

## How do social networks affect labor markets?

### Job-referral networks can make labor markets more productive and efficient but may increase the importance of luck in job matches

Keywords: referral networks, wages, unemployment, inequality, social interactions

#### ELEVATOR PITCH

Social networks, or “job-referral” networks, can help make labor markets become more efficient. Outside the firm, they help workers obtain employment after displacement and secure higher-paying jobs. They can also match highly-skilled workers to more productive employment. Inside the firm, referrals facilitate employment relationships that are more stable, productive, and profitable. In aggregate, referral networks help “grease the wheels” of a labor market that can be beset by a range of information problems. However, such networks can also be segmented along racial, ethnic, and socio-economic lines, which brings into question the effect they may have on inequality between and within different groups of workers.

#### KEY FINDINGS

##### Pros

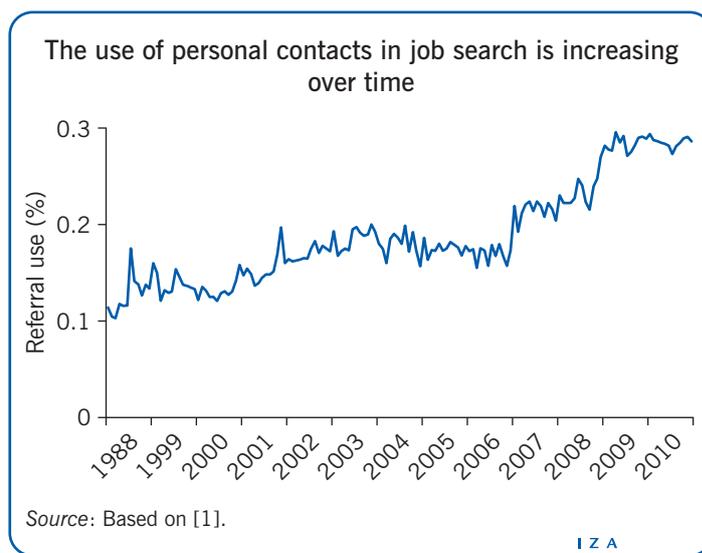
- + Referral networks improve labor market efficiency by increasing the information job seekers and employers have about each other.
- + Referral networks help job seekers find employment, and firms locate available workers.
- + Referred workers remain on the job longer, and are often more highly skilled.
- + Workers can find higher-paying jobs through referral networks.
- + Referral networks match more able workers to higher-paying firms.

##### Cons

- The use of referral networks can exacerbate inequality between groups with limited social contact.
- Job referrals may be a search method of last resort for workers with limited outside options.
- Referral use is pro-cyclical and tied to local labor market conditions.
- Good data is lacking on how job-referral networks affect labor markets.

#### AUTHOR'S MAIN MESSAGE

Employee referral networks can help resolve many different kinds of information problems that arise in labor markets. However, given the limited evidence available it would be advisable to avoid policies that explicitly curtail or encourage their use. Policymakers should support easier access to administrative data for researchers and initiate new surveys that include information on referral and social networks, as well as encourage new technologies and mechanisms to address labor market information problems currently being addressed by referrals. Concerns that referral networks might perpetuate economic disparities could be better addressed through policies that foster social integration.



## MOTIVATION

Even though information technology is expanding and becoming more sophisticated and accessible to an increasing number of people, social interactions nevertheless still play a key role in matching workers to jobs throughout the developed and developing world.

Employee referral is a recruitment method used by firms to identify potential employees from within existing employees' social networks. The incentive for employees to refer social contacts for an available job is often a referral financial bonus. Employers recognize this method of recruitment as being a more cost-effective and efficient method of recruitment, as referral networks are able to address many different kinds of information problems that can normally plague the labor market. Referral networks can help employers find better workers as well as help workers find better jobs. More generally, these networks can speed up the rate at which workers and firms find each other.

Because of their widespread use, understanding how referral networks affect the labor market is important for research and policy. On the one hand, referral networks are likely to make labor markets more fluid and flexible. On the other hand, because social networks develop around existing social and economic hierarchies, they may also contribute to labor market inequality and immobility.

This leads to the primary empirical question of whether referral networks improve labor market outcomes at all. If so, the central policy question is whether they do so by improving labor market efficiency or simply by redirecting employment opportunities.

