Discussions: "Optimal Monetary Policy Rules and House Prices: The Role of Financial Frictions" by Alessandro Notarpietro and Stefano Siviero

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Summary

The global financial crisis of 2008-09 led by a collapse in the U.S. housing market propelled the U.S. economy into the Great Recession. It has also rekindled the debate about appropriate monetary policy responses to housing price fluctuations. Prior to the crisis, a prominent view in the literature holds that an inflation-targeting central bank should not respond systematically to asset price fluctuations (Bernanke and Gertler, 1999, 2001). The argument goes like this. To the extent that asset price movements reflect efficient responses of asset markets to fundamental shocks to the economy, stabilizing asset price fluctuations would be counterproductive; if instead asset prices are driven by speculative bubbles, then it would be inappropriate to use monetary policy to stabilize asset prices because the central bank is no more capable of predicting speculative bubbles than the private sector. In either case, asset prices reflect expectations of future states of the economy; by stabilizing inflation expectations, monetary policy helps indirectly to stabilize asset prices.

This pre-crisis thinking is based on the standard New Keynesian model with no explicit financial frictions, in which asset prices do not interact with the real economy. The post-crisis literature has begun to examine the potential role of monetary policy in stabilizing asset price fluctuations. For example, Curdia and Woodford (2009, 2010) study the desirability of interest-rate rules that allow the central bank to respond to asset prices or credit spread in addition to deviations of inflation from a target and variations of output gap. Gertler and Karadi (2010) develop a dynamic stochastic general equilibrium (DSGE) model with financial intermediaries that face balance-sheet constraints to examine the effectiveness of unconventional monetary policy to combat a financial crisis.

Building on this recent literature, Notarpietro and Siviero (NS) consider the desirability of monetary policy rules that allow the central bank to respond to housing price fluctuations. Since the Great Recession was led by a collapse in the housing market, this task is naturally motivated. The model presented by NS is a simplified version of that initially studied by Iacoviello and Neri (2010), except that they modify the interest rate rule so that the central bank can potentially respond to housing price fluctuations as well as inflation and output growth. With calibrated parameters, NS report that the welfare-maximizing monetary policy rule typically responds to housing price changes and the sign and the size of the policy responses depend on the magnitude of financial frictions.

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Comments

In light of the recent crisis experience, studying the potential role of fiscal and monetary policy in stabilizing macroeconomic fluctuations driven by shocks to housing market is clearly an important and timely issue. The NS paper presents numerical simulation results for optimal interest rate rules in a carefully calibrated DSGE model. To better understand their result requires some further elaborations of the driving mechanism in the model. In particular, there are several issues that remain to be addressed. First, why should monetary policy react to housing prices? What is the source of tradeoff for monetary policy that leads to a breakdown of the divine coincidence and therefore renders strict inflation-targeting policy suboptimal? Second, what are the macroeconomic effects of housing price shocks in the U.S. data? Do these shocks behave like a shock to aggregate demand or supply? Third, should monetary policy be used as the primary instrument for stabilizing the macroeconomic effects of housing price shocks?

Why should monetary policy react to housing price fluctuations?

In the standard New Keynesian framework, staggered price setting leads to suboptimal price dispersion across firms. A strict inflation-targeting policy that achieves price stability helps eliminate such price dispersions and is thus socially optimal. In this class of models, monetary policy faces no tradeoff and a divine coincidence holds such that price stability implies a closed output gap (Blanchard and Gali, 2007).

Tradeoffs for monetary policy do arise in models with multiple sources of nominal rigidities. For example, Erceg, Henderson, and Levin (2000) study a New Keynesian model with sticky prices and sticky nominal wages. They find that optimal monetary policy should respond to both wage inflation and price inflation. Huang and Liu (2005) study a model with production chains and with staggered price setting among firms within each stage of production. They show that optimal monetary policy should assign positive weights to both finished goods price inflation and intermediate goods inflation. In general, under optimal policy rule, the weight assigned to inflation in a sector depends on the sector's expenditure share and the relative price stickiness (e.g., Woodford, 2003).

