

DEPARTMENT OF ECONOMICS

WORKING PAPER

2005



Department of Economics
Tufts University
Medford, MA 02155
(617) 627 – 3560
<http://ase.tufts.edu/econ>

Social Networks in Labor Markets

Written for the *New Palgrave Dictionary of Economics*, 2nd Edition, Palgrave MacMillan.

Abstract

Research in sociology and economics point to important role for social networks in labor markets. Social contacts mediate propagation of rich and reliable information among individuals and thus help workers find jobs and employers find employees. Recent theoretical advances show that for agents connected through networks employment is positively correlated across time and agents, unemployment exhibits duration dependence, and inequality can persist. Recent empirical findings underscore nonlinearities in social interactions and potentially important effects of self-selection. Socioeconomic characteristics can explain substantial spatial dependence in unemployment.

JEL classification codes: D85, A14, J64, J31, J70, L14

Keywords: networks, labor markets, social connections, unemployment, proximity, spatial dependence, information networks, neighborhoods and jobs.

The use of social networks is widespread both in employers' recruiting and workers' job-seeking. Social contacts help workers to find jobs, and employers to find employees. Indeed, social contacts convey rich and reliable information, which they spread widely and fast throughout the labor market. They thus constitute cost-effective search channels that both enrich the information available to both firms and workers, and enhance its quality.

The study of social networks in labor markets highlights the nature of labor market transactions as very different from trading in goods and reflects the importance of idiosyncrasies. The role of job market search and its dealing with frictions goes at least as far back as Stigler (1962). Everyday experience indicates that access to information is heavily influenced by social structure. Individuals use connections with others, such as friends, and social and professional acquaintances, to maintain information networks. Rees (1966) first drew attention to differences among workers in their use of the variety of available informational outlets. In this context, *formal* sources of information include state and private employment agencies, newspaper advertisements, union hiring halls, school and college placement services and, more recently, the Internet [Kuhn and Skuterud (2000)]. *Informal* sources include referrals from employees and other employers, direct inquiries by job seekers and indirect ones through social connections. A recent literature in economics has developed about the details of social interactions that affect the job search process. This literature is

complemented by the more extensive sociological analysis of networks. Several sociological works, including notably Granovetter (1974) and Boorman (1975) have been very influential within the economics literature. This entry explores the salience within both theoretical and empirical economics research of a social networks approach in the study of labor markets.

Several stylized facts about labor market networks have been established by empirical work on job information networks [Ioannides and Loury (2004)]. The *first* stylized fact is that there is widespread use of friends, relatives, and other acquaintances to search for jobs and it has increased over time. The *second* stylized fact about job information networks is that the use of friends and relatives to search for jobs often varies by location and by demographic characteristics. Differences in using informal contacts by age, race and ethnicity show conflicting patterns that suggest important subtleties associated with the operation of social networks are at work. This is confirmed by international comparative evidence. Pellizzari (2004) explores the empirical evidence for the countries of the European Union as of 2003, using the European Community Household Panel, and compares with the US, using the National Longitudinal Survey of Youth (NLSY). Pellizzari documents large cross-country and cross-industry variation in the wage differentials between jobs found through formal and informal methods. Across countries and industries, premiums and penalties are equally frequent. Such differences may be attributed to different recruitment strategies by firms and to different institutional and social practices which may compound the impact of differences in industrial compositions of economies. The *third* stylized fact about job information networks is that job search through friends and relatives is generally productive. Both employed and unemployed workers who used friends to search for jobs received more offers per contact and accepted more offers per contact than did workers who used other sources of information about job openings. The *fourth* stylized fact about job information networks is that part of the variation in the productivity of job search through networks by demographic group simply reflects differences in usage. In particular, US data suggest that almost one-fifth of the total difference in probability of gaining employment between black and white youth resulted from racial differences in the use of social contacts.

We crudely distinguish two mechanisms through which social contacts impact on the functioning of the labor market. First, referrals relay information across the two sides of the labor market, firms and workers. Second, workers' connections disseminate job information within the supply-side of the labor market through word-of-mouth communication.

Hires mediated by referrals reduce employer uncertainty about prospective workers' productivity for a number of reasons [Montgomery (1991)]. One is that incumbent workers are likely to refer their trusted acquaintances and help them be better informed about their prospective employers. A second reason is that the long-term nature of the relationship

between incumbent employees and their employers provides the latter with superior information on the incumbents' productivity-related traits. It is thus not surprising that evidence shows that referral bonuses bring high returns to firms. Yet, excessive reliance on referrals deprives firms and individuals who happen to be outside the social networks of firms' workers of mutually beneficial matches.

Recent findings have improved our understanding of the supply side effects of social networks [Calvó-Armengol and Jackson (2004, 2005)]. In their models, workers rely both on own search effort, and on information exchange with their social circles to find jobs. Information passing across acquaintances can display a variety of real-life features, e.g., when connections differ in terms of intensities, information recipients can be ranked so as to reflect these relational preferences. Their models are the first to explain several important stylized facts about labor markets, which are hard to explain altogether without an explicit social network model. We turn to those next.

