Discussion of "The Effects of Housing Prices and Monetary Policy in a Currency Union"

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1. Introduction

Central questions raised by recent experience are "why do housing prices fluctuate?" and "what should central banks do about it?" For member states of a currency union, such as Spain or Texas, independent monetary policy cannot be conducted, so that it is important to inquire whether fluctuating housing prices make currency union participation undesirable.

In this timely paper, Oriol Aspachs-Bracons and Pau Rabanal provide some useful insights into the nature of the Spanish experience, into the mechanics of a two-region dynamic stochastic general equilibrium (DSGE) model that contains a housing sector in each region, and on the differences between responses to various shocks under alternative policy rules. It is one component of the authors' recent work that contributes to a rapidly growing literature on housing and macroeconomics.

Since housing is a durable good, the authors draw on two relevant background literatures, each of which is New Keynesian in structure. In terms of the housing literature, the DSGE model analysis builds most directly on prior work by Iacoviello and Neri (2010), which constructs a closed-economy macroeconomic model with separate sectors for "final consumption" and "housing investment." In the housing literature, central questions are the response of housing investment, housing prices, final consumption, and aggregate output to shocks in monetary policy in housing demand. In terms of the durability literature, the DSGE model analysis is related to work by Barsky, House, and Kimball (2007), Monacelli (2009), and Sterk (2010) that also studies closed-economy models with separate sectors that are "non-durable" and "durable" in nature. In both housing and durability literatures, a variety of nominal frictions are examined, including wage and price stickiness. In both literatures,

issues of co-movement are central, such as (i) do housing prices move with housing investment? and (ii) do sectoral outputs move together or inversely? Consequently, real frictions play an important role, in terms of the imperfect substitutability or costly reallocation of capital and labor across sectors. These two literatures also explore the role of financial market imperfections, such as the idea that some households have borrowing demands that are subject to collateral requirements as in Iavoviello and Neri (2010), Monacelli (2009), and Sterk (2010).

In addition to these elements, Aspachs-Bracons and Rabanal (henceforth, AR) explore a two-region model that features two differently sized regions and is designed to be applied to Spain and the euro area. Clearly, additional issues of co-movement arise in such a setting if a particular region is affected by shocks that are not occurring elsewhere.

The research strategy follows the path of Christiano, Eichenbaum, and Evans (1999) of estimating a small structural vector autoregression (SVAR) and calculating impulse responses to a subset of shocks, to which the result of a model economy is then compared. For AR's analysis of quarterly Spanish data, these are an interest rate shock—taken to the result of euro-area monetary policy—and a housing demand shock. The analysis is conducted over a historical period (1997 through 2010) during which there were major variations in housing investment, housing prices, mortgage borrowing, and the current account.[1] The DSGE model is of the broad family of small-scale operational monetary policy frameworks with agent optimization and many frictions, of which Christiano, Eichenbaum, and Evans (2005) and Smets and Wouters (2003) are leading contributions.

The organization of my comments is as follows. In section 2, I discuss some general aspects of the Spanish housing experience. In section 3, I discuss the results of the VAR estimation. In section 4, I consider the linkage between results in this paper and in the closed-economy analysis of Iacoviello and Neri (2010) that stresses housing market spillovers. In section 5, I briefly discuss the authors' conclusions about monetary policy.

[1]While the full monetary integration did not occur until 1999, the authors suggest that Spain effectively coordinated its interest rate policy with other euro-area countries starting in 1997.

2. The Spanish Experience

To a reader not knowledgeable about the Spanish experience, such as me, there is a lot of interesting information that is contained in figures 1 through 4. Throughout my discussion, when I refer to any particular figure such as figure 1, I will be considering the figure in the Aspachs-Bracons and Rabanal paper.

