Housing bubbles: what are their causes and can we get rid of them?

by

Paul van den Noord[1]

"And we will never return to the old boom and bust."
Gordon Brown, Budget Statement, 21 March 2007

In his invitation to give this lecture Governor Novotny mentioned that I was the best placed person to do so. This is flattering, but personally I consider Robert Shiller to be the most prominent scholar on this topic. He surely merits the Nobel Prize he received a few weeks ago. Allow me to pay tribute to Robert Shiller by reproducing the following chart from his website:

Fig 1. Long-run US housing data
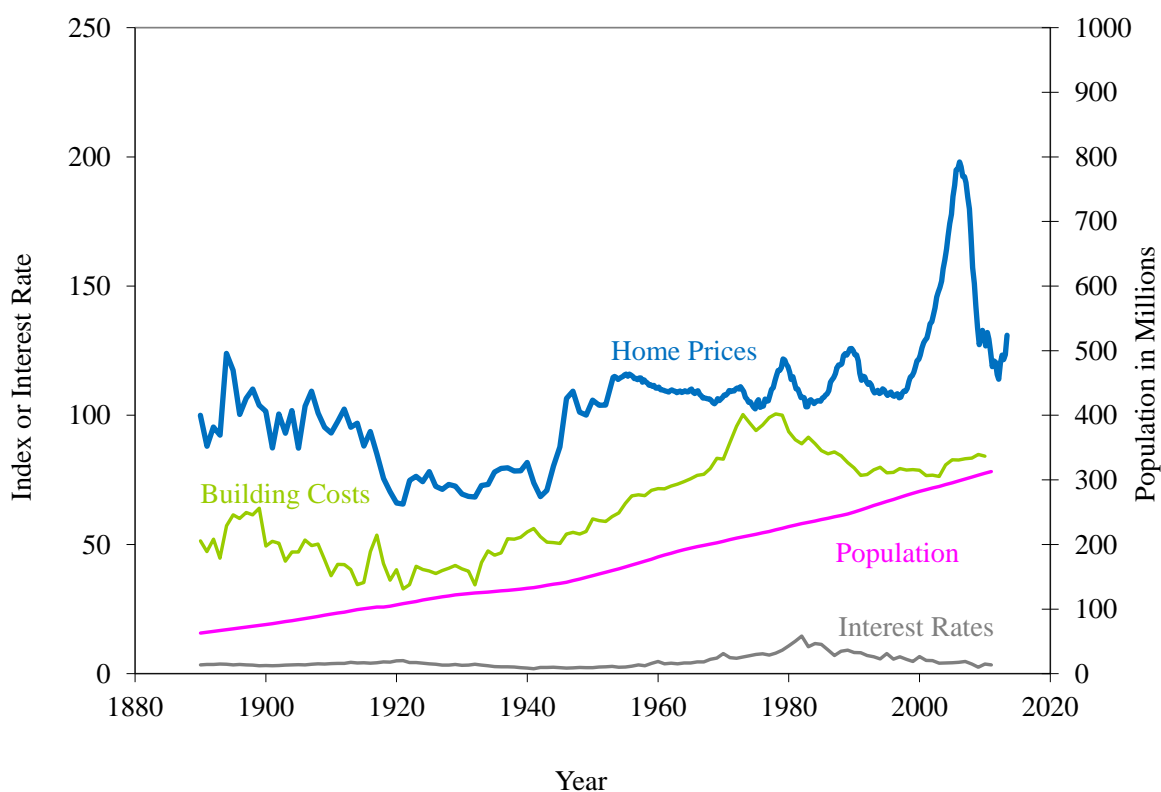
Source: Robert J. Shiller, *Irrational Exuberance*, 2nd. Edition, Princeton University Press, 2005, 2009, Broadway Books 2006, also Subprime Solution, 2008, as updated by the author.

What is immediately clear from his chart is that real house prices, at least in the United States, have portrayed a distinct cyclical pattern since the mid-1970s, with the amplitude steadily increasing.

---

[1] Autonomy Capital, London. All views expressed in this presentation are my own and cannot be attributed to the Company or its staff.

Specifically, we observe three cycles, with the third one just having ended and possibly a fourth one starting. Another stylised feature of this period is the steady decline of interest rates from their historical peak around 1980, while (real) building costs fell. So I think it is worth looking at this period in more detail. What has made it so special?

