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Job mobility, wage dispersion, and technological change: An asymmetric information perspective[☆]



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ABSTRACT

This paper develops a model of job mobility and wage dispersion with asymmetric information. Contrary to existing models in which the superior information of current employers leads to market collapse, this model generates a unique equilibrium outcome in which (a) positive turnover exists and (b) identical workers may be paid differently. The model implies that, in the presence of technological change that is skill-biased and favors general skills over firm-specific skills, the wage distribution becomes more spread out (corresponding to greater inequality) and job mobility increases.

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1. Introduction

There are two well-documented empirical regularities concerning the labor market for young workers. First, young workers frequently change jobs. A typical U.S. worker holds seven jobs in the first 10 years of his labor-market experience; see, for example, [Topel and Ward \(1992\)](#). Second, the wage distribution of young workers widens over time, both unconditionally and conditionally (on the observables); see, for example, [Farber and Gibbons \(1996\)](#). Moreover, wage dispersion has increased significantly over the past 35 years; see, for example, [Autor et al. \(2005\)](#).

Job mobility and wage dispersion have both been studied extensively and important insights have been gained on both.¹ Existing models of job mobility, however, rarely discuss their implications for wage dispersion, nor do models of wage dispersion typically consider job mobility. This is surprising because models of either mobility or dispersion often share two common sets of assumptions. First, information about the abilities of workers is imperfect and is revealed over time. Second, workers can receive multiple offers from different firms at the same time. These assumptions reflect a set of underlying economic forces – namely imperfect information, learning, and multiplicity of wage offers – that are common to both job mobility and wage dispersion. Therefore, one might expect that patterns in job mobility and in wage dispersion are connected.

In this paper, I develop a model that offers a framework for studying the joint determination of wages and job changes as a result of asymmetric learning. The model applies to settings where the current employer knows more about a worker's

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¹ Important models of job mobility include [Jovanovic \(1979a,b\)](#), [Greenwald \(1986\)](#), [Gibbons and Katz \(1991\)](#), and [Acemoglu and Pischke \(1998, 1999\)](#). Important models of wage dispersion include [Burdett and Judd \(1983\)](#) and [Burdett and Mortensen \(1998\)](#). [Mortensen \(2001\)](#) offers an excellent survey of wage-dispersion models.

ability than prospective employers do.² The superior information of the current employer creates a standard lemons problem. In this model, however, the presence of the lemons problem does not lead to market collapse. Instead, there exists a unique equilibrium allocation in which the current employer offers a wage equal to the average outside output of all types below the worker's ability, and outside firms compete for the workers by using mixed strategies. The unique equilibrium allocation determines both the allocation of workers with heterogeneous abilities to different firms and how wages change when workers change jobs.

The setup of this model is similar to Greenwald's (1986) classic asymmetric-information model, but with one important difference (described below). There are two periods, a single worker, and finitely many firms. At the beginning of period 1, firms compete for the worker using wage competition à la Bertrand. The worker picks a period 1 employer. At the end of period 1, the incumbent (period 1 employer) learns about the worker's ability while outside firms do not. Moreover, the worker may accumulate firm-specific human capital, which makes him more productive at the incumbent firm in period 2. Fully aware of the informational and production advantage of the incumbent, all firms offer wage contracts simultaneously to the worker at the beginning of period 2.

The key difference between our model and Greenwald's involves the timing of offers at the beginning of period 2. Greenwald assumes (as do many subsequent models) that the incumbent knows all the offers made by the outside firms before making a counteroffer. This timing of offers makes the lemons problem in the second-hand labor market so severe that the market collapses when there are no exogenous movers or differences in match qualities. In this model, in contrast, I assume that the incumbent and outside firms make their offers simultaneously. The assumption about the simultaneity of offers has been used in the literature; see, for example, Waldman (1984). This difference in timing alleviates the lemons problem and produces endogenous turnover and a non-degenerate wage dispersion.

In the unique equilibrium allocation of this model, the current employer's wage offer is strictly increasing in the worker's ability. The outside firms randomize their wage offers between the minimal and the maximal wage offers by the current employer. This randomization implies that some workers will receive outside offers higher than the current employer's offer. Consequently, endogenous turnover can arise in this model without requiring exogenous movers or differences in match qualities. In addition, the randomization generates wage dispersion for workers. The wage dispersion occurs at two levels. The first level indicates that different workers are in general paid differently because the current employer's wage is increasing in the worker's ability. The second level provides that workers of identical abilities can also be paid differently because outside firms randomize their wage offers so, for two identical workers, one may receive a high outside offer and the other may not.

A particular feature of the model is that there are explicit formulas for turnover probabilities and for wage distribution. The formulas on turnovers imply that, in contrast to models with symmetric information, turnover probability depends on both firm-specific and general human capital levels. The formulas for wage distribution allow one to compare the wage distribution of the workers who stay with the incumbent firm with those who have left.

The main application of the model uses these formulas to study the effect of technological change on wage inequality and job mobility. To the extent that technological change favors workers with higher abilities over those with lower abilities and favors general skills over specific skills in production, the model generates the following predictions. First, the wage distribution becomes more spread out as described in Bickel and Lehmann (1979), which corresponds to greater inequality. Note that the model is one of asymmetric information; it applies to workers with the same observables. Therefore, the widening of the wage dispersion refers to the increase in residual inequality, i.e., the dispersion of wages in observationally equivalent groups. Second, the job mobility of all worker types increases. Third, the proportional increase in job mobility is larger for workers with higher levels of firm-specific human capital. These patterns are consistent with empirical evidence on recent changes in wage inequality and job mobility in the United States.

Literature review: This paper is related to three strands of the literature. First, in terms of topic, this paper belongs to the literature that explores the effect of asymmetric information on labor market outcomes. Greenwald (1986) shows that asymmetric information reduces turnover and leads to compression in wages. Waldman (1984) shows that asymmetric information leads to distortion in promotion decisions.³ Gibbons and Katz (1991) explore the consequence of asymmetric information on layoff decisions, and Acemoglu and Pischke (1998, 1999) study the effect of asymmetric information in general.

This paper adds to the literature by showing that a mixed strategy can occur with asymmetric information. The mixed strategy implies that the turnover probability of a worker decreases continuously in the worker's ability, whereas the turnover probability takes a zero-one form in most of the existing literature.⁴ In addition, the mixed strategy implies that identical workers can be paid differently, whereas there is typically no wage dispersion for workers of identical abilities in the literature.

Second, in terms of its analytical structure, this model is most closely related to the first-price auction models with privately informed bidders; see, for example, Engelbrecht-Wiggans, Milgrom, and Weber (EMW) (1983). While this type of auction has been studied in the auction literature, the implications of EMW have not been explored in the labor market

² Several recent papers test the empirical implications of the asymmetric information in the labor market; see, for example, Kahn (2009), Pinkston (2009), and Schoenberg (2007).

³ Golan (2005) shows that promotion can be efficient if the incumbent firm is allowed to make counteroffers.

⁴ One exception is Novos (1995). The continuity of turnover probability arises in his model because, in addition to their abilities, workers also differ in their tastes for the job.

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