



Bursting of the US housing bubble

There is concern that America may be on the brink of its biggest ever house-price bust. Both sales of homes and housing starts in the United States have slumped in recent months. The worry is that static or falling home prices will dampen consumer sentiment with lower spending and economic activity not far behind. Some commentators, like Nouriel Roubini, argue that the housing downturn will likely lead to a recession in early 2007.¹ Any downturn will have repercussions for the world economy.

The bursting of the US housing bubble will change expected returns to housing assets and will lead to a reallocation of capital within the United States as well as between countries. This reallocation of capital will have knock-on effects for the world economy, exchange rates and international capital flows. These financial effects need to be assessed alongside the effects on the real economy from lower investment in housing and lower spending from the negative wealth effect. These are all analysed with the economywide framework used in this issue of *Scenarios*.

The housing bubble

The rise in the US house prices and also in other parts of the world since 2000 has been described by *The Economist* magazine as the 'biggest bubble in history'.² Since 2000, *The Economist* has estimated that the value of residential property in developed countries rose by more than \$30 trillion.

The boom in house prices was driven by historically low interest rates and a lack of perceived returns on stockmarkets following the bust of the stockmarket boom in 2000. The course of US house prices and the stockmarket bust are shown in chart 1. Following the share slump, changing perceptions of relative returns on assets caused investors to switch holdings of assets in favour of housing. As investors switched preferences from stocks to property, rising prices of houses generated expectations of further rises in property values, fuelling additional speculative demands.

Key points

- US real GDP could contract by over 4 per cent from baseline a year after the bubble bursts
 - Sufficient to cause a recession in the United States
- A major reallocation of capital occurs, mostly to offshore assets
- The US current account deficit improves by 1.2 per cent of GDP from baseline, one year on
- There are two flow-on effects for other world economies: a negative effect from the US slowdown and a positive effect from the reallocation of US housing capital
- Mostly the positive effect outweighs the negative except for Singapore, the Philippines and Hong Kong
- Assumes nothing else happening such as changing risk premiums demanded by investors

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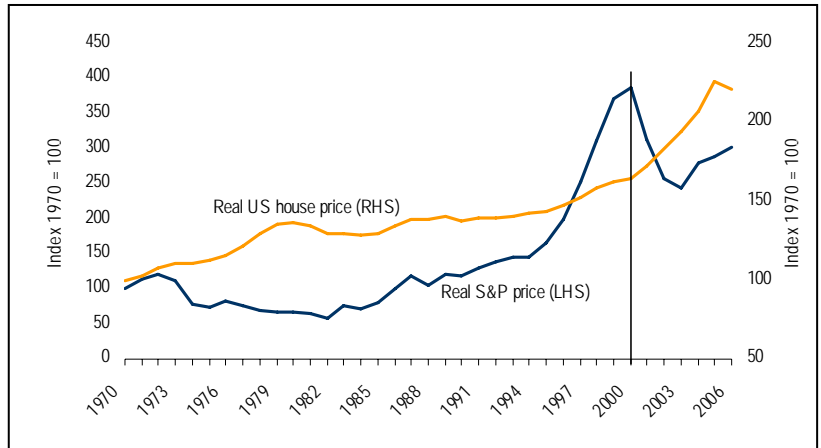
¹ Roubini, N. 'The Coming Housing and Economic Crash', <http://www.rgemonitor.com/blog/roubini/148366>.

² *The Economist* 2005, Special Report 'The global housing boom', pp. 52–54, June, 18.

Using these scenarios

Nobody can foretell the future. If they could, they wouldn't tell you about it. These scenarios are not predictions or forecasts. To make profitable investments from this information you also need to decide how likely the events portrayed here are, and what is already priced in the markets. The value of this material is in the insights it offers into the economic effects of various possible events.

