Essays on Networks and Labor Market Mobility

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ABSTRACT

This dissertation applies the tools of network analysis to study job mobility. Job mobility is a complex phenomenon, and network theory provides a novel and practical framework for dealing with this complexity in understanding how individuals move from job to job. My first essay measures the effect of job referral networks on search outcomes. The key contribution of this essay is providing evidence of one mechanism by which social interactions affect earnings. An on-the-job search model extended to include social transmission of job information yields an empirical specification in which one's current job offer depends on the average offer of his social contacts. Using block level variation in the quality of jobs held by one's residential neighbors, I find that when changing jobs an individual with better local network contacts will obtain a higher quality job. In addition to the main result, this paper provides new evidence on the spatial structure of the wage distribution within urban areas. In the second essay I apply network algorithms to detect groups of workers and employers with relatively homogeneous patterns of job mobility. Workers with interchangeable skills should have similar patterns of mobility across employers that use those skills in roughly the same way. Grouping workers and jobs solely on the basis of similar mobility patterns reveals labor market sectors with distinct compensation structures. My final essay, joint with John Abowd, uses network models to facilitate identification of employer-specific wage premia in a decomposition of log earnings from matched employer-employee data. We exploit the relational information in the data to construct instruments for the observed employment histories.

I. Job Referral Networks and the Determination of Earnings in Local Labor Markets (Job Market Paper)

The use of personal contacts to search for work is a ubiquitous and persistent feature of modern labor markets. How do social networks direct the flow of job information? What implications might they have for labor market efficiency, the spatial concentration of poverty, and income mobility? To shed new light on this topic, I model and empirically evaluate the role of neighborhood-level referral networks in job search. I identify positive and economically signification effects of the quality of jobs held by a worker's neighbors on the quality of his next job. These are the first results on direct local interactions in earnings determination estimated in the context of a job search model.

In a labor market characterized by search frictions, identical workers may be paid different amounts by different employers. Those looking for jobs seek out higher rents, and workers holding jobs prefer to share these rents with their friends and neighbors. To capture this process of social rent sharing, I extend an on-the-job search model with worker and employer heterogeneity to include social interactions in job search. In the model, individuals are more likely to sample a job with the same premium as their neighbors. Relative to a baseline model without contagion, social interactions generate excess correlation in outcomes between connected workers. The model also predicts that workers with better social contacts will experience better outcomes from job-to-job mobility.

To test these predictions, I use data on individual work histories from the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program matched to residential addresses. I estimate the job search model on estimates of firm-specific wage premia derived from a decomposition of log earnings into worker- and employer-specific heterogeneity components. The employer-specific wage premia conform to two stylized facts consistent with the model. First, there is evidence of a job ladder: workers tend to move into jobs with better wage premia. Second, there is significant spatial correlation of wage premia for jobs held by individual workers for detailed geographies. These stylized facts are novel, and provide evidence of the importance of sorting for the spatial distribution of earnings.

I identify the contribution to job search outcomes of the quality of local social networks from quasi-random assignment of workers to residential blocks within larger neighborhoods. This facilitates distinguishing neighborhood quality from network quality. Neighborhood quality affects search outcomes through a number of channels, for instance differential access to transportation. Workers' residential location decisions are made on the basis of neighborhood quality, but they cannot sort perfectly by block. Thus, the variation in network quality within the neighborhood is exogenous. I measure one's local network quality from the distribution of employer-specific wage premia held by workers from the same residential block. My model predicts the excess spatial correlation found in employer wage premia at the block level beyond that found at the tract level. Both conventional and quantile regressions confirm that the relationship between network quality and job search outcomes is significant, economically meaningful, and conforms to the predictions of my enhanced search model.

II. Free to Move? Network Analysis of Job-to-Job Mobility

The purpose of this paper is to place workers and employers into groups that are relatively homogeneous with respect to job mobility. Theory suggests that workers with interchangeable skills should have similar patterns of mobility across employers that use those skills in roughly the same way. Alternatively, in a model of labor market segmentation, workers in the secondary sector of the labor market cannot easily move into the primary sector in which access to jobs may be rationed. Both models imply that one can infer homogeneous groups of workers and jobs from patterns in longitudinal data on job mobility.

The key contribution of this paper is to apply the tools of network analysis to find these homogeneous groups of workers and jobs from patterns of job mobility. Job-to-job mobility is modeled as a realized mobility network connecting workers to employers. The empirical component of the paper uses data from the PSID to construct a realized mobility network connecting workers to the detailed industry-occupation pairs in which they are employed. Assuming workers are more likely to change jobs within a segment than to exit yields a likelihood function over all possible partitions of the network. Although this problem has high dimension, it is possible to maximize the likelihood function by simulated annealing. The resulting estimates group industry-occupation pairs into two groups with distinct employment patterns, and compensation profiles.

Separating jobs solely on the basis of mobility patterns reveals a small sector in which earnings determination is highly correlated with education and minimally correlated with demographic characteristics relative to the larger sector. The smaller sector is made up of professional and managerial occupations in the service and finance sectors. By contrast, the larger sector is made up of clerical, service, and routine labor. Using an alternative measure of network clustering, I find evidence that the labor market contains at least five large economically and demographically-distinct groups of workers. The same patterns are replicated, but with some refinement. The largest two sectors are split between service and manufacturing jobs at all occupational levels, with three smaller sectors centered on specific occupational groups.

III. Endogenous Mobility (with John Abowd)

In this work, which is in preparation, we propose and implement a method for bounding the amount of endogeneity bias in estimates of person- and employer-specific earnings heterogeneity. Unbiased and efficient estimates of these quantities are of interest for numerous applications in labor economics, empirical industrial organization, and macroeconomics. We instrument for observed work histories with simulations drawn from a model for the evolution of the realized mobility network that connects workers and employers over time. These instruments exploit the relational information ("network" statistics) contained in the linked data to build the instruments. Implementation of a conventional IV estimator is computationally prohibitive, so we proceed by Monte Carlo methods.