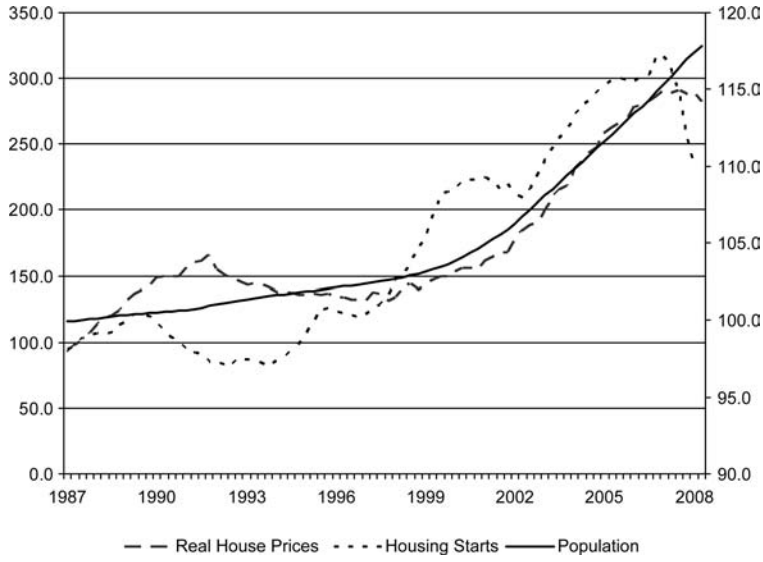
Importance to Real Aggregate Activity. To begin, these initial figures assure us that we are talking about something pretty important in terms of macroeconomics: as shown in figure 2, the boom was a major increase in housing investment relative to GDP (I^H/Y) during 1988 through 2005, with an increase from about 5 percent to about 9 percent. In 2006 through mid-2007, this ratio stayed at about the 9 percent level; then it declined dramatically to about 5 percent of GDP. In a simple accounting sense, if there was no change in any other sector, the housing boom led to a cyclical swing of 5 percent up and down.

Size of Housing Price Movements. Figure 1 shows that, starting in 1998, there was a surge in house prices that lasted through the end of 2007: in the middle of the period, housing price inflation exceeded 15 percent per year. The co-movement in figure 1 is broadly consistent with the hypothesis—which I associate with John Taylor (2007) for the United States—that loose monetary policy drove down the nominal interest rate and led to the housing boom, i.e., to a major increase in real housing prices. That is, there is a clear negative association between the level of the interest rate and the rate of change of house prices, starting in 1998 and continuing through 2008. Taylor's particular argument is that the U.S. policy rate was low during 2003–06, relative to the prediction of his benchmark rule, which cannot be directly evaluated from figure 1. But there is an evident decline in the one-year interbank rate and an acceleration of housing price inflation during 2001–05.

This rate-of-change information is not the same as the real housing price, which I would have preferred to see, so I went to a recent International Monetary Fund (IMF) report on the Spanish housing market.[2]

[2]The IMF Country Report No. 09/129 (April 2009) is available at www.imf.org/external/pubs/ft/scr/2009/cr09129.pdf.

Figure K1. Housing Prices and Housing Starts (Left Scale) and Population (Right Scale) Are Indices with 1987=100



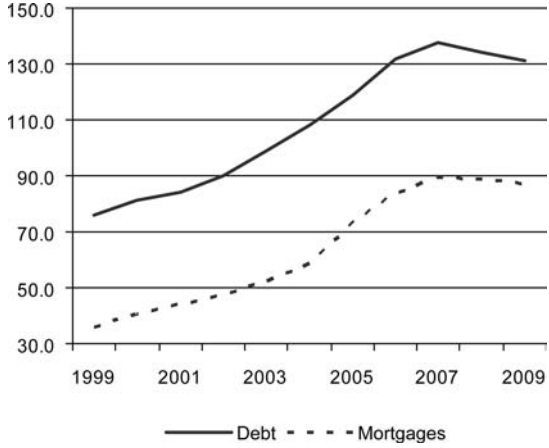
Source: IMF data courtesy of Pau Rabanal.