Chart 1 United States house prices and stockmarket



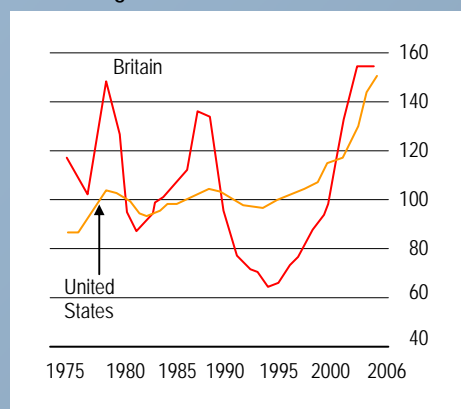
Source: US Office of Housing Enterprise Oversight (OHEO) deflated by US consumption deflator and R. J. Schiller, *International Exuberance*, Second Edition, 2005, Princeton University Press.

When is a boom a 'bubble'?

There is no hard and fast definition of a housing bubble, but generally it is characterised by rapid speculation in house values until they reach unsustainable levels relative to incomes or some other economic fundamentals.³ That highlights the identification problem in looking at bubbles. As Ben Bernanke puts it, while the price of an asset is observable, the corresponding fundamentals such as the expected return from the asset is not.⁴ Hence, there are widespread attempts to estimate 'fundamental value' for housing assets.

One such 'fundamental' is the ratio of house prices to rents. This ratio is reported by *The Economist* and reflects a sort of price/earning ratio for the housing market. The ratio for United States is shown in chart 2. That house prices have boomed relative to rents is clear from chart 2 and the take-off since 2000 is self-evident. Compared to an average level over 1975–2000, it shows America's market is 'overvalued' by 35 per cent. Of course, the market can return to 'fundamental' values by either rents rising, house prices falling or both. But unless inflation is allowed to get out of control, there will be a limit on rental increases. That means house prices — based on the 'fundamentals' are likely to fall. America's market has already begun to turn down.

Chart 2: Ratio of house prices to rents, 1975–2000, average = 100



Source: The Economist, HSBC.

The possible course of house prices

Typically, housing bubbles do not 'burst' like stockmarkets can. Mostly, at the end of a boom, prices stop rising and then fall slowly as people 'sit' on their assets. Initially, the inventory of unsold

³ Wikipedia, *Real Estate Bubble*, http://www.wikipedia.org/wiki/housing_bubble.

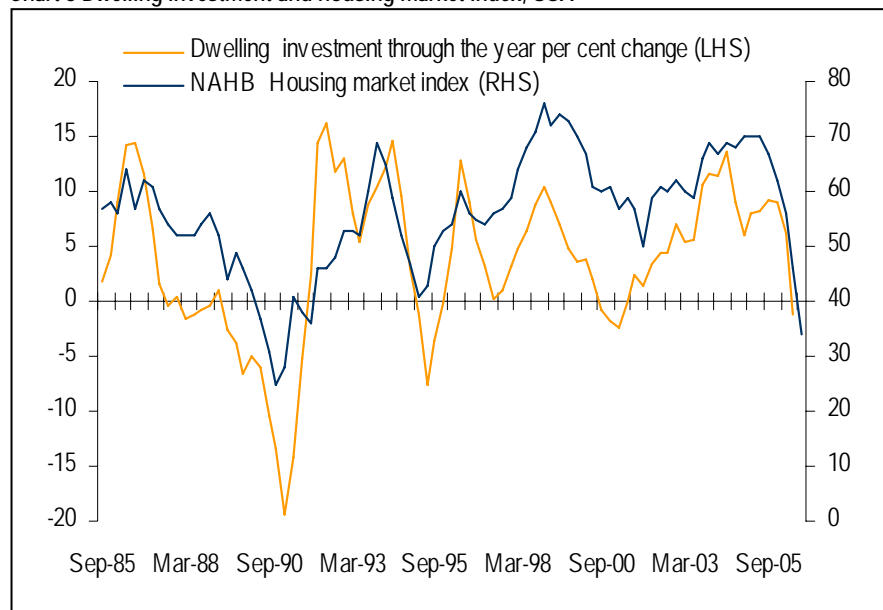
⁴ The Federal Reserve Board, Remarks by Governor Ben S. Bernanke, 'Asset-Price "Bubbles" and Monetary Policy', Before the New York Chapter of the National Association for Business Economics, New York, October 15, 2002.

homes rises before price pressure is felt. Even so, there can be large effects. In one study on bubbles bursting the IMF found that housing price busts were less frequent than stockmarket busts but they lasted twice as long and were associated with output losses that were twice as large.⁵ The IMF found that on average, the output level three years after a house price bust was 8 per cent below the level based on average growth rates before the bust.⁶ So output effects from a housing price bust can be protracted and severe.

