COMMENTS ON "CAPITAL INFLOWS AND THE US HOUSING BOOM" BY FILIPA SÁ AND TOMASZ WIEDALEK

Pedro Gete
Georgetown University
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Several years after the housing boom (and bust) that happened in the US and several other countries, the question of what caused it is still unsettled. There are four popular explanations. First, loose monetary policy (see, for example, Taylor 2009). Second, financial innovation and a reduction in down-payment requirements (see, for example, Favilukis et al. 2013). Third, overoptimistic expectations about future housing price gains (see Glaeser et al. 2013 or Gete 2014, among others). Fourth, a "savings glut" in China and other emerging economies, which created capital flows that lowered interest rates in advanced economies (see for example Bernanke 2005 or Caballero et al. 2008).

Sá and Wiedalek (2015, this issue of the JMCB, SW from here on) is an interesting empirical contribution to the previous question. SW derive sign restrictions to identify several potential drivers of housing dynamics. Then SW estimate a Bayesian VAR with data from the US and a composite of the rest of the world (ROW) from 1979Q1 to 2006Q4. Using the sign restrictions to identify the shocks, SW analyze impulse responses and variance decompositions of US real house prices and residential investment. The main findings of the paper are that savings glut shocks (shocks increasing the discount factor of the ROW) account for around 7 or 9% of the variance of the 1, 3 and 5 years ahead forecast error of US residential investment and house prices. Shocks to Loan-to-Value (LTV) account for around 4% of the variance of US residential investment, and between 4 and 10% of US real house prices, depending on the time horizon.

The identification of structural vector autoregressions (SVARs) with sign restrictions, although not yet popular to study housing dynamics, is increasingly used to analyze many types of economic shocks. For example, sign restrictions SVARs have been used to measure the effects of monetary policy shocks (Faust 1998; Canova and De Nicolo 2002; Uhlig 2005), news shocks (Fratzscher and Straub 2013), technology shocks (Dedola and Neri 2007; Peersman and Straub 2009), government spending shocks (Pappa 2009), oil price shocks (Kilian and Murphy 2012), and housing demand and supply shocks (Bian and Gete 2014; Gete 2009; Gete 2014). The sign restrictions methodology insures that the identified shocks are consistent with their theoretical counterparts. In other words, if the shock identified as X does not do what according to economic theory shock X should do, then the sign restrictions methodology will not identify that shock as shock X. Thus, sign restrictions SVARs avoid the contradictions, or puzzles, between theory and SVAR results that are a major drawback of SVARs identified with recursive identification

schemes (also known as Cholesky or short-term restrictions).[1] The price to pay for theoretically consistent identification is that the sign restrictions identify *sets* of structural shocks. Moreover, many times it is difficult to perform "horse-races" between different shocks as there are shocks for which it is hard to derive sign restrictions that are theoretically robust.

SW carefully deal with the issues associated with set identification. They provide a theoretically robust identification of the savings glut shocks in the ROW. These are shocks that lead to lower consumption in the ROW, lower real rates in the US, a real appreciation of the dollar and a US current account deficit. However, the identification of the other "structural shocks" in SW is more problematic. For example, it is a standard theoretical result that a positive housing preference shock (a shock to housing demand) leads to increases in house prices and also in residential investment (at least in the short run). The model analyzed by SW is consistent with these findings (Figure 3f). However, SW's SVAR claims to identify "LTV/housing preference shocks" which lead to lower house prices in the short run (Figure 4). This contradiction between a solid theoretical result and the identified SVAR implies that the identified shock is not a housing demand shock. It can perfectly well be a loan-to-value (LTV) shock. LTV shocks do not always lead to house price increases; positive LTV shocks increase demand for housing from borrowers but decrease savers' demand. For house prices to increase, the increase in borrowers' demand for housing needs to dominate the decrease in savers' demand. This is not usually the case in models in which borrowers are more impatient because impatient households prefer non-durable consumption relative to durables (housing).

The sign restrictions to identify monetary policy in SW rely on the behavior of the current account and the real exchange rate. They assume that the US central bank reducing interest rates creates a deficit in the US current account and depreciates the real US exchange rate. However, theory is not conclusive on these variables and SW's sign restrictions may not correctly identify monetary policy shocks. For example, models of the J-curve show that when the Central Bank lowers interest rates, the domestic currency has a nominal exchange rate depreciation that leads to higher exports and lower imports. The reaction of the trade balance (and the current account) depends on the price-elasticity of exports and imports. If they are highly elastic, then higher exports and lower imports lead to a trade surplus. However, if imports are inelastic then first we may observe a trade (and current account) deficit and then a reversal towards a trade surplus (thus a J-curve in the current account). Furthermore, the sign reaction of the real exchange rate to monetary policy is not unequivocal. SW's sign restriction is that a reduction in the US monetary policy rate implies a US real exchange rate depreciation. However,

[1] For example, in a recursive identification of monetary policy, it is common to encounter the "liquidity puzzle". That is, when identifying monetary policy shocks as surprise increases in the stock of money, the SVARs say that interest rates tend to go up, contradicting monetary models in which interest rates decrease in those cases. Or the "price puzzle" in which after a contractionary monetary policy shock, even with interest rates going up and money supply going down, inflation in the SVAR goes up rather than down. Thus, another contradiction with an undisputed theoretical result.

this may not happen if the following occurs: 1) The US Central Bank lowers interest rates, then since durable goods are more interest-sensitive than nondurables (Erceg and Levin 2006), the demand for durable goods reacts more than the demand for non-durables and generates housing prices increases in the domestic economy (assuming inelastic housing supply). 2) Since housing is non-tradable and if the law of one price applies to tradable goods, then higher non-tradable prices in the domestic economy would appreciate the US real exchange rate (a Balassa-Samuelson effect).

Focusing on the shocks whose identification is more robust, it is interesting that SW's results coincide with the related literature. For example, Gete (2014), using data that cover both the housing boom and bust, and different sign restrictions to identify LTV, population and price expectation shocks in a SVAR, finds very similar magnitudes for the effects of LTV shocks. Also, this shock has smaller effects than the other two. Price expectations (or a bubble) is the shock that best explains recent US housing dynamics. Bian and Gete (2014), who study housing dynamics in China also identify savings glut as a driver of housing dynamics with magnitudes in the ballpark of those obtained by SW. They show that fundamental shocks (population, credit and productivity) play a major role in the dynamics of house prices and residential investment before 2009. Preference shocks seem especially relevant in the last several years.

To conclude, preventing another housing boom and bust is one of the main goals of the new macroprudential regulations that many countries are putting in place. SW's result that capital inflows played a role in the US housing boom raises important questions about how optimal regulation should deal with them. To be able to answer these questions we need more empirical work about the channels through which capital inflows affect asset markets. SW's contribution in answering the question of what caused the recent housing boom leads to new and interesting questions.

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