Absent financial frictions, housing prices fluctuations reflect efficient responses of the economy to the underlying shocks and monetary policy should not target housing prices. If housing rents are sticky, however, optimal policy should respond to fluctuations in rental inflation in addition to goods price inflation, but Jeske and Liu (2013) show that the optimal weight assigned to rental inflation should be smaller than the housing expenditure share because production of rental services is house intensive and the input prices (i.e., housing prices) are volatile.

The NS paper considers a DSGE model with credit constraints, in which the constrained agents use houses as a collateral asset for borrowing. The presence of credit constraints implies that housing price fluctuations are suboptimal even if goods prices are flexible. The inefficiency associated with credit constraints creates potential room for policy interventions. Nonetheless, strict inflation targeting may

still be the second-best policy unless housing price fluctuations introduce a tradeoff for monetary policy.

But do housing price fluctuations introduce a monetary policy tradeoff? The NS model is too complex to obtain analytical characterizations of optimal monetary policy. Numerical simulations based on calibrated parameters suggest that optimal interest rate rules do respond to housing price fluctuations, and thus housing price shocks seem to introduce a tradeoff for monetary policy.

An alternative approach to examine whether housing price fluctuations can lead to a policy tradeoff in the data. If a housing price shock acts like a demand shock that raises unemployment and lowers inflation, then monetary policy easing would help mitigate the adverse impact of declines in housing prices on the macro economy. If instead a housing price shock acts like a supply shock that reduces the economy's productive capacity, then it would raise both unemployment and inflation and optimal monetary policy would then face a tradeoff. Such a tradeoff would call for deviations of monetary policy from strict inflation targeting and some weights should be assigned to housing price fluctuations.

Macroeconomic effects of housing price shocks

Before we examine the macroeconomic effects of housing price shocks in the data, it is useful to understand what shocks in the model drive housing price fluctuations.

The NS paper focuses on two shocks—a housing demand shock and a loan-to-value (LTV) shock. I focus here on housing demand shocks because they are the primarily driving force for housing price fluctuations in DSGE models with collateral constraints (e.g., Iacoviello, 2005; Iacoviello and Neri, 2010; Liu, Wang, and Zha, 2013).

In the NS model, housing demand shocks are captured by a preference shifter for housing services. To understand why housing demand shock is the main driving force for fluctuations in housing prices, consider the simple example presented in Liu, Wang and Zha (LWZ, 2013). In the LWZ model, as in the NS model, there are two types of households. The patient household is the saver and the impatient household is the borrower, whose borrowing capacity is determined by the collateral value (housing value). Since the patient household does not face credit constraints, she is the marginal investor, whose Euler equation for housing determines the housing price. Thus, I focus on the patient household's Euler equation.

Suppose that the patient household has a linear utility function in consumption and housing. In particular, the period utility function takes the form

$$u(C_t, H_t)) = C_t + \varphi_t H_t,$$

where C_t denotes consumption of goods and non-housing services, H_t denotes housing services, and the term φ_t is an exogenous taste shifter representing changes in housing demand. The housing Euler equation from the patient household's optimizing problem is given by

$$q_t = \beta E_t q_{t+1} + \varphi_t,$$

where the term q_t denotes the housing price and the parameter β is the subjective discount factor for the patient household. Evidently, housing prices can fluctuate only if the shadow changes. Here, with linear utility, the shadow rent is simply the housing demand shock (φ_t). Absent housing demand shocks (i.e., with φ_t held constant), the housing price would not fluctuate. Other shocks such as TFP shocks drive macroeconomic fluctuations, but not housing prices. In the more general case with curvatures in the utility function, the shadow rent would be a function of C_t and H_t. Absent housing demand shocks, the shadow rent would be as volatile as these macroeconomic variables, and the model would have difficulties in generating the observed large and persistent fluctuations in housing prices. Thus housing demand shocks are important to trigger fluctuations in housing prices, which are in turn amplified and propagated through collateral constraints to generate the observed interactions between housing prices and macroeconomic fluctuations.

Now, how do housing price shocks impact on the macro economy? Do they behave like an aggregate demand shock or a supply shock?

