

## Methodological issues regarding residential real estate prices

Paul Hilbers

Before commenting on the excellent papers by Case and Wachter (2003) and Wood (2003), I would like to emphasise that I will be reviewing the issue of developing residential real estate price indices from a user point of view rather than as a compiler or statistical expert. In that light, I would like to spend a few words on the particular interest of my Department - the Monetary and Financial Systems Department (MFD) in the IMF - in the important work on improving residential real estate indicators that is currently taking place worldwide, as reflected in the many papers discussed during this conference.

As already noted by the Managing Director in his opening remarks, the IMF, together with the World Bank, set up a programme in 1999 to assess the financial systems of our member countries. This so-called Financial Sector Assessment Program (FSAP) is voluntary in nature. So far about 60 countries have participated in the programme, including many systemically important ones (such as Canada, Germany, Japan, Korea, Switzerland, the United Kingdom, etc), and about 30 more have indicated their willingness to do so in the near future.

The programme has two key components: assessments of compliance with international standards and codes and a macroprudential analysis of the soundness of the financial system. The former is guided by the financial sector standards and accompanying methodology documents developed in recent years by international standard-setting bodies, such as the Basel Committee for Banking Supervision. For the latter component, however, there was a need to develop a set of Financial Soundness Indicators (FSIs). Therefore, MFD and the Statistics Department (STA) organised a consultative meeting in September 1999 on Macroprudential Indicators (MPIs), since renamed FSIs.<sup>1</sup> The purpose was to develop a list of relevant indicators for analyses of financial sector soundness, including to support our FSAPs. An important conclusion of that consultative meeting was that one should pay close attention to developments on asset markets, and in particular real estate markets.<sup>2</sup>

As a follow-up, in 2001 a study was issued on the link between real estate price developments and financial crises.<sup>3</sup> An important conclusion was that in many cases there seemed to be a clear relation. In particular, the paper concluded that imbalanced real estate price developments often contribute to financial sector distress and trends in real estate markets should be monitored closely in the context of financial sector assessments. It also noted that the lack of good quality and timely data with respect to developments in the real estate markets was a major complicating factor.<sup>4</sup>

The papers by Case and Wachter and Wood illustrate the complexities of developing useful and reliable indicators for developments in residential real estate prices. They show that (1) there are many different ways of compiling price indicators for residential real estate, (2) there are many different sources of data, both official and private, and (3) these indicators and sources may give different pictures of developments in residential real estate prices (although Wood concludes that differences are larger in the short term than in the long term). The question then is: what makes real estate markets so special? Both papers deal with this issue, and let me make a few general points about this taken from our 2001 study, focusing first on the markets, then on the causes of cycles/bubbles, and finally on the important role of the banks.

Real estate markets are characterised by heterogeneity. No two properties are identical and information on market transactions is often limited and not generally available. Also, real estate

---

<sup>1</sup> See IMF (2003).

<sup>2</sup> For details, see Evans et al (2000).

<sup>3</sup> Hilbers et al (2001). For a study focused on Asia, see Collins and Senhadji (2002).

<sup>4</sup> See also Sundararajan et al (2002), pp 32-4.

markets are typically characterised by infrequent trades, a negotiated pricing process, large transaction costs and rigid supply. In contrast to stock markets and other financial markets there is, therefore, no clear market price. Differences in financing structure, regulatory framework, tax treatment, and the use of real estate as collateral further complicate international comparisons.

The price of a property should in principle equal the discounted present value of the expected stream of future income (rents - this is also what Case and Wachter say on page 3). In a well-functioning market, this price should equilibrate demand and supply. The fundamental equilibrium price can be thought of as the price at which the stock of existing real estate equals the replacement cost. However, the real estate market is characterised by several market imperfections that distort the adjustment toward equilibrium. First, the market suffers from imperfect information about future demand. Second, supply is rigid in the sense that new construction may take several years to be completed, and in many markets the supply of land is a binding constraint. Also, in markets where collateralised lending is widespread, real estate prices affect the availability of resources to finance real estate, which may again affect the price of real estate. Some of these market imperfections can lead to cycles that differ from the economic cycle or to bubbles.

Certain mechanisms can trigger or amplify the appearance of these cycles and bubbles in real estate markets. Some of them are related to non-financial characteristics of real estate markets, but in many cases banks and their lending policies play a large role. Key mechanisms include:

- *The combination of fixed supply and the optimistic investor.* In markets where supply (land and in the short run also buildings) is fixed, a few investors willing to pay a price above the fundamental price can determine the market price, if their demand is sufficient to clear the market. In efficient financial markets, such a process of price increases would be moderated by investors selling short and supply would increase until the price has returned to its fundamental level, but in markets with fixed supply this mechanism does not function well, at least not in the short run. These optimistic investors are likely to stay in the market as long as prices are rising and financial resources are available.
- *Construction lags and imperfect information.* When the price of existing real estate rises above the replacement cost, developers will initiate new construction and increase the supply.<sup>5</sup> However, as new construction may take several years to be completed, the adjustment to equilibrium will be slow. Prices will continue to rise until the new construction is ready for occupancy. By that time, demand for real estate may have fallen or several competing construction projects may have resulted in over-supply, without a fundamental equilibrium being reached.
- *Collateral.* Increasing real estate prices raise the market value of collateral on outstanding real estate loans. This lowers the risks for lenders and may increase their willingness to lend more to finance real estate projects. Hence, the use of real estate as collateral tends to exacerbate real estate cycles.
- *Financial liberalisation.* Following liberalisation and deregulation, new financial markets and institutions tend to emerge. Prime borrowers find that their funding needs can be met at lower costs on domestic and international capital markets. Faced with shrinking margins, banks will search for better yields and may move to new categories of borrowers while underestimating the risk of these loans, eg, in Eastern Europe.
- *Bank holdings of real estate.* As noted also in Case and Wachter, rising real estate prices may finally encourage increased lending to the real estate sector as a bank's own holdings of real estate rise in value.

