Hiring through referrals

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Abstract

An equilibrium search model of the labor market is combined with a social network. The key features are that the workers' network transmits information about jobs and that wages and firm entry are determined endogenously. Empirically, the inter-industry variation in aggregate matching efficiency is attributed to variation in referral use. The model predicts that the efficiency of the aggregate matching function is pro-cyclical which is consistent with empirical evidence.

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1. Introduction

Social networks are an important feature of labor markets (Granovetter [17]). Approximately half of all American workers report learning about their job through their social network (friends, acquaintances, relatives, etc.) and a similar proportion of employers report using the social

networks of their current employees when hiring (the evidence is summarized in Section 2 and is surveyed in Ioannides and Loury [21], and Topa [32]).

Surprisingly, however, social networks are typically not included in the equilibrium models that are used to study labor markets. For instance, in their extensive survey of search-theoretic models of the labor market, Rogerson, Shimer and Wright [29] do not cite any papers that include social networks or referrals. Social networks have been extensively studied using graph theory (Jackson [22]). When applied to labor markets, however, these models usually restrict attention to partial equilibrium analyses where, for instance, wages or labor demand are exogenous (e.g. Calvo-Armengol and Jackson [7]).[2]

The present paper proposes to bridge this gap by combining an equilibrium search model with a network structure that is simple enough to preserve tractability but also rich enough to deliver several predictions that can be confronted with the data.

In the model, workers are homogeneous in terms of their productivity and network. Each worker is linked with a measure of other workers and the network is exogenous. Vacancies are created both through the free entry of new firms and through the expansion of producing firms.[3] A firm and a worker meet either through search in the frictional market, which is described by a standard matching function, or through a referral, which occurs when a producing firm expands and asks its current employee to refer a link. The flow surplus of a worker–firm match is equal to output plus the value of the referrals and the wage is determined through Nash bargaining.

The structure of the model is used to examine the large inter-industry differentials in aggregate matching efficiency documented in Davis, Faberman and Haltiwanger [12] and Sahin, Song, Topa and Violante [30]. This variation is decomposed into the two channels of matching, referrals and the market, whose relative importance is determined by the rate of referral generation and the efficiency of the market matching function, respectively.

A property of the model is that a higher rate of generating referrals increases both aggregate matching efficiency and the proportion of jobs found through a referral. However, a higher efficiency of the market matching function increases aggregate matching efficiency but reduces the prevalence of referrals. Therefore, the source of inter-industry variation in the speed of matching can be determined by examining the empirical correlation between referral prevalence and aggregate matching efficiency.

To evaluate the above, a standard aggregate matching function (i.e. one where referrals are not explicitly modeled) is estimated and the rates of referral prevalence are calculated for every major industry.[4] It turns out that the estimates for the aggregate matching efficiency are positively and significantly correlated with the prevalence of referrals across industries. According to the model, therefore, the variation in referral prevalence is the proximate cause for the observed inter-industry variation in aggregate matching efficiency. As a result, examining why referral use varies across industries is informative about the nature of labor market frictions.

The next property of the model is that an increase in the unemployment rate reduces the flow of referrals, in addition to increasing congestion among the unemployed. This leads to the prediction that the job finding rate is a decreasing function of the unemployment rate *conditional on labor market tightness*; in other words, aggregate matching efficiency is pro-cyclical. This prediction

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[2] Calvo-Armengol and Zenou [8], Fontaine [13] and Galeotti and Merlino [15] are exceptions and are discussed below.

[3] However, the distribution of firm sizes is degenerate: each firm hires one worker and vacancies created through an expansion are immediately sold off.

[4] Data from the National Longitudinal Survey of Youth, the Job Openings and Turnover Survey and the Current Population Survey is used. See Section 4 for the full data description.