What has pundits worried is the sharp 12 per cent drop in US sales of existing homes over a year ago while sales of new homes is down 17 per cent. The National Association of House Builders data is shown on chart 2.

There are plenty of anecdotal stories of US house prices 20 per cent below asking prices a year ago but nationally the market only seems slightly down. Across the United States, the National Association of Realtors reports the median price of existing homes to be 1.7 per cent below a year ago.⁷ More price pressure could be expected, however, since the inventory of existing homes available for sale is 7.5 months at the current pace of sales which is the highest supply since April 1993.⁸

Chart 3 Dwelling investment and housing market index, USA



Source: National Association of House Builders; Bureau of Economic Analysis.

The gloom in the housing markets is also reflected in the Housing Market Index collected and published by the National Association of Home Builders. Their index has declined to its lowest level since 1991 (see chart 3).⁹ Consistent with this decline in the index,

⁵ IMF 2003, *World Economic Outlook*, 'When Bubbles Burst', April.

⁶ IMF, p. 68.

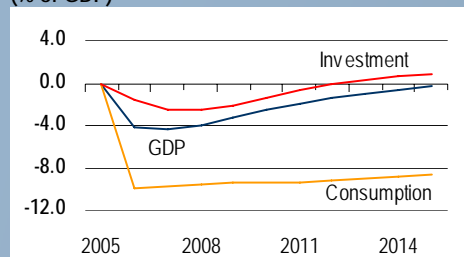
⁷ National Association of Realtors, Press Release, 'Existing – Home Sales Holding At A Sustainable Pace', 25 September 2006

⁸ National Association of Realtors Press Release, 25 September 2006

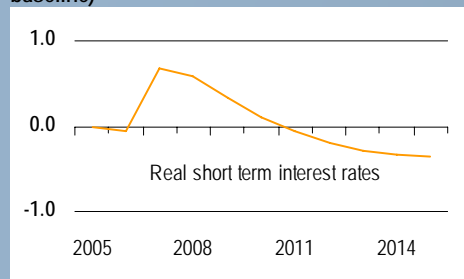
⁹ National Association of House Builders.

Chart 4: Effects of the US housing bust on the US economy (change from baseline)

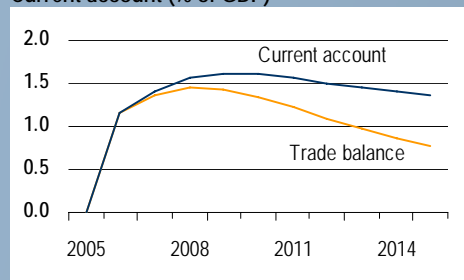
Real GDP, consumption and investment (% of GDP)



Interest rates (percentage point deviation from baseline)



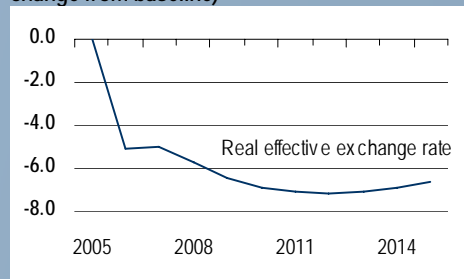
Current account (% of GDP)



Exports and imports (% of GDP)



Real effective exchange rate (percentage point change from baseline)



dwelling investment in the United States is also off 15 per cent as shown on chart 3. Federal Reserve Chairman Ben Bernanke was reported saying the housing correction could shave a percentage point off GDP in the second half of the year.¹⁰

The economics of a house-price bust

The bursting of a house price bubble has several economic effects working through both the real and financial sides of an economy.

