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Discussion

Wei Xiong began by acknowledging the need to better understand both the supply and demand factors that are driving house price behavior in China. He argued that the inelastic supply-side dynamics are predominately determined by the Chinese government. He believes that the Chinese government has tried to manage house prices by slowly and strategically releasing land for development. He noted that the policy of government-controlled land supply also exists in a number of Asian countries. He believes that house price dynamics are affected by how much land the government chooses to release. He also gave the example of Singapore, where price appreciation has risen in line with income growth.

Hanming Fang further responded to several points raised by the discussants, Erik Hurst and Martin Schneider. Fang first acknowledged Hurst's suggestion to develop a conceptual framework that provides a link between income growth and housing. He noted that any simple homothetic preference framework will give a condition where housing expenditure will be a constant share of income. In a representative agent model with a fixed-housing supply, income growth will appear as increases in house prices. He noted the unique role that the Chinese local government plays in determining house prices.

Fang also responded to Hurst's discussion about the existence of ownership of multiple homes in China. Hurst suggested that one explanation for the increase in Chinese housing demand, and hence house prices, could be the lack of alternate investment options. Suggestive evidence for this hypothesis comes from data on ownership of multiple homes from China's Urban Household Survey. Fang disagreed about the interpretation of multiple homeownership as evidence of preference

for housing as an investment vehicle. He noted that for many people who own more than one apartment, at least one of the apartments was acquired in 1997 or earlier. This fact is significant because prior to 1998, apartment units were typically very poor quality and were provided by work units at a very subsidized price, rather than purchased on the market. It was only after 1998 that the People's Bank of China introduced mortgages and loans, boosting the commercial housing market.

Martin Schneider and Kaiji Chen both raised questions about the heterogeneity in house price dynamics across cities. Schneider, in his discussion of the paper, questioned whether the low volatility in second- and third-tier cities was the result of averaging across cities within the tiers, which downplays the actual volatility of house prices at the city level. Chen also raised a related question about the heterogeneity of house price growth relative to income growth across third-tier cities. He commented that the house price index constructed by the authors showed that house price growth significantly outpaced income growth. This seemed at odds with anecdotal stories about ghost towns in a number of third-tier cities. He wondered if the authors' house price index was averaging out the heterogeneity within the third-tier cities.

Fang responded by acknowledging that they are essentially assuming uniform house price changes across the different parts of the cities when they take an average across all cities within the tier to construct their house price index. This assumption was driven by data considerations, because there were insufficient observations at the subcity level to create a finer district-level price index. They did explore this issue with Beijing, where they had sufficient data for different parts of the city. They found that the subcity level house price indices exhibited similar patterns. Wei Xiong reiterated Fang's comments about the existence of substantial heterogeneity in house price dynamics across cities within a tier but noted that the data quality issues made it difficult to explore this further.

Andrew Atkeson then asked if the authors had any information about land rents and what the patterns in the price-to-rent ratio looked like. He suggested looking at this ratio to distinguish between some of the models proposed in the discussions by Erik Hurst and Martin Schneider. In Hurst's model of land rents, the price-to-rent ratio was constant. This was in contrast to Schneider's model, where the price-to-rent ratio varied over time.

Martin Eichenbaum agreed with Andrew Atkeson's comment about the usefulness of looking at price-to-rent ratios for understanding

whether a collapse in the housing market will occur in China. He noted that housing markets in emerging market countries are not stable environments. This can result in heterogeneous beliefs about house price growth, which makes it difficult to predict *ex-ante* whether a boom-bust or a boom-boom will occur in the future. He suggested that data on price-to-rent ratios could be more informative. If price-to-rent ratios are high, then it can be *ex-ante* predictive of housing bust episodes.

Robert Hall, on the other hand, commented that it should not be a mystery that price-to-rent ratios are high in rapidly growing countries. It is a direct implication of the Gordon growth formula. He noted that this says that the market believes there is going to be more growth in emerging countries than in the United States, which has been true for quite some time.

