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Expectation-driven cycles in the housing market: Evidence from survey data☆

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ABSTRACT

Using a vector-autoregression (VAR) model and data from the University of Michigan Survey of Consumers, we provide evidence on the importance of news and consumers' beliefs for housing-market dynamics and aggregate fluctuations. We document that innovations to News on Business Conditions generate hump-shaped responses in house prices and other macroeconomic variables. We also show that innovations to Expectations of Rising House Prices are particularly important in explaining the path of macroeconomic variables during housing booms. To disentangle the effects of News on Business Conditions from other sources of expectation-driven cycles, we estimate a VAR where the News variable is ordered first. Innovations to News on Business Conditions generate Expectations of Rising House Prices. However, during housing booms, innovations to Expectations of Rising House Prices unrelated to News on Business Conditions account for a large part of macroeconomic fluctuations. Shocks to News and Expectations account together for more than half of the forecast error variance of house prices, and other macroeconomic variables, during periods of booms in house prices.

1. Introduction

Boom–bust cycles in asset prices and economic activity are a source of concern for policymakers. The boom in U.S. house prices, followed by the recent bust in 2007, has brought the topic back onto the agenda for researchers. Household's optimism about future house price appreciation is generally regarded as an explanation for housing booms.[1]

The aim of this paper is to investigate the importance of news and changes in households' beliefs for house prices and other macroeconomic variables.[2] For this purpose we use data from the Michigan Survey of Consumers and vector-autoregression (VAR) analysis. We focus on two forward-looking questions reported by the survey.

The first survey variable we use is News Heard of Recent Changes in Business Conditions (henceforth "News on Business Conditions"), which reports news heard and that we interpret as a proxy for news revealed to households about future economic activity. News on Business Conditions leads real GDP growth with high correlation. The VAR model is estimated using U.S. quarterly data over the sample period 1965:Q1–2009:Q4. Our VAR analysis shows that unexplained changes in News on Business Conditions have statistically significant implications for the future path of private consumption, inflation, house prices and the federal funds rate.

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[1] See, among others, Case and Shiller (2003), Piazzesi and Schneider (2009) and Nofsinger (2002).

[2] Recent papers by Leduc and Sill (2013) and Barsky and Sims (2012) use survey data to investigate the importance of shocks to expectations for macroeconomic fluctuations. See Section 2.

The instantaneous impact on macroeconomic variables is relatively small, but, for most of the endogenous variables, it increases and peaks after about four quarters. In particular, a positive shock to News on Business Conditions generates hump-shaped responses in both consumption and house prices. Unexpected News on Business Conditions contribute significantly to the forecast error variance of all endogenous variables. The relationship between News on Business Conditions and house prices is robust to the addition in the VAR model of residential investment and household mortgages. Mortgage loans may be important in the transmission and amplification of shocks due to the credit-channel effects implied by changes in house prices and leverage, while residential investment also captures the supply side of the housing market. A positive innovation to News on Business Conditions also generates hump-shaped responses in mortgage credit and residential investment. In both models, the housing boom is coupled with a tightening of monetary policy.

The Michigan Survey of Consumers also includes a survey about current buying conditions for houses by asking consumers whether it is currently a good time to buy a house and why. We focus on the index that reports the fraction of consumers that believe it is a good time to buy because house prices will increase (henceforth "Expectations of Rising House Prices"). Previous papers have looked at this index as a measure of consumer optimism about house prices (see Piazzesi and Schneider, 2009). Like an innovation in News on Business Conditions, unexpected changes in Expectations of Rising House Prices generate a hump-shaped response in house price with a peak occurring after about four quarters. However, the quantitative effect is smaller. Changes in the Expectations of Rising House Prices contribute by a smaller fraction to the four-quarter-ahead error variance of both house prices and other macroeconomic variables. Innovations to Expectations of Rising House Prices are particularly important when accounting for fluctuations in house prices, residential investment and mortgage credit during periods of housing booms. The contribution of changes in Expectations of Rising House Prices to the forecast error variance of housing-market variables, as well as private consumption, is between 40 and 50% during periods of housing booms.

