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Markets and Communities: Tensions and Possible Solutions*

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Abstract

The basis for free markets and societies provided by the Austrian school of economics, and most notably Friedrich Hayek, is the discovery and transmission of knowledge that cannot be possessed by a central planner. The kind of social innovation envisioned requires distinct communities experimenting with different sets of norms and practices. This paper explores a tension between free markets and communities that must be resolved for the potential gains from a free society to be realized. In particular, we show that free mobility of labor can lead to inefficient breakdown of communities. This problem is exacerbated by heterogeneity in productivity among community members and redistribution within communities. We discuss mitigating factors and possible solutions to the tension between markets and communities.

Key words: Labor mobility, community, social networks, brain drain, urban policy

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All errors are mine.

1 Free Markets and Communities

For most of our 200,000 year history, anatomically modern human beings lived in small nomadic bands consisting of 25-50 kin members. These small communities traded very little, if at all, and were highly egalitarian. The transition to agriculture, dated to around 12,000 years ago, created larger-scale settlements and produced a surplus which enabled more complex forms of organization and division of labor. This enabled the development of writing, money and trade, among many other innovations. Though one could think of the institutions of economic exchange being built on ancient instincts and norms of cooperation (Carvalho & Koyama 2010), our nomadic ancestors could scarcely have imagined the growth in scale and complexity of economic exchange, what John Hick's termed "the rise of the market" (Hicks 1969). Indeed, these developments "were little understood at the time, or indeed for centuries afterwards, even by the greatest scientists and philosophers" (Hayek 1988, p. 38).

Even today, it is not widely appreciated how markets form and operate, aggregating the preferences of millions of consumers and producers, without some level of altruism, joint intentionality among the participants (Akerlof 2016), or centralized coordination. That altruism (the 'butcher's benevolence) and joint intentionality are not critical was best articulated by Bernard Mandeville (1989) and Adam Smith (1976). The Walrasian paradigm set out to model the decentralized operation of markets, culminating in the Arrow-Debreu framework in which (under certain restrictive assumptions) every competitive equilibrium is Pareto efficient (Arrow 1951, Debreu 1951, Arrow & Debreu 1954). It was soon noticed, however, by Lange (1936), Lerner (1938) and others, that, within the Walrasian framework itself, a centralized economy could replicate any efficient allocation that could be achieved by a decentralized market.

It was Friedrich Hayek (1945) who, in a fundamental paper, identified the missing ingredient provided by free, decentralized markets and advanced the case for them most cogently. Knowledge is key. Hayek pointed to the absence of centralized knowledge about the specific properties of the economic system, including marginal utilities, which are required to perform the calculations for implementing an efficient allocation. Instead knowledge is formed in a distributed fashion at the population level, with the price system acting as a kind of nervous system, transmitting knowledge between decentralized agents. It is worth quoting Hayek at length here:

> *If* we possess all the relevant information, *if* we can start out from a given system of preferences and *if* we command complete knowledge of available means, the problem which remains is purely one of logic. That is, the answer to the question of what is the best use of the available means is implicit in our assumptions. The conditions which the solution of this optimum problem must satisfy have been fully worked out and can be stated best in mathematical form: put at their briefest, they are that the marginal rates of substitution between any two commodities or factors must be the same in all their different uses.
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> This, however, is emphatically *not* the economic problem which society faces. And the economic calculus which we have developed to solve this logical problem, though an important step toward the solution of the economic problem of society, does not yet provide an answer to it. The reason for this is that the "data" from which the economic calculus starts are never for the whole society "given" to a single mind which could work out the implications, and can never be so given.
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> The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate "given" resources if "given" is taken to mean given to a single mind which deliberately solves the problem set by these "data." It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality.
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> Hayek (1945, p. 519-520, emphasis in original)

Hayek goes on to develop a broader conception of a free society on the same basis, that is, epistemic humility grounded in the notion that knowledge emerges at the population level rather than assuming its possession by one omniscient individual or entity (Hayek 1960, 1988). Hayek states:

