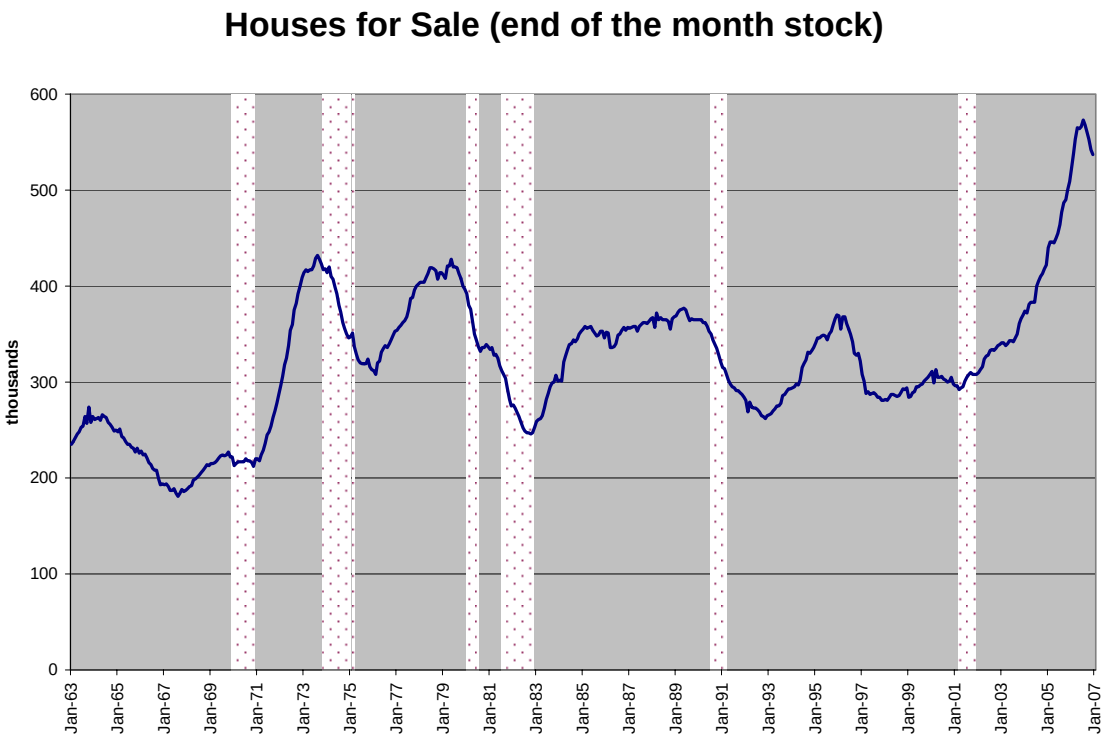


Source: US Census Bureau

Starts and permits are not the only indicators to pay attention to in the housing market. Inventories are as important as excess inventories are crucial drivers of demand and supply cycles; we analyze the housing inventory overhang in the next subsection. Also, a look at new homes under construction confirms the same message coming from the previous indicators. We are still far from the bottom of the housing recession[5]. While the average drop of new houses under construction in the previous downturns has been around 40 percent, in this one that contraction is still only17 percent, another sign that the housing downturn has still a long way to go.

[5] Some homebuilders do not share this view (http://www.bloomberg.com/apps/news?pid=20601103&sid=aoJGrOG6F6TM&refer=news).

