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FOCUS PAPER

Directed search over the lifecycle

by Ludo Visschers

The US economy displays a great deal of labour reallocation, in the sense that workers move frequently between employment, unemployment and across different employers. However, these aggregate transition rates hide dramatic differences in the extent of labour reallocation for workers of different ages. The purpose of this paper is to explain these differences, specifically for young, middle-aged and old workers. To this end, a life-cycle model of the labour market is introduced, in which different worker–firm matches have different productivity and the allocation of the right workers to the right firms is a time-consuming process because of search and learning frictions. On one side of the labour market, firms choose how many and what type of vacancies to open. On the other side, both employed and unemployed workers choose which type of vacancy to seek. In this sense, the search process is directed. When workers and firms match, they begin production and eventually learn the quality of their union.

In equilibrium, all workers face a choice between searching for vacancies that offer relatively higher wages and searching for vacancies that are relatively easier to find. The choices faced by a particular worker depend on his age, experience and current employment position (i.e., unemployment or employment in a match of a given quality). Overall, these three characteristics determine his optimal search strategy and, consequently, the velocity at which he moves across employment states.

The model is calibrated using aggregate data on transition rates for employed and unemployed workers, both using mean values which are unconditional and conditional on employment tenure. The calibration reveals a great deal of heterogeneity in the quality of firm–worker matches. For example, a match in the 90th percentile of the quality distribution is approximately three times more productive than a match in the 10th percentile. Both the search and learning frictions in the model are modest. However, the large heterogeneity in match quality and the modest frictions add up to generate a rather time-consuming process of assigning the right workers to the right firms.

The calibrated model predicts quite well the mean of transition rates conditional on a workers' age. The model is then used to decompose the overall effect of age on the transition rates into the contribution from three characteristics that differ between older and younger workers: work-life expectancy, experience and selection into matches of different quality. The decline in the job-finding rate experienced by unemployed workers between the ages of 50 and 65 is mainly due to the decline in work-life expectancy, which reduces workers' value to firms as production partners. The decline in the employment exit rate experienced by workers between the ages of 20 and 30 is mostly due to their transition from low to high quality matches, which reduces their incentive to move into unemployment. Moreover, the steady decline throughout the life cycle in the job-to-job transition rate is caused initially by the increase in the quality of the workers' matches and later by the decline in work-life expectancy.

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Credit and Labour Market Foundations of the Macroeconomy

FEBRUARY 2019

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Finally, the model is used to identify the causes of productivity and wage growth over the life cycle. Almost all of the growth in labour productivity takes place during the first ten years of the workers' lives, and approximately 76% of this growth is due to increases in experience, while 24% is due to improvements in the quality of the matches. Similarly, almost all of the life-cycle growth in wages takes place early in a worker's career.

The model developed and introduced in this paper provides a successful and practical way to introduce life cycle considerations into macroeconomic analysis of the labour market. The model is successful because it accounts for the pattern of workers' transitions across employment states over the life cycle. The model is practical because it can be easily solved in the presence of aggregate shocks. In this paper, the model is solved in the presence of aggregate demographic shocks, rather than under the standard counterfactual assumption of a constant population growth rate. The model could also have been used to study how much of the recent slow-down in the growth rate of wages and labour productivity can be attributed to the ageing of the baby boomers. Similarly, other authors have solved a version of this model with aggregate productivity shocks, which they used to understand the impact of recessions on the careers of young workers.

Information

This paper is from Menzio, Guido., Telyukova, Irina A., Visschers, Ludo., Directed search over the life cycle in Review of Economic Dynamics, vol. 19, January 2016, pp. 38-62

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