> It might be said that civilization begins when the individual in pursuit of his ends can make use of more knowledge than he has himself acquired and when he can transcend the boundaries of his ignorance by profiting from knowledge he himself does not possess. Hayek (1960, p. 22l)

This is the same as the modern conception of culture as cumulative intergenerational learning, which distinguishes humans from non-human primates (e.g. Boyd & Richerson 1985, Henrich 2017). To this process, Hayek emphasizes the importance of "[...] the independent and competitive efforts of many to induce the emergence of what we shall want when we see it" (Hayek 1960, p. 29). He recognizes that this "[...] involves competition between organized and unorganized groups no less than competition between individuals" (Hayek 1960, p. 37). The conception of distinct communities experimenting with different sets of norms and practices had already been emphasized by John Stuart Mill: "As it is useful that while mankind are imperfect there should be different opinions, so is it that there should be different experiments of living" (Mill 1998, p. 63). Hayek adds a warning:

> To turn the whole society into a single organization built and directed according to a single plan would be to extinguish the very forces that shaped the individual human minds that planned it. Hayek (1960, p. 37)

In this view, distinct communities must be viable for cultural evolution to proceed. This is the liberal archipelago envisioned by Chandran Kukathas (2003). Thus, Hayek's conception of distributed learning and computation is extended from markets to social interactions within and between communities.

Not only does Hayek's vision of cultural evolution anticipate modern cultural evolutionary theory (e.g. Boyd & Richerson 1985, 2005), it is also consistent with modern evolutionary game theory (Young 1998, Sandholm 2010), which was imported back into economics after its development in evolutionary biology (see Smith 1982). Evolutionary game theory does not assume individual agents understand the system in which they interact, nor can they guide it in any meaningful way. Rather: "Agents adapt—they are not devoid of rationality—but they are not hyper-rational. They look around them, they gather information, and they act fairly sensibly on the basis of their information most of the time" (Young 1998, p. 5). The evolutionary process this generates can be thought of as a form of distributed computation. Thus, rationality is not a property of the individual, but can be thought of as existing at the population level. Patterns of behavior emerge from the decentralized decisions of many agents whose preferences and information are "aggregated" through the evolutionary process of interaction. This concept of emergence, important today in complex systems research more generally (see for e.g. Holland 2000), is a hallmark of the Austrian school of economics, featuring prominently in the work of Carl Menger (1892) and Ludwig von Mises (1949), as well as Hayek.

There is a remaining tension, however, within this grand view of adaptive markets and societies. In Hayek's analysis, markets and communities are largely independent. Where they are related, the positive effects of markets on communities, especially in promoting trust and cooperation, are emphasized (e.g. Hayek 1988). Again, Hayek's hypothesis is supported by modern experimental research on culture. Henrich et al. (2004) show that one of the most important factors promoting trust and cooperation in small-scale societies around the world is a high level of market exchange. Nevertheless, the possibility that free markets have harmful effects on communities, as articulated by Karl Polanyi (1944), Stergios Skaperdas (2003) and others, should be taken seriously. We can do so using standard tools of modern game theory.

In this paper, we analyze a tension between markets and communities in which free labor mobility can lead to the inefficient breakdown of communities. Though our emphasis will be on labor mobility, one could provide a similar analysis for capital mobility. Consider a city and a community. The community could be a small town/village near the city or a separate cultural community within the city. Members of the community choose to remain in the community or relocate to the city. The city makes them more productive, but the community provides club goods not available in the city, such as social interaction, risk sharing, matching in the marriage market, and a sense of identity and belonging. We characterize conditions under which the community breaks down, that is, under which there is complete exit of the community for the city. Heterogeneity in productivity among community members makes communities less stable, as high productivity types are more easily induced to exit, and in doing so set off a cascade in which even low productivity types leave for the city. Egalitarian communities, that redistribute output, are even more fragile.