## DISCUSSION OF PROS AND CONS

By most measures, the use of personal contacts by workers and firms to facilitate job search is widespread and growing over time. The illustration on page 1 reports the use of personal contacts in job search among the unemployed from the US Current Population Survey (CPS). The use of personal contacts nearly tripled over a ten-year period. Referrals are also a productive form of job search. Estimates vary across sources, but researchers consistently find between 30% and 50% of workers report having found their current job through referral.

### **Social similarity, sorting, and “homophily”**

People choose with whom to socialize in general, and with whom to share job information in particular. A large body of sociological evidence supports the casual observation that people tend to socialize with people who are similar to themselves in some way. The term used to describe this tendency is “homophily.” For example, there is a strong tendency in social networks toward homophily on the basis of ethnicity and socio-economic status.

The presence of homophily has a number of implications for the analysis of job information and referral networks. On the one hand, because of the effect of homophily on unobserved characteristics (such as punctuality, discipline), good workers might be more likely to know other good workers. If so, then referrals perform a screening role. On the other hand, if social networks are stratified by race, ethnicity, and economic status, then referral networks can reinforce between-group inequality. More troublingly, referral networks can play both roles at the same time. That is, it is possible that firms use referrals

as a screening mechanism, but the opportunity to take advantage of that screening role favors some groups of workers more than others.

### **Sources of evidence**

Until recently, data and empirical evidence on the relevance of referral networks has been quite limited. The survey data used to study labor markets do not, in most countries, regularly collect information on job finding through referral. The empirical research has therefore been largely confined to idiosyncratic surveys or survey supplements.

New research has made up for the dearth of survey evidence with novel and complementary sources of information. Administrative record data (such as data arising from unemployment insurance or social security records that match individual workers to the firms that employ them) contain details on the relationships among workers, particularly as neighbors and co-workers, which can be creatively used to obtain evidence on the use, and effects, of referral networks. Personnel records and field experiments demonstrate exactly how and why some firms and workers use referrals. Studies based on these new data sources indicate that referral networks can improve individual labor market outcomes and overall efficiency, but perhaps in a manner that could exacerbate inequality.

Research based on different information sources must be interpreted with a clear sense of what the data can, and cannot, reveal. This contribution discusses empirical results from all sources as revealing information about “referral networks.” In studies based on survey and personnel records, there is often information about whether a worker was referred to their present job, or has been asking people they know for information as part of their job search. However, these data sources generally lack information on the nature of those social contacts. By contrast, in administrative record data, referrals are not usually explicitly recorded. Rather, the transmission of job information must be inferred from other details in the data.

### **Evidence from administrative records**

Administrative record data allow researchers to construct highly plausible measures of job information networks and can be used to infer the effects of job referral. These measures rely on the fact that in such data it is possible to observe affiliations that put individual workers in close physical proximity, either because they are co-workers in the same establishment, or because they live or work in the same neighborhood. That co-workers and neighbors interact socially has been well-established by sociological and anthropological research. It follows that the labor market characteristics and outcomes of former co-workers or neighbors can be informative about the type and quality of job information to which an individual worker might be exposed.

If networks of co-workers or neighbors direct the flow of information about labor market opportunities, their influence can, in principle, be detected by comparing the labor market outcomes of workers with access to networks of different quality. In practice, such comparisons may not reveal the effect of social networks, but instead reflect the presence of sorting or self-selection. The role of homophily in the formation of social networks means that a worker will tend to associate with people who have similar abilities and

traits that affect labor market outcomes. As a result of this sorting, an individual's labor market outcomes will be correlated with the outcomes of people in their social network, whether or not there is any exchange of job-related information. This means that, for example, an analysis which finds workers embedded in networks where wages are high are also likely to have high wages, but cannot be interpreted as providing clear evidence that social networks improve wages. Progress in understanding the labor market effects of networks requires research designs that convincingly separate the influence of referral networks from the effects of sorting. All of the following studies tackle the fundamental challenge of distinguishing the influence of social networks from sorting, in increasingly sophisticated ways.

### *Neighborhood networks*

A very influential paper used data from the US city of Boston that match individuals to both their home and work locations to show that administrative record data could provide persuasive evidence on the existence of job referral [2]. The authors show that a pair of workers living in the same block are three times more likely to also work in the same firm than a pair of workers living in the same neighborhood, but on different blocks. Consistent with homophily in social interactions, these effects are stronger for workers of the same race and the same gender. The results are also stronger for workers with low levels of education, which is consistent with other research that suggests that informal networks are more important for this group.

