

Credit supply and the housing boom

Alejandro Justiniano, Giorgio Primiceri, Andrea Tambalotti 27 February 2015

There is no consensus among economists on the forces that drove the historical rise of US house prices and household debt that preceded the Global Crisis. In this column, the authors argue that the fundamental factor behind that boom was an increase in the supply of mortgage credit. This rise was brought about by the diffusion of securitisation and shadow banking, and by a surge in foreign capital inflows. The finding is based on a straightforward interpretation of four key macroeconomic developments between 2000 and 2006, provided by a simple general equilibrium model of housing and credit.



Alejandro Justiniano

Senior Economist and Research Advisor in the Macroeconomics group, Federal Reserve Bank of Chicago



Giorgio Primiceri

Associate Professor of Economics, Northwestern University



Andrea Tambalotti

Assistant Vice President and Function Head in the Macroeconomic and Monetary Studies Function, Federal Reserve Bank of New York

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The Global Crisis precipitated the worst US recession since the Great Depression. The spectacular rise in house prices and household debt during the first half of the 2000s, which is illustrated in Figures 1 and 2, was a crucial factor behind these events. Yet, economists disagree on the fundamental causes of this credit and housing boom.

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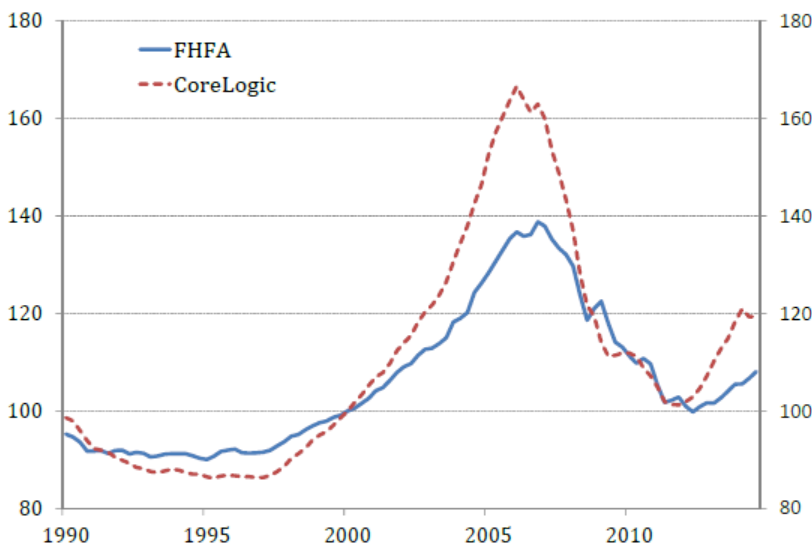
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Figure 1. Real house prices



Notes: FHFA is the all-transactions house price index from the Federal Housing and Financing Agency. CoreLogic is the repeated sales national house price index produced by CoreLogic. Both indexes are deflated by the headline consumer price index, and normalized to 100 in

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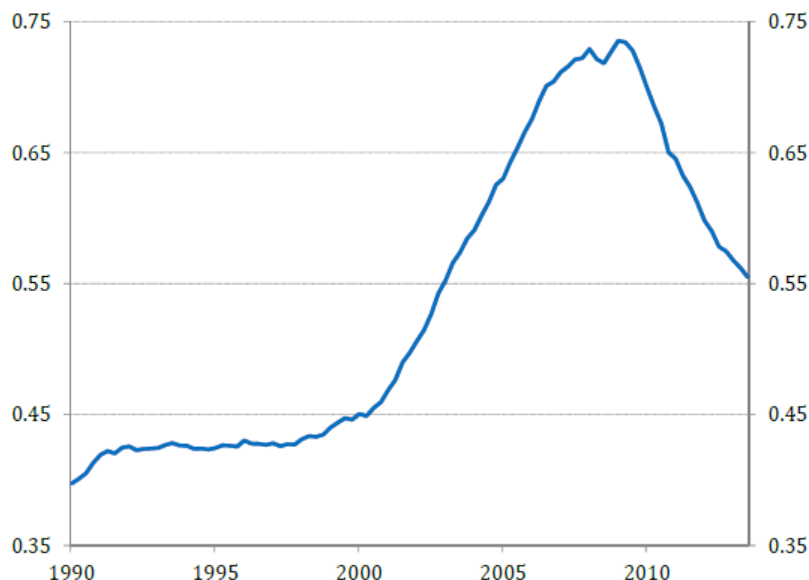
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Figure 2. Household mortgages-to-GDP ratio



Notes: Household mortgages are nominal home mortgages from the balance sheet of households and nonprofit organizations in the Flow of Funds. GDP is in current prices from the NIPA tables.