Exit from the community is usually interpreted as meaning the community is no longer valuable to its members and they would not mind if it disappeared. That is not necessarily correct here. This interpretation neglects the interactive aspect of community. In our model the club goods provided by the community exhibit increasing returns and individuals do not internalize the costs imposed on others of exit. This naturally creates scope for inefficient outcomes. In each case we analyze, there is an open set of parameters under which complete exit from the community is an equilibrium and is inefficient, in the strong sense of Pareto dominance: every community member prefers the outcome in which they all remain in the community to all other outcomes. The sustainability of such communities is not just in the interest of nostalgists and Luddites. Rather, these communities provide valuable resources for their members, while still being fragile in the face of market forces. The existence of such communities conducting independent experiments in living, including small egalitarian communities, is vital for the formation of social knowledge in the Hayekian sense of socially distributed learning and computation.

In the remainder of the paper, we present a simple model of community formation subject to market pressures, with several variations. We show this model can explain patterns of migration within and between countries, as well as various examples of community breakdown. We then discuss mitigating factors and possible solutions to the problem of community breakdown, before concluding.

2 A Model of Community Breakdown

We now develop a simple model to illustrate the ways in which free markets, specifically free labor mobility, can lead to the inefficient breakdown of communities.

Consider two locations, which for convenience we will call a community c and a city C. The community consists of a finite set of individuals N, where $|N| = n > 1$. Again, the community could be a small town/village near the city or a separate cultural community within the city which produces its own club goods. Being in the city means interacting freely outside of any community structure and having no access to club goods.

At the beginning of the game, community members simultaneously choose a location, remaining in the community or 'moving to' the city.[1] Let the set of individuals who choose to remain in the community be M, where $|M| = m$. Let $\theta_i > 0$ be i's productivity. An individual produces positive spillovers within the community (but not in the city), through production of a club good. The payoff from the remaining in the community, for $i \in M$ is

[1]For simplicity, we assume the (unmodeled) population in the city cannot move to the community.

$$u_i(c;m) = \underbrace{\theta_i}_{\text{private consumption}} + \underbrace{\sum_{j \in M} \theta_j}_{\text{club good}} . \tag{1}$$

The payoff from moving to the city is simply

$$u_i(C) = \underbrace{\beta\theta_i}_{\text{private consumption}} , \tag{2}$$

where $\beta > 1$. One can think of a person moving to the city receiving a higher wage but foregoing the club goods (e.g. social interaction, risk sharing, marriage market) provided by community membership. Hence β can be a measure of economic inequality between the city and community.

The structure of the game is common knowledge.

2.1 Homogeneous Productivity

Let us begin with the homogeneous case: $\theta_i = \theta$ for all $i \in N$.

The payoff to remaining in the community is

$$u(c;m) = \theta + m\theta = \theta(m+1). \tag{3}$$

The payoff to moving to the city is $u(C) = \beta\theta$ for all $i \in N$, regardless of the choices of other individuals.

First, consider a Nash equilibrium in which all individuals choose the city ($m = 0$). There is no profitable deviation for any player if and only if $u(C) \geq u(c;1)$ or equivalently:

$$\beta \geq 2, \tag{4}$$

that is, when inequality between the city and community is sufficiently large.

Now consider the other symmetric Nash equilibrium in which all individuals choose the community ($m = n$). There is no profitable deviation for any player if and only if $u(c;n) \geq u(C)$ or equivalently:

$$\beta \leq n + 1. \tag{5}$$

Note that this is also the condition under which "all community" Pareto dominates "all city".

This leads to the following proposition:

Proposition 1 *Consider the homogeneous case. There exists a Nash equilibrium in which all community members to move to the city, $m = 0$, if and only if inequality between city and community is sufficiently large, $\beta \geq 2$. For $\beta < n + 1$, this equilibrium is inefficient, in the sense that it is Pareto dominated by the outcome in which all $i \in N$ remain in the community.*

Hence labor mobility can produce undesirable outcomes even in the homogeneous case. Free markets for labor clash with the coexistence of distinct communities that generate valuable club goods and conduct (possibly) independent experiments in living.

