

The cyclical upgrading of labor and on-the-job search

Michael U. Krause ^{a,*}, Thomas A. Lubik ^{b,1}

^a *Economic Research Center, Deutsche Bundesbank, Wilhelm-Epstein-Str. 14, 60431 Frankfurt, Germany*

^b *Department of Economics, Johns Hopkins University, Mergenthaler Hall, 3400 N. Charles Street, Baltimore, MD 21218, USA*

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Abstract

This paper examines patterns of worker reallocation in the search and matching model of the labor market. We show that on-the-job search is crucial for explaining the observed cyclical upgrading of workers to better employment opportunities in booms. This is due to the rising availability of employed searchers which facilitates recruitment for newly created high-wage jobs. The standard model fails to exhibit such behavior. At the same time, the model is consistent with salient features of labor market dynamics, such as the volatility of vacancies and unemployment, and a highly procyclical rate of job-to-job transitions. This suggests an important channel for the reallocation of workers across jobs as well as the propagation of aggregate shocks.

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1. Introduction

Search and matching theory, as outlined by [Mortensen and Pissarides \(1994\)](#) and [Pissarides \(1994\)](#) has become the dominant framework for the analysis of labor market dynamics over the business cycle.² An initial focus on the cyclical behavior of job flows, such as job creation and destruction, has been met with reasonable success, as shown by [Mortensen and Pissarides \(1994\)](#), [Cole and Rogerson \(1999\)](#) and others. However, recent research has begun to uncover aspects of the data that the search and matching model is not able to reconcile without strong auxiliary

* Corresponding author. Tel.: +49 69 9566 2382; fax: +49 69 9566 3082.

E-mail addresses: michael.u.krause@bundesbank.de (M.U. Krause), thomas.lubik@jhu.edu (T.A. Lubik).

¹ Tel.: +1 410 516 5564; fax: +1 410 516 7600.

² Examples are [Merz \(1995\)](#), [Andolfatto \(1996\)](#), and [Den Haan et al. \(2000\)](#).

assumptions. For instance, [Hall \(2005\)](#) and [Shimer \(2005\)](#) argue that the cyclicity of vacancies and unemployment can only be explained when assuming either implausibly large shocks to productivity or exogenously rigid wages.

This paper introduces on-the-job search in a search and matching model to account for key patterns of labor reallocation over the business cycle. With workers in low-wage jobs searching while on the job, we find that high-wage sectors exhibit more cyclical employment growth.³ Apart from this new result, the model also generates strongly procyclical job-to-job worker flows, a dimension missing from many models. Consequently, while most new hires in a boom are in good jobs, the outflows from unemployment shift towards low-wage employment. Thus, there is a cyclical change in the composition of new employment opportunities for unemployed workers.

The behavior of our model is in line with a number of empirical regularities on worker flows emphasized in the literature. It features a form of vacancy chain, since job-to-job quits induce creation of job vacancies ([Akerlof et al., 1988](#); [Contini and Revelli, 1997](#)). Hiring into new jobs and replacement hiring are strongly procyclical. As argued by [Okun \(1973\)](#), booms are associated with a relative larger supply of good jobs. Search on the job facilitates the reallocation of workers from bad to good jobs, and therefore the creation of good jobs in a boom. This point is also stressed by [Mortensen \(1994\)](#) and [Mortensen and Pissarides \(1999\)](#), and elaborated upon more recently by [Barlevy \(2002\)](#). Finally, workers that have been employed for a long time have lower quit rates, since they are more likely to have made the transition to a good job.⁴

In the model, job heterogeneity is introduced via two job types that differ in terms of profitability and thus wages. This offers a natural motivation for search on the job. Workers in low-wage ('bad') jobs search in order to gain employment in high-wage ('good') jobs. Good job vacancies can be matched with employed and unemployed job seekers, whereas firms in the bad job sector only hire unemployed workers. Wages are determined by surplus sharing for each matched job-worker unit and are continuously renegotiated. We calibrate the model to match salient long-run features of job and worker flows.

The main reason for on-the-job search to play such an important role is that it accelerates the reallocation of workers across jobs. In a standard model, all job growth has to be fed from the pool of the unemployed, which is quickly exhausted in a boom. Instead, increasing search activity by the already employed opens a new channel of employment growth for new, higher value firms. The availability of employed searchers relaxes the economy's resource constraint: input into the production of new matches is rising since employed workers see an incentive for higher search intensity. In that sense, on-the-job search resembles variable factor utilization in the aggregate production function. The incentive to search more intensively is maintained throughout a boom, and the ability of the economy to allocate workers more efficiently is thus enhanced.

This paper also adds to a literature that explores the efficiency of booms and recessions. [Barlevy \(2002\)](#) argues that on-the-job search is crucial for explaining mobility patterns in the labor market, and emphasizes its role for the efficient allocation of resources over the cycle. One view holds that recessions facilitate the reallocation from unproductive to more productive uses.⁵ However, this should imply that recessions are times when newly created jobs are the most productive. [Barlevy](#) cites evidence by [Davis et al. \(1996\)](#) that jobs created in recessions are of lower average quality and yield below average pay. He also argues that the fact that worker

³ For evidence on the cyclicity of employment, see [McLaughlin and Bills \(2001\)](#) and [Aaronson and Christopher \(2004\)](#).

⁴ See, for example, [Pissarides \(1994\)](#) for an overview of the relevant empirical findings.

⁵ See, for example, [Caballero and Hammour \(1996\)](#).

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