First, information passed from employed individuals to their unemployed acquaintances makes it more likely that these acquaintances will become employed. This generates positive correlation between employment and wages of networked individuals *within* and *across* periods. Such positive long-run correlation arises despite the short-run rival nature of job information in the following sense: indirect contacts who are two links away in a network are potential competitors for any job held by any common friend. *Second*, duration dependence and persistence in unemployment, both of which are well documented, can be understood as social effects: the longer an individual is unemployed the more likely it is that her social environment is associated with unfavorable future unemployment prospects. This explanation for duration dependence complements more common ones, such as unobserved heterogeneity. This effect resembles an externality and is also responsible for stickiness in aggregate employment dynamics. The closer the economy is to very high employment (or unemployment), the harder it is to leave that state. For similar reasons, parts of the economy can experience a boom while simultaneously other parts of the economy are experiencing a bust.

These are implications of *exogenous* information networks. With an endogenous network that results from agents' participation decisions, the model's predictions are the following. *Third*, the likelihood of dropping out of the labor force is higher for an individual whose social contacts have poor employment experience, or for an individual with few acquaintances. *Fourth*, small differences in initial conditions of different individuals and of network structure can lead to large differences in drop-out rates. Indeed, when an individual drops out, the prospects worsen for all those who remain, and this generates spillover effects in others' decisions to participate or to drop out. Differences in collective employment histories combine with differences in network structure to produce sustained inequality of wages and drop-out

rates that feed on each other. So, history matters and is responsible for producing persistent income inequality for reasons that are very different from those due to inequalities in human capital investments. Because spillover effects work in reverse, selective and targeted (rather than separate) interventions in the labor market that provide incentives for individuals not to drop out are likely to have amplified effects.

Empirical research has yet to employ fully formal network concepts. It relies typically on concepts of association because of geographic or cultural proximity. There is evidence of persistent correlations in patterns of unemployment in US cities. Socioeconomic characteristics, and in particular ethnic and occupational distance, seem to explain a substantial component of the spatial dependence in unemployment. Topa (2001) and Conley and Topa (2002) argue that social interactions can indeed explain the spatial correlation patterns present in the data. Weinberg, Reagan, and Yankow (2004) show that one standard deviation improvement in neighborhood social characteristics and in job proximity raises individuals' hours worked by 6% and 4% in the average, respectively. Such social interactions have nonlinear effects. The greatest impact is in the worst neighborhoods. Being in a disadvantaged neighborhood is more important rather than the labor activity of one's neighbors *per se*. Bayer *et al.* (2004) document that people who live close to each other, defined as being in the same census block — a US census block encompasses 3,500 to 5,000 residents of a contiguous geographical area — also tend to work together, that is in the same census block. Using Dartmouth College (where roommates are assigned randomly) data, Marmaros and Sacerdote (2002) find large positive correlations between getting help from fraternity/sorority contacts and obtaining prestigious, high-paying jobs. Still, other research points to self-selection as the likely origin of such effects: Oreopoulos (2003) finds that when neighborhoods are not selected, neighborhood quality plays *little* role in determining a youth's eventual earnings, likelihood of unemployment, and welfare participation, while correlations among outcomes for siblings are much higher.

As richer network data become available, further empirical tests of the implications of labor market networks should be developed, which ultimately may call for more elaborate network modelling tools in labor economics. Such research deserves attention.

Antoni Calvó-Armengol, *ICREA, Universitat Autònoma de Barcelona*, and *CEPR*.

Yannis M. Ioannides, *Tufts University*.

References

- Bayer, Patrick, Stephen L. Ross, and Giorgio Topa (2004), "Place of Work and Place of Residence: Informal Hiring Networks and Labor Market Outcomes," working paper,

Yale University, March.

- Boorman, Scott A. (1975), “A Combinatorial Optimization Model for Transmission of Job Information through Contact Networks,” *Bell Journal of Economics and Management Science*, 6, 216–249.
- Calvó-Armengol, Antoni, and Matthew O. Jackson (2004), “The Effects of Social Networks on Employment and Inequality,” *American Economic Review*, 94, 3, 426–454.
- Calvó-Armengol, Antoni, and Matthew O. Jackson (2005), “Networks in Labor Markets: Wages and Employment Dynamics and Inequality,” mimeo, Caltech
- Conley, Timothy, and Giorgio Topa (2002), “Socio-Economic Distance and Spatial Patterns in Unemployment,” *Journal of Applied Econometrics*, 17, 4, 303–327.
- Granovetter, Mark S. (1974), *Getting a Job: A Study of Contacts and Careers*, first edition, Harvard University Press, Cambridge, MA.
- Kuhn, Peter, and Mikal Skuterud (2000), “Job Search Methods: Internet versus Traditional,” *Monthly Labor Review*, October, 3–11.
- Ioannides, Yannis M., and Linda D. Loury (2004) “Job Information Networks, Neighborhood Effects, and Inequality,” *Journal of Economic Literature*, XLII, December, 1056–1093.
- Marmaros, David, and Bruce Sacerdote (2002), “Peer and Social Networks in Job Search,” *European Economic Review*, 46, 4–5, 870–879.
- Montgomery, James D. (1991) “Social Networks and Labor Market Outcomes: Towards an Economic Analysis,” *American Economic Review*, 81, 5, 1408–1418.
- Oreopoulos, Philip (2003), “The Long-Run Consequences of Living in a Poor Neighborhood,” *Quarterly Journal of Economics*, CXVIII, 4, 1533–1575.
- Pellizzari, Michele (2004), “Do Friends and Relatives Really Help in Getting a Good Job?” CEP discussion paper no 623, London School of Economics, March.
- Rees, Albert (1966) “Information Networks in Labor Markets,” *American Economic Review, Papers and Proceedings*, 56, 2, 559–566.
- Stigler, George, J. 1962. “Information in the Labor Market.” *Journal of Political Economy* 70, 5, 94–105.

