

## Lessons from the Kibbutz on the Equality–Incentives Trade-off

Ran Abramitzky

**T**he first kibbutz, called Degania, was established southwest of the Sea of Galilee in 1910, but the vast majority of kibbutzim were established in the 1930s and 1940s, shortly before the creation of the state of Israel in 1948. The stereotypical view emphasizes that the founders of kibbutzim were often socialist idealist Jews from Eastern Europe. They migrated to the area of the Middle East that is now modern-day Israel, rejected capitalism, and attempted to create an egalitarian society based on Marxist principles. They aimed to create a “new human being” who cared about the group more than about himself, a *homo sociologicus* who would challenge the selfish *homo economicus*. This idealistic view can explain many of the key features of kibbutzim: equal sharing in the distribution of income; no private property; a noncash economy; communal dining halls where members ate their meals together; high provision of local public goods for use by kibbutz members; separate communal residences for children outside their parents’ homes, which were supposed to free women from their traditional role in society and allow them to be treated equally with men; collective education to instill socialist and Zionist values (Dror, 2001); communal production, whereby kibbutz members worked inside their kibbutzim in agriculture or in one of the kibbutz plants; and no use of hired labor from outside kibbutzim—because hiring labor was considered “exploitation” under the reigning socialist ideology.

To an economist, steeped in thinking about incentives that self-interested individuals face, there are three reasons why an equal-sharing arrangement of this sort seems unlikely to last. First, high-ability members have an incentive to exit equal-sharing arrangements to earn a wage premium—so-called “brain drain.” Second,

■ *Ran Abramitzky is Assistant Professor of Economics, Stanford University, Stanford, California. His e-mail address is <ranabr@stanford.edu>.*

doi=10.1257/jep.25.1.185

low-ability individuals have an incentive to enter equal-sharing arrangements so that they can be subsidized by more-able individuals—so-called adverse selection. Third, in context of equal sharing, shirking and free-riding are likely to be prevalent.

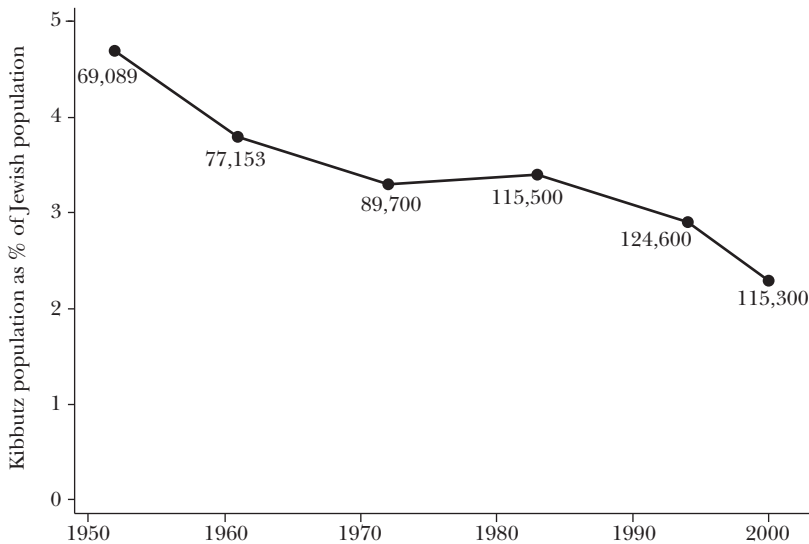
However, kibbutzim have survived successfully for the past century and currently consist of 120,000 members living in 268 kibbutzim. Kibbutzim began as communal farms, but when Israel industrialized in the 1950s and 1960s, they followed suit and developed a large industrial base alongside agriculture. Thus, while it is true that much of Israel's agricultural production takes place in kibbutzim, it is not true that kibbutzim are mostly based on agriculture: specifically, the production in kibbutzim is currently about 80 percent industry (mainly food and machinery) and 20 percent agriculture. Indeed, living standards in kibbutzim were higher than Israel's average for many years (Barkai, 1977).

Moreover, the number of kibbutz members has increased dramatically since they were first established. Figure 1 shows the evolution since 1952 of the number of kibbutz members, and the kibbutz population as a percentage of the total Jewish population of Israel. The number of people living in kibbutzim rose from 1952 to 1990, but after 1990 the absolute number declined. The share of this group in Israel's population was declining over the entire time period, from over 5 percent of the population in 1952 to less than 2.5 percent in 2000. The source of kibbutz population growth changed over the years. Early population growth was often from new members joining from the outside. Most founders of kibbutzim came to Israel in what are called the second and third waves of immigration (*Aliya*), which occurred in the periods 1904–1914 and 1919–1923. Since then, the main source of population growth has been internal, namely kibbutz-born individuals who stay in their kibbutz.

