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Labor market participation, unemployment and monetary policy ☆

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ABSTRACT

Models of unemployment and monetary policy usually assume constant participation. Incorporating a participation decision into a standard New Keynesian model with matching frictions, we show that market tightness becomes endogenously more volatile because both the opportunity cost of home production and the reservation wage vary with participation. The model can simultaneously explain the low volatility of participation, the high volatility of unemployment, and a procyclical workers' outside option of working. A policy of strict inflation targeting is close to optimal, and increasing the response of the interest rate to inflation does not have a large impact on the volatility of unemployment because of the endogenous response of participation.

1. Introduction

Recent empirical evidence has shown that movements in the labor force explain between one-fourth (Barnichon and Figura, 2010) and one-third (Elsby et al., 2015) of the cyclical variation in the unemployment rate. This fact is in stark contrast with most recent dynamic stochastic general-equilibrium models with nominal rigidities and matching frictions. This paper builds an otherwise-standard New Keynesian model with matching frictions featuring a labor market participation decision, and compares it to an alternative model assuming an exogenously constant labor force.

We find that, even though the labor force is the least volatile among labor market variables, neglecting it might be misleading. For a given participation rate, shocks and policies that affect firms' incentives to post vacancies directly determine employment and the unemployment rate. In a model of endogenous labor force, they also affect labor market variables through the participation decision via two channels. On the one hand, they make job search more or less attractive due to their effect on job-finding rates, and they thus induce the household to vary labor supply. On the other hand, they affect workers' outside option, which feeds back on vacancy posting and, ultimately, on the initial change in labor demand. A model that accounts for these two channels delivers different implications for the transmission of shocks and monetary policy on labor market variables, as compared to a model with fixed labor supply.

Our findings contribute to the literature in two respects. First, they speak to the debate initiated by Shimer (2005) and continued with Hagedorn and Manovskii (2008) and, recently, with Chodorow-Reich and Karabarbounis (forthcoming). In both the exogenous and the endogenous participation models, the marginal value of home production, which is introduced

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to capture non-work activity, is procyclical conditional on market productivity shocks. As pointed out by Chodorow-Reich and Karabarbounis (forthcoming), this fact implies that a high relative average value of non-work to work activity does not necessarily address the Shimer critique, contrary to the proposal by Hagedorn and Manovskii (2008). However, in the endogenous participation model the household chooses participation so as to tie the marginal rate of substitution between market and home goods to labor market tightness, which indeed captures the opportunity cost of home producing. At equilibrium, the marginal rate of substitution becomes less volatile than under exogenous participation because households substitute market work with housework. As a result, firms find it cheaper to post vacancies when technology improves, and the unemployment rate is about four times more volatile than under constant participation.

Second, our findings show that treating the labor force as invariant to policy leads to incorrect evaluation of a change in the monetary policy rule on the volatility of labor market variables. For instance, the exogenous participation model overpredicts the surge in the volatility of employment and of the unemployment rate due to inflation stabilization, conditional on technology shocks. Similarly, it overstates the fall in the volatility of employment due to unemployment stabilization, conditional on preference shocks. This is because the policy change is absorbed by the participation margin to a large extent. As a result, the welfare ranking of alternative monetary policy rules varies across models. Under our calibration, a monetary policy rule assigning some weight to the unemployment rate is welfare improving compared to a rule that neither fully stabilizes inflation nor targets the unemployment rate. The opposite holds if participation is assumed to be constant.

Entry to the labor market is modeled as the outcome of an optimal time-allocation problem among market work, housework and search activity, and micro evidence is used to calibrate the household's opportunity cost of search in terms of forgone home production.[1] A combination of technology and preference shocks ensures that both the endogenous and the exogenous models match key second moments of labor market variables. Then, our mechanism is validated by showing that the model also accounts for observed fluctuations of the participation rate in the U.S. economy, a moment that is not targeted.

Two papers in particular are related to ours. Galí (2010) considers a model of adjustment costs to employment and an endogenous labor force. Differently from us, he does not tackle the role of the participation margin for monetary policy and he assumes a large opportunity cost of search, as compared to the micro evidence, downplaying the importance of labor force fluctuations. When the search cost is indeed large, the exogenous and the endogenous participation models display very similar dynamics. Christiano et al. (2012) consider a New Keynesian model with endogenous search intensity. However, they abstract from matching frictions neglecting the mechanism highlighted here, which is entirely driven by the general–equilibrium interaction between participation decisions and vacancy posting.

The paper is organized as follows. Section 2 describes our model economy, Section 3 explains the calibration strategy, Section 4 investigates the incentives driving the participation decision, Section 5 performs the policy analysis, and Section 6 concludes.

2. The model

The economy is populated by a representative large household whose utility depends on market- and home-produced goods, firms producing a homogeneous intermediate good under perfect competition, and final retailers selling a differentiated market good under monopolistic competition.[2] There are search frictions à la Diamond (1982) and Mortensen and Pissarides (1999) in the labor market, and the household's members can be employed, unemployed or non-participant. The employed engage in market production; the unemployed home produce in the residual time unoccupied by job search; the non-participant solely devote to housework. In the intermediate-good sector, firms need to be matched with a household member in order to produce and, when searching, they are subject to a vacancy posting cost. Jobs can be exogenously discontinued at any time. In the final-goods sector prices are sticky, as in Calvo (1983).[3]

2.1. Households

The representative household consists of a mass 1 continuum of family members. The mass of employed, unemployed, and non-participant members is denoted by E_t, U_t, and N_t, respectively. The pool of labor market participants is given by $L_t = 1 - N_t$, which can be interpreted as the participation rate.

In a generic period, say $t-1$, after all decisions have been taken and executed, a fraction ρ of the employed are separated from their job. The unemployed, the non-participants, and separated workers $U_{t-1} + N_{t-1} + \rho E_{t-1} = 1 - (1-\rho)E_{t-1}$ form the non-employment pool, out of which some members become searchers in the following period, S_t, and the remaining ones

[1] Changes in time devoted to home-related activity upon entering the labor force roughly match time spent in job search, as we document in Table 1.

[2] The paper describes the primitives of the model and illustrates only the key equilibrium conditions. All derivations are relegated to the online appendix available at http://dx.doi.org/10.1016/j.jmoneco.2016.03.001.

[3] A two-sector setup keeps matching frictions separated from price rigidity as in Walsh (2005) and Trigari (2006).

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