This figure—marked K1 so that it can be readily distinguished in the discussion below from the AR figures—shows the co-movement of real housing prices, housing starts, and population over 1987–2008. The AR sample period begins in 1996 and goes through 2009, so that there is substantial overlap. From my standpoint, when AR discuss housing price shocks, figure K1 suggests that they are right to focus on increasing population as one of the potential core drivers (they also discuss the related, reinforcing factor that the number of households per capita has been rising in Spain: see their figure 4 and related text).[3]

They also stress that there was a surge in mortgage credit. In their figure 3, credit relative to GDP jumps by about 20 percent

[3]It is also clear from their discussion that population variations involve potentially endogenous immigration responses, which complicates the interpretation of a figure like K1.

Figure K2. Total Debt and Mortgage Debt as Ratios to Spanish Disposable Income



Source: Supplied by Pau Rabanal based on data from Euro Stat and the Bank of Spain.

in the two years 2005–06. Looking again at developments along the lines outlined in the IMF report, shown as figure K2, mortgage credit relative to disposable income increases substantially during 2001–07: it dominates the rise in total debt, which moves from about 75 to 135 percent of disposable income. The developments are strongest in 2005–06 in figure K2 as well.

Putting these elements together, it looks like the major acceleration of mortgage lending occurred *after* the major acceleration of housing prices. Prices appear to lead lending, rather than the other way around. I don't think that this lag mechanism is present in their model, but it could be added at relatively low cost and its implications explored.

3. SVAR Results

The procedure of first estimating an SVAR with limited restrictions and then comparing DSGE and SVAR impulse responses is a natural strategy. It is modest in that the analyst does not impose a lot

of structure on the empirical model and seeks only a partial identification, restricting attention to the response of the SVAR to a subset of structural shocks.

Specifically, AR estimate a vector autoregression in final private consumption, residential investment, real output (GDP), a three-month interest rate, and real housing prices. They order the variables as just indicated and assume that there is a lower triangular matrix B in a system of the form

$$Y_t = C + \sum_{l=1}^{L} A_l Y_{t-l} + B u_t,$$

where C is a vector of constants, A_l are lag coefficient matrices, and u_t are the shocks, only the last two of which are given a structural interpretation: (i) the shock to the interest rate, which can affect housing prices but has no other within-period effects; and (ii) the shock to housing prices, which is given a demand/preference shock interpretation.

3.1 What Do They Find?

Aspachs-Bracons and Rabanal report results on impulse responses and historical decompositions for their two identified shocks.

3.1.1 Monetary Shock

The impulse responses shown in figure 5 indicate that a 25-basis-point "monetary policy" shock to the short-term interest rate has a sustained effect on the level of the nominal interest rate for two to three years in duration, with a peak response of 40 basis points. The higher interest rate leads to a decline in housing prices and investment that begins within a year, with a trough response of 2 percent of investment and 2–3 percent of house prices that occurs in the second and third years. By contrast, the policy shock has a quite small effect on the level of consumption and output within a year, but there may be larger effects at the three-year horizon: these are estimated to be $-1/2$ percent for both consumption and output, although the confidence intervals are wide.

The historical decomposition of the 1998–2008 period provided in figure 7 suggests that monetary policy shocks played a role in the boom and bust of housing prices and investment, but a modest one.

3.1.2 House Price Shocks

The impulse responses to a housing price shock shown in figure 6 are quite suggestive. The shock has an essentially uniform positive impact at all horizons on prices, of about 10 percent. It stimulates an increase in investment that is initially modest, peaks at 30 percent, and then dies away. While the shock has little short-horizon effect on output and consumption, it leads to estimated impacts of about 1.5 percent in each. Potentially, this might be the effect of news about permanent income, mitigated by frictions which slow down the impact of it.

3.1.3 How Do They Use the SVAR?

Aspachs-Bracons and Rabanal use the SVAR essentially to determine the sign and relative size of various responses which their model should capture. They do not take the longer-run empirical dynamics as a target.

4. Assessing Housing Spillovers

I like the fact that Aspachs-Bracons and Rabanal show us how various model frictions contribute to producing differing responses of housing price and housing investment as well as other macroeconomic responses to the two shocks. A good bit of their analysis focuses on comparison with the closed-economy work on housing, by Iacoviello and Neri (2010), so that my discussion will also consider this comparison.

