

# Discussion

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In addressing housing bubble concerns, the first challenge is the measurement problem. Policymakers need to have an accurate grasp of housing market developments, including housing price levels and housing price dynamics, before they are able to assess the degree of housing price overvaluation and decide whether policy actions should be taken to address outstanding concerns.

This paper is a good example of how solid research can support the policy decision process. Based on housing and land transaction data, the authors use the hedonic approach to calculate constant quality housing price and land price indices in 35 Chinese cities. This new and unique dataset on residential land transactions at the city level is by itself an important contribution, and the statistical and economic findings provide valuable insights on the housing boom observed in China over the past decade.

The key findings are as follows. First, in constructing the housing price index, the authors find that the hedonic approach can more accurately reflect time variation in housing prices. By contrast, the two popular measures currently used in China, one using the simple average of transaction prices and the other a pseudo repeat-sale approach, both have significant downward bias. Second, based on new and unique land transaction data, the authors find that residential land values have skyrocketed in China over the 2003 to 2011 sample period. The average annual compound rate of real, constant quality land price growth is above 10 per cent in most cities and exceeds 20 per cent in 11 out of 35 sample cities. Third, land price growth has been higher and more volatile than housing price growth in China. Fourth, there are strong common year effects in land price appreciation, while city fixed effects and local market conditions explain little of the variation in land price growth. This seems to suggest that the frequent adjustment of central government policies is an important determinant of land price dynamics.

While the paper itself has very rich content, my discussion will focus on three aspects: housing price measurement, housing price assessment and the relationship between housing prices and land prices.

### Housing price measurement

Constructing a reliable housing price index is a daunting task in China. There are some well-known reasons. For instance, the private housing market (called commodity housing in China) only started to be developed after the housing market reform in 1998. The collection of housing transaction data started even later and the data quality was poor in the early years. The short history and variable quality in data coverage undermine the reliability of housing price estimates. In addition, housing prices tend to be under-reported for tax evasion purposes.

In my view, the most significant finding in this paper is the inappropriateness of the repeat-sale method, popular in advanced economies, in China. As the secondary housing market is small in China, the repeat-sale method is proxied by using new home prices of different units within the same housing complex in different sales periods. Interestingly, the downward bias is the largest for this method, compared with the hedonic approach and simple average of transaction prices.

The authors point out two possible reasons for the underperformance of the pseudo repeat-sale method: unobserved unit-level heterogeneity and developers' pricing strategies. Here I would like to point out another possible reason: the constant hedonic feature assumption implicit in the repeat-sale method is highly problematic in a fast-changing country like China.

The repeat-sale method can be considered as a special application of the hedonic approach, in which housing prices depend on a time trend as well as a number of housing-specific characteristics (hedonic factors) such as location and housing quality. By using sales prices of the same home (or the same housing complex) at different periods, the change in housing prices is a perfect reflection of the time trend *if hedonic factors do not change over time*. However, this assumption is questionable in China due to the rapid urbanisation process and rapid changes in city landscape.

Take for example the two most important hedonic features used in this study: distance to the city centre and distance to the closest subway station. First, the concept and location of the city centre have changed dramatically in many Chinese cities over the past decade. During the rapid urbanisation process, the city area has expanded very quickly. A common phenomenon is that the old city centre has gradually lost its popularity and been replaced by a new city centre that was a suburb only 5 to 10 years ago. Obviously, distance to the city centre can be a time-varying feature.

The distance to the closest subway station is even more questionable. The subway system in China only started to grow in recent years, but the pace of expansion has been astonishing. Taking Shanghai as an example, in 2007 Shanghai had 5 subway lines in operation with a total length of 145 kilometres. In 2011, the Shanghai subway system included 11 lines or 429 kilometres, surpassing New York and Tokyo to become the longest city subway system in the world. By 2020, Shanghai aims to expand the subway system further to 22 lines or 877 kilometres. Such rapid growth has been unprecedented in human history.

If the city landscape changes so dramatically, the constant hedonic feature assumption implicit in the repeat-sale method is simply wrong. This explains the underperformance of this approach in China. Even for the more flexible hedonic approach, the big challenge is to value hedonic features appropriately. This is complicated by the fact that housing prices are forward-looking. For instance, in calculating the distance to the closest subway station, shall we use the current subway system or the planned system?

## Housing price assessment

Housing price assessment is not an issue addressed in this paper. However, the finding that actual housing price growth is much faster than reflected in the official data leads to the question of whether there is a housing bubble in China.

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Here I would like to distinguish among several concepts that are often confused with each other: rapid housing price growth, housing price overvaluation and housing bubbles (Glindro *et al* 2008).

Rapid housing price growth does not necessarily mean housing price overvaluation or a housing bubble. For instance, in China housing price growth may reflect the fact that prices started at low levels (after the housing market reform in 1998). Also, it could be driven by the rapid increase in the fundamental value of residential properties, against the backdrop of rapid urbanisation, income increases and improved access to the mortgage market.

In addition, because the housing market is not frictionless (e.g. due to lags in supply), actual housing prices can often deviate from their fundamental values. For policymakers, it is important to distinguish between housing price overvaluation driven by imperfections in the housing market and those purely driven by overly optimistic expectations (a narrowly defined housing bubble). The policy implications are quite different: the former can be addressed by removing market frictions and the latter requires measures to control unwarranted high expectations of capital gains, or 'animal spirits' in the housing market.

