On cooperation in open communities

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ABSTRACT

Economic interactions often take place in open communities, where agents are free to leave in order to join a more preferred community. Tiebout (1956) conjectured that "voting with feet" might generate considerable efficiency gains, since individuals with different preferences sort themselves into those communities that suit them most. We provide new empirical insights into Tiebout's intuition by showing that self-selection in open heterogeneous communities can significantly foster communities' success. Voting with feet improves cooperation by facilitating the right initial match between individuals and institutions and by establishing a cooperative environment that is attractive for others to join.

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The consumer–voter may be viewed as picking that community which best satisfies his preference pattern for public goods. Charles M. Tiebout (1956, p. 418)

1. Introduction

Understanding the determinants and the extent of human cooperation is one of the most challenging issues in economics. Human cooperation in social dilemmas is particularly puzzling because the conflict between collective and individual interests creates the well-known free-rider problem (Hardin, 1968; Dawes, 1980). In order to disentangle different motives of cooperation and defection, researchers have successfully studied behavior in controlled social dilemma experiments (Isaac et al., 1985; Marwell and Ames, 1981; see, for a survey, Ledyard (1995), and Chaudhuri (2011)). A common feature of these experimental studies is

that subjects interact in an *exogenously* imposed framework from which they cannot escape. In reality, however, humans often can vote *with their feet*. Already Tiebout (1956) suggests that individuals with different preferences for specific bundles of local public goods sort themselves into different communities. These bundles may differ, e.g., in school quality, or environmental protection. Tiebout argues that if communities are sufficiently heterogeneous and open, and if individuals are fully mobile, voting with feet generates considerable efficiency gains in public goods provision. From a broader perspective, different institutions governing people's interactions in economic and political frameworks may also be interpreted as being part of bundles of local public goods. These institutional differences may lead citizens to migrate to different jurisdictions or even to different countries.[1] Frey and

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[1] For a prominent example from history when people voting with their feet for a political system, recall the large-scale migration in the 1950s, when thousands of East Germans fled to the West to benefit from and to contribute to the "Wirtschaftswunder" (economic boom) taking place there. To quote from Time Magazine: "In the only kind of voting that remains to the East Germans – what one British diplomat calls voting with their feet – they have chosen to flee the country at a rate which for the past three months has averaged a startling 1000 refugees a day." (Time Magazine, 1955). Examples that are more recent include the immigration from Central America to the US and the high number of refugees from Africa who try to reach Europe – often by risking their lives. According to the Economist: "By some estimates, more than 600,000 illegal migrants are waiting on the southern Mediterranean shore, hoping to embark for a better life." (Economist, 2014).

Eichenberger (1996, 1999), for example, propose to increase welfare by promoting competition between newly emerging jurisdictions. Their *functional, overlapping, competing jurisdictions* (FOCJ) emerge from below as a response to citizens' preferences. The FOCJ have the right to levy taxes to finance the public services they provide. This concept even goes beyond the institution choice studied in this paper, because individuals not only vote with their feet between the existing institutions, but also have the right to establish FOCJ by popular referenda. Frey and Eichenberger suggest that the future European constitution should allow for the evolution of FOCJ. Romer's concept of charter cities describes a similar idea (Romer, 2010a,b).[2]

A few experimental papers have already shed some light on endogenous institution choice. The nature of the institutions fostering cooperation and the dynamic aspects that drive the process, however, are not well understood. In this paper, we aim at closing this gap by investigating public goods provision in open communities with voting with feet mechanisms in a series of controlled laboratory experiments. To set the grounds for our main research question, we first investigate *the nature of the institutions* available for selection in the voting with feet decision. We consider an institution that allows individuals to reward others and an institution that allows individuals to punish others, both to a cost to themselves. For closed communities, the evidence on the cooperation-enhancing effects of these mechanisms is rather mixed: While Fehr and Gächter (2000) and Gächter et al. (2008), for example, find that punishment alone works very well; Andreoni et al. (2003) and Sefton et al. (2007) suggest that a combination of rewards and punishment might improve on this.[3]

Gürerk et al. (2006) examine public goods provision in open communities. The subjects choose between a standard voluntary contribution mechanism (VCM) and an institution, which additionally allows both costly rewards and costly punishment. They show that the combination of rewards and punishment yields high levels of cooperation. We extend this analysis by conducting two treatments, which separate the combination: In treatment VR-REW, the subjects choose between a VCM and an institution that allows rewarding others at personal costs; in treatment VF-PUN, the subjects choose between a VCM and an institution that allows punishing others at personal costs. We show that contributions in VF-PUN significantly outperform those in VF-REW and are not significantly different from those of the combined institution studied in Gürerk et al. (2006). VF-PUN, unlike VF-REW, exhibits the same slow growth pattern as the combined institution studied in Gürerk et al (2006). Thus, the *dynamics of community choice* in both cases, Gürerk et al. (2006) and VF-PUN, are characterized by *self-selection* of the subjects into different communities and the *slow growth* of a community.

