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Home equity, mobility, and macroeconomic fluctuations

Vincent Sterk

University College London, United Kingdom

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ABSTRACT

How does a fall in house prices affect real activity? This paper presents a tractable business cycle model in which a decline in house prices reduces geographical mobility, creating distortions in the labor market. This happens because homeowners face declines in their home equity levels, which makes it more difficult to provide the downpayment required for a new mortgage loan. Therefore, unemployed homeowners more often turn down job offers that would require them to move. The model can account for joint cyclical patterns in housing and labor market aggregates, and predicts a breakdown of the Beveridge curve in 2009. Counterfactual experiments are used to quantify the macroeconomic importance of the mobility channel during the Great Recession.
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1. Introduction

During the "Great Recession" of 2008, the U.S. economy experienced unusual disruptions in both housing and labor markets. Housing markets were hit by sharp declines in both prices and the number of transactions. Labor markets witnessed an increase in aggregate unemployment that was surprisingly large, even given the strong decline in job vacancies (Elsby et al., 2010). The upper panel of Fig. 1 plots vacancies versus the unemployment rate. The figure shows that the historically strong and negative correlation between these two variables, known as the Beveridge Curve, broke down during 2009. A common interpretation of this phenomenon is that frictions in the labor market had become more severe, causing unemployed workers and firms to be matched less efficiently. The simultaneous bust in house prices suggests that the reduction in labor market efficiency may have been related to problems in the housing market.

This paper explores the link between housing and labor markets over the business cycle from a macro perspective. I study cyclical patterns in U.S. data spanning four decades and document that busts in the housing market are associated with downturns in the labor market. Additionally, I construct state-level measures of labor market efficiency and show that during the Great Recession, states with more low-equity homeowners experienced greater declines in labor market efficiency.

To interpret these findings, I develop a parsimonious Dynamic and Stochastic General Equilibrium (DSGE) model in which house prices affect unemployment through a geographical mobility channel. When house prices decline, borrowing-constrained homeowners face difficulties in moving to a new house, reducing their incentives to accept job offers that are not within commutable distances from their current homes. As a consequence, a decline in house prices causes unemployment to rise and output to fall, which in turn feeds back into house prices.

I calibrate the model and show that it can account for much of the observed cyclical co-movements in housing and labor market variables. Moreover, based on only house price and output data, the model generates for 2009 a flattening of the Beveridge Curve, like in the data. That said, joint fluctuations in housing and labor markets do not fully derive from causal

E-mail address: v.sterk@ucl.ac.uk

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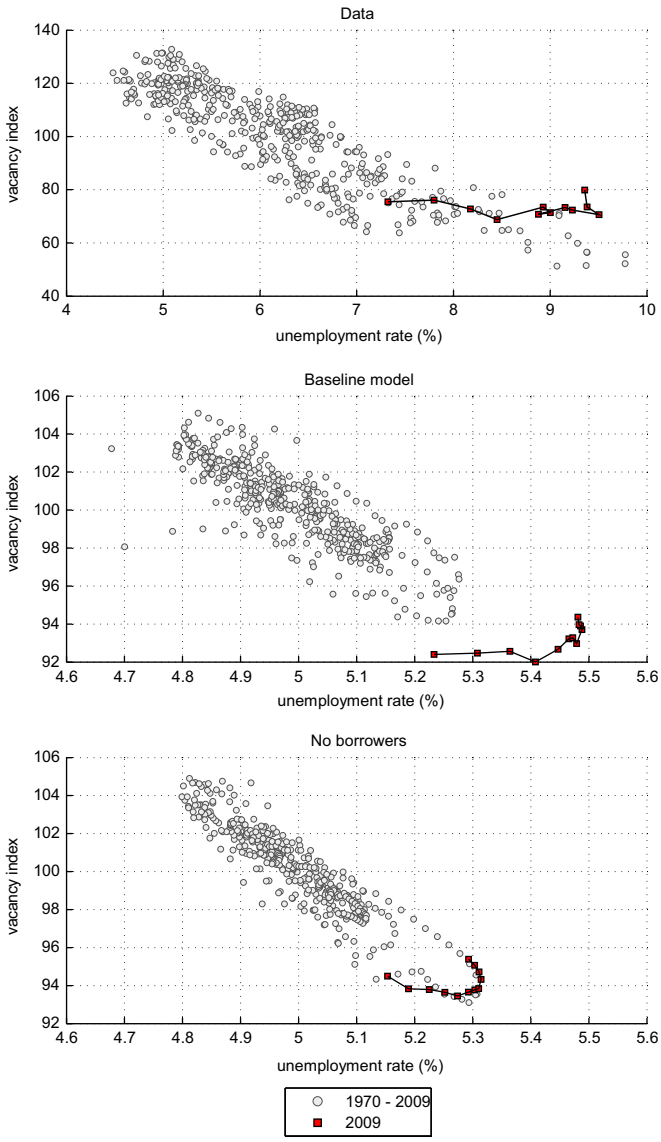

Fig. 1. Beveridge curve in the data, in the baseline model and in the model without borrowers. *Notes*: observations are monthly and cover the period from January 1970 until December 2009. All variables were logged and HP-filtered with smoothing parameter value $81 \cdot 10^5$. This value corresponds to the one used by Shimer (2005) for quarterly data, but is adjusted for the frequency using the factor recommended by Ravn and Uhlig (2002). After filtering, levels were re-constructed by adding either the average of the trend component over the sample (for the data) or the steady-state level (for the model). Data source unemployment rate: U.S. Department of Labor. Data source vacancy index: (Barnichon, 2010).

spillovers due to the mobility channel. The quantitative importance of such spillovers is strongly disciplined by model parameters, in particular parameters that pin down the fraction of households that is credit-constrained. Simple counterfactual experiments are used to isolate the effect of a fall in house prices on mobility and other macro-outcomes.

The model is able to reproduce the positive co-movement between house prices and transactions observed in the data, due to the presence of a refinancing constraint that is new to DSGE models.[1] A standard modeling choice is to assume that collateral constraints tie the amount of debt to the value of the underlying housing collateral, and that in each period mortgagors are required to refinance their loans (see e.g. Iacoviello, 2005). The unrealistic implication of these assumptions is that fluctuations in house prices affect the borrowing limits of all homeowners during each period. By contrast, my constraint only requires those who move to a new house to refinance their loans, so households can shield their borrowing capacity from a fall in house prices by staying in their current locations, avoiding the need to take out a new mortgage loan.

[1] Stein (1995) considers a similar constraint and shows that it can generate positive co-movement between house prices and transaction volumes in a very stylized three-period model. The advantage of my constraint is that it is easily embedded in a DSGE framework that can be solved using standard techniques.

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