This paper begins with a discussion of the benefits and costs of equal-sharing arrangements. It then follows a theoretical framework, presented formally in Abramitzky (2008), which views kibbutzim as risk-sharing communities that are subject to incentive constraints. Specifically, kibbutzim aim for a high degree of equality of their compensation schemes, both because of egalitarian ideology and for risk-sharing considerations (that is, the objective functions of the kibbutzim are concave). However, these efforts at maintaining full sharing are subject to three incentive constraints: a participation constraint that “brain drain” must be limited; a no adverse selection constraint that entry of low-productivity members must be discouraged; and an incentive compatibility constraint that limits shirking.<sup>1</sup> To maintain a high degree of equality while satisfying these incentive constraints, theory

<sup>1</sup> Lazear (1986, 2000a, 2000b) highlighted the selection effect of pay-for-performance contracts and illustrated its effect on performance. The main focus of agency theory has been the incentive effects of contracts; a classic reference for the incentive effect of equal sharing is Holmstrom (1982). An empirical literature on asymmetric information and moral hazard also exists (for example, the survey by Chiappori and Salanie, 2000). The focus of the empirical literature on free riding is profit sharing in firms and its association with performance. See Prendergast (1999, 2002) for a survey on the literature of the provision of incentives in firms, and Knez and Simester (2001) for a contribution on firmwide incentives and monitoring. For laboratory experiments on free riding, see, for example, Fehr and Gächter (2000).

Figure 1  
The Population of Kibbutzim



Source: Pavin (2001).

Notes: This figure shows the total population of kibbutzim as a percentage of the Jewish population in Israel (along the y-axis). The values given by the points are the total number of kibbutz members.

highlights the importance of contracting among individuals who appear to have similar abilities before entering the contract and of “posting a bond” when entering the contract to make later exit costly; screening out low-ability entrants; and penalizing shirking with monetary and social sanctions. The following three sections present evidence on the extent to which these problems arise in the kibbutzim and on the institutions and actions used by kibbutzim to limit these problems.

The late 1980s saw an upheaval known as “the kibbutz crisis,” in which a number of elements of kibbutz life came under stress: many kibbutzim borrowed heavily and then experienced financial stress; the development of a high-tech economy in Israel offered potentially larger rewards for high-ability workers; and the ideological commitment to the socialist aspect of kibbutz life continued to wane. As Figure 1 showed, the years following the kibbutz crisis are a time period when the absolute number of kibbutz members declined for the first time. This episode offers a chance to see how the kibbutz members and institutions responded to outside shocks that tightened the incentive constraints they faced, which made their egalitarian social model harder to maintain.

The conclusion of this paper discusses general lessons the kibbutzim offer for societies and organizations that aim at equality. In a number of ways, the kibbutzim offer an exceptional environment to examine the potential trade-off between equality and incentives. Unlike members of many other communally based living arrangements, kibbutz members were never at the margin of society, and they

have always interacted with the rest of the population and played an important role in Israeli society; in this sense, the study of kibbutzim is more relevant for understanding other economic organizations than the study of other communes whose members have been unaware of their outside options. In general, people might tolerate the existing social order if they are unaware that there are good outside options (which could explain the high degree of information control used by many communist countries).<sup>2</sup> In fact, members interact with nonmembers by age 18 through the mandatory military service, and many kibbutz members (especially since the 1980s) work outside their kibbutzim and then share their salaries equally with others in the kibbutz.

A number of other organizations and communities use various lock-in mechanisms to limit brain drain, screening to regulate the quality of entrants, and social sanctions to limit shirking—ranging from the lower-powered incentives apparent in professional partnerships, cooperatives, and even academic departments, to more high-powered incentives used by some village economies in developing countries, communist countries, and even welfare states. However, such measures must typically be used in extreme ways if a community is to be based on full equal sharing, which helps to explain why such communities are so rare and why they tend to be short-lived.