Figure 5



Source: US Census Bureau

2.2. The large and growing glut of unsold new and existing homes

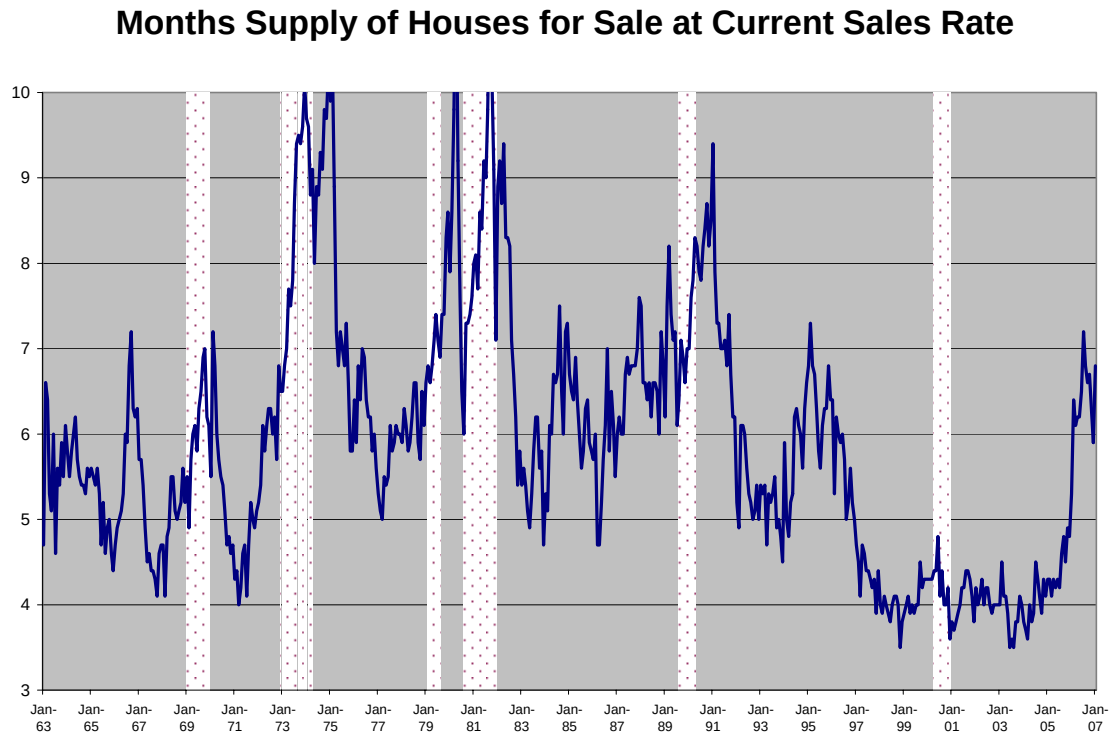
How large is the overhang of new and existing unsold homes? Interestingly when housing starts were peaking in January 2006 with over 2.2 million units started, new houses for sale were still 42 percent below the today's level. New unsold homes that are for sale were about 530 thousand at the end of 2006, almost double the historical (pre-2001) average of about 310 thousand. And including existing homes for sale, the total vacancy of homes – new and existing – currently for sales is 1.8 million. Note also that the inventory of new homes that are unsold has not yet reached its peak. As of January 2007, SAAR starts for one-family homes were about 1.1 million while SAAR completions (new supply) were still about 1.5 million. Instead SAAR sales of news homes (demand) were down to 0.937 million. Thus, at the current rate of new supply and new demand – if sustained over 2007 – the inventory of new one-family homes could increase by another 600 thousand units.

And even after considering that starts have now sharply fallen towards 1.1 million units of new one-unit homes, the gap between future supply in late 2007 (given by current starts at 1.1 million) and current demand (0.93 million) suggests a further large accumulation of unsold homes. Thus, the glut of new homes will get worse in 2007 unless the demand of new homes starts to significantly increase above the supply

(completions) of new homes. Given current trends in supply, demand and starts an increase in the overhang of unsold new homes is highly likely.

This analysis above is reinforced by the fact that the months of supply of new houses at current sales rates is at 6.8 and still rising; this ratio currently lays above the long term average of 5.9 (but far form the peak of 11.6 of April 1980).

Figure 6



Source: US Census Bureau

In the next section we present a more formal analysis of long run demand and supply of housing that provides another – more analytical – confirmation that starts have still a long way to go before they reach their bottom. The most important aspect of this formal analysis is that most of its results are independent of whether the US experiences an economy-wide recession in 2007 or in the next few years. I.e. our long-run analysis suggests that – even in the absence of a US recession in the next four years - the housing recession will get much worse before it bottoms out. Of course, if the US were to experience also an economy-wide recession in the next four year the housing recession will worsen even more than in the benchmark that does not include an economy-wide recession.

3. Scenarios for Housing in 2007-2010 Based on a Supply and Demand Analysis of Long-Term Trends in Housing

3.1. A model of demand and supply of housing.

In this section we present our analysis of long-term trends in housing supply, demand and inventory to assess when and at which level the housing sector will bottom out in the current housing recession. The main result is that the housing recession will get much worse compared to current conditions before it bottoms out some time in 2008.

Completions and starts

To start our analysis, we estimate the long-run demand for housing units. Indeed, the long-run level of housing starts and completions is a function of the housing units[6] needed (long-run demand). The need for new housing units is dictated by population dynamics and household formation, as well as loss and destruction of already existing units.

If we take 2000 as our base year[7] we observe that the units per person (total existing housing units/total population) in 2000 were 0.4119. Using the US Census projections[8] we can estimate that population growth will average 2.68 million people per year between 2001 and 2010. Assuming a constant value of 0.4119 units per person, population growth calls for an average 1.104 million new units per year between 2001 and 2010. Taking into account the units lost every year to fire, natural disasters, demolitions, and other reasons we estimate that the average yearly need for units between 2001 and 2010 amounts to about 1.700 million[9].

