Journal of Economic Behavior & Organization 119 (2015) 211–233

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

Explaining U-shape of the referral hiring pattern in a search model with heterogeneous workers

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ARTICLE INFO

Article history:
Received 13 June 2014
Received in revised form 20 August 2015
Accepted 24 August 2015
Available online 1 September 2015

JEL classification:
J23
J31
J38
J64

Keywords:
Family contacts
Professional networks
U-shape
Referral puzzle
Wage premiums
Wage penalties

ABSTRACT

This paper presents a search model with heterogeneous workers, social networks and endogenous search intensity. There are three job search channels: costly formal applications and two costless informal channels – through family and professional networks. Our model explains a U-shape referral hiring pattern observed in empirical studies and a strong selection of workers on productivity across the three channels. Moreover, combining family and professional referrals into one informal channel may generate a spurious result of wage premiums (penalties) if high (low) productivity workers are dominating in the empirical data and their productivity is not fully observable to the econometrician.

1. Introduction

Several studies show that referrals are mostly used by workers in the tails of the skill distribution, whereas all other workers in the middle are more likely to use a formal channel of job search (Brown et al., 2012) for the US, Corak and Piraino (2011) for Canada, Boxman et al. (1991) for the Netherlands). The purpose of this article is to explain this U-shape referral hiring pattern in a labour market matching model with heterogeneous workers, social networks and referrals.

The ingredients of the model are as follows. Firms are homogeneous at the stage of a vacancy, but workers differ in their productivity which we also interpret as skill heterogeneity. There are two types of social contacts. Family contacts are exogenous in the model and serve as a residual method of search. In addition, every worker has a fixed number of professional contacts.[1] Ioannides and Datcher Loury (2004) report that acquired social contacts develop along dimensions such as race, ethnicity, religious affiliation and education. Therefore, in our model we assume a strong degree of network homophily along the productivity or the skill dimension. Thus, the job-finding rate through the network of professional contacts is

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[1] The importance of relatives for job search is reported by Corak and Piraino (2011) and Kramarz and Skans (2014). For the role of former co-workers see Cingano and Rosolia (2012) and Glitz (2013).

http://dx.doi.org/10.1016/j.jebo.2015.08.012
0167-2681/

skill-specific. In this setup, we distinguish between the three job search channels: formal applications to posted vacancies and two informal channels – through family and professional networks. Both informal channels of search are costless for workers, but preparing a formal application is associated with a positive effort cost. Moreover, through the endogenous group-specific advertising intensity firms can direct their network search towards particular groups of incumbent employees. This contrasts with the formal search channel, which is random and undirected.

There are two key predictions of the model which can be described in the following way:

- The model exhibits a strong U-shape referral hiring pattern: workers in the right (left) tail of the productivity distribution have the highest propensity of finding a job with a help of professional (family) contacts, whereas the formal channel of search is mostly utilized by workers in the middle range of the distribution;
- When the two types of social contacts are separated, family contacts are associated with wage penalties, whereas referrals from professional contacts are associated with wage premiums. The average effect of referrals on wages is ambiguous and depends on the relative proportions of high and low productivity workers in the population.

To the best of our knowledge there are no other studies that can generate these two predictions in a unified theoretical framework. First, we explain the mechanism which is generating the U-shape. Low productivity workers expect low wages thus it's not optimal for them to exert costly search effort. At the same time hiring these workers is not profitable for firms, so that firms prefer to direct their search towards more productive worker groups. Hence low productivity workers rely on family referrals as a method of last resort. Further we show that due to the strong homophily of professional networks firms correctly anticipate a high productivity applicant if they approach an incumbent employee of the same type. Such a behaviour of firms is based on the belief that people usually refer workers who are similar to themselves (Galenianos, 2014; Saloner, 1985; Montgomery, 1991). Therefore, high productivity workers tend to find their jobs by means of professional referrals. It also implies that average workers mostly use the formal channel: their expected wages are sufficiently high and motivating to exert search effort but their outside opportunities in terms of professional referrals are not yet too good. This describes the U-shape hiring pattern as an outcome of workers' selection across search channels. Selection on productivity is consistent with empirical evidence, for example, when pooling data for 14 European countries, Pelizzari (2010) shows that referrals are associated with a wage penalty of 17.4% before controlling for worker characteristics. However, this effect is reduced to only 4.4% after controlling for observable worker traits and down to 2% when controlling for unobservables.

Next we analyze the effect of referrals on wages. As low productivity types are more likely to rely on family contacts, the equilibrium wage distribution of workers who used this channel is first order stochastically dominated by the distribution of workers who used a formal method. So the model predicts wage penalties associated with family contacts. In contrast, high productivity workers are more likely to rely on professional contacts. Thus the equilibrium earnings distribution corresponding to this channel first order stochastically dominates the distribution of workers who used a formal method. Hence the network of professional contacts is associated with wage premiums. Intuitively, wage penalties/premiums arise due to the self-selection of workers into a specific search channel and are robust to different shapes of the productivity distribution. This is different for the average effect of referrals on wages which is negative (positive) in a labour market with a large fraction of low (high) types. This finding may serve as an explanation for the mixed empirical evidence on referral wages as most studies do not distinguish between family and professional referrals focusing on a unique informal channel.[2]

Yet there are several notable exceptions among empirical papers. For example, Cappellari and Tatsiramos (2015) report that high skilled workers with a better network quality of non-relatives experience wage premiums in the British labour market. In contrast, low skilled workers with a better network quality of relatives are more likely to experience a wage penalty associated with a referral. Likewise, empirical evidence presented in Meliciani and Radicchia (2011) for Italy suggests that workers entering the labour market via professional contacts enjoy a wage bonus, whereas those recruited via referrals from family and close friends receive on average lower wages. Similar results are also reported by Sylos Labini (2004) for Italy and Antoninis (2006) for Egypt which is a direct support for the second prediction of our model.

More empirical evidence in favour of the selection mechanism described by our model is provided by Kramarz and Skans (2014) for Sweden and Kuzubas and Szabo (2014) for Indonesia. For example, the former study finds that parental networks matter more in the job search process for low educated youths even though there is a wage penalty in the first years of employment. Moreover, Kuzubas and Szabo (2014) report that in their sample low educated workers are more likely to find a job through family and close friends (52%) compared to college graduates (34%). In addition, Meliciani and Radicchia (2011) write that "people entering the labour market via relatives and friends contacts have lower levels of education, no specific competencies or training than the average and seem to be generally concentrated into lower occupational groups" (p. 521).

[2] For example, Staiger (1990), Simon and Warner (1992) and Granovetter (1995) report that referrals are associated with wage premiums in the United States. The hypothesis of wage premiums is also supported by Margolis and Simonnet (2003) and Goos and Salomons (2007) for France and the United Kingdom. In contrast, Bentolila et al. (2010) report wage penalties in the United States and the European Union. This result is supported by Delattre and Sabatier (2007), Pistaferri (1999) as well as Addison and Portugal (2002) for France, Italy and Portugal respectively. This contradicting empirical evidence, which can be well described as a "referral puzzle", is summarized in Pelizzari (2010) who writes that "... in the European Union premiums and penalties to finding jobs through personal contacts are equally frequent and are of about the same size".