This study has been very influential, both as a model for how to address the self-selection problem and, more importantly, for demonstrating that social interactions in job search can plausibly be inferred from administrative record data in which there is no direct evidence of referral or information sharing. The results imply that where you live, and who you know, can affect where you work. These findings have now been replicated in studies using a wider range of US cities and employing a different empirical strategy [3], [4], as well as in working papers based on administrative record data from France and Germany.

These studies leave open many questions regarding how, precisely, residential referral networks affect individual labor market outcomes, and the role of referral networks in individual job search. The latter question is addressed in a study using matched employer-employee data across 30 US cities in which workers can be followed from job to job [4]. The idea is that firms differ in how much they are willing to pay a given worker. In such an environment, referral networks may channel opportunities to work in higher paying firms to workers with better connections. The study finds that workers on blocks with neighbors that are already employed in better-paying jobs are more likely to find a job, and especially to find jobs in higher-paying firms, than workers who reside in the same neighborhood, but on blocks with neighbors in lower-paying jobs.

The preceding research illustrates the tension between the role of referrals in increasing productivity on the one hand, but also the role of luck (i.e. "who you know") in individual labor market outcomes on the other. Its results indicate that referrals are more likely to be made by better workers, and to be received by better workers. The findings are consistent with the idea that homophily facilitates screening: employers use referral networks to find higher-quality employees. However, workers with better referral networks will find employment with firms that pay a higher wage. To the extent that the labor market is

characterized by “good” and “bad” jobs, referral networks shepherd better-connected workers toward the “better” jobs.

#### *Family networks*

Another study using Swedish administrative data comes to somewhat different conclusions [5]. The authors observe whether children become employed in the same establishments as one of their parents when entering the labor market. Like the studies of neighborhood networks discussed above, and the studies of co-worker networks discussed next, this study does not have direct evidence on referral. However, whereas those studies must rely on the presumption that individuals residing in the same neighborhood, or who were past colleagues in the same firm, share information about jobs, it is substantially more plausible that when a child ends up working in the same plant as their parent, their parent actively participated in helping him or her find that job. The effects of parental referrals are somewhat different than the apparent effects of neighborhood-based referrals. Accordingly, such interactions are more likely when: (i) parents are better workers; but (ii) children are less educated. The results of the study also suggest that referred children have lower starting wages than other new entrants.

This latter result partially contradicts evidence on referral from firm personnel records, which tends to find that referred workers receive higher starting wages. These conflicting results highlight a broader tension in studies of referral networks: social interactions are used in job search to solve a wide range of information problems. As such, their effects may not be the same when studied across different contexts. This fact is demonstrated in data from a supplement to the US National Longitudinal Survey of Youth 1979 cohort. Among all young male workers, referral is associated with longer tenure. However, referral is associated with higher wages for some workers and lower wages for others. Like the Swedish study, the workers for whom referral is associated with lower wages are those whose referrals come from family members. For this latter group, it seems that referral may be a search method of last resort for workers with poor labor market opportunities [6].

#### *Co-worker networks*

A growing number of studies have productively studied referral networks based on relationships among past co-workers. A study using Italian matched employer–employee data finds that displaced workers are significantly more likely to find new employment when a larger share of their former co-workers are employed [7]. These results, and extensions based on similar analysis of former co-workers, have been replicated in studies using matched employer–employee data from several other countries, including Austria, Brazil, and Germany.

The results are consistent with the transmission of job information through referral networks. Like some of the research based on residential neighborhood networks, the findings include the possibility of direct referral relationships, where workers find employment in the same firm as one of their social contacts, but also the possibility of indirect referrals, where employed workers pass on information about job opportunities outside their current employer.

*Ethnic networks*

Finally, there is very strong evidence across a range of studies that referrals based on ethnicity improve the quality of job matches. A recent paper focused on studying this channel shows that: (i) referred workers have longer-lasting jobs; (ii) referred workers have higher starting wages; and (iii) the difference in wages between referred and non-referred workers falls over time. The authors use German matched employer–employee data—relying on ethnic similarity to proxy for referral use—to test these predictions. They are able to validate their findings using unique survey data that include direct information on referrals [8].