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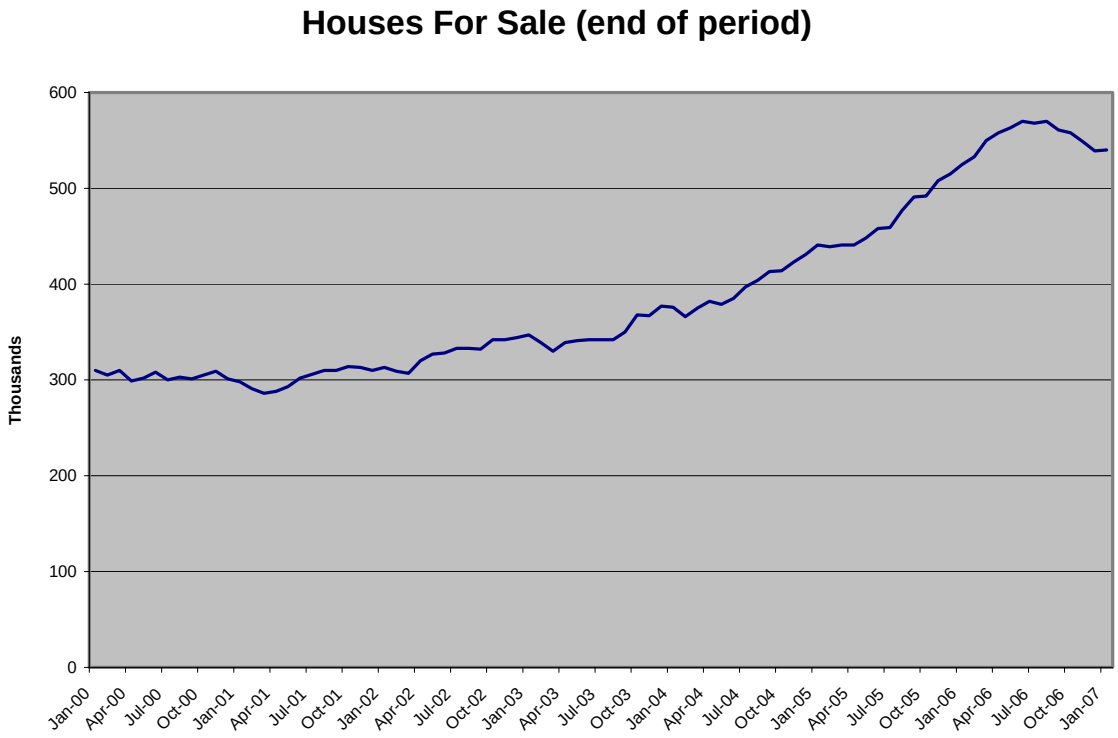
[6] We use the same definition of units provided by our data source. "A housing unit is a house, an apartment, a group of rooms, or a single room occupied or intended for occupancy as separate living quarters. Separate living quarters are those in which the occupants do not live and eat with other persons in the structure and which have direct access from the outside of the building or through a common hall. For vacant units, the criteria of separateness and direct access are applied to the intended occupants whenever possible. If the information cannot be obtained, the criteria are applied to the previous occupants. Tents and boats are excluded if vacant, used for business, or used for extra sleeping space or vacations. Vacant seasonal/migratory mobile homes are included in the count of vacant seasonal/migratory housing units. Living quarters of the following types are excluded from the housing unit inventory: Dormitories, bunkhouses, and barracks; quarters in predominantly transient hotels, motels, and the like, except those occupied by persons who consider the hotel their usual place of residence; quarters in institutions, general hospitals, and military installations except those occupied by staff members or resident employees who have separate living arrangements". Available at http://www.census.gov/hhes/www/housing/hvs/qtr306/q306def.html.

[7] Note that looking at the time series explored above, 2000 is a year in which the indicators reviewed were at levels close or corresponding to the long period average.

[8] Available at http://www.census.gov/ipc/www/usinterimproj/usproj2000-2050.xls

[9] Brookings Institution (*Toward a new Metropolis: The opportunity to rebuild America, 2004*) estimates that the number of houses to be replaced each year because of natural disasters and other reasons amounts roughly 670,000. A more recent study by UBS (*UBS Housing Signposts – Revised Housing Starts Forecasts, November 6th 2006*) estimates that the number of houses to be replaced each year amounts to 560,000. For our estimates of houses to be replaced we use take an average of the numbers provided by the two studies.