Evidence from several financial sector crises points to a high exposure of banks to the real estate sector. As also indicated by Case and Wachter, this exposure can take different forms:

- holdings of real estate assets in the banks' portfolios;
- lending to customers for real estate purchases (often collateralised);

---

<sup>5</sup> Herring and Wachter (1999).

- financing of real estate developers and construction companies;
- lending to non-bank intermediaries, such as finance companies, that engage in real estate lending; and
- relying on real estate to collateralise other kinds of lending.

The higher the exposure of banks to real estate, the more amplified the cycles in real estate markets can become. Still, banks tend to underestimate the risks associated with high exposure to this sector. As also indicated by Case and Wachter, there are two important explanations.

- *Disaster myopia or low frequency shocks.* Real estate cycles are often long and an entire generation may have passed since the last serious decline in prices occurred. If real estate prices have risen steadily for many years, the repayment record of real estate loans will likely be good. Hence, during a real estate boom, lenders can be lulled into a false sense of security, as real estate prices are rising and loan-to-value ratios on outstanding loans decline, leading to a higher portfolio quality. Profitability in terms of expected returns is high, but the risks are underestimated.
- *Inadequate data and weak analysis.* Banks may underestimate the risk of heavy exposure to the real estate sector because of inadequate information and weak analysis.

This brings us to the key subject of the papers in this session, namely how can we compile better indicators for residential real estate prices. This is not only important for the buyer/seller of residential real estate but also for financial institutions involved in financing, which provide an important link to financial stability. Both the paper by Case and Wachter and the one by Wood discuss in detail the methodology for developing residential real estate indicators, describing the pros and cons of the key types of indicators, and comparing the actual behaviour of these indicators over the past period (see Box 1). An important conclusion seems to be that the better the indicator from a theoretical point of view - and hedonic indicators are clear favourites - the more difficult it is to compile. Both papers seem to agree here, but at the same time it is interesting to note that there is a discrepancy in the empirical results. Whereas Case and Wachter note important differences in the outcomes over a longer period in the United States, Wood concludes that in the long run the results for the different indicators in the United Kingdom seem to converge. It would be interesting to know the reason behind this difference.

Box 1		
<b>Price indices for residential real estate: a comparison</b>		
	<b>Advantage</b>	<b>Drawback</b>
(a) Average or median prices	– Easy to collect	– No correction for quality changes
(b) Representative property method	– Avoid (most) quality change problems	– Focuses only on one sort of properties and ignores developments elsewhere
(c) Hedonic price models	– Control for quality changes – Not just one representative property (as b)	– Data requirements – Potential bias from incorrect model specification
(d) Repeat-sales method - derived from hedonic price model	– Less data requirements – Less dependent on model	– Requires at least two sales – Quality of same property may change between sales

To start where I began, from a user point of view I would prefer to have available a range of indicators rather than just one. This will provide the user with the broadest set of information, provided the caveats that come with the different indicators are clearly identified. From that perspective, the papers discussed here are very useful, and more work in further developing a methodology and comparing the empirical results, not just for the United States and the United Kingdom but also for other countries, would be welcome.

## References

- Case, Bradford and Susan Wachter (2003): *Real estate price indexes as financial soundness indicators: methodological issues*, paper presented at the IMF/BIS conference on real estate indicators and financial stability, Washington, October.
- Collyns, Charles and Abdelhak Senhadji (2002): *Lending booms, real estate bubbles and the Asian crisis*, IMF, working paper 02/20, Washington.
- Evans, Owen, Alfredo Leone, Mahinder Gill and Paul Hilbers (2000): *Macroprudential indicators of financial system soundness*, IMF, occasional paper, no 192, Washington.
- Herring, Richard J and Susan M Wachter (1999): *Real estate booms and banking busts - an international perspective*, Group of Thirty, occasional paper, no 58, Washington.
- Hilbers, Paul, Qin Lei and Lisbeth Zacho (2001): *Real estate market developments and financial sector soundness*, IMF, working paper 01/129, Washington.
- International Monetary Fund (2003): *Financial sector assessment program - reviewing lessons and issues going forward*, Washington. Available via the Internet: <http://www.imf.org/external/np/fsap/2003/review.htm>
- Sundararajan, V, Charles Enoch, Armida San Jose, Paul Hilbers, Russell Krueger, Marina Moretti and Graham Slack (2002): *Financial soundness indicators: analytical aspects and country practices*, IMF, occasional paper 212, Washington.
- Wood, Robert (2003): *A comparison of UK residential house price indices*, paper presented at the IMF/BIS conference on real estate indicators and financial stability, Washington, October.