Note that for $\beta < 2$, the unique Nash equilibrium is "all community", $m = n$, and this equilibrium is Pareto dominant. For $\beta > n + 1$, the unique Nash equilibrium is "all city", $m = 0$, and this equilibrium is Pareto dominant.

Hence even where inefficient breakdown of the community can occur in equilibrium, for $\beta \in [2, n + 1)$, the efficient outcome $m = n$ is still a Nash equilibrium. This community structure can, however, be destabilized if a critical mass of community members leaves for the city. How stable is the community? That is, starting in the state $m = n$, how many deviations from community to city would it take for moving to the city to be a best response for all remaining individuals? We call this the *tipping point* for this community (Schelling 1978). Though the analysis here is static, this tipping point is an important measure of stability in dynamic, evolutionary models (Young 1998, Sandholm 2010).

The tipping point, which we denote by τ^*, is determined as follows. Consider d deviations from state $m = n$. It is a best response for remaining players to deviate to the city if and only if

$$\beta\theta \geq \theta(n - d + 1), \tag{6}$$

or $d \geq n + 1 - \beta \equiv d^*$.

Recall that $\lceil y \rceil$ is the smallest integer greater than or equal to y. Thus, we can state the following proposition:

Proposition 2 *Consider the homogeneous case with intermediate inequality between city and community: $\beta \in [2, n+1)$. The tipping point for the community, i.e. the number of deviations from state $m = n$ required to make city C a best response for all other players, is*

$$\tau^* \equiv \lceil d^* \rceil = \lceil n + 1 - \beta \rceil. \tag{7}$$

The higher the inequality between city and community, β, the lower the tipping point and the less stable is the community. Note that as $\beta \to n+1$ (i.e. the upper bound for existence of the "all community" equilibrium), the tipping point goes to one. That is, even though the outcome in which all individuals remain in the community is Pareto dominant, even a single person leaving the community for the city can completely destabilize the community.

Though we will not do so here, this tipping point analysis could be built upon to study flows of people into and out of the community over time and determine which state $m = 0$ or $m = n$ is stochastically stable (Foster & Young 1990, Young 1993), i.e. which state the process spends virtually all the time in as time goes to infinity.

We can also examine the share of the community required to deviate by dividing τ^* by the population size n. Doing so, we see that the share is increasing in n (because $\beta > 1$ by assumption). Hence smaller communities are more easily destabilized than larger ones.

We can use this simple model to understand a range of social phenomena. For example, accounts of British cities during the 19th century paint a picture of squalor, disease and death among the working classes (Engels 1993). Why then was there such a large outflow from the countryside to the newly industrialized cities (Williamson 2002)? One interpretation could be that people preferred the higher wages in the city, and that large-scale rural-urban migration made immigrants better off on the whole, despite the hazardous living conditions. That could be the case, but our analysis shows it is not necessarily so, at least not for the first generation moving to the city. Instead, random deviations and experimentation by a small share of community members who move to the city can trigger mass exodus from a rural community, even if everyone prefers the outcome of all remaining in the community.

As we shall now see, heterogeneous productivity can lead to a 'brain drain' which further destabilizes the community.

2.2 Heterogeneous Productivity

Let us now examine heterogeneity and specifically a mean-preserving spread in productivity. There are two types of community members. High productivity (H) types have productivity $\theta + \alpha$, where $\alpha \in (0, \theta)$. Low productivity (L) types have productivity $\theta - \alpha$. The number of H types is denoted by n_H, where $1 \leq n_H < n$. One can think of H types as community leaders, since they not only produce more private consumption for themselves but also a greater contribution to the club good than L types.