**Referral networks and the aggregate economy**

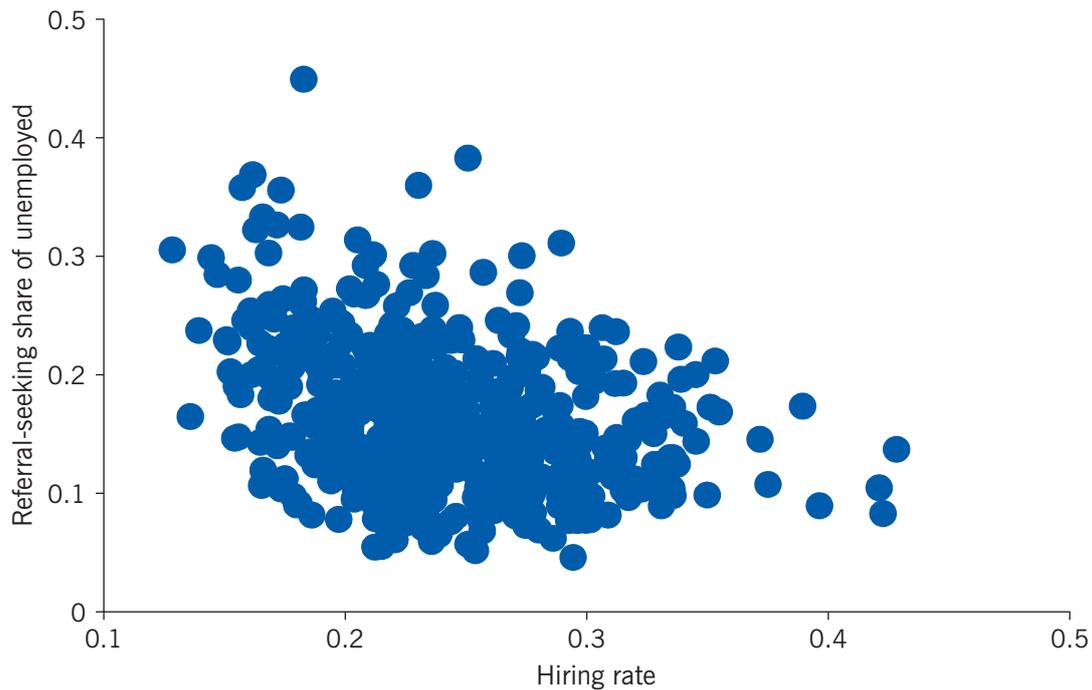
Because referrals are such a widely-used form of job search, there has been considerable interest in modeling the effects of referral use on aggregate labor market outcomes; particularly for understanding their effects on job matching and the possibility that referral networks could help or hinder macroeconomic policies that target unemployment and the distribution of earnings.

Several recent papers incorporate information on referral use directly into macroeconomic models of search and matching. One of these papers shows that referral use is strongly positively correlated with the efficiency of matching across sectors, as measured by the speed at which unemployed workers are matched to job vacancies [9]. The author develops a model in which this outcome is explained by variation in the rate at which referral opportunities are generated across sectors. This model also explains that matching is easier when the economy is expanding than when it is contracting (pro-cyclical). During expansions, referrals are generated at an increasing rate, and so it becomes easier for firms to fill vacant positions.

Two other papers develop models in which referral networks evolve as an endogenous response to local labor market conditions [1], [10]. One of these evaluates the predictions of the model using data on referral-seeking behavior from the CPS as well as US data on local labor market conditions from the Quarterly Workforce Indicators, and data on referral productivity from the Cornell National Social Survey [1]. The model predicts that referral networks can help the labor market run more smoothly by facilitating matching, but only up to a certain point. Eventually, the value of referral networks is diluted, as the number of people using them grows.

One implication of these models is that local labor market conditions are a strong predictor of referral-seeking behavior. Figure 1 presents evidence that is consistent with these predictions, and important generally for understanding the role referrals play in the labor market. The figure displays quarterly data by US state between 1998 and 2010 on the share of unemployed workers in a given state that report using personal contacts as part of job search against the rate at which workers are hired into new positions. It can be seen that when the rate of hiring is high, the use of personal contacts is low. The authors of one paper evaluate the predictions of their model using unique data on referral use from the UK Quarterly Labour Force Survey [10]. They show that referral-seeking is positively correlated with the rate at which workers leave their current job.

Figure 1. Correlation between referral network density and the hiring rate



Notes: US state-level data by quarter between 1998 and 2010. The vertical axis reports the share of unemployed workers in the Basic Current Population Survey that report using friends and neighbors in job search. The horizontal axis reports hiring rates from the Quarterly Workforce Indicators (QWI).