Figure 1 below presents the impulse responses of several macroeconomic variables to a negative shock to housing prices, estimated from a Baynesian Vector Autoregression (VAR) model using U.S. time-series data, following the approach in Sims and Zha (1998). The VAR model contains four variables, including (1) real housing prices measured by the CoreLogic Housing Price Index including distressed sales, deflated by the personal consumption expenditure price index (PCEPI), (2) the unemployment rate (from the Bureau of Labor Statistics), (3) an inflation rate measured by year-over-year changes in the PCEPI, and (4) a nominal interest rate measured by the effective Fed funds rate. All data are monthly series and seasonally adjusted. The sample ranges from January 1976 to August 2014. The Cholesky identification assumption is that the housing price does not respond to shocks to the other variables in the impact period, but those other shocks do affect the housing price dynamics after the impact period through cross-equation restrictions in the VAR model. Consistent with this assumption, the housing price is ordered the first in the VAR.

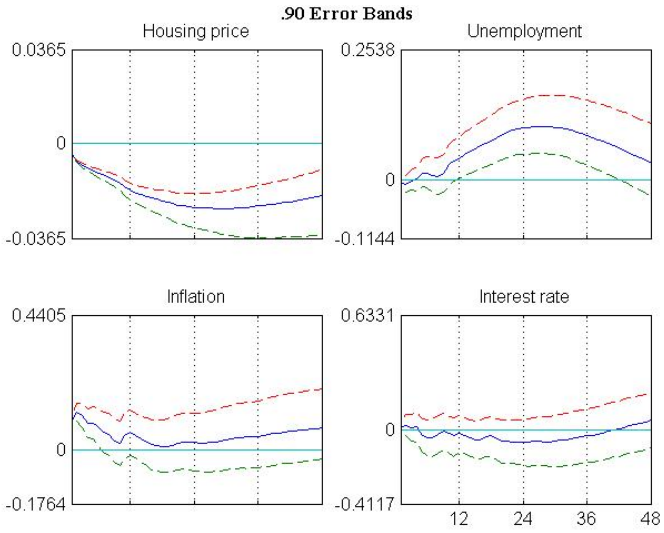

Figure 1. Impulse responses to a housing price shock in a VAR model

The figure shows that a negative shock to the housing price leads to persistent declines in the housing price, persistent increases in the unemployment rate and a short-run increase in the inflation rate. All these responses are significant at the 90-percent level. The responses of the nominal interest rate are relatively muted and statistically insignificant.

The impulse responses show that the negative housing price shock has recessionary effects, so that unemployment rises persistently. The shock also raises inflation while unemployment increases. In this sense, the housing price shock acts like an aggregate supply shock, similar to a cost-push shock in the standard New Keynesian framework.

To the extent that housing price shocks act like a supply shock, they would in general lead to a tradeoff between stabilizing inflation and output gap for optimal monetary policy. Thus, the "divine coincidence" in the standard New Keynesian framework breaks down: achieving price stability by itself does not close the output gap. This helps understand why a strict inflation-targeting policy rule does not necessarily maximize social welfare, consistent with the NS finding that optimal interest rate rules should include a term that involves changes in housing prices.

Monetary policy or macro-prudential policy

The data suggest that housing price shocks act like a supply shock that can potentially introduce a tradeoff between price stability and output gap stabilization for monetary policy. However, it does not follow that the government should rely primarily on monetary policy for stabilizing macroeconomic fluctuations induced by housing price shocks.

The literature has shown that, in the presence of collateral constraints, a pecuniary externality typically leads to inefficient credit booms and busts. For example,

Lorenzoni (2008) shows that a decentralized economy with limited contract enforcement that gives rise to credit constraints can result in excessive borrowing ex ante and excessive volatility ex post relative to socially efficient allocations. This is because atomistic private agents may underestimate the general equilibrium effects of their asset sales in a bad state of the economy on asset prices, and policies that limit asset-price declines in a crisis can be welfare improving.

What Lorenzoni (2008) has in mind is a macro-prudential policy, not a monetary policy. Bianchi and Mendoza (2010) show that optimal macro-prudential policy can be implemented by state-contingent taxes on debt (see also Jeanne and Korinek, 2010).

The NS model abstracts from fiscal policy instruments and is thus silent about the relative effectiveness of monetary policy relative to fiscal policy for stabilizing macroeconomic fluctuations driven by housing price shocks. The pre-crisis boom in private credit and the deep recession subsequent to the collapse in the housing market call for a better understanding of appropriate policy designs—both fiscal and monetary policies— that may help prevent or at least mitigate the adverse impact of credit booms and busts.

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