The set of H types choosing to remain in the community is denoted by M_H, where $|M_H| = m_H$. The payoff to remaining in the community for an H type is

$$\begin{aligned} u(c; m, H) &= (\theta + \alpha) + m_H(\theta + \alpha) + (m - m_H)(\theta - \alpha) \\ &= (\theta + \alpha) + (\theta - \alpha)m + 2\alpha m_H. \end{aligned} \tag{8}$$

Similarly, the payoff to remaining in the community for an L type is

$$u(c; m, L) = (\theta - \alpha) + (\theta - \alpha)m + 2\alpha m_H. \tag{9}$$

The payoff to moving to the city is $u(C; H) = \beta(\theta + \alpha)$ for an H type and $u(C; L) = \beta(\theta - \alpha)$ for an L type.

First, consider a Nash equilibrium in which all individuals choose the city ($m = 0$). There is no profitable deviation for any player if and only if $u(C; L) \geq u(c; 1, L)$ or equivalently $\beta \geq 2$, as in the homogeneous case.

Now consider the other symmetric Nash equilibrium in which all individuals choose the community ($m = n$). By inspection of (8) and (9), H types have the most to gain from moving to the city. Hence there is no profitable deviation for any player if and only if $u(C; H) \geq u(c; n, H)$ or equivalently:

$$\beta \leq \frac{\theta - \alpha}{\theta + \alpha} n + \frac{2\alpha}{\theta + \alpha} n_H + 1. \tag{10}$$

Notice that the right-hand side of (10) is smaller than $n+1$ (because $n_H < n$ by assumption). Hence "all community" is a Nash equilibrium under a smaller set of conditions than when productivity is homogeneous. A simple mean-preserving spread in productivity undermines community formation.

As before, (10) is also the condition under which the "all community" outcome is Pareto dominant.

Under heterogeneity, there can also be an asymmetric Nash equilibrium in which only low productivity types remain in the community. The incentive compatibility conditions for H and L types respectively are:

$$\beta \geq \frac{\theta - \alpha}{\theta + \alpha}(n - n_H + 1) + \frac{2\alpha}{\theta + \alpha} + 1 \tag{11}$$

$$\beta \leq n - n_H + 1. \tag{12}$$

Even in this equilibrium, there can be an inefficient breakdown of the community:

Proposition 3 *Consider the heterogeneous case.*

There exists a Nash equilibrium in which all community members to move to the city, $m = 0$, if and only if inequality between city and community is sufficiently large, $\beta \geq 2$.

There also exists a Nash equilibrium in which all H types move to the city and all L types remain in the community if and only if $\beta \in \left[\frac{\theta-\alpha}{\theta+\alpha}(n - n_H + 1) + \frac{2\alpha}{\theta+\alpha} + 1, n - n_H + 1\right]$.

For $\beta < \frac{\theta-\alpha}{\theta+\alpha} n + \frac{2\alpha}{\theta+\alpha} n_H + 1$, both equilibria are inefficient, in the sense that they are Pareto dominated by the outcome in which all $i \in N$ remain in the community.

To assess the role of heterogeneity in destabilizing the community, let us examine the tipping point for the community.

Observing (12), we know the deviation of all H types to the city will make it a best response for each L type to deviate to the city if and only if $\beta \geq n - n_H + 1$. In this case, there is a cascade out of the community in which the pivotal agent will be an H type. Consider d deviations by H types. It is a best response for a remaining H type to deviate to the city if and only if

$$\beta(\theta + \alpha) \geq (\theta + \alpha) + (\theta - \alpha)(n - d) + 2\alpha(n_H - d), \tag{13}$$

or

$$d \geq \frac{\theta - \alpha}{\theta + \alpha} n + \frac{2\alpha}{\theta + \alpha} n_H + 1 - \beta \ \equiv \ d^{**}. \tag{14}$$

Thus, we can state the following proposition:

Proposition 4 *Consider the heterogeneous case with intermediate inequality between city and community:* $\beta \in \left[2, \frac{\theta-\alpha}{\theta+\alpha} n + \frac{2\alpha}{\theta+\alpha} n_H + 1\right)$.