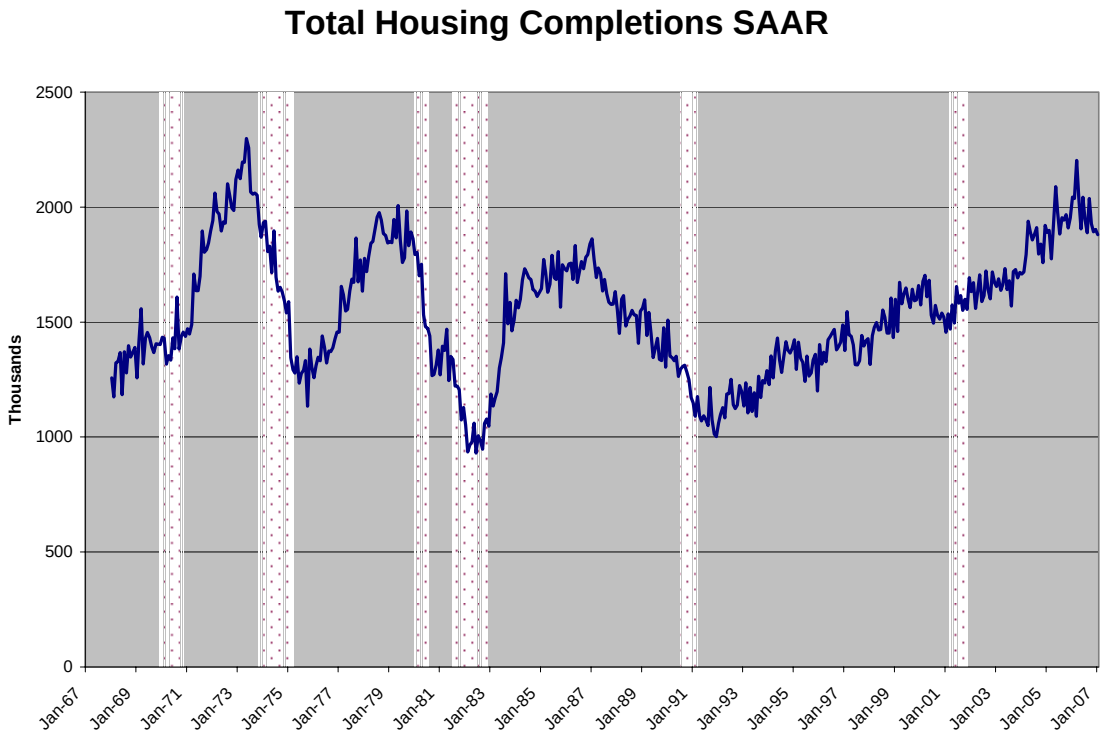
Figure 7



Source: US Census Bureau

If we take into account the overbuilding observed in the last few years, it is very likely that an adjustment in the inventories of unsold homes will have to take place: thus the production (supply) of new units will stay below the estimated need (demand) until the excess inventories are reabsorbed. Between 2001 and 2006 overbuilding produced a sharp increase in inventories relative respect to its long-term average. The average long-term stock of new homes for sale between 1963 and 2001 was 0.310 million; in December 2006 the stock of new homes for sale reached 0.537 million, giving an excess relative the long-term average of 0.227 million. If we assume that this overbuilding of inventories will be reabsorbed over the next four years in a linear manner (i.e. 57 thousand per year), then between 2007 and 2010 total completions should average 1.643 million per year to bring back the stock of inventories to its historical average level by 2010.

Figure 8

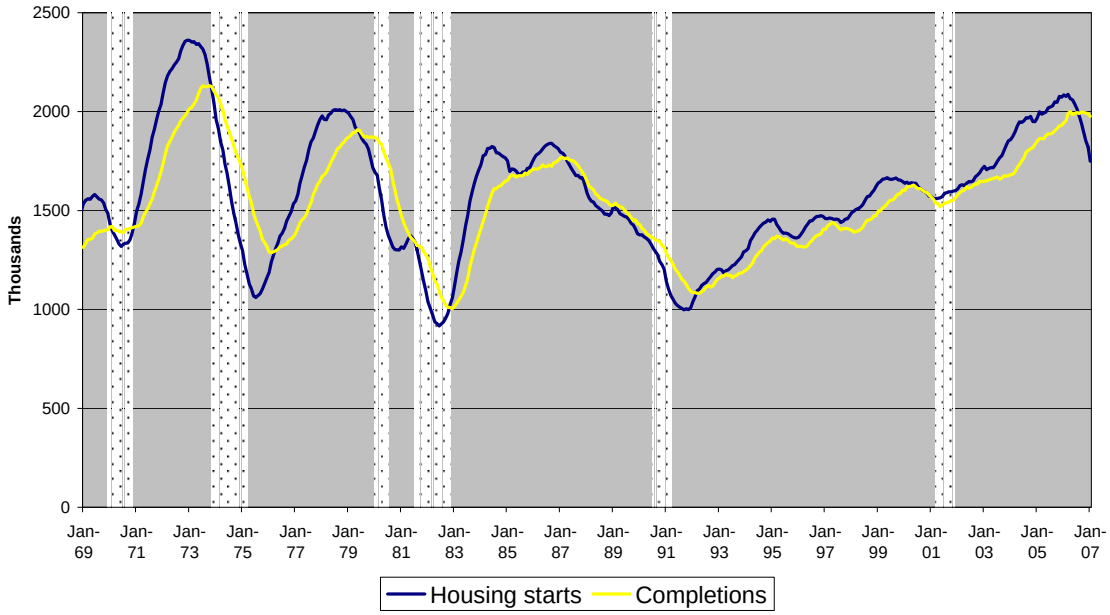


Source: US Census Bureau

Completions are currently still at very high levels compared to our estimate (1.643 million) of the level needed to reduce the stock of unsold inventories, given the long-run demand. In January the seasonally adjusted yearly rate was 1.880 million. Total housing completions peaked in March 2006 at 2.203 million units. Thus, so far they have fallen only 15 percent.