This motivates our main research question: Which of the two aspects (self-selection or slow-growth) drives the success of voting with feet in open communities. When communities are newly established, self-selection may initiate and foster a culture of high cooperation, because individuals who join a community in an early stage might be particularly committed to engaging in its success. Observations in line with this conjecture are documented in, e.g., Gächter and Thöni (2005), Brekke et al. (2011), and Falk et al. (2013). At a later stage, other individuals attracted by the success of a cooperation-enhancing community may join. Another, different reason for a community's success might be that cooperation is easier if a community starts small and grows slowly than when it already starts at a larger size. Evidence pointing to this direction is presented, e.g., by Weber (2006), who finds that a slow growth path improves coordination.[4] Based on the finding that a pure punishment institution is as successful as the combined punishment and reward institution, and more successful than a pure reward institution when offered as an alternative to VCM, we restrict the further analyses to punishment institutions. In treatment EX-PUN, we exogenously allocate the subjects to the punishment and the VCM community in a way that exactly mirrors the choices in VF-PUN. By comparing EX-PUN to VF-PUN, we investigate whether an exogenously slow growing punishment community does as well as a community, which grows endogenously by voting with feet. Finally, in treatment FIX-PUN, we study two equally sized communities, the VCM, and the punishment community. In the treatment FIX-PUN, the subjects are allocated exogenously to the communities as in EX-PUN. The difference is that in the EX-PUN, the punishment community starts small and steadily grows while in the FIX-PUN the community size does not vary over time. The comparison of EX-PUN and FIX-PUN allows studying how slow community growth influences cooperation. We find that self-selection of subjects is important for the establishment and efficient maintenance of cooperation (contributions in VF-PUN are significantly higher than contributions in EX-PUN) and that slow growth does not seem to have an effect per se (contributions in EX-PUN are not significantly different from contributions in FIX-PUN).

Our findings highlight a so far undervalued feature of Tiebout's idea. Voting with feet by "consumer-voter […] picking that community which best satisfies his preference pattern for public goods" (Tiebout, 1956) improves cooperation, and thus efficiency, by facilitating the right initial match between individuals and different institutional rules, and by establishing a cooperative environment which is attractive for others to join. Moreover, we show that a community that allows peer punishment is the most successful with regard to cooperation and that (additional) reward possibilities do not improve on this.

The paper is organized as follows. In the next section, we review the related literature. Section 3 introduces the interaction framework that we use to investigate cooperation in open communities, and reports the experimental design and procedure. Section 4 presents our findings. Section 5 summarizes and concludes.

2. Related literature

Tiebout's hypothesis has inspired economic thinking for decades.[5] Oates (1999, 2006) reviews the empirical studies on Tiebout's model and concludes that "a body of widely differing kinds of evidence exists, much (but not all) of which seems favorable to Tiebout". Banzhaf and Walsh (2008), for example, show that households vote with their feet for environmental quality in California. Rhode and Strumpf (2003), however, do not find support for Tiebout's hypothesis in the data on Boston districts during the period 1850–1990. For more recent work see Boadway and Tremblay (2012) and Bayer and McMillan (2012).

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[2] Harvard Business Review in collaboration with the World Economic Forum considers Romer's concept as one of the 10 breakthrough ideas for 2010. In a nutshell, the idea behind the concept is that economic growth is likely to be supported by giving people the possibility to *freely* choose (to work/live) among (co-existing) jurisdictional territories governed by different institutional rules. The rules of charter cities may not only differ in degree (such as different tax rates) but even in quality (such as having different laws for commerce and civil law). A key point of charter cities (different from colonialism) is that there is no coercion to move. Everyone is free to choose under which jurisdiction he or she wants to live and hence (implicitly) accepts and gets involved under the rules that govern the particular jurisdiction. As stated by Romer on his website "[t]he process of movement between can be more effective than the process of change from within" (http://www.chartercities.org/).

[3] For review articles on this topic, see Milinski and Rockenbach (2012) and the recent book by van Lange et al. (2013).

[4] If players have social preferences, for example, if they are sufficiently inequity averse, a public goods game as considered in our study can indeed be a coordination game (see Fehr and Schmidt (1999)). Conditional cooperators, for example, contribute only if others contribute a similar amount.

[5] Some scholars formalized Tiebout's rather informal idea. Gloom and Lagunoff (1998), for example, theoretically analyze a competition between two open communities with two distinct rules for public goods provision: compulsory provision versus voluntary contribution. They find indications that individuals eventually "select" the involuntary provision mechanism. Conley and Konishi (2002) provide theoretical support for Tiebout's conjecture by defining a "migration-proof Tiebout equilibrium", which is tailored to multi-jurisdictional competition. Banzhaf and Walsh (2008) present a locational equilibrium model that predicts increases in communities experiencing exogenous improvements in public goods.