Operationalizing equilibrium unemployment: A general equilibrium external economies approach[☆]

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Abstract

This paper presents a new formulation of equilibrium unemployment that is inspired by job search or matching models. Unlike those approaches, however, this formulation does not rely on an explicit stochastic process. The matching process is incorporated through external economies in the labor market such that market expansions reduce the unemployment rate and contractions increase it. The model gives intuitively appealing results in both its static and dynamic versions with relatively little modeling overhead. Conceptually, this formulation represents a modest revision of the standard Arrow–Debreu model, and it builds on the external economies literature. To illustrate the formulation in an applied model, results are presented from an analysis of the United States' commitment to reduce carbon emissions under the Kyoto Protocol. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

There are several informative theories of unemployment. Among these, equilibrium models of job search ('matching models') are particularly appealing, yet these ideas have not yet found their way into applied general equilibrium models. The purpose of this paper is to introduce a practical method by which job search can be incorporated in economy-wide models. The starting point for this exercise is to think about unemployment as the result of a process by which willing individuals are transformed into employed workers. This process involves an external effect through which the economy-wide vacancy rate and the unemployment rate alter the job matching probability of individual workers. This paper presents this simple theory of equilibrium unemployment and its operation in a general equilibrium model. There are two compelling aspects of this formulation. First, the model is quite tractable as it relies on a well established technique for representing external economies. Second, there are some very appealing qualitative properties of the model. When placed in a dynamic context, the formulation captures the magnified short-run unemployment reactions consistent with the business cycle.

The dynamic model offers a practical strategy for incorporating equilibrium unemployment in large-scale general equilibrium models. Current applied models often center on long-run efficiency and welfare impacts. Although these considerations are probably of most importance, many policymakers find them intangible. Modeling unemployment bouts and other transitional adjustment dynamics builds a modeling procedure's credibility in the eyes of policymakers and weakens the persistent influence of disequilibrium models. The model presented here can deliver insights on short-run dynamic issues that are not available in existing frameworks.

Unemployment should be modeled as a natural feature of equilibrium, and fluctuations in the unemployment rate should be tracked as rational responses by agents to the opportunities they face.[1] An empirically acceptable theory should provide a positive rate of unemployment but, more importantly, the theory should postulate sensible responses to shocks. Current theories of equilibrium unemployment rely on a real wage equation in which there is a premium on the reservation wage. This paper exploits this equation in a general form as an equilibrium condition for workforce participation. Consistent with the

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[1] In the late 1960s, in an effort to reevaluate the Phillips curve, there was a push to develop new theories of unemployment that did not rely on disequilibrium models. This work explored the role of job search models and much of it can be found in Phelps (1970). These search models were subsequently refined (see, for example, Lucas and Prescott, 1974; Hall, 1979; Diamond, 1982; Mortensen, 1986). This study relies primarily on the work by Pissarides (1979, 1990), which clearly specifies a matching technology. Other theories of equilibrium unemployment expanded on the importance of information asymmetries between workers and employers (Salop, 1979; Shapiro and Stiglitz, 1984).