The proximate causes

Figure 2 shows the development of real house prices in the G7 economies from the early-1970s until now, using PPP-adjusted GDP weights, based on OECD data. It is a de-trended series using a log-linear trend. It is shown alongside the weighted average of the output gap of the same group of countries and using the same set of weights.

Fig. 2 The real house price cycle and the output gap
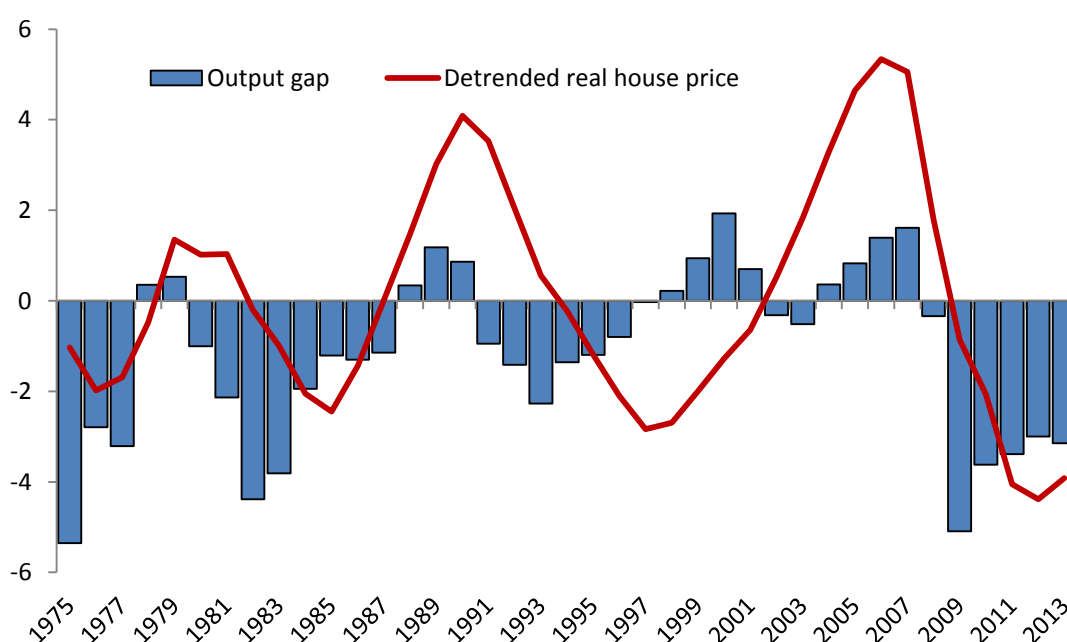
Note: Real house price as a per cent difference from (a log-linear) trend, weighted average of the G7 countries, using purchasing power-adjusted GDP weights, output gap as a per cent of potential GDP using the same set of weights, numbers for 2013 refer to the first half of the year.

Source: OECD, author's calculations.

Three observations can be made.

1. **The average real house price for the G7 economies portrays the same cyclical pattern as Shiller's chart**. Obviously this should not surprise us too much given that the United States represents almost half of the G7. But broadly similar cyclical patterns can be observed for all but two G7 countries – the exceptions being Japan and Germany. Specifically, while until the mid-1990s the German and Japanese housing cycles were broadly in sync with those of the G7 at large, neither country has experienced the third boom/bust cycle that started in the mid-1990s and that has just ended.[2] However, despite these idiosyncratic exceptions, I

---

[2] In the case of Japan this is probably explained by the magnitude of the early-1990s bust, which was so devastating that the real estate sector never recovered, not least since the economy was caught in a liquidity

believe Figure 2 depicts the common component of the housing cycle in the developed economies in the past four decades.