The higher loan-to-value ratio hypothesis

The most common narrative in the macroeconomic literature attributes the surge in debt and house prices to a progressive loosening of collateral requirements for mortgage borrowers, such as those brought about by the diffusion of mortgages with higher initial loan-to-value (LTV) ratios, of multiple mortgages on the same property, and of home equity lines of credit.

Several recent papers use quantitative general equilibrium models to explore the implications of these less stringent collateral requirements for house prices and other macroeconomic outcomes (e.g. Favilukis et al. 2013, Bianchi et al. 2012, Boz and Mendoza 2014, Garriga et al. 2012). In all of these models, a collateral constraint limits households' ability to borrow to a fraction of the value of their real estate. When this maximum loan-to-value ratio is relaxed, households can increase their leverage and borrow more. As a result, the demand for both credit and housing increases, boosting home prices.

There is little doubt that during the boom collateral requirements became looser, at least for certain borrowers, as documented for instance by Duca et al. (2011), Favilukis et al. (2013), and Geanakoplos (2010). But can higher loan-to-value ratios account qualitatively and quantitatively for the unprecedented increase in house prices and debt, while remaining consistent with other macroeconomic developments during the same period?

Two facts suggest that the answer to this question is no.

- First, if the relaxation of collateral constraints had been widespread, it should have resulted in a surge of mortgage debt relative to the value of real estate.

In the data, however, household debt and real estate values rose in tandem,

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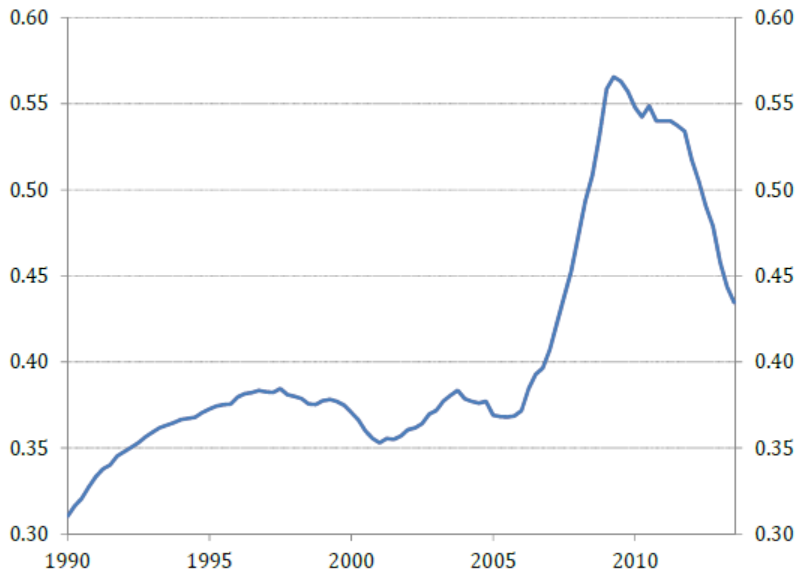
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leaving their ratio roughly unchanged over the first half of the 2000s, as shown in Figure 3. In fact, this ratio only spiked when home prices tumbled starting in 2006.