Figure 9

Housing Starts and Completions (12 months moving average)



Source: US Census Bureau

Note that completions follow starts with a lag that goes from 6 to 12 months. Also, note that the peak for completions is usually lower than the peak for housing starts and the trough of completions is higher than that of starts. During the past cycles, starts have bottomed at a level which was on average 21 percent lower than the bottom of completions.[10]

Housing starts in January 2007 reached a level of 1.408 per year, after falling 38 percent from their peak of January 2006. Starts seem to have reached a level which is close to their long-term average; however, it is hard to conclude that they have stabilized. Our analysis below shows that one can expect them to fall significantly more during this housing recession.

3.2 How much more will starts and completions fall in the current housing recession? Significantly more based on scenarios for the housing market in 2007-2010

So far we presented our estimates in term of yearly average over the next four years, the table below shows what we expect the dynamics to be in the next four years.

[10] Completions bottom at a higher level than starts because, once starts reach their trough, they start rising and thus the SAAR level of completions – that lag starts by about three quarters – do not reach the bottom of starts.

Table 2

	Average 2006	Estimate 2007	Estimate 2008	Estimate 2009	Estimate 2010	Estimated Average 2007-2010
Units needed		1.700	1.700	1.700	1.700	1.700
Change in inventories		-0.057	-0.057	-0.057	-0.057	-0.057
Completions (baseline)		1.643	1.643	1.643	1.643	1.643
Completions	1.989	1.862	1.460	1.550	1.700	1.643
Starts	1.862	1.460	1.550	1.700	1.700	1.603

In Table 2 we present our benchmark scenario. Starting from this benchmark we will then build more realistic scenarios. To build this benchmark table we used some simplifying assumptions. We assume that the units needed (demand), previously estimated, will be constant at 1.700 million units for each of the next four years (i.e. stable demand). Moreover, we assume that the fall in inventories (to achieve the optimal stock by 2010) will be the same in each one of the next four years (linear fall in inventory levels). Finally, we assume that all houses started are completed in a 12-month period.[11] Therefore, our state variable, namely our point of departure to build the table above, is that houses started in 2006 will all be – on average - completed in 2007. Consequently, each year's housing starts tell us what the number of completions will be in the following year[12].

Given that housing starts in 2006 averaged 1.862 million, the same number of units will be completed on average in 2007 (given the assumption of a one-year average time to complete a home). We estimate that starts will reach a bottom in 2007 with an average of 1.460 million units.[13] The housing market will then start to recover in 2008 until production reaches the estimated long-term need by 2010 and overbuilding stock is reabsorbed by that date.

We now proceed to relax our first assumption. We now assume that the housing need is not constant throughout the next four years, but it is lower in the first two years (down to 1.6 million rather than 1.7) to be followed by demand being above trend – at 1.8 million – in the following two years (so that the 2007-2010 demand still averages 1.7 million per

[11] Since it takes about three quarters – rather than four - to complete a new home, this is a simplifying assumption that allows to track completions from starts from year to year in a simpler way. The substance of our analysis is not in any way affected by this simplifying assumption.

[12] This assumption has a shortcoming: the bottom of houses started will be equal to the bottom of houses completed throughout the adjustment. This is at odds with past dynamics shown in the previous chart; however, our simplified adjustment does not take into account monthly movements, like those in the chart, but yearly ones.

[13] How do we get a figure of 1.460 for the housing starts bottom in 2007? Completions lag starts by a year and completions need to average the long-run demand (net of desired inventory adjustment) over the 2007-2010 period. Since average completions in 2007 will be equal to the average of starts in 2006, and since starts usually bottom out at 21 percent below completions, starts are estimated to bottom out at a level of 21 percent below the level of 2007 completions. Then, the path of starts in the following three years is determined by the need to achieve the needed supply of new housing over the 2007-2010 period consistent with the lag between starts and completions.

year). This new assumption about the intertemporal path of demand in 2007-2010 is based on the fact that demand in late 2006 and early 2007 has fallen well below the long-run demand, as excessive demand in the boom years is now leading to a below trend path for demand to work out the excess demand of the last 5 years. So, demand is now assumed to be below long-run need for two years (2007-2008) to be followed by two years of above-trend demand in 2009-2010 as a way to satisfy the average long-run demand of 1.7 over the 2007-2010 horizon. This case for the dynamic path of demand is depicted in the table below.