Suppose $\beta \geq n - n_H + 1$. *The tipping point for the community is*

$$\tau^{**} \equiv \lceil d^{**} \rceil = \left\lceil \frac{\theta - \alpha}{\theta + \alpha} n + \frac{2\alpha}{\theta + \alpha} n_H + 1 - \beta \right\rceil, \tag{15}$$

which is lower than the tipping point τ^* *in the homogeneous case for* n *sufficiently large.*

The reason $\tau^{**} > \tau^*$ when $\beta \geq n - n_H + 1$ is as follows. Under heterogeneity, community breakdown can proceed with H types (e.g. community leaders), who are easily induced to leave, doing so first. Their leaving reduces the value of community membership for L types who may then be induced to leave for the city without any further deviations (if $\beta \geq n - n_H + 1$).

Once again, a simple mean-preserving spread can exacerbate the problem of inefficient community breakdown. Greater heterogeneity, with a large number of types, could trigger such a cascade even more easily, as the highest type leaves first, triggering exit by the second highest type, which triggers exit by the third highest type, and so forth.

The decline of rust belt communities in the United States today could be linked to industrial decline (higher β) combined with such a 'brain drain'. Independent of trends in racial and economic segregation, there has been a large increase in geographic segregation based on education in the United States since the 1940s (Domina 2006). This of course has profound political implications. It might also help explain the scale of high-skilled immigration to developed countries. During the 1990s alone, the number of highly educated immigrants from developing countries living in OECD member countries doubled, spawning a large literature on mechanisms to stop the brain drain (Docquier & Rapoport 2012). Our model describes the interactive social (not just economic) effects of this exodus on the countries of origin. Finally, our analysis is consistent with William Julius Wilson's thesis that poverty in US inner cities is due to the deindustrialization of cities in the 1970s, combined with the relocation of community leaders to the suburbs following desegregation (Wilson 2011).

2.3 An Egalitarian Community

In addition to producing positive spillovers, many communities engage in redistribution. We stick with the heterogeneous case and introduce equal sharing of output by the community.

Under equal sharing the payoff from the remaining in the community, for $i \in M$ is

$$u_i(c;m) = \underbrace{\frac{1}{m}\sum_{j\in M}\theta_j}_{\text{private consumption}} + \underbrace{\sum_{j\in M}\theta_j}_{\text{club good}} . \tag{16}$$

The payoff from moving to the city is as before $u_i(C) = \beta\theta_i$.

We proceed as in the other cases. Consider a Nash equilibrium in which all individuals choose the city ($m = 0$). There is no profitable deviation for any player if and only if $u(C; L) \geq u(c; 1, L)$ or equivalently $\beta \geq 2$, as in the homogeneous case and heterogenous case without sharing.

Now consider the other symmetric Nash equilibrium in which all individuals choose the community ($m = n$). Again, H types have the most to gain from moving to the city.

Hence there is no profitable deviation for any player if and only if $u(C;H) \geq u(c;n,H)$ or equivalently:

$$\beta \;\leq\; \frac{\theta-\alpha}{\theta+\alpha}n + \frac{2\alpha}{\theta+\alpha}n_H + \underbrace{\frac{2\alpha}{\theta+\alpha}\frac{n_H}{n} + \frac{\theta-\alpha}{\theta+\alpha}}_{<1}. \tag{17}$$

The right-hand side of (17) is smaller than the right-hand side of (10) (because $n_H < n$ by assumption). Hence "all community" is a Nash equilibrium under an even smaller set of conditions than when there is no redistribution. The reason is that equal sharing by the community further enlarges the gain in private consumption from moving to the city, especially for high productivity types.

Again, (17) is also the condition under which the "all community" outcome is Pareto dominant.