Figure 3. Household mortgages-to-real estate ratio

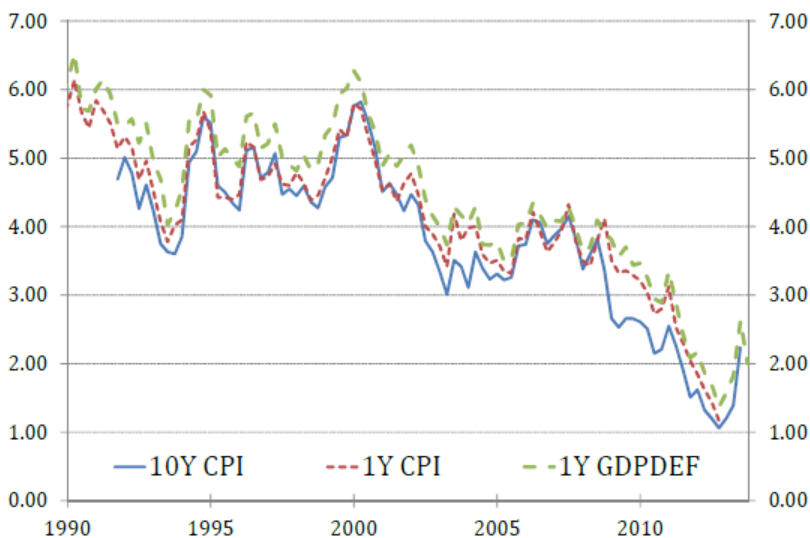


Notes: Household mortgages are nominal home mortgages from the balance sheet of households and nonprofit organizations in the Flow of Funds, as in figure 2. Real estate is the market value of real estate also from the Flow of Funds.

- Second, more relaxed collateral requirements allow borrowers to increase their demand for credit.

Therefore, interest rates must rise to convince the lenders to supply the additional funds demanded by the now less constrained borrowers. In the data, however, real mortgage interest rates fell during the 2000s, as shown in Figure 4.

Figure 4. Real mortgage interest rates



Notes: 30-year conventional mortgage rate minus three different measures of expected inflation from the Survey of Professional Forecasters. 10Y CPI corresponds to the 10-year ahead CPI forecast; 1Y CPI corresponds to the 1-year ahead CPI forecast; 1Y GDPDEF corresponds to the 1-year ahead GDP deflator forecast.

The credit supply story

The fall in mortgage interest rates depicted in Figure 4 points to a shift in credit supply as a straightforward alternative explanation of the credit and housing boom of the early 2000s. We develop this hypothesis within a simple general equilibrium model in Justiniano et al. (2015).

In the model, both borrowing and lending are subject to a friction. On the borrowing side, this friction takes the form of a collateral constraint, as in the rest of the literature. Therefore, changes to this constraint, such as those due to a higher maximum loan-to-value ratio, shift the demand for credit. On the lending side, we model the friction as a limit to the amount of funds that savers can direct towards mortgage finance. This simple lending constraint is equivalent to a leverage restriction on financial intermediaries, along the lines of Brunnermeier and Sannikov (2014) and He and Krishnamurthy (2013). Changes to this constraint then act as credit supply shifters.

Lending constraints, which are the main novel feature of our framework, are a simple modelling device to capture a host of technological and institutional factors that restrain the flow of savings into the mortgage market. Starting in the late 1990s, the explosion of securitisation and of market-based financial intermediation, together with changes in the regulatory environment, lowered many of these barriers, increasing the supply of mortgage credit.

Among the sources of looser lending constraints, the pooling and tranching of mortgages into mortgage-backed securities (MBS) plays a central role through several channels.

- First, tranching creates highly rated assets out of pools of risky mortgages.

These assets can then be purchased by those institutional investors that are restricted by regulation to only hold fixed-income securities with high ratings. As a result, the boom in securitisation contributed to channel into mortgages a large pool of savings that had previously been directed towards other safe assets, such as government bonds (Brunnermeier 2009).

- Second, investing in those same senior mortgage-backed-securities tranches freed up intermediary capital, due to their lower regulatory charges.

Combined with the rise of off-balance-sheet vehicles, this form of 'regulatory arbitrage' allowed banks to increase leverage without raising new capital, expanding their ability to supply credit to mortgage markets (Acharya and Richardson 2009, Acharya et al. 2013).

- Third, securitisation allowed banks to convert illiquid loans into liquid funds, reducing their funding costs and hence increasing their capacity to lend (Loutskina and Strahan 2009).

International factors also played an important role in increasing the supply of funds available to American home buyers, as a 'glut' of global savings flowed towards US safe assets, including agency mortgage-backed-securities (Bernanke et al. 2011).

Figure 5 plots the effects of a relaxation of lending constraints in a calibrated version of our model. When savers and financial institutions are less restricted

in their lending, the supply of credit increases and interest rates fall. Since access to credit requires collateral, the increased availability of funds at lower interest rates makes the existing collateral—houses—scarcer and hence more valuable. As a result of higher real estate values, borrowers can increase their debt, even though their debt-to-collateral ratio remains unchanged. Quantitatively, the responses of debt, house prices, aggregate leverage and mortgage rates reported in Figure 5 match well the empirical facts illustrated in Figure 1 through 4.