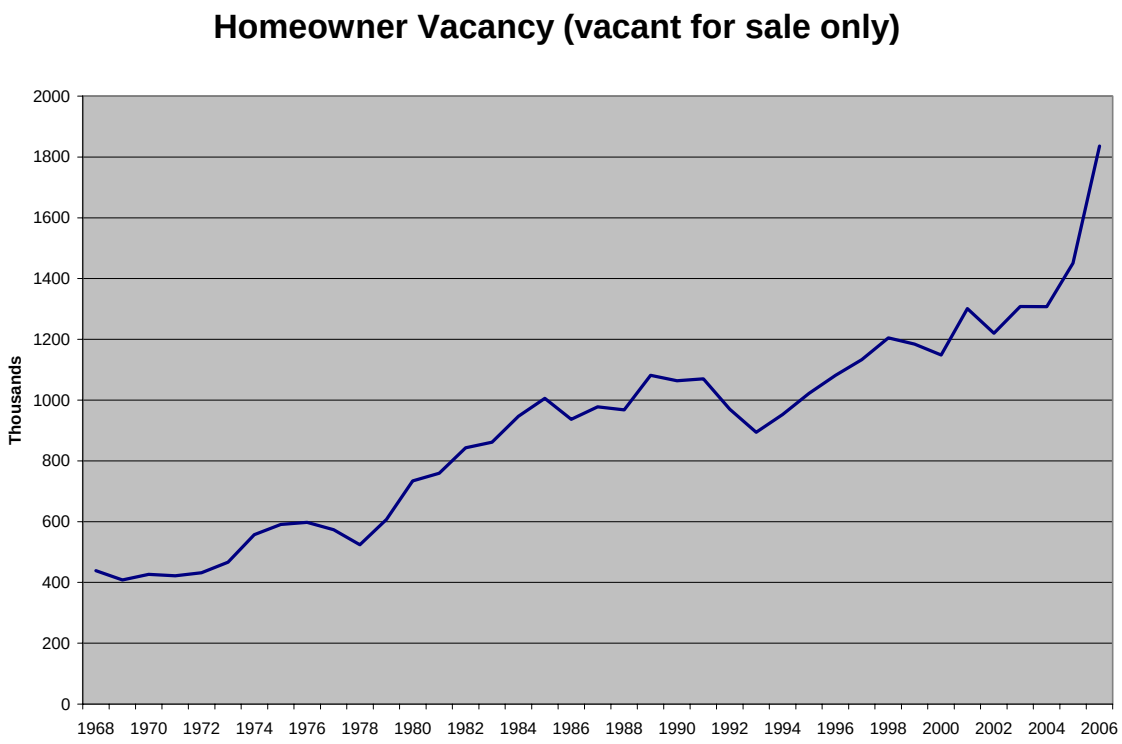
Table 3

	Average 2006	Estimate 2007	Estimate 2008	Estimate 2009	Estimate 2010	Estimated Average 2007-2010
Units needed		1.600	1.600	1.800	1.800	1.700
Change in inventories		-0.057	-0.057	-0.057	-0.057	-0.057
Completions (baseline)		1.543	1.543	1.743	1.743	1.643
Completions	1.989	1.862	1.375	1.555	1.780	1.643
Starts	1.862	1.375	1.555	1.780	1.700	1.603

In this case, given that the desired inventory change is assumed to be constant every year in 2007-2010, the supply of houses in the first two years has to fall even more than in the previous case where demand was stable[14]. In this new scenario, housing starts bottom out at 1.375 million, then rebound to 1.555 in 2008 and next adjust to the estimated need of completions for the rest of the decade.

[14] Note that change in inventories by definition equals the difference between production and demand. In our case the production is represented by completions and the demand by the estimated need of units.

Figure 10



Source: US Census Bureau

To obtain the estimates above we have used a measure of inventories that incorporates only new houses. This underestimates the excess of supply that exists in the economy. In order to have a more complete picture we look at the data on vacant units for sale, which include new units as well as existing ones[15]. Interestingly, vacant units for sale, shown in the figure above, spiked up in 2006. In the decade between 1985 and 1995 this indicator oscillated around 1 million units on average. It averaged 1.3 million units between 2001 and 2005 and reached an all time high of 1.836 million units in 2006. It is very likely that this excess supply of the total existing and new homes will put downward pressure on the supply of new homes over the next few years. Specifically, the fact that the stock of existing and new homes has increased from its long-run average of 1 million

