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An Agent-Based Model of Origin Destination Estimation (ABODE)

Nebiyou Tilahun, David Levinson

Abstract

This paper proposes and tests an agent-based model of worker and job matching. The model takes residential locations of workers and the locations of employers as exogenous and deals specifically with the interactions between firms and workers in creating a job-worker match and the commute outcomes. It is meant to illustrate that by explicitly modeling the search and hiring process, origins and

destinations (ODs) can be linked at a disaggregate level. The model is tested on a toy-city as well as using data from the Twin Cities area. The toy-city model illustrates that the model predicts reasonable commute outcomes, with agents selecting the closest work place when wage and skill differentiation is absent in the labor market. The introduction of wage dispersion and skill differentiation in the model increases the the average home to work distances considerably. Using data from Twin Cities area of Minneapolis-St. Paul, aggregate commute and wage outcomes from the model are shown to capture the trends in the observed data. Overall, the results suggest that the behavior rules as implemented lead to reasonable patterns. Future directions are also discussed.

Keywords

Transport, Modeling, Trip Distribution, Job-Worker matching

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