How high are China's housing prices now? We can probably get a rough idea by calculating housing price-to-income ratios at the city level. Based on JPMorgan's estimates, at the end of 2011 the housing price-to-income ratio averaged 9.1 in China at the national level, which was moderately above reasonable levels (in the range of 6 to 8 times). In tier 1 cities, such as Beijing, Shanghai and Shenzhen, price-to-income ratios were at astonishingly high levels (exceeding 17). This is consistent with the findings in this paper and suggests that any policy action should take into account regional heterogeneity.

### Relationship between housing prices and land prices

Another interesting question in this paper is the interaction between housing price and land price cycles. The authors have focused on the impact of land prices on housing prices. They find that there is significant positive correlation between this quarter's housing price growth and last quarter's land price growth, but there is no link between this year's housing price growth and last year's land price growth. In other words, the land price cycle seems to lead the housing price cycle by about one quarter. Here I would encourage the authors to extend the analysis in the following directions.

First, the relationship between housing and land price cycles might be bi-directional. As land price is an important component of total cost for real estate developers, it is not surprising that higher land prices today will lead to higher housing prices tomorrow. However, the impact could also work in the reverse way, because land prices are forward-looking and depend on developers' expectations on future housing price movements. In a buoyant market, rapid housing price increases may have caused developers to form high expectations on future price movements and thus bid high prices in the land auction process.

Second, the finding that land prices lead housing prices by one quarter, but not longer, seems puzzling. From the day a developer purchases land to the day that the project can be ready for sale is at least one to two years in China. If the lead-lag relationship mainly reflects cost considerations, the one quarter lag is difficult to understand.

Finally, housing prices and land prices may be affected by the same factor, such as the role of government intervention. The authors suggest that the common year effect in land price appreciation can be attributed to frequent adjustment in government policies. It will not be surprising if government intervention also affects housing price movements, and hence the two cycles could be synchronised. The rich dataset in this paper allows the authors to dig further into such questions.

## Reference

**Glindro ET, T Subhanij, J Szeto and H Zhu (2008)**, 'Determinants of House Prices in Nine Asia-Pacific Economies', BIS Working Paper No 263.

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## 2. General Discussion

The real newly built housing price indices presented in the paper were the subject of much discussion. For Beijing and Shanghai, a number of participants noted, and sought an explanation for, the end-of-sample increase in the paper's real newly built housing price index relative to the average index. Co-author Yongheng Deng said housing price dynamics in Beijing were more complicated than the model could explain. Dr Deng pointed to the role of expectations, suggesting that home buyers in Beijing were entering the market and bidding up prices on the expectation the government would release more stimulus. He also referred to a recent paper which sought to explain the specific divergence between housing price measures in these cities with reference to the role of Central Government state-owned enterprises. Co-author Joe Gyourko also highlighted that, particularly for these markets, sales activity has shifted away from the urban core. The average index, which does not adjust for this shifting in quality, was therefore exhibiting significant downward bias.

Against this background, several participants questioned whether newly built housing and land prices in these cities had moved away from fundamentals. It was suggested that one metric for assessing whether housing prices had shifted away from fundamentals was the ratio of housing prices to disposable incomes in these cities. In Beijing and Shanghai these ratios were higher than in other cities. One participant, however, was unsurprised by cross-city differences in housing price-to-income ratios and argued that different equilibrium outcomes in housing price-to-income ratios by city could be explained, for example, by varying urban density. The authors welcomed this point adding that there could also be a systematic tendency for households in some cities to under-report income.

Another participant said it was useful to emphasise the newly built aspect of the hedonic housing indices, thereby making clear the limitations of these indices for policymakers. For example, the participant said a newly built index could not be used to assess the financial stability of the mortgage market via metrics such as household sector leverage. Instead, what is needed is a stock-weighted concept of prices taking into consideration values from the secondary market. This participant also noted, however, that these newly built housing price indices, combined with the constant quality land price data, were entirely appropriate for assessing the risks in the property

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development sector. Indeed, financial stability risks in the property development sector, rather than the household sector, were more likely to spill over to the banking sector (with the recent episode in the United States a notable exception).

While there was broad consensus that a hedonic approach to housing price measurement in China was desirable much of the discussion focused on measurement difficulties. For example, several participants sought more details on the hedonics employed. In particular, one participant requested more information about variables used to capture quality variation within a building (e.g. an apartment on a higher floor). The discussion also focused on how to treat time variation in some of the hedonics. For example, it was suggested that with the subway system rapidly evolving there, it could lead to a time-varying covariance between the hedonic variable 'distance to the nearest subway station' and housing prices. In response, Dr Deng said the hedonic approach to estimating housing prices in rapidly developing regions required careful thought.

One participant echoed the discussant's surprise about the significantly positive correlation between the current period's housing price growth and last quarter's land price growth. Given the development cycle is in years, the participant was surprised that lagged land values beyond one quarter were not a significant determinant of housing prices. Another participant added that causality should, *a priori*, be bi-directional. It was suggested that these anomalies could reflect data issues and that these data were not reliable enough to perform a thorough analysis of the relationship between land and housing prices.

In regard to the volume of land sales, participants picked up on the significantly positive association between the level of local government budgetary deficits in previous years and the volume of land sold in the current period. This link – highlighting the reliance of land sales as an off-budget fiscal income source – was viewed as unstable. One participant said because local governments do not have a local taxing authority they have strong incentives to release land to generate revenue, which comprised a remarkably high share of government revenue in some cities.

Continuing on the theme of sustainability, Dr Gyourko said that while the paper offered no evidence of overvaluation, rates of land price appreciation for certain cities were striking, even considering the fact prices in China were coming off a pre-reform era of undervaluation.