Career Dynamics
of Doctoral Scientists and Engineers

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Abstract

This paper specifies and estimates a dynamic model of task choices with symmetric learning about one of task-specific abilities and dependence on past performance. The model is applied to the career choice problem of doctoral scientists and engineers to explain the following puzzle: Early in their career, the majority of doctorates are employed in R&D and earn the lowest salaries relative to other tasks. However, as careers progress, they leave R&D for more applied tasks or completely change careers, while those who stay in R&D experience large earnings growth. This paper explains this puzzle with the presence of incomplete information about research ability which can be obtained by engaging in R&D. The model is fit to the rarely used Survey of Doctoral Recipients (1973-2001): a longitudinal data set on the employment histories and earnings of doctorates educated in the US. The parameters of the model are estimated using the Method of Simulated Moments. The predictions of the model are used to evaluate the effects of two counterfactual experiments on the supply of the research skills. First, different learning schemes are compared to the case of full information. Second, the effects of R&D subsidies and changes in the employment options outside sciences and engineering are assessed.

Keywords: occupational choices; learning; science and technology; human capital; high-skill labor markets.

JEL Classification Codes: J24, J44, J62, D83.

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