[15] A housing unit is vacant if no one is living in it at the time of the interview, unless its occupants are only temporarily absent. In addition, a vacant unit may be one which is entirely occupied by persons who have a usual residence elsewhere. New units not yet occupied are classified as vacant housing units if construction has reached a point where all exterior windows and doors are installed and final usable floors are in place. Vacant units are excluded if they are exposed to the elements, that is, if the roof, walls, windows, or doors no longer protect the interior from the elements, or if there is positive evidence (such as a sign on the house or block) that the unit is to be demolished or is condemned. Also excluded are quarters being used entirely for nonresidential purposes, such as a store or an office, or quarters used for the storage of business supplies or inventory, machinery, or agricultural products. Vacant sleeping rooms in lodging houses, transient accommodations, barracks, and other quarters not defined as housing units are not included in the statistics in this report. Available online on the US Census website at: http://www.census.gov/hhes/www/housing/hvs/qtr406/q406def.html

to 1.836 units in the last seven years suggests that the sharp increase in existing homes that are now on sale may represent new homes that were purchased for speculative reasons in the last few years and that they are now on the market – and increasing the glut of new or semi-new homes. I.e. the usual turnover of existing homes cannot explain the sharp increase – since 2000 – in the unsold stock of existing homes for sales: most of these homes are effectively putting pressure on the market for new homes.
Given the need to reabsorb over the next four years the excess stock of new and existing homes, we assume that vacancies will go back to the levels of 2000 – 1.148 million – and the excess supply will be reabsorbed in the next four years. Then, then we have to subtract from our yearly need (demand) of 1.700 houses per year a total of 0.172 to estimate the needed path for the supply of new home. Then, this subtraction leaves us with completions averaging 1.528[16] million per year in the next four years.

Table 4

	Average 2006	Estimate 2007	Estimate 2008	Estimate 2009	Estimate 2010	Estimated Average 2007-2010
Units needed		1.700	1.700	1.700	1.700	1.700
Change in inventories		-0.172	-0.172	-0.172	-0.172	-0.172
Completions (baseline)		1.528	1.528	1.528	1.528	1.528
Completions	1.989	1.862	1.300	1.350	1.600	1.528
Starts	1.862	1.300	1.350	1.600	1.700	1.488

Once we have defined the new scenario, the table above is obtained with the same assumptions that we used before: a constant need (demand) of units at 1.7 milion throughout the 2007-2010 period, constant change in (new and existing) inventories throughout the period and all houses started are completed in a period of 12 months. As expected, in this scenario starts fall more than in the previous two cases. In this scenario, starts bottom out at a level of 1.300 million in 2007; then, they stay at a low level throughout 2008 while starting most of their recovery in the following two years.

[16] Total homes completed *not for sale* (for rent, contractor built, owner built) are running at about 500 thousand per year. Therefore, out of the 1.528 million completions estimates, about 1.03 million are the houses estimated to be completed for sale. This number matches current demand (sales) quite well. In January 2007 new one-family houses sold were 937 thousand (SAAR) and we estimate that total homes sold were about 1.04 million (SAAR). (This estimate is based the proportion between new-one family completed for sale and total completions for sale in 2006). However, demand might well fall further, as depicted in the scenario that considers the intertemporal path of demand (table 5).

Table 5

	Average 2006	Estimate 2007	Estimate 2008	Estimate 2009	Estimate 2010	Estimated Average 2007-2010
Units needed		1.600	1.600	1.800	1.800	1.700
Change in inventories		-0.172	-0.172	-0.172	-0.172	-0.172
Completions (baseline)		1.428	1.428	1.628	1.628	1.528
Completions	1.989	1.862	1.250	1.300	1.700	1.528
Starts	1.862	1.250	1.300	1.700	1.700	1.488

In the next variant of this scenario, as before, we relax the assumption of a constant demand over 2007-2010. Fewer units are needed in the first two years and consequently the need (demand) increases above the four-year average in the following two year. In this case, the bottom of starts is estimated to reach 1.250 million units in 2007 (given a constant linear fall in inventories in 2007-2010). Production (supply) would stay weak throughout 2008 and rebound thereafter. This last scenario (where we considered both the likely intertemporal path of demand and the need to work out the excess overhang of both new and existing homes) appears as the most likely scenario for starts, completions and demand over the next four years.

Note that, in this scenario, a bottom level for starts of 1.250 million implies a 44 percent fall from the peak of the cycle of January 2006 and a further 11 percent fall in starts from the last available data point of January 2007 (1.408).

In the final scenario that we like to consider, we depict an economy-wide recession scenario for 2007. We assume that in a recession scenario the demand (housing need) would fall down to 1.400 in 2007 (instead of falling down to 1.6 as in the no recession scenario). Demand would then recover in 2008 and would increase further in 2009 and 2010 to maintain the average over the four years of 1.700 million (to satisfy long run demand after the 2007 recession). This US recession scenario is depicted in the table below.

