Simon Gilchrist

Commentary

Overview

The paper by Kosuke Aoki, James Proudman, and Gertjan Vlieghe considers the link between housing prices and consumption in a model where housing equity influences household borrowing capacity. Specifically, a rise in housing prices reduces household leverage and improves household balance sheets. As household balance sheets improve, mortgage premiums fall and housing demand increases. On the consumption side, the improvement in household balance sheets also increases the amount that credit-constrained consumers can borrow for current consumption. As a result, movements in housing prices amplify the effects of underlying disturbances to the economy. Housing investment, consumption, and output exhibit greater volatility and greater comovement than one would obtain in a model with perfect capital markets. The model also contains important feedback effects in general equilibrium: as housing prices rise and balance sheets improve, the increased demand for housing raises house prices even further. The rise in house prices causes further improvements in balance sheets, which fuel further increases in consumption and housing investment, among other things. This general-equilibrium feedback mechanism provides an additional source of amplification and propagation to underlying disturbances to the macroeconomy.

Aoki, Proudman, and Vlieghe use the model to consider the effect of two possible types of financial deregulation that have improved household access to capital markets. In the first experiment, households can more easily access housing collateral for consumption purposes. As housing prices rise, households divert more of these gains in housing wealth to alternative uses of funds. This reduces the feedback mechanism in the economy as well as the volatility of housing prices and housing investment, but raises the volatility of overall consumption. In the second experiment, the number of credit-constrained households—households whose borrowing capacity is linked to their balance-sheet and hence housing equity—is reduced. This experiment strengthens the feedback mechanism and raises the volatility of housing prices and housing investment, but reduces the volatility of consumption. Although these two experiments have opposite implications regarding the amplification of housing prices and housing investment relative to consumption, the authors suggest that the likely effect of deregulation is to dampen housing price volatility and increase consumption volatility.

In addition to developing these model implications, the paper provides a detailed description of recent developments in U.K. financial markets, emphasizing the role of mortgage equity withdrawals and changes in retail lending that provide support for the aforementioned experiments. The paper also provides a vector autoregression (VAR)-based analysis of the effect of monetary policy on housing prices, housing investment, and consumption. Overall, the study is well-executed and informative. The authors deserve praise for a

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well-articulated model that allows one to consider the effect of financial market imperfections on housing investment and consumption. In my comments, I will focus on a few specific issues: how to think about the model's implications within a fairly standard New Keynesian framework, and how well the model's implications fit the facts on hand, with a regard to where to go from here.

A Closer Look at the Model

To model financial market imperfections on the household side, the authors adopt some sensible simplifying assumptions. They artificially divide households into consumers and homeowners. As homeowners, households finance the stock of both new and existing housing using existing housing equity as collateral. As leverage in the housing market rises, households face a larger premium on mortgage interest rates. Owing to adjustment costs, positive shocks to the economy raise housing prices, improve household balance sheets (reduce leverage), and reduce mortgage premiums. This mechanism is analogous to the financial accelerator mechanism for business-fixed investment developed in the Bernanke, Gertler, and Gilchrist (BGG) framework. To allow for housing price movements to affect consumption directly, Aoki, Proudman, and Vlieghe posit a group of credit-constrained households who borrow against housing equity. Although it is not explicitly modeled as a financial contract, this link between housing prices and consumption provides an additional channel through which asset prices affect aggregate demand.

The model underlying the analysis of the paper may be viewed as a variant of a dynamic New Keynesian framework. Although the financial accelerator mechanism has both supply and demand effects, the supply-side effects are unlikely to be quantitatively important and the basic mechanism can be understood by examining the model's implications for a dynamic IS curve. The model allows for three different types of spending behavior: permanent-income households who satisfy a standard-consumption Euler equation of the form

$$c_t^P = E_t\{c_{t+1}^P\} - \sigma_c E_t\{r_{t+1}\}, \tag{1}$$

rule-of-thumb households whose consumption is linked to equity withdrawals from housing

$$c_t^R = s(n_t - q_t - k_t),\ s > 0, \tag{2}$$

and housing investment, which satisfies an Euler equation motivated by adjustment costs

$$i_t = E_t\{i_{t+1}\} - \sigma_i E_t\{r_{t+1}^h\}. \tag{3}$$

In these equations, all variables may be considered log deviations from steady state. r_{t+1} is the real rate of return on bonds; r_{t+1}^h is the rate of return on housing; and n_t measures housing equity, while $q_t + k_t$ represents housing expenditures (price times quantity), so that $q_t + k_t - n_t$ measures leverage—housing expenditures relative to housing equity.[1] As leverage falls, rule-of-thumb households withdraw more equity and consume more.

