



On-the-job search and strategic bargaining

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Abstract

This paper studies wage bargaining in a simple economy in which both employed and unemployed workers search for better jobs. The axiomatic Nash bargaining solution and standard strategic bargaining solutions are inapplicable because the set of feasible payoffs is nonconvex. I instead develop a strategic model of wage bargaining between a single worker and firm that is applicable to such an environment. I show that if workers and firms are homogeneous, there are market equilibria with a continuous wage distribution in which identical firms bargain to different wages, each of which is a subgame perfect equilibrium of the bargaining game. If firms are heterogeneous, I characterize market equilibria in which more productive firms pay higher wages. I compare the quantitative predictions of this model with Burdett and Mortensen's [1998. Wage differentials, employer size and unemployment. *International Economic Review* 39, 257–273.] wage posting model and argue that the bargaining model is theoretically more appealing along important dimensions.

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1. Introduction

This paper modifies the [Burdett and Mortensen \(1998\)](#) model of on-the-job search by allowing wages to be determined via strategic bargaining rather than posted unilaterally by firms. There are both empirical and theoretical motivations for studying such a model. Empirically, [Mortensen \(2003, Section 4.3.4\)](#) argues that a bargaining model provides a

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better description of the data than does the wage posting model, although his model of bargaining is not totally explicit. Theoretically, bargaining is pervasive in search models *without* on-the-job search and so it is intellectually interesting to understand how bargaining affects the equilibrium of a model of on-the-job search. Moreover, there are significant theoretical shortcomings of the wage posting model. Coles (2001) explains that the equilibrium of the Burdett and Mortensen (1998) model is not time consistent (or renegotiation-proof) because once a firm lures a worker away from her old employer, it has an incentive to cut its wage. By construction, an equilibrium wage in the bargaining model is renegotiation-proof. Finally, the wage posting model is not readily amenable to a study of out-of-steady state dynamics. Doing so is much easier in the bargaining model I develop here.

Search theorists are increasingly aware of the need to incorporate on-the-job search into their models. In part this is because job-to-job transitions are pervasive in the United States economy. According to conservative estimates, job-to-job transitions are about half as common as unemployment-to-employment transitions (Blanchard and Diamond, 1989). Using evidence from a newer data set, Fallick and Fleischman (2004) argue that half of all new employment relationships result from a job-to-job transition rather than a movement from unemployment or out of the labor force into employment.

But the interest in on-the-job search models is also a consequence of the novel theoretical results that they generate. Burdett and Mortensen (1998) develop a wage-posting model in which firms offer high wages to attract workers from other firms and to reduce worker turnover. They show that the unique equilibrium of the labor market is characterized by a continuous wage distribution, even if all workers and firms are identical. If firms are heterogeneous, higher productivity firms pay higher wages. This paper has spawned a number of extensions. Stevens (2004) and Burdett and Coles (2003) allow firms to post wage contracts rather than just a single wage. The latter paper shows that if workers are risk averse, equilibrium involves a distribution of contracts, each with an upward-sloping wage profile. Postel-Vinay and Robin (2002) allow firms to match outside offers and show that workers may voluntarily take a wage cut in order to move to a firm that is likely to be more aggressive in matching outside offers in the future. Cahuc et al. (2006) explicitly model the bargaining game between a worker and one or more potential employers. Moreover, many of these models have been tested using matched worker–firm data sets; Mortensen (2003) is a prominent example.

At the same time, there is a substantial gap between this model and the ‘standard’ labor market model of search, summarized in Pissarides’s (2000) textbook. In the simplest version of that model, only unemployed workers search for jobs. When a worker and firm meet, the wage is set in accordance with the axiomatic Nash (1953) bargaining solution. Pissarides shows that this results in the worker and firm splitting the gains from trade, with the worker’s share determined by her (exogenous) bargaining power. There have been some attempts to introduce on-the-job search into the bargaining model. Pissarides (1994) assumes that a worker and firm split the surplus from matching. The equilibrium of the resulting model is qualitatively different from the equilibrium of the Burdett and Mortensen (1998) model: If workers and firms are homogeneous, then all workers earn the same wage at all jobs, so there is no wage dispersion. The natural conclusion is that whether there is wage dispersion in a homogeneous agent economy with on-the-job search depends critically on whether firms post wages or wages are bargained.

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