2. **The correlation between the housing cycle and the overall business cycle has become less over time.** The first and second housing boom–bust cycles, from the late-1970s to the mid-1980s and from the mid-1980s to the mid-1990s, have tended to lag the overall business cycle by several years – both upswings and downswings, suggesting (but not proving) there may be a causal relationship. The third housing cycle, by contrast, seems to have developed independently from the overall business cycle, with its upswing phase actually gaining momentum in the 2001-03 recession. Specifically:

   a. The **first housing cycle** started in the wake of the recovery from the short, but deep, 1975 recession. Monetary policy was substantially eased in response to that recession as the oil price hike after the Yom Kippur War that preceded it was fully accommodated. Housing was probably seen as a hedge against inflation, and this may have set in motion the first housing cycle.

   b. The **second housing cycle**, from the mid-1980s to the mid-1990s, started after the economy had been recovering from the second oil shock that was triggered by the Iranian Revolution in 1979 and was followed by the early-1980s recession. This time around it was easy monetary policy in response to the 1987 stock market crash that, if not triggering the housing cycle, certainly added fuel to it – along with a first wave of financial liberalisation.

   c. In contrast with previous housing cycles, the **third housing cycle** evolved quite independently from the overall business cycle. It roughly started when interest rates in the developed world fell in 1998 when bond markets in advanced markets served as a safe haven in the Asian crisis. The economy then went into the dotcom boom. However, the subsequent downturn in 2001-03 did nothing to stem the housing upswing and in fact added fuel to it. One explanation for this may be that when the stock market slumped in 2000-01, and monetary policy was eased in response, housing became a buy for investors and households as money and housing were both cheap. This is not to deny the role of financial deregulation, the development of toxic financial products, failing rating agencies, and all the rest of it. But perhaps these developments were largely endogenous, spurred by extremely easy monetary conditions and, initially, cheap housing. It prepared the ground for the financial crisis and the Great Recession that followed, and which has been the deepest since World War II.

3. **The amplitude of the housing cycle has increased over time**. Why is this? In my view it may tell us something about the deeper causes of the housing cycle. The hypothesis I will develop in what follows (and at this point it is just that -- a hypothesis) is that in the past four decades the housing cycle has been largely endogenous – i.e. not primarily the result of

---

trap culminating in persistent deflation and (too) high real interest rates. In the case of Germany the explanation resides in the reunification shock in 1990 when a government-led construction boom coincided with massive money creation due to the generous conversion rate of Ostmarks into Deutschemarks. As excess supply has been gradually worked off, real house prices have finally started to recover in Germany recently – prompting the Bundesbank to issue a (probably premature) warning of a housing bubble inflating.

randomly occurring serial "exogenous" shocks, but self-sustained and, what is more, potentially explosive.

The deeper causes

I have so far avoided the term "bubbles" to avert the usual criticism that it is impossible to detect a bubble. But I think bubbles are like pornography: hard to define but immediately obvious when you see them. So I do consider the past housing boom and bust cycles as bubbles.

What explains them? Recently I run into what I consider a remarkable paper, co-authored by an economist and a psychoanalyst who must have gone through great pains to learn to speak each other's language and come up with a common framework rooted in both disciplines.[3]

Let's see what they are saying.

"To form groups is characteristic of people. (…) In situations in which an individual is not able to ward off his anxiety, he may turn to others (…). The group of like-minded investors may serve to license the behaviour of its members, so long as the behaviour is compliant with the group direction, The established convention becomes, for example, that home prices will continue to rise, which in turn leads to rising prices as more and more people enter into what becomes an euphoric stage of buying, disregarding risk. (…) Men and women seen earlier as reasonable and thoughtful people are regaling the group and outsiders, saying that "real estate prices will always go up."

Of course at some point prices will be driven up to a level where they are no longer affordable for anyone. The Ponzi game nears its zenith. At this point: "Housing prices are falling, and since we don't know any way of predicting the future except by projecting the present to the future, we will believe the housing prices will continue to fall. Everyone acts accordingly, tries selling before prices fall even further. This behaviour, of course, produces the crash. (…) Individual arrogance, omnipotence and sense of invulnerability also fade."

They do not fail to add that:

"As Krugman convincingly argues concerning the housing bubble and its after effects, most economists got it wrong. Blinded by their belief in rational economic actors, and perfect markets, the perceived power of sophisticated mathematical models, and the invention and expanding use of exotic financial instruments intended as risk ameliorants, and the inherent stability of markets, potentials for catastrophic failures in the market economy were ignored."

So there we are: economic actors in housing markets are not rational, they base their price prediction on past trends, and when the tide turns because house prices have become unaffordable they stampede to the exit, producing the crash they always feared.