For the asymmetric Nash equilibrium, in which only low productivity types remain in the community, the incentive compatibility conditions for H and L types respectively are:

$$\beta \;\geq\; \frac{\theta-\alpha}{\theta+\alpha}(n-n_H+1) + \frac{2\alpha}{\theta+\alpha} + \frac{2\alpha}{\theta+\alpha}\frac{1}{n} + \frac{\theta-\alpha}{\theta+\alpha} \tag{18}$$

$$\beta \;\leq\; n-n_H+1. \tag{19}$$

Again, there can be an inefficient breakdown of the community:

Proposition 5 *Consider the heterogeneous case with equal sharing by the community.*

There exists a Nash equilibrium in which all community members to move to the city, $m=0$, if and only if inequality between city and community is sufficiently large, $\beta \geq 2$.

There also exists a Nash equilibrium in which all H types move to the city and all L types remain in the community if and only if $\beta \in \left[\frac{\theta-\alpha}{\theta+\alpha}(n-n_H+1) + \frac{2\alpha}{\theta+\alpha} + \frac{2\alpha}{\theta+\alpha}\frac{1}{n} + \frac{\theta-\alpha}{\theta+\alpha}, n-n_H+1\right]$.

For $\beta < \frac{\theta-\alpha}{\theta+\alpha}n + \frac{2\alpha}{\theta+\alpha}n_H + \frac{2\alpha}{\theta+\alpha}\frac{n_H}{n} + \frac{\theta-\alpha}{\theta+\alpha}$, both equilibria are inefficient, in the sense that they are Pareto dominated by the outcome in which all $i \in N$ remain in the community.

To examine the tipping point of the community with equal sharing, consider d deviations by H types. It is a best response for a remaining H type to deviate to the city if and only if

$$\beta(\theta+\alpha) \geq \frac{n_H - d}{n-d}(\theta+\alpha) + \frac{n-n_H}{n-d}(\theta-\alpha) + (\theta-\alpha)(n-d) + 2\alpha(n_H - d), \tag{20}$$

or

$$d \geq \frac{\theta-\alpha}{\theta+\alpha}n + \frac{2\alpha}{\theta+\alpha}n_H + \frac{n_H-d}{n-d} + \frac{n-n_H}{n-d}\frac{\theta-\alpha}{\theta+\alpha} - \beta\,. \tag{21}$$

The value of d that equates (21) is denoted by d^{***}. By comparing the right-hand sides of (14) and (21), we see that $\tau^{***} = \lceil d^{***} \rceil < \tau^{**}$ for n sufficiently large (so that integer rounding is not an issue). This result is summarized as follows:

Proposition 6 *Consider the heterogeneous case with equal sharing and intermediate inequality between city and community:* $\beta \in \left[2, \frac{\theta-\alpha}{\theta+\alpha}n + \frac{2\alpha}{\theta+\alpha}n_H + \frac{2\alpha}{\theta+\alpha}\frac{n_H}{n} + \frac{\theta-\alpha}{\theta+\alpha}\right)$.

Suppose $\beta \geq n - n_H + 1$. *The tipping point for the community is given by* $\tau^{***} = \lceil d^{***} \rceil$, *which is lower than the tipping point without sharing,* τ^{**}, *for* n *sufficiently large.*

Equal sharing by the community lowers the private consumption of H types in the community, enlarging their gain from moving to the city. Therefore, fewer deviations by H types are required to trigger a cascade which induces L types to leave the community. Recall that, under the conditions of the proposition, this community breakdown is inefficient.

The foremost work on the problems faced by egalitarian communities in the presence of market pressures is by Ran Abramitzky (2008, 2011, 2018), who studies the egalitarian Israeli kibbutzim. Abramitzky links the sharp decline in kibbutz membership since the 1980s to an exogenous financial shock which lowered the standard of living of members (equivalent to a rise in β), with high-ability types comprising a larger share of those exiting (egalitarian) kibbutzim than among rural-urban migrants as a whole. Our model contributes an account of how this ‘brain drain’ can be amplified by positive externalities, with exit by highly productive members triggering a cascade of relocations from community to city, which could eventually induce low-productivity members to exit.

3 Possible Solutions to Community Breakdown

We now discuss three possible solutions to the tension between markets and communities. In doing so, we will identify factors that naturally mitigate the problem and the limitations of the potential solutions identified here.

