Discussion

Robert Gordon opened the discussion by noting that the authors' presentation mainly focused on the housing boom rather than the current account. He questioned the authors' focus on a negative correlation between housing prices and the current account. Gordon proposed that a boom in housing would worsen the current account by increasing residential investment and decreasing national saving by loosening capital constraints. Klaus Adam responded that since supply of houses is inelastic, investment would be unchanged in their model, but that saving would decrease by the channel that Gordon specified.

Gordon also remarked that the authors used financial constraints in the model without mentioning financial institutions. He thought that differences in the institutions that regulate and implement financing constraints may help to explain the different behavior of housing prices across countries in the recent past.

Finally, Gordon was skeptical about the connection asserted between the real interest rate and house prices. He noted that the authors were using a short sample of only 10 years to document this relationship. He asserted that the relationship is less clear over a longer period. Adam replied by noting that financial constraints were more stringent in earlier times. The model might imply a weaker relationship between real interest rates and housing prices under a more stringent regulatory regime.

Xavier Gabaix compared the model to Kindleberger's model of manias, bubbles, and crashes. Kindleberger assumed an initial "displacement," a perfectly rational initial reason why prices go up, after which agents extrapolate this initial increase in prices into the future. Eventually, the behavior given these beliefs should violate budget constraints,

which triggers a crash. Gabaix remarked that the initial increase in prices in the authors' model was due to the decrease in the interest rate. He wondered why the authors were only focusing on house prices as opposed to all asset prices. He also noted that the magnitude of the housing price increase was not only due to the magnitude of the initial interest rate drop but also due to the initial level of the interest rates. If an asset price is inversely proportional to the interest rate then the change in the interest rate affects the price by more the lower the initial value of the interest rate. He thought that it would be interesting to look at historical data and see what other bubbles the model can predict. Adam agreed that the agents have to hold wrong expectations to get a bubble. He asserted that the expectations data provide a justification for their mechanism. He noted that Marcet's and his earlier papers, where the authors consider stock market prices, provide some evidence that expectations move up jointly with asset prices.

David Laibson pointed out that the agents in the model believe that there will be a lot of long-run volatility in asset prices. Thus, it is puzzling that banks were willing to give so many mortgages at zero or 5% down and that other institutions were willing to write credit default swaps insuring derivatives on these mortgages.

James Kahn addressed the evidence of heterogeneous behavior of house prices across countries.

He noted that the authors presented a figure with an increase in the prices in five countries and a decrease in prices in two countries. He claimed that the countries with declining house prices are disproportionally represented in this sample. He asserted that with a bigger sample, it would be harder to justify the thesis of heterogeneous behavior of prices across countries in the recent past.

James Poterba followed up on Hansen's comment about learning from the rental market. The agents looking to buy a house can learn from rental prices. The issue is what agents learn from the rental market and how the agents translate this information to the housing market. Poterba proposed to extend the model with taste shocks between renting and owning a house. This type of shock would affect both the owner-occupied market and the rental market. Even if it is difficult to infer information about the shock from the owner-occupied market data, it could still be possible to infer additional information from rental market data. Next, Poterba suggested that the reason for looking at cross-country differences is the possibility of getting variation in the tax treatment of housing. He claimed that there is virtually

no country that taxes the implicit rental value of housing. However, there are substantial differences across countries in the tax rules that are applied to the capital gains on houses. There are also differences in other aspects of tax rules, for example, the tax treatment of mortgage interest that might change the user cost specification for housing units. He added that even in the United States, there were some changes in the tax treatment of capital gains on housing that took place around 1997 that tend to reduce the tax burden on owner-occupied houses.

Daron Acemoglu insisted that it is important to justify a particular departure from the rational expectations assumption. He stressed that he did not see such a justification in this paper. He thought that a model where only a fraction of agents have misspecified beliefs would be more reasonable. However, he warned that it would probably be difficult to solve.

Acemoglu wanted the authors to specify a metric for the departure from rational expectations and suggested that the authors conduct a sensitivity analysis with respect to the value of this metric. Michael Woodford also thought that the question of the degree to which the departure from the rational expectations should be thought of as small is a central issue. According to his summary of their argument, the authors say that the model is similar to a model with rational expectations in the sense that they could nest a model with rational expectations within their specification, and they estimate the value of their beta parameter that best fits the data. He proposed that an alternative metric for asking if agents have beliefs that are close to rational expectations would be to ask instead how similar agents' beliefs are to the data-generating process. Adam responded by noting that if the beliefs converge to the rational expectations beliefs then, due to the continuity of the model outcomes with respect to the beliefs, the outcomes will converge to the rational expectations equilibrium outcomes. He noted that with a unit root component for very large horizons, beliefs and model outcomes will diverge. However, they will converge in the limit for any finite horizon.

Woodford also reinforced Hansen's point about the extent to which one should regard agents as having fairly dogmatic beliefs. However, one can ask to what extent behavior would be different if one allowed the priors to be more diffuse than the specific prior that the authors assumed.

Darrell Duffie reinforced the point made by Hansen that the collateral constraint on borrowing is constant over time in the model. He

provided an example from the US mortgage market: as the collateral constraint was relaxed, low income, subprime borrowers stayed constrained and levered even more, in contrast with high income borrowers who were at their interior maxima and did not lever more.

Mark Bils thought that the negative correlation between the current account and housing prices that the authors present in figure 1 of the paper was striking. However, he stressed that this is a short horizon for making such an inference. He added that the mechanism that drives this correlation is more about the production of housing. He observed that the current account deficit increased by 5% as a share of GDP since 1996. He wondered what fraction of this increase can be explained by the model.

Klaus Adam responded to some points that Hansen raised in his discussion. First, he noted that it is difficult to solve the model with occasionally binding constraints. Second, he stated that it is possible to get uncertainty premia if the agents in the model are risk averse with respect to consumption.

Albert Marcet started by commenting on why they did not include various complications into the model. He stated that the objective of the paper was to show that a small deviation from rational expectations can deliver new results. He acknowledged that they could not match many features, because they chose to use the simplest model that suited their objective. Next, he commented on Hansen's point about the linear nature of the model. He agreed that it would be interesting to explore nonlinearities and mentioned that they have an appendix where they explore some of these effects. Next he addressed the issue of the plausibility of the assumed deviation from rational expectations. First, he noted that economists are comfortable using many different utility functions to model behavior. He argued that economists should enjoy a similar degree to freedom in modeling expectations formation. He stressed that their model includes a system of beliefs that offers testable predictions.