Some would argue that this type of behaviour is in fact not irrational, but rather the outcome of cold-blooded calculation, with each agent betting on his or her ability to surf the wave and get off in

---

[3] Allan Compton and Sule Ozler (2011), *A psychoanalytic approach to explanation of the Housing Bubble: From individual to group*, June 2011, Department of Psychiatry and Biobehavioral Science, UCLA and New Center for Psychoanalysis.
,

time. However, while this premise may be correct for professional investors in relatively liquid (financial) assets, it looks invalid for once-in-a-lifetime amateur investors in what is probably the most illiquid asset of all.

So what does this tell us about the price dynamics in housing markets? It must be the case that, at least part of the time, price expectations are adaptive, i.e. *up* when prices have been going up and *down* when they have been going down. The expected rate of change in house prices enters the demand for housing through two channels:

- The **user cost channel**. When households or investors expect house prices to go up and realise a capital gain, this capital gain reduces the user cost of housing, making housing an attractive investment and boosting demand for it as well as its price.
- The **collateral channel**, which applies to credit-constrained households and investors. When house prices are expected to increase, banks are more inclined to extend credit as they are confident the collateral will prove to be solid. This, in turn, boosts housing demand, and prices.

The two channels together act as a financial accelerator mechanism. When house prices go up, they push demand and prices further up, until lack of affordability prevents further price increases, and vice versa for price downturns. Accelerator mechanisms tend to produce an endogenous cycle, which may be explosive, or not, depending on the sensitivity of demand to past price increases.

It is surprisingly simple to come up with a naïve and yet sensible economic model to mimic this type of cyclical behaviour. All we need is a housing demand equation, a housing supply equation and a market clearing condition:

$$H^d = H^d\left(p_H, \Delta p_{H(t-1)}, \dots\right)$$

$$H^s = H^s\left(p_H, H_{(t-1)}, \dots\right)$$

$$H = H^s = H^d$$

where:

$$\frac{\partial H^d}{\partial p_H} < 0, \frac{\partial H^d}{\partial \Delta p_{H(t-1)}} > 0, \frac{\partial H^s}{\partial p_H} > 0, , \frac{\partial H^s}{\partial H_{(t-1)}} > 0$$

The first equation says that housing demand H^d is a negative function of the housing price level p_H (through the affordability channel) and a positive function of the past change in the house price level (through the user cost and collateral channels). The second equation says that housing supply H^s depends on the existing housing stock $H_{(t-1)}$ while any (gross) additions to this stock depend on the profitability of residential construction, and hence the house price level, with a positive sign. Solving the model yields the following reduced form house price equation:

$$p_H = f\left(\Delta p_{H(t-1)}, H_{(t-1)}, \dots\right)$$

The signs on the two left-hand side variables are, respectively, positive and negative. Figure 3 shows a simulation of this naïve model which replicates the historical pattern quite well. It is estimated on the real house price series shown in Figure 2.The crucial parameter is the one that links the real

house price to the past change in the real house price: if that parameter is bigger than one (and the econometric estimate suggests that to be the case), the oscillation is explosive.

Fig 3. Simulated real house price level
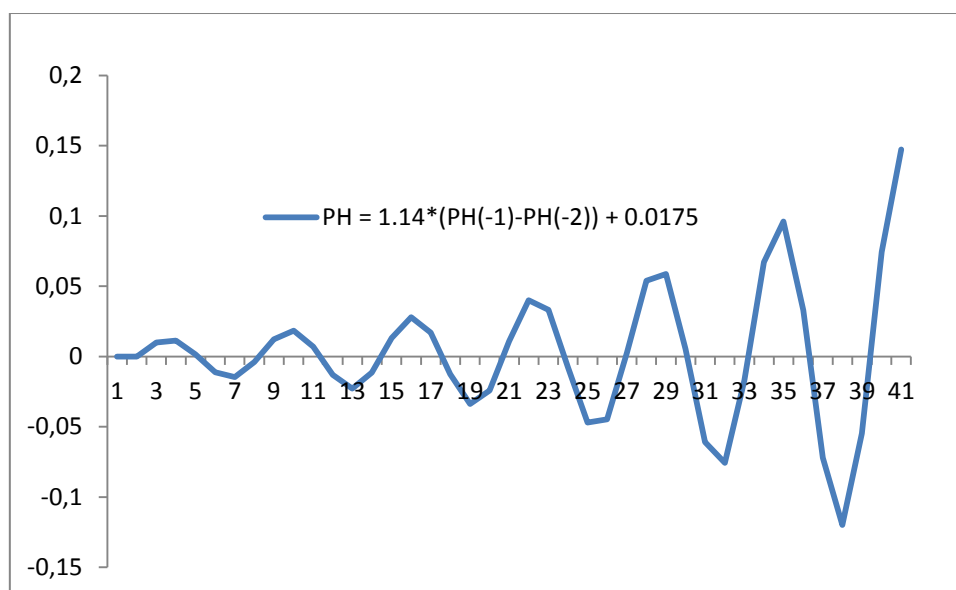
With this in mind, let's take another look at the historical data and see if there is another narrative possible. Figure 4 shows the same index of real house prices as in Figure 2, but now plotted against the weighted average real interest rate (10-years sovereign bond yield less the rate of change of the GDP deflator) of the G7 countries. The per cent change in the average real interest rate is shown. This choice is based on my presumption that the interest rate sensitivity of house prices depends in part on the initial level of the real interest rate (if it is low, the sensitivity to even a minor change in the real rate is high and vice versa).