During a house-price boom there is a substantial increase in real activity as investment in new houses and their fit-out increases. There are more jobs in housing and the investment generates more economic activity. Of course the resources for extra activity in housing have to come from somewhere and that means less activity in other sectors of the economy than would otherwise occur. When a house-price boom bursts, new housing-starts to fall and the process reverses itself — less activity in housing, but more resources available for extra activity elsewhere in the economy. An economywide model is needed to capture this aspect of a bursting of a house-price bubble.

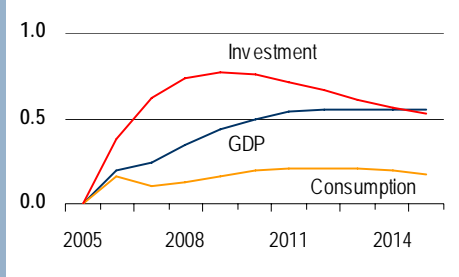
There is another important aspect of house prices that affects the economy. That is the effect on household wealth and hence consumption. When house prices rise, those people who own a home feel richer. Their wealth has gone up. Real consumption is a function of perceived real lifetime wealth, so consumers can be tempted to spend more. Either existing savings can be run down or consumers can re-finance their mortgages and ‘extract’ some of the increase in equity using the banking and financial system. At one stage last year, quarterly equity extraction in the US was US\$850 billion. It is currently close to US\$497 billion. This equity extraction is available for investment elsewhere, extra spending or both.

When the ‘bubble’ bursts, the above effect reverses itself. Consumers now feel less wealthy and cut back spending. Investors, facing lower expected capital gains from their investments, shift their attention to other assets. This shift to other assets can be within a country or to another country, or both. When investment flows to offshore assets the capital movements generates changes in current account balances, exports and imports, and real exchange rates. These financial effects from a housing bust therefore affect real activity. Hence a model that incorporates financial effects as well as the impact of wealth on consumption needs to be used to assess the impact of a bursting of a house-price boom. The APG-Cubed model incorporates all of these effects (see box 1).

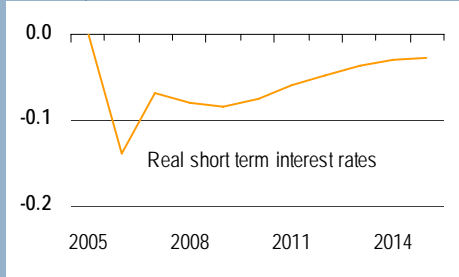
¹⁰ *Wall Street Journal*, ‘Bernanke expects housing slide to curb second half growth’. October 5, 2006

Chart 5: Effects of the US housing bust on the Chinese economy (change from baseline)

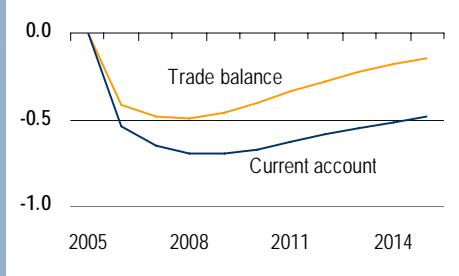
Real GDP, consumption and investment (% of GDP)



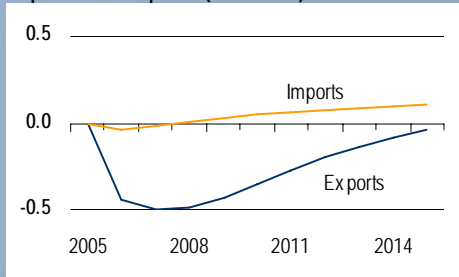
Interest rates (percentage point deviation from baseline)



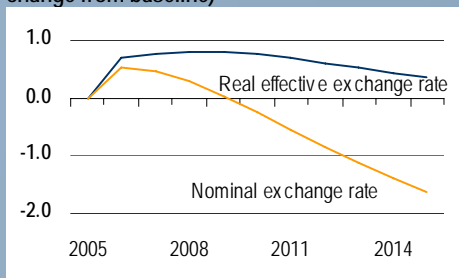
Current account (% of GDP)



