



Occupational mismatch and social networks



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ABSTRACT

A labor market model with heterogeneous workers and jobs is provided to investigate the effects of social networks as a job information channel regarding the level of mismatch between workers and firms. The efficiency in producing good matches of the formal market is compared to that of social networks. It is assumed that links between workers represent favoring relationships: workers recommend each other for any kinds of jobs, regardless of the quality of the resulting match. This study shows that as the fraction of ties connecting similar agents (homophily) increases, the level of mismatch decreases. If this fraction is sufficiently high, networks provide good matches at a higher rate than the formal market, for any efficiency level of the market. In this case, the mismatch level is lower in economies with social networks than it would be if workers did not use social contacts for job search. Hence, the presence of social networks can reduce mismatch despite favoritism. Implications of mismatch creation for the expected wages of jobs obtainable through different search methods are also discussed.

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1. Introduction

1.1. Motivation

Workers often use social contacts while searching for a job, in addition to formal methods such as newspaper ads or direct application to employers. Research shows that 30–60 percent of workers obtain employment through informal methods (see, for example, [Granovetter, 1995 \[1974\]](#); [Holzer, 1987](#); [Bentolila et al., 2010](#); [Pellizzari, 2010](#)). The extensive use of social networks originates from the important roles such networks play in mitigating two primary informational problems prevalent in the labor market: (1) job referrals provide information about the unobserved characteristics of workers for firms (see, for example, [Montgomery, 1991](#); [Galenianos, 2013](#)); and (2) employed workers transmit information about vacancies to their unemployed social contacts and in this way reduce search frictions ([Calvo-Armengol and Zenou, 2005](#)).

While most papers analyze the signaling function of referrals, this paper considers the role of social networks in reducing search frictions. The few articles studying social networks in the search and matching framework assume that workers are homogeneous and investigate the impact of social contacts and network connectivity on the unemployment rate ([Calvo-Armengol and Zenou, 2005](#); [Ioannides and Soetevent, 2006](#)). This paper analyzes two new aspects of the job search via

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social ties. First, it introduces heterogeneous workers and vacancies to the model and studies how social networks influence the matching of workers to the jobs suitable for their skills. It defines “mismatch” as the disagreement between the skills required by a job and those possessed by the worker occupying the position.¹ Second, this paper emphasizes that labor market outcomes are affected not only by the number of contacts, but also by the characteristics of those contacts, in this case the types of the skills they possess.

The results of this study show that the impact of social networks on matching efficiency depends on the degree of homophily, defined as the tendency of workers with identical skill background to be connected in the network. This study finds that when the homophily level is sufficiently high, the mismatch level in the economy with social networks is lower than it would be if workers did not use social contacts for their job search. This paper also compares social networks and the formal market with regard to the likelihood of creating good matches. It assumes that social networks consist of favoring relationships: workers recommend each other to vacancies even if the referred worker lacks the required skills for the job.² The formal market is modeled as a random arrival process of jobs to unemployed workers, where an efficiency parameter captures the likelihood that the market produces good matches. This study finds that, despite favoritism, social contacts are less likely to create mismatch than the formal market when the homophily level is large enough; this result holds true for any efficiency level of the market.

Three factors lead to the above-mentioned results. First, similar contacts are more likely to provide information on good matches than dissimilar ones; therefore, for higher degrees of homophily the network is more efficient in terms of matching. Second, it is assumed that employed workers hear about the new openings within the sector of their current job. It follows that a worker can transmit a good job offer to those contacts who possess similar skills, as long as s/he is employed in a good match. In this way, when the homophily level is high, the network becomes more efficient when there are more workers employed in good matches. The fraction of workers employed in good matches increases when the market efficiency parameter rises; consequently, the efficiencies of the two search methods are interrelated: a more efficient market implies a more efficient network. Because of this interconnection, for high levels of homophily, there is no level at which the market is more efficient at matching than the social network. Third, it is assumed that job tenure is shorter in bad matches than in good matches, which increases the fraction of workers employed in good matches in the equilibrium; it also increases the likelihood of hearing about a good job via social contacts.

Previous literature also focused on the impact of social networks on mismatch. [Bentolila et al. \(2010\)](#) show that the social network always increases the mismatch level in society, and that the formal market is more efficient in terms of matching than the network even for high values of homophily. There are two important differences between [Bentolila et al. \(2010\)](#) and this model. First, in [Bentolila et al. \(2010\)](#), agents perfectly direct their search on the formal market and, consequently, the market does not create mismatch, only the social network. In the model presented here, the directed search on the formal market is imperfect, and a parameter is introduced which captures how often this search method provides a good match. Second, their model is static in the sense that the information access of social contacts is exogenously given and does not depend on their employment status. Therefore, the market efficiency does not affect the arrival rate of good offers via social contacts. In the dynamic model presented here, every agent moves between three states: unemployment, employment in a bad match, or employment in a good match. This means that contacts can transmit different types of job information depending on their actual sector of employment, and the market efficiency increases the efficiency of the social network. These important differences give rise to the possibility that the social network is more efficient in terms of matching than the formal market when the homophily level is large enough.

[Montgomery \(1991\)](#) analyzes the impact of social networks on match quality in a context where workers differ in unobservable ability and homogeneous firms seek to employ high-ability workers. He finds that the average match quality is higher through social ties than on the market whenever more than half of the links connect similar workers. In contrast, in this study's model, the required homophily level is always higher and depends on other parameters of the model. The first difference between his paper and this study is that this study considers a model with heterogeneous firms and the problem of assignment of workers to sectors according to their observable skills, rather than the role of social networks in signaling unobservable ability. Moreover, in Montgomery's model, firms choose to hire through referrals only when the referral's (already observed) productivity is high and the firm can exploit the homophilous nature of social ties to find high-ability workers. In this study's model, the arrival of workers to firms through the network is random, as workers pass job information to a randomly chosen neighbor of theirs and firms do not choose the network channel for hiring based on information about the referral's type or his/her (possibly unknown) network characteristics. Despite this random arrival process, the network can be more efficient than the formal market.

¹ Mismatch has alternative definitions as well. Some papers define mismatch based on the *quantity* of education: a worker is mismatched if s/he is over- or undereducated compared to the job's required quantity of education ([Leuven and Oosterbeek, 2011](#); [Korpi and Tahlin, 2008](#)). Another literature defines mismatch as the difference in the occupational or geographical distribution of labor between demand and supply ([Thisse and Zenou, 2000](#); [Shimer, 2007](#); [Sahin et al., 2011](#)) and investigates the impact of this difference on the unemployment rate.

² Agents might have good reasons to recommend someone with inappropriate skills for a job despite possibly suffering reputation loss with the employer. One such reason is that social ties are used in many contexts other than the labor market, for example risk sharing, and the reputation loss might be compensated by benefits along these other dimensions ([Beaman and Magruder, 2012](#)). Forwarding job offers contributes to the maintenance of such beneficial links. Another reason for passing along unsuitable offers is that such behavior is reciprocated in the future, resulting in a shorter unemployment period for the individual ([Bramoulle and Goyal, 2013](#)).

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