Available online at www.sciencedirect.com

ScienceDirect

Journal of Economic Theory 151 (2014) 163–195

JOURNAL OF Economic Theory

www.elsevier.com/locate/jet

Stable marriages and search frictions

Stephan Lauermann [a], Georg Nöldeke [b,*]

[a] *Department of Economics, University of Michigan, USA*
[b] *Faculty of Business and Economics, University of Basel, Switzerland*

Received 8 May 2013; final version received 17 October 2013; accepted 1 November 2013

Available online 8 November 2013

Abstract

Stable matchings are the primary solution concept for two-sided matching markets with nontransferable utility. We investigate the strategic foundations of stability in a decentralized matching market. Towards this end, we embed the standard marriage markets in a search model with random meetings. We study the limit of steady-state equilibria as exogenous frictions vanish. The main result is that convergence of equilibrium matchings to stable matchings is guaranteed if and only if there is a unique stable matching in the underlying marriage market. Whenever there are multiple stable matchings, sequences of equilibrium matchings converging to unstable, inefficient matchings can be constructed. Thus, vanishing frictions do not guarantee the stability and efficiency of decentralized marriage markets.
© 2013 Elsevier Inc. All rights reserved.

JEL classification: C78; D83

Keywords: Marriage market; Nontransferable utility; Stable matchings; Search frictions

1. Introduction

This paper considers a two-sided matching market with nontransferable utility: agents on each side of the market match with at most one agent from the other side of the market, and agents cannot make transfers. Following standard practice, we refer to such a market as a *marriage market* and use the corresponding terminology; see Roth and Sotomayor [26]. The central theoretical problem in a marriage market is to determine who will match with whom. The concept of stable matchings introduced in Gale and Shapley [17] provides an answer: a matching is stable

* Corresponding author.
E-mail addresses: slauerma@umich.edu (S. Lauermann), georg.noeldeke@unibas.ch (G. Nöldeke).

0022-0531/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jet.2013.11.001

if no matched agent prefers to be single and no pair of agents prefers each other to their assigned partner in the matching.

Most of the recent literature on matching considers questions of economic design in centralized markets. However, many of those markets that are analyzed using stability concepts, including the marriage market in its literal sense, are decentralized. Roth and Sotomayor [26, p. 22] conjecture that even in a decentralized market, we might expect matchings to be stable if frictions are negligible in the sense that "the agents have a very good idea of one another's preferences and have easy access to each other." The purpose of this paper is to test this conjecture. In particular, we assume complete information about preferences and ask whether "easy access" to potential partners implies the stability of matchings.

To investigate this question, we embed a marriage market in a search model with random meetings and investigate the limit of steady-state equilibria in the search model when search frictions vanish. Our approach is thus akin to the one in the literature on convergence to competitive equilibria in dynamic matching and bargaining games, surveyed in Osborne and Rubinstein [24] and Gale [16].[1] The concern motivating our paper is the same as the one motivating this literature, namely, to investigate the strategic foundations of stable outcomes in decentralized markets. The key difference is that we consider the nontransferable utility case.

In the underlying marriage market that we consider, there are a finite number of men and women. All individuals have strict preferences over mates and staying single; no further restrictions on preferences are imposed. In the search model there are continua of men and women with each individual in the marriage market represented by one of a finite number of types. The rate at which men and women meet one another is determined by the size of the population of agents searching for a potential partner according to a continuous contact function. If a man and a woman meet, they decide whether to accept each other. If both accept, the agents leave as a matched pair. Otherwise, both continue searching. The opportunity cost of rejecting a partner and waiting for a better match is an exogenous risk that an agent will have to abandon the search and remain single. Exogenously arriving unmatched men and women keep the stock of agents who are searching for partners from depleting. We study the matchings that result from steady-state equilibria and refer to these as equilibrium matchings.

Due to the randomness inherent in the contact process and the risk of exogenous exit, different agents of the same type will obtain different outcomes in a steady-state equilibrium. The equilibrium matchings arising in the search model thus correspond to *fractional matchings* as considered in Roth et al. [28]. We find it convenient to refer to matchings in which all agents of the same type receive the same match as *simple matchings* and to reserve the term fractional matchings for matchings that are not simple; the term matching encompasses both possibilities. The distinction between simple and fractional matching patterns plays a key role in our analysis.

In the search model the speed of the contact process determines how difficult it is to access potential partners and will thus serve as our measure of frictions. To investigate whether equilibrium matchings approximate stable matchings when search frictions are small, we study those matchings in the marriage market that can be obtained as limits of equilibrium matchings in the search model as the speed of the contact process goes to infinity. We refer to these matchings (both, simple and fractional) as limit matchings.

[1] A rather different approach to the emergence of stable matchings in marriage markets with decentralized decision making is pursued by Roth and Vande Vate [27]. They demonstrate that starting from any initial matching, the process of allowing randomly chosen "blocking pairs" of myopic agents to match converges to a stable matching. Their model abstracts from the strategic considerations and frictions that are at the heart of our approach.

Download English Version:

https://daneshyari.com/en/article/957009

Download Persian Version:

https://daneshyari.com/article/957009

Daneshyari.com