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Business cycles, unemployment insurance, and the calibration of matching models

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Abstract

This paper theoretically and empirically documents a puzzle that arises when an RBC economy with a job matching function is used to model unemployment. The standard model can generate sufficiently large cyclical fluctuations in unemployment, or a sufficiently small response of unemployment to labor market policies, but it cannot do both. Variable search and separation, finite UI benefit duration, efficiency wages, and capital all fail to resolve this puzzle. However, either sticky wages or match-specific productivity shocks can improve the model's performance by making the firm's flow of surplus more procyclical, which makes hiring more procyclical too.

JEL classification: C78; E24; E32; I38; J64

Keywords: Real business cycles; Matching function; Unemployment insurance

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1. Introduction

A model of real business cycles with matching (RBCM) is a natural candidate for exploring many dynamic policy issues. Postulating a job matching function helps us give a coherent analysis of unemployment and its response to labor market policies (see Rogerson et al., 2005 for a recent survey of matching models). Moreover, Merz (1995), Andolfatto (1996), and den Haan et al. (2000) have claimed that endogenizing unemployment by means of a matching function improves the fit of real business cycle models. Thus it is tempting to use the RBCM framework to measure the costs of business cycles or the purported benefits of output stabilization, or to ask whether unemployment benefits should vary with the cycle, among other issues.

These questions interest us. But when we tried to build a model to address them, we quickly encountered problems with the RBCM framework which existing literature had not pointed out. For our purposes, we needed a model consistent both with business cycle facts and with the effects of labor market policies. We found it easy to choose parameters to make the cyclical variation in unemployment as large in the model as it is in the data, or to make the response of unemployment to a change in the unemployment insurance (UI) benefit as small in the model as it is in the data. But no calibration permits the standard RBCM model to reproduce both these features: improving the fit over the cycle makes the fit worse with respect to policy, and *vice versa*. Similar problems occur with employment, vacancies, tightness, and the probability of job finding.

These findings are related to a prominent recent controversy. Shimer (2004, 2005) and Hall (2003, 2005a, b) studied the cyclical dynamics of calibrated RBCM models and obtained fluctuations of unemployment and vacancies an order of magnitude smaller than those in the data.[1] The reason is that in their models, productivity shocks cause strong wage movements that offset the incentive to vary hiring, thus eliminating most fluctuations in unemployment and vacancies. As a corollary, they also found that a model with sticky wages, instead of the more traditional Nash wage bargaining framework, does a better job of reproducing labor market fluctuations.

While our observations are related to those of Shimer and Hall, we feel that an important element is missing in their argument, because their claim that unemployment is insufficiently variable in the RBCM model is not true in general. In fact, it is specific to their particular calibration: Shimer and Hall both assume that workers' cost of working is low compared to their productivity, so that the match surplus is large. When this restriction is removed, it is easy to make unemployment volatile. If the surplus is small on average, then a small fall in labor productivity may eat up a large proportion of the surplus, so that realistic productivity fluctuations generate arbitrarily high variability in vacancies, unemployment, and tightness. Stated differently, if the cost of working is acyclical, and is on average only slightly less than after-tax labor productivity, then wages will be relatively rigid and profits and hiring incentives will be strongly procyclical.

[1] An early paper anticipating Shimer and Hall's results is Millard et al. (1997).