Figure 5. Response to a change in the lending limit



Notes: Response of key macroeconomic variables to a relaxation of the lending constraint, in the calibrated model of Justiniano et al. (2015).

Conclusion

In this column, we argued that any reconstruction of the fundamental causes of the housing and credit boom that preceded the Great Recession must be consistent with four stylised facts: house prices and debt surged, the ratio of debt to house values was roughly constant, and real mortgage rates fell. From the perspective of these four facts, explanations that rely exclusively on an increase in credit demand associated with more generous credit conditions—for instance in the form of higher loan-to-value ratios—are lacking. On the contrary, a shift in credit supply associated with the emergence of securitisation and shadow banking, is qualitatively and quantitatively consistent with the four facts.

This interpretation of the macroeconomic facts has the additional merit of being consistent with the micro-econometric evidence of Mian and Sufi (2009 and 2010). They show that an expansion in credit supply was the fundamental driver of the surge in household debt, and that borrowing against the increased value of real estate accounts for a significant fraction of this build-up in debt.

Shifting the focus of the inquiry into the causes of the boom from credit demand to credit supply has potentially important implications for the study of macro-prudential policy, since much of the literature on this topic has tended to model the boom as stemming from looser borrowing constraints. Exploring the normative implications of the alternative view proposed in this article is an exciting avenue for future research.

Disclaimer: The views expressed in this paper are those of the authors and do not necessarily represent those of the Federal Reserve Banks of Chicago, New York or the Federal Reserve System.

References

Acharya, V, and M Richardson (2009), “Causes of the Financial Crisis”, *Critical Review*, 21, 195–210.

Acharya, V V, P Schnabl, P., and G Suarez (2013), “Securitization without risk transfer”, *Journal of Financial Economics*, 107, 515–536.

Bernanke, B, C Bertaut, L Pounder DeMarco, and S Kamin (2011), “International capital flows and the returns to safe assets in the United States, 2003-2007”, International Finance Discussion Papers 1014, Board of Governors of the Federal Reserve System (U.S.).

Bianchi, J, E Boz, and E Mendoza (2012), “Macroprudential Policy in a Fisherian Model of Financial Innovation”, *IMF Economic Review*, 60, 223-269.

Boz, E, and E Mendoza (2014), “Financial Innovation, the Discovery of Risk, and the U.S. Credit Crisis”, *Journal of Monetary Economics*, 69, 1-22.

Brunnermeier, M K (2009), “Deciphering the Liquidity and Credit Crunch 2007-2008”, *Journal of Economic Perspectives*, 23, 77-100.

Brunnermeier, M K, and Y Sannikov, (2014), “A Macroeconomic Model With A Financial Sector”, *American Economic Review*, 104, 379-421.

Duca, J, J Muellbauer, and A Murphy (2011), “House Prices and Credit Constraints: Making Sense of the US Experience”, *Economic Journal*, 121, 533-551.

Favilukis, J, S C Ludvigson, and S V Nieuwerburgh (2013), “The Macroeconomic Effects of Housing Wealth, Housing Finance, and Limited Risk Sharing in General Equilibrium”, New York University, mimeo.

Garriga, C, R E Manuelli, and A Peralta-Alva (2012), “A model of price swings in the housing market”, Working Papers 2012-022, Federal Reserve Bank of St. Louis.

Geanakoplos, J (2010), “Solving the Present Crisis and Managing the Leverage Cycle”, *Federal Reserve Bank of New York Economic Policy Review*, August 2010, pp. 101-131.

He, Z, and A Krishnamurthy (2013), “Intermediary Asset Pricing”, *American Economic Review*, 103, 732-770.

Justiniano, A, G E Primiceri, and A Tambalotti (2015), “[Credit Supply and the Housing Boom](#)”, CEPR Discussion Paper 10358.

Loutskina, E, and P E Strahan (2009), “Securitization and the Declining Impact of Bank Finance on Loan Supply: Evidence from Mortgage Acceptance Rates”, *Journal of Finance*, 64, 861-889.

Mian, A, and A Sufi (2009), “The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis”, *The Quarterly Journal of*

Economics, 124, 1449-1496.

Mian, A, and A Sufi (2011), "House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis", *American Economic Review*, 101, 2132-56.

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