Source: Author's calculations based on Schmutte, I. M. "Labor markets with endogenous job referral networks: Theory and empirical evidence." *Labour Economics* 42 (2016): 30–2 [1].

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## Referrals in the workplace

Personnel records provide an alternative and very productive source of data for understanding the role referrals play for firms. The key advantage of such data is that personnel records often indicate when a worker has received a referral before being interviewed or hired. Depending on the data, there may be additional information, including the identity of the worker who provided the referral and other information from the screening process.

One study uses personnel records from a single large firm that allows testing of several different explanations for why referrals are valuable. The study shows that referred workers keep their jobs longer than workers hired without referral and that they also have higher wages at the point of hire. The key finding, though, is that the initial wage advantage dissipates over time. The fact that it does so, along with several other features of the data, is consistent with the employers using referrals to help screen for more productive workers [11]. Intuitively, a referral can reduce the amount of time it takes for the firm to learn the worker's productivity. If the primary function of referrals is to speed up the learning process, then the initial wage advantage to referral dissipates with worker tenure since, over time, firms can eventually assess for themselves the quality of all employed workers.

The preceding analysis has the shortcoming, which is common to research with personnel records, that the findings are generated from a single firm, thus making it difficult to

draw general conclusions. Another recent study overcomes this limitation by conducting a similar analysis using personnel records across nine different firms [12]. The study also finds that referred workers stay on the job longer, but, more controversially, that they are quite similar in terms of observed skills. Importantly, the study shows that referred workers are more profitable, primarily because they reduce turnover costs. This suggests that among these firms, referrals are less important for eliminating information asymmetries, as implied by another study [11], and more important for reducing generic matching frictions in the manner proposed in the models discussed above [9].

## LIMITATIONS AND GAPS

Referrals and referral networks are channels of information between workers and employers. Different parts of the labor market have different information problems and, as a result, it is hard to say precisely how referrals function in different contexts. Some studies find evidence consistent with referrals improving outcomes for workers with limited outside options [5]. Others indicate that referrals improve match quality and suggest that they are directed toward more highly-skilled workers [4], [8]. Likewise, contrasting results based on personnel records suggest referrals may play a different role in financial sector firms than they do in call centers or trucking firms [11], [12]. This should not be surprising, and there is probably not a single answer to the question of what role referral networks play in the labor market.

However, regardless of what, specifically, referral networks do, two things are fairly certain: (i) referrals improve labor market efficiency; and (ii) referral networks affect the distribution of labor market outcomes. Existing research has focused on verifying how referrals improve efficiency, but less attention has been paid to the possibility that referral networks can exacerbate inequality or lead labor markets to low-level equilibria. Both possibilities are in need of additional study.

To date, little economic research addresses how changing information technology affects the role of referral networks in job search. Online job boards have been a useful platform for conducting field experiments on the effects of referral [13]. The illustration on page 1 shows that the use of referrals in job search has steadily increased, which suggests that information technology is not a substitute for personal referral networks; indeed, it may be a complement [4]. At this point, it is unknown whether technology might change the structure of referral networks, or help workers and firms use them more efficiently, or less aggressively. Here, too, to make progress, more data or more creative uses of existing data is required.

## SUMMARY AND POLICY ADVICE

Empirical evidence indicates that the influence of social networks should be incorporated into the analysis of policies that affect individual labor market outcomes, as well as policies intended to influence aggregate unemployment, earnings inequality, and social mobility. Social networks can help labor markets run more smoothly by alleviating information frictions. However, they also allow existing patterns of social stratification to be reinforced as economic disparities.

It would be unwise to seek to limit the use of referral networks in hiring. Rather, policy can advance in three directions. First, the evidence base concerning referral networks is

growing rapidly, but is still hindered by limitations on available data. Policymakers should support increased access to administrative data, new surveys that include information on referral and social networks, and the conduct of field experiments that shed light on how referral networks function. Second, it may be possible through new technologies to find new mechanisms that address the information problems currently solved by using referrals. Finally, policies that encourage social and economic diversity in the spheres where referral networks form, can help eliminate their deleterious effects on economic inequality, while preserving their salutary effects on labor market efficiency.

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### **Competing interests**

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares to have observed these principles.

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### Further reading

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