Iacoviello and Neri (2010) argue that there are important "spillovers" from the housing market into consumption, but not on investment of a business form. By contrast, AR conclude in section 5 that "the response of non-durable consumption does not appear to be sensitive to different levels of financial frictions. The effects on residential investment are more important, especially (sensitive) to the different specifications of the loan-to-value ratio."

Now, what is the story in Iacoviello and Neri? It is a very popular one: some households are constrained in terms of final consumption purchases by the fact that they cannot borrow against future income but only against the collateral value of their house. Accordingly, declines in housing prices—which would produce declines in housing investment in any model with a Q-theoretic mechanism—also can affect final consumption of other goods, thus bringing about sectoral co-movement. For example, Iacoviello and Neri (2010, p. 141) display a positive response of consumption to a housing preference shock in a baseline model, but a negative one in a variant without a collateral effect. In their benchmark setup, the income share of individuals that are borrowing constrained is about 20 percent.

Detailed microeconomic evidence produced by Hryshko, Luengo-Prado, and Sørenson (2010) shows that there are important departures from full consumption smoothing when individuals are hit by large negative income shocks and if they also live in areas that have been hit by important declines in real estate values. I interpret this evidence as indicating that credit constraints preclude the use of home equity and related loans to undertake consumption smoothing against adverse shocks. That is, there is some detailed microeconomic evidence for the mechanisms that Iacoviello and Neri (2010) (henceforth, IN) seek to integrate into the macro model.

But AR argue that the credit constraint mechanism does not seem to have a large effect on the operation of a macroeconomic model when it is implemented in the manner suggested by IN.[4] To make this argument, AR employ sensitivity analysis in figures 12 (response to a monetary policy shock) and 13 (response to a housing preference shock) across various values of the income share of constrained individuals and the level of the loan-to-value (LTV) ratio in the borrowing constraint. The differential effect shows up only in figure 13, which is the response to the housing preference shock that is also the main focus of IN. Standardizing the unit in the two studies, a 1 percent initial shock to housing prices produces a peak response of consumption of about .07 percent in IN, while it produces

[4]Sterk (2010) has also questioned how much such financial constraint mechanisms alter the sectoral co-movement within the financial frictions model of Monacelli (2009).

about a .06 percent response in AR. So, the two analyses seem to be telling a similar story about the magnitude of housing market spillovers, with IN stressing that the effect is positive and with AR stressing that it is positive and small from their perspective.[5]

Both studies indicate that labor market frictions—imperfect substitutability and nominal stickiness—are important for the dynamic response of the model to housing and monetary policy shocks.

5. Changing Monetary Policy

The purpose of constructing DSGE models is to provide answers to big questions like, "does it matter whether Spain is part of a currency union?" for which macroeconomists agree that the Lucas (1976) critique invalidates the use of reduced-form models like SVARs.

Aspachs-Bracons and Rabanal are interested in the specific big question: if Spain had been following an independent monetary policy, then would there have been important consequences of adopting a policy rule that included "leaning against house price inflation"?

Concretely, in figure 14, AR compare the response to a housing demand shock when monetary policy in their economy is alternatively (i) EMU monetary policy, which does not respond to developments in Spanish housing markets; (ii) an independent Spanish central bank following a strict inflation-targeting form of the Taylor rule; and (iii) an independent Spanish central bank leaning against house price inflation. They show that there is little difference between (i) and (ii). They highlight the finding that "leaning against housing inflation" policy does relatively little in terms of curtailing a housing price and investment boom, but does impose costs in terms of reduced output in the non-durable consumption goods sector, which did not arise under the alternative two policies.

[5]Overall, the "size" of the housing spillover is somewhat dependent on the context as well as these numerical values, as Matteo Iacoviello has stressed to me. There was a very large shock to the housing market in the United States and some other countries, so that multipliers which look small can nevertheless lead to a substantial response. Iacoviello points out that the .07 coefficient implies that a 20 percent decline in real housing values—roughly that in the United States—would lead to a 1.4 percent decline in aggregate consumption.

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