Our VAR analysis shows that News on Business Conditions and Expectations of Rising House Prices contain information about future house prices and other macroeconomic variables. These findings raise the question of whether the two surveys capture the same information. Thus, we attempt to disentangle the effects of News on Business Conditions from other exogenous sources of fluctuation in Expectations of Rising House Prices. In a VAR with the News variable ordered first, innovations in News on Business Conditions explain about 20% of changes in Expectations of Rising House Prices. On the other hand, innovations in Expectations do not affect News on Business Conditions. The transmission of shocks to News on Business Conditions is not affected by the inclusion of Expectations of Rising House Prices in the analysis, and maintains the same importance over the entire sample. Changes in Expectations of Rising House Prices that are not driven by News on Business Conditions explain little of macroeconomic fluctuations over the sample. However, during housing booms, exogenous changes in Expectations of Rising House Prices explain a larger part of variations in house prices, residential investment and interest rates than do innovations in News on Business Conditions. We find that, during housing booms, both shocks together account for about 55 and 70% of variations in house prices and housing investment, respectively. Our results suggest that expectation-driven cycles are significant sources of business-cycle fluctuations and are particularly important in explaining booms in the housing market. The importance of shocks to News on Business Conditions and Expectations of Rising House Prices is supported by several extensions of the VAR analysis. Specifically, our results are robust to the use of alternative measures of economic activity, such as real GDP and business investment, to the use of alternative house-price indexes that include existing homes, and to the addition of the 30-year mortgage rate, which is used to finance a large part of U.S. home purchases. The rest of the paper is organized as follows: Section 2 highlights the differences and similarities of our work with closely related papers. Section 3 explores the effects of shocks to News on Business Conditions for house prices and macroeconomic developments. Section 4 studies the effects of unexplained changes in Expectations of Rising House Prices and Section 5 disentangles the effects of News on Business Conditions from those of exogenous shocks to Expectations of Rising House Prices. Section 6 conducts robustness analysis. Section 7 concludes.

2. Consumers' expectations in VAR models

Household optimism about future house price accelerations is a frequently used explanation for run-ups in house prices. In particular, Case and Shiller (2003) document that expectations of future house-price increase played an important role in past periods of rising house prices in the U.S. Piazzesi and Schneider (2009) find that the belief in rising house prices, as measured by the percentage of agents who believe that prices would rise further, increased during the last housing boom exactly when prices reached their historical highs. These authors also find that expectations of future house-price appreciation are related to optimism about economic conditions. Nofsinger (2002) argues that the emotions and psychological biases of households play an important role in the boom–bust cycle, with increased speculative behavior late in an economic expansion and restricted economic behavior in a contraction. In the following sections we document the empirical importance of news and innovations in consumers' beliefs for housing-market dynamics.

Our analysis follows Leduc and Sill (2013) and Barsky and Sims (2012) in introducing survey and expectation data into an otherwise standard VAR model. Using a structural vector auto-regression (VAR) model and survey-data of unemployment-rate expectations, Leduc and Sill (2013) show that changes in expected future economic activity contribute significantly to current economic fluctuations. In particular, they use alternative survey forecasts of the unemployment rate as compiled by the Livingston Survey, the Survey of Professional Forecasters and the Michigan Survey of Consumers and estimate a structural VAR model with actual unemployment, inflation, the 3-month Treasury bill rate and expected unemployment. In the context of a three-variable VAR with real GDP, real consumption and survey data from the Michigan Survey, Barsky and Sims (2012) show that unexpected shifts in the responses to questions that measure consumers' confidence about future economic conditions have powerful predictive implications for the future paths of macroeconomic variables.

Our paper differs from their work in two dimensions. First, we estimate a VAR model that includes standard macroeconomic variables, housing market variables (as in Iacoviello, 2005 and Musso et al., 2011) and survey data to measure the importance of shocks to news and expectations. Second, we use a measure of expectations that captures the belief in rising house prices, rather than unemployment expectations as in Leduc and Sill (2013), or the more general measure of consumers' confidence used by Barsky and Sims (2012). Thus, following Piazzesi and Schneider (2009), we focus on the fraction of respondents in the Michigan Survey of Consumers that expect house prices to increase, which we label as "Expectations of Rising House Prices". This survey series is displayed in the bottom panel of Fig. 1. See Section 4 for further details regarding this series. We also use the Michigan Survey of Consumers,