The graph suggests that the second half of the 1970s and the first half of the 1980s was an extraordinary period, one I would call the "big bang". The first five years of the big bang coincided with the aftermath of the first oil shock. This was a strongly inflationary event that was fully accommodated by monetary policy, as noted earlier. This is reflected in the sharp fall of the real interest rate in that period, as shown in the graph. In the first half of the 1980s we see exactly the opposite happening. Though the economy was again hit by an inflationary shock (the second oil shock), monetary policy was actually tightened and the real interest rate surged, as again shown in the graph. This has come to be known as the "Volcker shock", a hard-nosed (and successful) attempt by FOMC chair Volcker to weed out inflation for good.

So here is my hypothesis. The accelerator mechanism that produces the housing cycle was shocked in the late-1970s and early1980s to such an extent that an endogenous boom-bust super cycle -- the main features of which are described by my naïve model -- was set in motion. The fact that real interest rates have shown a secular but modest decline since the big bang episode has probably served as a lubricant for the cycle to be sustained. Moreover, the surge in real interest rates in 1994 and 2007 both heralded (but did not on their own cause) falls in the level of real house prices. This mechanism has now produced three waves. It seems a fourth – potentially even bigger – wave has

started. If true, this is of course of major concern. Is the global economy able to absorb an even bigger shock than the 2007/08 scare? This underscores the need to contain the housing cycle. How?

Fig. 4 The real house price cycle and the real interest rate

Note: Real house price as a per cent difference from (a log-linear) trend, weighted average of the G7 countries, using purchasing power-adjusted GDP weights; numbers for 2013 refer to the first half of the year. Real interest using the same set of weights and shown as per cent changes from previous period.

Source: OECD, author's calculations.

Stemming the next housing bubble

Before addressing this issue it may be useful to reflect on whether or not policymakers actually want to stem the next housing bubble. The economies in developed countries are working off excessive leveraging, which is a legacy of the latest housing cycle. With investment weak and saving strong, capital markets will have to clear at a lower real interest rate. However, with nominal rates at the zero bound, inflation is low or may fall and real interest rates rate increase so that markets cannot clear: excess supply is permanent. Against that backdrop, a next wave of house price increases, and the associated wealth effects spurring economic activity, may be seen as welcome. But it is not without its risk. In fact, the price to pay may be another, even more devastating, financial crisis.

Containing that risk means containing the next housing bubble. In a recent report, the International Monetary Fund provides direction.[4] It looks at both macroprudential policies tools and other policy tools that impinge on the cyclicality of housing and related markets.

For instance, many countries do not (or only lightly) tax imputed rent, while providing generous relief for mortgage interest. This encourages households to borrow against housing assets, either to invest in housing or non-housing assets or to finance immediate consumption. Removing or diminishing this tax distortion can help to mute the accelerator mechanism described above and

---

[4] IMF (2013), *Key aspects of macroprudential policy*, International Monetary Fund, Washington DC, June 2013.

therefor stem the housing boom-bust cycle. Figure 5 suggests such a relationship between the tax treatment of housing and the extent of the housing cycle exists. As well, structural measures that affect the supply of housing, such as land use policies, and the functioning of housing markets more generally can be useful in reducing the volatility in house prices as suggested by Figure 6. While these measures should not be viewed as macroprudential *stricto sensu*, their effect on house price dynamics may have certain benefits.