Table 6

	Average 2006	Estimate 2007	Estimate 2008	Estimate 2009	Estimate 2010	Estimated Average 2007-2010
Units needed		1.400	1.600	1.850	1.950	1.700
Change in inventories		-0.172	-0.172	-0.172	-0.172	-0.172
Completions (baseline)		1.228	1.428	1.678	1.778	1.528
Completions	1.989	1.862	1.100	1.365	1.785	1.528
Starts	1.862	1.100	1.365	1.785	1.700	1.488

In this scenario starts could fall all the way down to 1.1 million, which would be in line with the previous downturns of the housing sector. As observed before, in the previous housing cycles starts fell on average 51 percent from peak to trough. A level of 1.1

million implies a fall of exactly 51 percent from the January 2006 peak of 2.265 million units. 1.1 million is also consistent with a 922 thousand average trough for starts in the previous seven housing recessions generously augmented by 20 percent (if one were to argue that demographics and income growth have led to a long term increase in trend housing starts).[17]

Finally, there are a number of factors that we have not considered explicitly and that may lead to an even sharper housing downturn than the one in the scenarios above.
First, an element that we did not take into account in our computations is the amount of cancellations that are not captured in the sales data and therefore in inventories[18]. The major homebuilders have recently stated that order cancellations are as high as 30-40 percent. The implication is that inventories are greatly underestimated and new home sales are way overestimated; thus, the downward adjustment on the production side could be even bigger than described above if there is a need to reduce an even higher level of inventories. Second, the demand for housing in the next few years will be negatively affected by the current credit crunch in sub-prime lending. Sub-prime mortgages represented about 20 percent of originations in 2005 and 2006 (and as high as 25 percent in the latter part of 2006). The developing credit crunch in sub-prime lending will significantly affect the ability of lower score and poorer households to buy new homes. Also, there is now evidence that the sub-prime credit crunch may be spreading to other parts – higher rated ones – of the housing mortgage market. If this were to occur, housing demand would be further reduced. Third, in the 2001-2006 period one of the important drivers of housing demand was the speculative demand for housing (as opposed to the fundamental demand); such speculative demand was fed by – and in turn fed – higher home prices. Now that home price appreciation has, at best, flattened out to zero or, at worse based on some indicators, gone into negative territory (outright fall in home prices) this important component of housing demand is fizzling out, thus potentially exacerbating the excess supply glut and the overhang of unsold homes.

4. Conclusions

The ongoing US housing recession may end up being one of the worst housing recessions in the last few decades. An analysis of the housing market suggests that, even if the US economy were to achieve a soft landing and avoid a hard landing (recession or growth recession) the current housing recession is still quite far from bottoming out in spite of the fact that housing starts have already fallen about 38 percent from their peak. In previous housing recessions starts fell by about 51 percent and in many episodes of excess boom that went bust – similar to the latest cycle – the fall in housing starts was even more severe.

[17] However, as argued above, such a trend increase in starts does appear from the data or from Figure 2; thus assuming such a 20 percent increase in trend starts is extremely generous and biases upward the trough of starts. In previous housing recessions starts bottomed on average at 922 thousand, not 1.1milllion.
[18] See http://www.census.gov/const/www/salescancellations.html.

Our analysis of long-run demand and supply conditions in the housing market suggests that, once one considers a variety of factors and scenarios, even if we assume a soft landing for the US economy housing starts may fall to 1.25 million, about 11 percent lower than the current already highly depressed level of 1.408 million. Thus, even if the US economy were to avoid a hard landing, the housing recession is not close to its bottom: the fall in permits, starts, construction and completions has still a long way to go before the housing sector bottoms out at much lower level of activity, relative to today, some time in 2008.

Moreover, in a recessionary scenario for the US economy housing starts would fall at least down to 1.1 million, 22 percent below current levels and 51 percent below the January 2006 peak of starts. Of course, the contraction in housing would be even more severe in this hard landing scenario relative to the soft landing benchmark scenario. But the fall in housing starts could be even worse if – as likely - an economy wide recession were to lead to a fall in housing demand that is larger than the moderate one described in our US recession scenario. So, our recession scenarios represent more an upper bound – rather than a lower bound – for how sharp the housing contraction would be during an economy-wide recession.

There are a number of other factors – not considered in detail in this paper – that could make the housing recession more severe and contribute to trigger a deeper housing recession and an economy-wide recession. These include a credit crunch going from sub-prime mortgages to other mortgages and to consumer credit overall; strong wealth and home equity withdrawal effects of a fall in home prices; the collapse in the speculative demand for homes. Also a perverse interaction between CDOs (that have been financing for the last two years some of the riskiest tranches (mezzanine) of RMBSs) and mortgage backed securities (that are at the core of the transfer of mortgage risk from banks to other financial institutions) could exacerbate the financial shocks that are triggering a credit crunch. The massive losses of sellers of insurance, mostly CDO managers and CDO investors, in the ABX market – where the costs of insuring against default of BBB-tranches of mortgages have skyrocketed in recent weeks – may lead to the drying up of the CDO liquidity that is essential for the well functioning of residential MBSs. We will consider these various sources of amplification of the housing recession via real and financial channels in several forthcoming research notes.

Finally, vicious cycles and negative feedback loops between the housing recession and the ensuing credit crunch leading to an economy-wide recession could and would loop back negatively to the housing market and deepen its recession. We will consider these negative feedbacks – that are currently the major risk faced by the US economy and its financial markets - in forthcoming studies.