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Matching, human capital, and the covariance structure of earnings

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Abstract

This paper tests the theory of job matching and the theory of human capital by examining the covariance structure of residuals from a typical Mincer log earnings equation using methods of moments techniques. Job matching theory predicts that we should observe an eventual decrease in the contribution of the job-match component in the residual variance as workers acquire tenure on the job. This prediction is mildly supported by the data. On the other hand, human capital theory predicts a trade-off between job-specific intercept and slope parameters. This prediction, which is not shared by the theory of matching, is strongly supported by the data. This is especially true for men with at least a high school degree. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

Two competing explanations for the existence of a positive return to tenure are human capital and matching. Both theories predict that the conditional mean of wages should rise with tenure.[2] In this paper, I attempt to distinguish between these two theories by

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[2] See Becker (1975)'s development and exposition of the theory of human capital and Jovanovic (1979a,b, 1984) for the job matching argument. Mortensen (1988) incorporates both human capital and matching and derives the optimal separation strategies. For an analysis of worker mobility patterns in the United States and their relationship with both models, see also Farber (1999).

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focusing on their implications for the covariance structure of earnings. Using data from the National Longitudinal Survey of Youth (NLSY) over the period 1979–1996, I find strong evidence of a negative correlation between job-specific wage growth and the job-specific intercept, a prediction of the theory of human capital that is not shared by the theory of job matching.

The existence of a return to employer tenure has been a subject of controversy over the last 15 years. Although ordinary least-squares estimates indicate a positive relationship between wages and tenure (e.g. Mincer and Jovanovic, 1981), endogeneity problems have led researchers to develop estimation methods that account for the fact that firm seniority is likely to be correlated with unobservable factors, such as the quality of the worker/firm match. Using data from the Panel Study of Income Dynamics (PSID), Abraham and Farber (1987), Altonji and Shakotko (1987), and Altonji and Williams (1997) find no evidence of a significant return to tenure, while Topel (1991) finds large returns. With data from the National Longitudinal Survey of Young Men, Marshall and Zarkin (1987) also find quite a small tenure effect once they empirically control for the selection process by which only acceptable wage offers on the current job are ever observed. Other authors have focused on the importance of industry-specific capital as a factor of wage growth. With data from the Displaced Worker Surveys, Neal (1995) finds that tenure with the predisplacement employer is positively correlated with the wage earned in the post-displacement job only for those workers who stay in the same industry, a result that is difficult to reconcile with the view that tenure measures only the accumulation of firm-specific skills. Using data from the PSID and the NLSY, Parent (2000) finds that by creating a measure of industry tenure and adding this measure to the log-wage equation, the firm tenure effect all but disappears.

At a theoretical level, MacLeod and Malcomson (1993) find, in a simple model with competitive contract formation, that a positive or negative return to seniority can occur, depending on the nature of specific investments and the structure of market returns for human capital.

Thus, we can see that finding no return to firm seniority when estimating a wage regression cannot necessarily be interpreted as evidence against the importance of firm-specific investments in an employment relationship. For one thing, it might simply reflect the fact that firms are paying the full costs of such investments as well as reaping the full returns. Hence, working with the first conditional moments of wages may not be the appropriate or more convincing way of assessing the relative importance of human capital vs. matching. In previous work, Hause (1980) modeled the second moments of wages, their variances and covariances, to test the prediction of the general human capital model that those who invest more should have both a steeper slope and a lower intercept in their wage profile. This prediction implies that the covariance between these two individual-specific parameters should be negative. In this paper, I extend Hause's approach by introducing jobs into the analysis. It is then possible to isolate a similar key prediction of human capital theory that there should be a trade-off between the job-specific intercept and the tenure slope. Other things being equal, those who start out with a lower salary invest more in human capital and consequently should have a steeper slope. In contrast, the pure theory of matching does not predict such a trade-off within

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