Exports and imports (% of GDP)



Real effective exchange rate (percentage point change from baseline)



The scenario

Modelling the bursting of a housing bubble is difficult. In the APG-Cubed model part of consumption is generated by a stock of household capital (which is actually housing as well as white goods and automobiles) that households invest in each year in order to generate a flow of housing services over time. To capture the idea of a housing bubble bursting we model the shock as a fall in the expected productivity of the investments that are made in the stock of household capital of 10 per cent in 2006 remaining 10 per cent lower forever. This shock roughly translates into a 5.4 per cent drop in housing values a year after the start of the bust.

Results

The fall in wealth from the sharp fall in the value of housing causes a large drop in consumption. The initial decline a year after the bursting of the bubble is 10 per cent below baseline in the first year after the price drop. The effect persists for several years (panel 1, chart set 4).

The large drop in consumption weighs heavily on the economy and real GDP falls by 4.1 per cent below baseline one year after the shock before returning to baseline several years later (panel 1 of chart set 4). Thus the fall in the growth of real GDP is only felt in the first year but the level of GDP remains below baseline for a number of years.

Private investment falls 1.6 per cent of GDP below baseline depicted in panel 1 of chart 4 mostly reflecting the fall in housing investment but also because other private investment also falls reflecting the fall in overall economic activity. With the bursting of the housing bubble, investors now switch to alternative assets where expected returns are higher.

The large drop in consumer spending and real GDP in the United States means that a substantial part of the asset reallocation would go offshore rather than staying within US assets. The capital outflow this generates (or less capital inflow than otherwise) causes the US current account to improve by 1.2 per cent of GDP in 2006 and by 1.6 per cent of GDP by the fifth year from baseline (see panel 3 of chart set 4). Most of the improvement in the US current account from baseline is made up by an improvement in the trade balance as shown on panel 3.

Contributing to the improvement in the trade balance from baseline is an increase in US exports to the rest of the world and a reduction in imports shown on panel 4 of chart set 4. To facilitate this change in trade balance the US real effective exchange rate depreciates by between 5 and 7 per cent from baseline in the years following the bursting of the housing bubble (panel 5 of chart set 4).

Effects on other countries

One of the worries of a housing bubble bursting in the United States and a commensurate slowdown is the negative impact on the rest of the world. It is true that the United States is a large consuming nation and importer of goods and services from many countries, one of which is China. There are concerns that a recession in the United States would have a negative effect on countries such as China which would then slow with its own repercussions for things like commodity prices. But is that the complete story? It is true that there is a negative shock to the world economy from the US slowdown. But there is a positive effect as well. The capital that is reallocated out of the US housing market that finds its way to extra investments in other countries has a positive effect on investment, consumption and real GDP in those other economies. What effect dominates — the positive or the negative? It turns out there are differences between countries depending on how dependent they are on US demand for their own activity. China is a large economy with strong trade links to the US economy so we look at it first.

China

The effects of the bursting of the US housing bubble on China are shown in chart set 5. Panel 1 shows that real investment, real GDP and real consumption in China all rise with the US slowdown relative to baseline. The reason is that the positive stimulus from the extra investment as US housing capital is reallocated outweighs the negative effect of the US slowdown and fewer imports from China and other countries. The effect is small and real GDP could be 0.5 per cent higher than otherwise in China five years after the initial bursting of the bubble. This small effect reflects the two opposing effects mostly cancelling each other with a small net positive effect.

The effect on China's current account and trade balance (panel 3) is the 'mirror' image of the improvement in the US position. China's current account could be 0.5 per cent of GDP below what it would otherwise be one year after the bursting of the US housing bubble. Most of this effect is made up of a worsening of China's trade balance (from baseline) and that reduction is mostly made up by fewer exports rather than a change in imports (panel 4 of chart set 5). While the price (a small appreciation of the real exchange rate — panel 5) and income effects (expanded GDP and consumption) would tend to increase imports, fewer exports will free up resources to produce import replacement goods as well as less imports used in the production of exports.