To close the IS curve, the BGG framework specifies a positive relationship between the premium on the rate of return on housing and household leverage:

$$E_t\{r_{t+1}^h - r_{t+1}\} = v(q_t + k_t - n_t),\ v > 0. \tag{4}$$

Aggregate demand is a weighted average of the expenditure components

$$y_t = w_p c_t^p + w_r c_t^r + w_i i_t. \tag{5}$$

Combining these equations, we obtain the following dynamic IS curve

$$\begin{aligned} y_t - w_r s(n_t - q_t - k_t) = {} & E_t\{y_{t+1} - w_r s(n_{t+1} - q_{t+1} - k_{t+1})\} \\ & -(w_p\sigma_c + w_i\sigma_i)E_t\{r_{t+1}\} \\ & + w_i\sigma_i v(n_t - q_t - k_t). \end{aligned} \tag{6}$$

Iterating forward yields

$$\begin{aligned} y_t = {} & w_r s(n_t - q_t - k_t) - (w_p\sigma_c + w_i\sigma_i)E_t\left[\sum_{i=1}^{\infty} r_{t+i}\right] \\ & + w_i\sigma_i v E_t\left[\sum_{i=0}^{\infty}(n_{t+i} - q_{t+i} - k_{t+i})\right]. \end{aligned} \tag{7}$$

The first term on the right-hand side of equation 7 implies that aggregate demand depends on current balance-sheet conditions owing to rule-of-thumb consumers. The last term implies that aggregate demand also depends on future balance-sheet conditions owing to the forward-looking nature of housing investment decisions. In a more general model, i_t might represent all household expenditures that depend on external finance premia (for example, consumer durables and housing purchases). In either case, current aggregate demand is sensitive to both current and future balance-sheet conditions. An implication for policymakers is that the entire future path of household financial conditions matters for understanding the determinants of current aggregate demand. Another implication is that financial conditions are measured not simply as changes in asset prices, but in terms of the underlying strength of the balance sheet. This has obvious implications for how one should think about and construct financial conditions indexes.

To close the model, we need to determine the evolution of household net worth, housing prices, and the housing stock, as well as the path for real interest rates. This is done in a standard fashion following the dynamic New Keynesian framework expressed in the BGG model. The key insight here is that, owing to leverage in the economy, a positive shock to housing prices raises net worth more than housing expenditures, so that $n_t - q_t - k_t$ is procyclical. According to the model, movements in the balance sheet are also persistent and tend to die out more slowly than movements in real interest rates. As a result, the model amplifies and propagates shocks to monetary policy and other sources of fluctuations. How much current versus future financial conditions matter depends on the relative weights placed on rule-of-thumb consumers and the speed at which they may withdraw housing equity for consumption purposes.

Roughly speaking, the policy experiments change the relative weight, w_r, and the relationship between the balance sheet and current consumption, captured by the elasticity s. It is worth emphasizing that one can consider other experiments that imply an improvement in financial conditions. These would include a reduction in the monitoring costs incurred on housing contracts or an increase in average household leverage. The former would most likely dampen the volatility of both consumption and housing investment. The latter would increase the volatility of both consumption and housing investment. In short, specific conclusions regarding the effect of financial deregulation will depend on the type considered.

A Closer Look at the Facts

Aoki, Proudman, and Vlieghe provide a variety of facts and empirical results regarding both the evolution of financial markets and the dynamic relationship between housing prices, output, consumption, and interest rates. Their study documents the volatility of housing prices relative to consumption and output (a simple comparison with U.S. data suggests that U.K. housing prices are indeed substantially more volatile). It also provides a VAR-based analysis of the dynamic response of these variables to a monetary policy shock. Housing prices and durables consumption exhibit substantially more variation than output and nondurables.

Although suggestive, none of the results here provides direct evidence of a financial accelerator mechanism linking housing prices to consumption behavior. In particular, any model based on adjustment costs would provide positive comovement between housing prices, consumption, and output in response to real interest rate movements owing to innovations in monetary policy. What is lacking in the analysis is a clear identification scheme. One possibility would be to estimate directly an IS curve along the lines of the one specified above. Here, one could directly test for evidence of household balance sheets influencing aggregate demand. Another possibility would be to estimate the model via maximum likelihood. If financial deregulation has had an important influence on the relationship between housing prices and consumption, we should expect to see changes in the underlying structural parameters consistent with this hypothesis.

Perhaps more troubling for the existing model is the lagged response of housing prices relative to housing investment and durable goods consumption—note that housing prices also lag output, which explains their lack of predictive power. This timing is clearly at odds with the model's main mechanism whereby a reduction in interest rates causes an immediate increase in housing prices and, in the process, provides immediate improvements in household balance sheets that are then translated into additional movements in aggregate demand. It might be possible to rationalize the slow response of housing prices through the usual sticky-price mechanisms applied to the housing sector. Alternatively, Genesove and Mayer (1999) argue that time on the market varies over the cycle as house sellers with down-payment constraints seek to avoid capital losses. In both cases, expected future improvements in balance sheets still provide an amplification and propagation mechanism. Households may borrow against expected future housing gains or rule-of-thumb consumers may exhibit a lagged response if current consumption is tied to the current balance sheet. Either way, a richer model is needed to characterize fully the joint dynamics of housing prices, consumption, and output in response to monetary policy and other shocks.

In addition, Aoki, Proudman, and Vlieghe do not make a strong case for financial deregulation as a source of consumption volatility. The additional response of consumption that is obtained under either experiment appears to be too small to be of serious concern for policymakers. This finding is at odds with the spirit of the paper and with what seems to be the tone of discussion among U.K. policymakers regarding this issue. The paper provides the impression that financial deregulation has indeed increased consumption volatility. Neither the model nor the facts provided make a strong case for this statement, however. Whether the model can be calibrated to provide a bigger effect from financial deregulation and whether additional facts can be provided in support of such a hypothesis remain to be seen. I look forward to such additional research.

Endnotes

1. For expository purposes, these expressions are simplifications of the actual model specification used by the authors.

References

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