Fig 5. House price volatility and tax subsidies
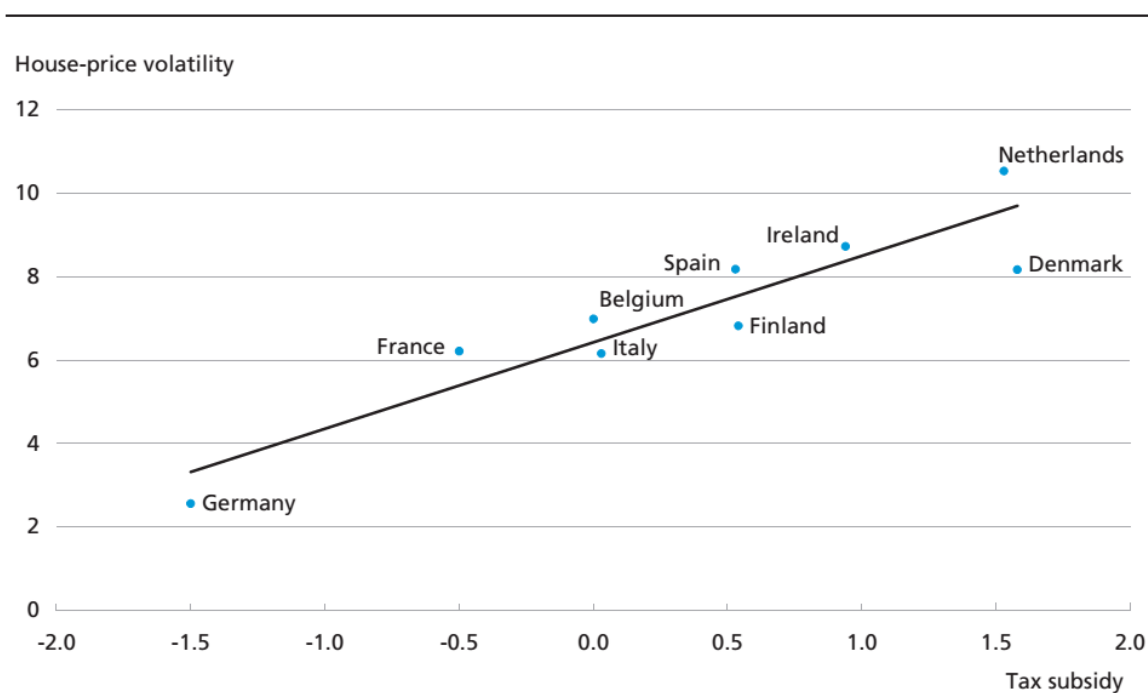
Note: The tax subsidy for owner-occupied housing consumption is calculated in accordance with the tax rules and levels of interest rates in 1999. The regression line inserted is estimated using ordinary least squares ($R^2 = 0.847$).

Source: National Bank of Denmark, "Developments in the market for owner-occupied housing in recent years – can house prices be explained?", in *Monetary Review*, First Quarter 2011.

Prudential tools directly impinging on housing markets include caps on loan-to-value (LTV) and debt to-income (DTI) ratios. An LTV ratio introduces a cap on the size of a mortgage loan relative to the value of a property, thereby imposing a minimum down payment. A DTI ratio restricts the size of a mortgage loan to a fixed multiple of household income, thereby containing unaffordable and unsustainable increases in household debt. Both types of measures impinge on the feedback of past developments in house prices on housing demand, by muting the collateral channel. According to the IMF the available research suggests that these tools can reduce feedbacks between credit and prices in the upswing, as well as improve resilience to shocks, thereby reducing default rates and boosting recovery values when the housing market turns.