Topa, Giorgio 2001. "Social Interactions, Local Spillovers and Unemployment." *Review of Economic Studies* 68, 2, 261-295.

Weinberg, Bruce A., Patricia B. Reagan, and Jeffrey J. Yankow (2004) "Do Neighborhoods Affect Work Behavior? Evidence from the NLSY79," *Journal of Labor Economics*, 24, 4, 891-924.

WORKING PAPER SERIES 2005

<http://ase.tufts.edu/econ/papers/papers.html>

- 2005-01** EGGLESTON, Karen, Keqin RAO and Jian WANG; “From Plan to Market in the Health Sector? China's Experience.”
- 2005-02** SHIMSHACK Jay; “Are Mercury Advisories Effective? Information, Education, and Fish Consumption.”
- 2005-03** KIM, Henry and Jinill KIM; “Welfare Effects of Tax Policy in Open Economies: Stabilization and Cooperation.”
- 2005-04** KIM, Henry, Jinill KIM and Robert KOLLMANN; “Applying Perturbation Methods to Incomplete Market Models with Exogenous Borrowing Constraints.”
- 2005-05** KIM, Henry, Jinill KIM, Ernst SCHAUMBURG and Christopher A. SIMS; “Calculating and Using Second Order Accurate Solutions of Discrete Time Dynamic Equilibrium Models.”
- 2005-06** KIM, Henry, Soyoung KIM and Yunjong WANG; “International Capital Flows and Boom-Bust Cycles in the Asia Pacific Region.”
- 2005-07** KIM, Henry, Soyoung KIM and Yunjong WANG; “Fear of Floating in East Asia.”
- 2005-08** SCHMIDHEINY, Kurt; “How Fiscal Decentralization Flattens Progressive Taxes.”
- 2005-09** SCHMIDHEINY, Kurt; “Segregation from Local Income Taxation When Households Differ in Both Preferences and Incomes.”

- 2005-10** DURLAUF, Steven N., Andros KOURTELLOS, and Chih Ming TAN; “How Robust Are the Linkages between Religiosity and Economic Growth?”
- 2005-11** KEELY, Louise C. and Chih Ming TAN; “Understanding Preferences For Income Redistribution.”
- 2005-12** TAN, Chih Ming; “No One True Path: Uncovering the Interplay between Geography, Institutions, and Fractionalization in Economic Development.”
- 2005-13** IOANNIDES, Yannis and Esteban ROSSI-HANSBERG; “Urban Growth.”
- 2005-14** PATERSON, Robert W. and Jeffrey E. ZABEL; “The Effects of Critical Habitat Designation on Housing Supply: An Analysis of California Housing Construction Activity.”
- 2005-15** KEELY, Louise C. and Chih Ming TAN; “Understanding Divergent Views on Redistribution Policy in the United States.”
- 2005-16** DOWNES, Tom and Shane GREENSTEIN; “Understanding Why Universal Service Obligations May Be Unnecessary: The Private Development of Local Internet Access Markets.”
- 2005-17** CALVO-ARMENGOL, Antoni and Yannis M. IOANNIDES; “Social Networks in Labor Markets.”
- 2005-18** IOANNIDES, Yannis M.; “Random Graphs and Social Networks: An Economics Perspective.”
- 2005-19** METCALF, Gilbert E.; “Tax Reform and Environmental Taxation.”
- 2005-20** DURLAUF, Steven N., Andros KOURTELLOS, and Chih Ming TAN; “Empirics of Growth and Development.”
- 2005-21** IOANNIDES, Yannis M. and Adriaan R. SOETEVENT; “Social Networking and Individual Outcomes Beyond the Mean Field Case.”

- 2005-22** CHISHOLM, Darlene and George NORMAN; “When to Exit a Product: Evidence from the U.S. Motion-Pictures Exhibition Market.”
- 2005-23** CHISHOLM, Darlene C., Margaret S. McMILLAN and George NORMAN; “Product Differentiation and Film Programming Choice: Do First-Run Movie Theatres Show the Same Films?”
- 2005-24** METCALF, Gilbert E. and Jongsang PARK; “A Comment on the Role of Prices for Excludable Public Goods.”