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Journal of Economic Dynamics & Control
25 (2001) 1039–1080

JOURNAL OF
Economic
Dynamics
& Control

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Backward unraveling over time: The evolution of strategic behavior in the entry level British medical labor markets☆

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Accepted 12 June 2000

Abstract

This paper studies an evolutionary programming technique, namely a genetic algorithm, to analyze how a population of decision-makers learn to coordinate the selection of an equilibrium or a social convention in a two-sided matching game with incomplete information. In the contexts of centralized and decentralized entry-level labor markets, evolution and adjustment paths of unraveling are explored using this technique in an environment inspired by the Kagel and Roth (2000. Quarterly Journal of Economics 115(1), 201–235) experimental study. As an interesting result, it is demonstrated that stability need not be required for the success of a matching mechanism under incomplete information in the long run. © 2001 Elsevier Science B.V. All rights reserved.

JEL classification: C63 computational techniques; C78 bargaining theory; matching theory; D83 search; learning and information

☆This paper has won one of the two graduate student prizes awarded by the Society for Computational Economics in 1999. I would like to express my gratitude especially to John Duffy, Alvin Roth, and also to Masaki Aoyagi, John Kagel, Philip Reny and James Warnick for valuable suggestions in preparation and progress of this study. I would like to also thank an anonymous referee. This study is presented at 'Computing in Economics and Finance '99' in Boston, MA and at the 'Workshop on Interactions and Learning' in the 'Summer Festival on Game Theory '98' in Stony Brook, NY. This paper is prepared from a chapter of Utku Ünver's dissertation.

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0165-1889/01/$ - see front matter © 2001 Elsevier Science B.V. All rights reserved.
PII: S0165-1889(00)00067-1

Keywords: Genetic algorithms; Linear programming matching; Stability; Two-sided matching; Unraveling

1. Introduction

In the markets where young professionals seek their first entry-level positions, the contract dates sometimes shift far earlier than the start of employment. This phenomenon, known as unraveling, causes ex-post inefficiencies in market matching even though it may lead to an equilibrium. In some unraveling markets, contracts are made before most of the needed information becomes available.

There are many real life examples of unraveling markets, where better qualified agents choose to contract early, and less qualified agents wait to make contracts until the start of employment. Elite colleges have both early and regular admission programs. Another example can be seen in pro-sports draft selections in the USA.[2] Post-season college football bowl selections and entry-level labor markets for judges and for medical interns are examples of natural experiments involving unraveling.

This study will focus on entry-level medical intern-hospital labor markets in Britain. It will explore the nature of strategic behavior in these markets. Centralized institutions were established to control the dates of contracts in these markets.

The entry-level medical intern labor markets in Britain are regional. We assume that almost every region is similar to the others in terms of the preferences of agents and information structure. Therefore, the only difference between these markets appears in the manner through which agents are appointed. British markets employ different mechanisms to match interns and hospital consultants to each other. These markets are not competitive. Wage negotiations do not exist. The markets are organized mostly in an oligopolistic structure that gives all the power to the hospital consultants in the design of these matching mechanisms. The jobs last only six months, so initial appointments are binding.

Kagel and Roth (2000) consider a study similar to the environment here. In that study, they conduct a laboratory experiment on the mechanisms used in Britain. Ünver (2000) works on an extended experiment. This study will be a complement to the Kagel and Roth (2000) study and to Ünver (2000), and will answer the questions regarding the stability of matching mechanisms using computational methods.

[2] Roth and Xing (1994), Li and Rosen (1998) present several other examples.

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