Fig 6. House price volatility and the price elasticity of housing supply

Standard deviation of annual real house price changes (1971-2002)
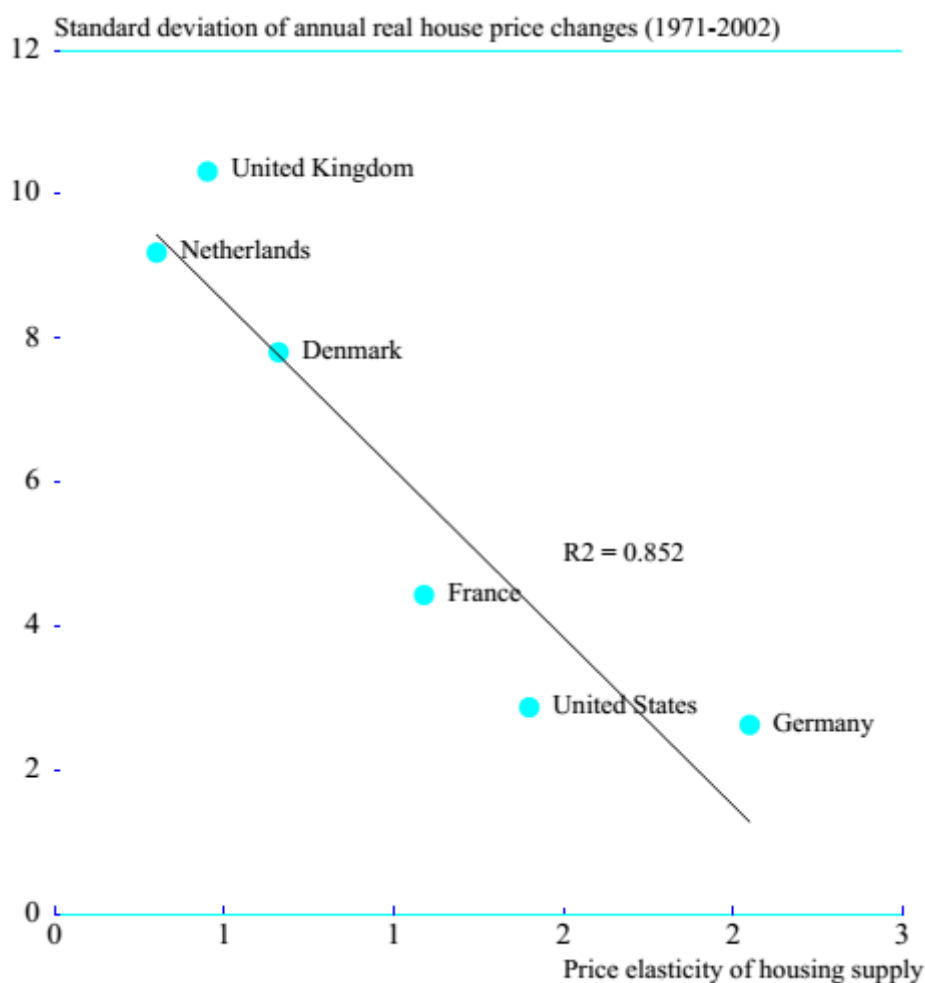
Source: Pietro Catte et al. (20 04), "Housing markets, wealth and the business cycle", *OECD Economics Department Working Papers* No. 394.

The IMF adds that an effective framework for **monitoring** systemic risk is key to operationalizing macroprudential policy. It needs to consider the growth in total credit as the empirical literature finds that increases in the ratio of private sector credit to GDP is the best single indicator of an increase in the probability of a crisis over a horizon of 1 to 3 years. However, it is also found that not all credit booms end in a bust, as they may be justified by better fundamentals, and that loan growth can contribute to a healthy financial deepening. It is therefore important to consider the macroeconomic environment that gives rise to increases in credit and additional indicators of the build-up of systemic risk. Combining the analysis of credit growth with other indicators can help in deciding whether excessive credit growth poses systemic risk.

To conclude

The mechanisms that produce housing booms and busts seem to be engrained in human nature. Their occurrence over the past four decades or so has been regular, and their amplitude has increased with every cycle. It is not ruled out that we are at the advent of yet another housing cycle,

this time even more pronounced than the previous one. This is potentially risky and calls for the deployment of well-targeted policy tools, both macroprudential and more traditional, including the removal of tax subsidies for housing mortgage lending, raising the elasticity of housing supply, and imposing maximum loan-to-value and debt-to-income ratios. One challenge is to convince political leaders of these necessities, not least since granting housing tax subsidies and constraining housing supply in the face of vocal NIMBY pressure groups are perceived to be vote winners. Fortunately macro-prudential policy tools are likely to be put in the hands of independent – but obviously accountable – authorities.