Other countries

Most other countries exhibit the same pattern of effects as depicted by China, the differences being how the balances of the positive

and negative effects play out. The effects on the current account, investment and real GDP for other countries is shown in table 1.

Mostly the positive effect on the US current account as a result of the bursting of the US housing bubble is reflected in a worsening (relative to baseline) of current accounts elsewhere. The exception is Singapore. Also, the negative effect from the contraction of the US economy dominates any positive effect from the reallocation of capital from the US housing market in the case of Singapore, the Philippines and Hong Kong in the first year after the bubble bursts. These economies experience a slight decline in real GDP from baseline as shown in table 1.

Conclusions

The bursting of the US housing bubble could have serious adverse consequences for the United States. That conclusion confirms other empirical work by the IMF. Although the size and speed of the bursting of the bubble is unknown, on the scale of shock simulated here the bursting of the bubble could be sufficient to put the United States into recession a year later.

Table 1: Results for a bursting of the US housing bubble (change relative to baseline)

	Change in current accounts (% of GDP)			Change in real investment (% of GDP)			Change in real GDP (%)		
	Year 1	Year 5	Year 10	Year 1	Year 5	Year 10	Year 1	Year 5	Year 10
United States	1.2	1.6	1.4	-1.5	-1.4	0.9	-4.1	-2.6	-0.3
Japan	-0.6	-0.7	-0.5	0.8	1.7	1.0	0.3	1.2	1.4
United Kingdom	-0.4	-0.5	-0.6	0.2	0.6	0.6	0.0	0.4	0.6
Europe	-0.4	-0.5	-0.5	0.4	1.1	0.9	0.3	0.9	1.3
Canada	-0.8	-1.8	-1.6	0.6	2.8	2.4	0.2	1.8	2.4
Australia	-0.6	-1.0	-0.9	0.4	1.0	0.9	0.2	0.8	1.0
New Zealand	-0.9	-1.9	-1.6	0.7	1.6	0.9	0.1	1.2	1.3
Indonesia	-0.5	-0.7	-0.5	0.5	0.9	0.7	0.4	0.6	0.7
Malaysia	-1.0	-2.1	-1.7	0.9	2.7	1.7	0.2	1.5	2.3
Philippines	-1.5	-2.6	-1.9	0.3	0.9	0.3	-0.1	0.6	0.6
Singapore	0.1	-1.2	-1.3	0.8	2.9	2.6	-0.0	1.6	3.0
Thailand	-1.0	-1.4	-1.1	0.4	0.9	0.6	0.1	0.5	0.9
China	-0.5	-0.7	-0.5	0.4	0.8	0.5	0.2	0.5	0.5
India	-0.4	-0.5	-0.5	0.3	0.6	0.6	0.2	0.4	0.6
Taiwan	-0.2	-0.9	-0.7	0.8	2.6	2.3	0.1	1.4	2.5
Korea	-0.8	-1.2	-0.9	0.6	1.7	1.2	0.4	1.2	1.6
Hong Kong	-0.4	-0.3	0.0	0.4	0.7	0.5	-0.5	0.4	0.9

Source: Simulations with APG-Cubed

But that contraction is not gloom and doom for the world economy. The negative flow-on effect from a United States contraction is more than offset by the positive stimulus from the reallocation of capital from the US housing market for all economies except Singapore, the Philippines and Hong Kong. These three economies rely relatively more on United States demand so the negative effect dominates.

The above conclusions pre-suppose 'nothing else is going on'. The policy responses in the United States may be more aggressive than assumed in the standard Henderson-Mckibbin-Taylor rule for the Fed in which the policy interest rate responds to both changes in inflation and output growth. In addition the simulations are for a bursting of the US housing market alone where the linkages between countries are driven through changes in the fundamentals that drive trade and capital flows. But it could be that, if this event was sudden and severe, it could cause risk premiums demanded by investors to rise everywhere in the world, if they wrongly believe that a US contraction must be bad news for other economies. Such a change in risk premiums would have negative flow-on effects elsewhere, but would be a separate simulation requiring its own analysis.

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