Hanming Fang pointed out that there is sparse information about rents in China. There is some limited information on rent from Joseph Gyourko. Fang described an estimate by Gyourko. Gyourko found that the price-to-rent ratio is roughly 50, which is twice as high as what you see in a typical US city. This ratio is even higher than in San Francisco, where the price-to-rent ratio is about 45. He noted that Gyourko was not sure whether the price-to-rent ratio was sustainable in China. Overall, Fang feels that there is a lot of uncertainty surrounding the Chinese housing market, which makes it difficult to know what will happen to it over the next decade.

Harald Uhlig spoke next, commenting on the anecdotal stories of the difficulties of buying a house in China. He gave the example of Chinese parents saving tremendously to give their son resources to buy a house. These stories suggest significant financial fragility for households, despite rising incomes in China, which seems at odds with the conclusions in the paper.

Wei Xiong acknowledged that down payments for housing are large relative to income—typically, about three times the average income in China. He agreed that it is the social norm in China for parents and families to subsidize their children for the down payment, which can create significant financial burden for households. However, he disagreed that this creates financial risk, because the risk is pooled within the household structure between parents and children. The pooling of resources means that children can borrow against expected income growth to buy a house with the help of their parents.

Ricardo Reis then asked the authors to relate their findings to the paper by Chang et al. (2015) that was previously presented. The Chang

et al. paper showed that the consumption-to-output ratio has declined significantly over the last few decades. At the same time, rents and house prices have gone up, as the current paper has shown. Reis asked whether this means that the Chinese are consuming much less non-housing-related goods and services. He also asked whether the increased housing consumption is sustainable in the future, given the expectations of income and house price growth. He also highlighted the difference between the housing booms in China and in southern Europe. Specifically, he noted that southern European house price booms were accompanied by declining savings rates, whereas in China the house price boom coincided with increasing savings.

Andrew Atkeson suggested that one way to answer Ricardo Reis's question is to look at a consumer expenditure survey in China. For instance, the survey would tell what fraction of the budget, for renters, goes toward renting a house. Comparing the housing consumption budget share for renters to that of homeowners would be informative about whether homeowners purchased a house because of expected house price appreciation or for rental services.

Jonathan Parker also suggested that the authors disentangle the changes in price-to-rent ratio from changes in the consumption-to-savings ratio. He noted that it is possible, in an accounting sense, for the price-to-rent ratio to rise while real consumption stayed constant. For instance, in a world where the stock of housing and value of land does not change, a doubling of house prices would raise the price-to-rent ratio but leave real consumption of housing unchanged. Savings would then appear to be increasing significantly, and it is saved by buying the capital stock of housing from the government.

Wei Xiong acknowledged the usefulness of examining the expenditure budget allocations of renters and homeowners using China's Urban Household Survey to see whether home buyers are purchasing for investment or consumption. However, Xiong cautioned about the difficulties in measuring consumption, savings rates, and labor income shares. For instance, imputed house services are included in measured consumption in the United States. However, the treatment of house services for consumption varies across surveys in China, which makes consumption difficult to measure consistently. Similarly, there are also issues surrounding the measurement of labor income. For example, he believed that the dramatic reduction in labor income share over the 2003–2004 period was partly due to the fact that the collection of income tax began to be officially enforced in China in 2004. This led to a

large number of firms switching to paying employees “in-kind,” which does not show up in the officially measured labor income series. He suspects that this artificially created a drop in measured labor income share, thereby inflating the savings rate.

Finally, Monika Piazzesi commented on the significant political economy questions that could arise in the future in China. She gave the example of housing on the Stanford campus. Whenever Stanford builds more houses on campus, the effects on house prices and the potential adverse implications for existing homeowners are widely discussed by the entire faculty. She imagines that these issues would be even more pronounced for those working in the Chinese government housing office.