3.1 Taxes

To stop the brain drain from developing countries, Bhagwati (1976) proposed taxing emigrants, with revenues remitted to their home countries via the United Nations. Even if this were politically feasible, it would do nothing to solve potentially excessive rural-urban migration within a country. An alternative would be city-level citizenship (in addition to national citizenship). China already has a version of this in its *hukou* system for managing massive rural-to-urban migration flows. Migrants to a city would pay a fee p, which could be set to align equilibrium locations with the efficient allocation. In our model, this would put a brake on community exit and may be preferred by all community members. Where the proceeds go would not matter; they could be burned and still improve the welfare of all community members.

There are of course two problems with this approach. First, the knowledge problem applies. A planner would require a great deal of knowledge to set p correctly. How would a planner know whether the "all city" equilibrium is inefficient? Even in this simple model, she would have to observe the system's parameters, including β and α. It would not be evident from location choices, and possibly not even from the expressed preferences of political activists. Thus, setting a high p could subsidize and preserve inefficient and possibly harmful communities. Second, there is the problem of the second best (Lipsey & Lancaster 1956). The model we have presented here is of course a gross simplification of reality, which we can never fully know. It examines a single aspect of interaction between markets and communities. But there may be many other dimensions to the interaction. In particular, the inefficient breakdown of communities may offset other inefficiencies in the system, including the potential for inefficiently low urban density due to positive externalizes within the city.

3.2 Competition

Competition between between multiple communities, as advocated by Mill, Hayek and Kukathas, could alleviate market pressures and inefficiency in two ways. First, competition for members could promote innovation and efficient club goods production by communities. Second, choice between communities could select for efficient equilibria. It well known in game theory that inefficient outcomes can be evolutionarily and even stochastically stable. For example, in 2×2 coordination games played by a single community, the risk-dominant equilibrium is stochastically stable under a range of learning protocols, even when it is Pareto dominated (Kandori et al. 1993, Young 1993). However, the Pareto-dominant convention is always selected when there are multiple disjoint communities and free movement of players between these communities (Dieckmann 1999). Naturally, players would migrate to the community closest to the efficient equilibrium. The coexistence of competing communities requires a spirit of toleration (Kukathas 2003) and sufficient state capacity (Johnson & Koyama 2019). One limitation of this approach is that communities usually have capacity constraints which act as a barrier to mobility between communities.

3.3 Distinction

Religious organizations are among the most ubiquitous and long-lived institutions in human history. Even at a small scale, Sosis (2000) finds that religious communes are stricter and longer lived than secular communes. Thus we could potentially learn a lot about community survival from religious communities. Perhaps the most important thing religious (or quasi-religious) groups do is to require members to adopt distinct belief systems and behavioral norms that deviate from those observed in mainstream society (Iannaccone 1992, 1994). This can enable a community to weather market pressures in several ways. First, it promotes efficient club goods production through screening, sorting and substitution effects (Iannaccone 1992, Carvalho 2016). Second, members are less likely to leave when they become attached to distinct belief systems and practices that cannot be supported outside of the community. Third, certain belief systems, such as those de-emphasizing material welfare, can induce costly forms of sacrifice that stabilize a community. For example, many religious and quasi-religious communities, including kibbutzim, levy an 'exit tax' in which leaving members are required to forfeit some or all of their assets. As Abramitzky (2008) shows, this slows down exit. The advantage is that, unlike an outside planner, the community can combine this expanded set of instruments with its local knowledge to promote its own survival. The downside of course is the formation of potentially pathological communities, such as suicide cults.

4 Conclusion

This paper has explored a key tension between free markets and communities. In particular, we have shown how the inefficient breakdown of communities can occur due to free mobility of labor and how this problem can be exacerbated by heterogeneity in productivity among community members and redistribution within communities. Finally, we have discussed three possible solutions to the tension between markets and communities, namely (a) various taxes on exit/entry, (b) competition between communities, and (c) distinctive beliefs systems and behavioral prescriptions.

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