## The Benefits and Costs of Equal Sharing

Many societies and countries have aimed at a high degree of equality: past hunter and gatherer societies; villages in developing countries; organizations and firms; and both communist countries and European welfare states. This widespread pattern suggests equal sharing offers significant benefits. In this section, I discuss the ideological and economic benefits of equal sharing that motivated its implementation by kibbutzim, as well as the incentive costs of equal sharing.<sup>3</sup>

Sociologists have highlighted the importance of ideology and social norms in sharing resources equally. Ideology can be viewed as inherent loyalty of members to their kibbutz and to the ideals of the kibbutz movement; certainly, ideological motives for equality played a central and substantial role in the context of kibbutzim. The role of ideology is hard to measure with individual-level data because members' level of ideology is not observed, but it can be measured with kibbutz-level data. Specifically, kibbutzim can be divided into the Takam group (about 60 percent of kibbutzim) and the Artzi group (32 percent of kibbutzim).<sup>4</sup> The two groups have recently united, but the historiography of the kibbutz suggests that kibbutzim affiliated with the Artzi group, which was formed by a leftist Eastern European group

<sup>2</sup> Abramitzky and Sin (2010) show a huge increase in Western ideas as measured by book translations following the collapse of communism in Eastern Europe.

<sup>3</sup> Another reason why societies may desire some level of equality is to avoid the negative externalities, such as high crime rates, that may result from having a very poor portion of society (see, for example, Benabou, 1996).

<sup>4</sup> The other main group is the called the "religion group," which constitutes about 6 percent of kibbutzim.

called Ha'shomer Ha'tzair, hold a higher degree of socialist ideology. I investigate the role of ideology in maintaining equal sharing by asking whether the kibbutzim in the Artzi group were less likely than the Takam to shift away from full equal sharing once the kibbutz way of life came under stress.

The information on kibbutzim's degree of equality was collected by Shlomo Getz of the Institute for Kibbutz Research based on kibbutzim's self-reported degree of income equality. Since the late 1990s, kibbutzim have shifted away from equal sharing by introducing various degrees of differentiating reforms, ranging from small deviations from equal sharing to substantial ones, wherein a member's budget is mostly based on his or her earnings. As of 2004, about 15 percent of kibbutzim still maintain full equal sharing between members, but the majority of kibbutzim adopted a "safety net" model, whereby members keep some fraction of their earnings and share the rest with their fellow members. The kibbutzim of the more-socialist Artzi group were almost 20 percentage points more likely than the Takam group to maintain equal sharing (Abramitzky, 2008).

An economic perspective provides a different and complementary rationale for equal sharing: that is, equal sharing provides insurance against idiosyncratic shocks to income. Kibbutz members know that whatever their circumstances are, they and their families will always get an equal share of the output. Although this insurance motive for equality in kibbutzim is largely overlooked, its importance is evident in kibbutzim's by-laws, which in earlier days were to a large extent standardized across kibbutzim. In a common phrase (and in my own translation from the Hebrew), the by-laws spell out kibbutzim's commitment to "provide for the economic, social, cultural, educational, and personal needs of members and their dependents . . . [and] to ensure a decent standard of living for kibbutz members and their dependents," as well as to "have mutual aid with other kibbutzim and rural villages." Mutual aid across kibbutzim provided further insurance against shocks to the specific kibbutz.

Insurance considerations were important initially because founders of kibbutzim came to a new country full of uncertainty and faced income shocks at a time when insurance markets were underdeveloped. Kibbutzim were founded by young individuals who were similar in their expected productivity and who shared a comparatively long period of social, ideological, and vocational training (Talmon, 1972). The rules were thus designed at a point when the individuals did not know what their abilities, productivities, fortune, or health would be, and thus wanted the worst possible outcome for a kibbutz member to be as good as possible.

In early days, the newcomers often became sick with malaria, and "as much as half of the work force could be idle because of illness on a given day" (Near, 1992). In a kibbutz where members have different occupations and abilities, and work in different industries, equal sharing provides members and their families with valuable insurance against productivity shocks. Even as insurance markets developed, equal sharing provided kibbutz members with insurance against shocks to their human capital. Such insurance was limited outside kibbutzim and available only in the forms of life insurance and disability insurance.

The conceptual framework highlights that, while insurance considerations can provide a rationale for a group of individuals to agree on equal sharing before they know their own productivities, at some point their productivities are revealed. If individuals are permitted to exit the equal-sharing agreement and instead receive their outside options, the risk-sharing arrangement might fail because of the lack of incentives for high-ability individuals to stay under equal sharing (the brain drain problem). In addition, if productivity is not only an in-born trait, but rather depends to some extent on effort, then the risk-sharing arrangement might fail because of the lack of incentives to work hard under equal sharing (moral hazard).

Ideology reenters the picture here. A member with a high level of ideology is less likely to leave or shirk than is a member with a low level of ideology. Thus, the presence of ideologically committed members is important for maintaining equal sharing, while mitigating brain drain and moral hazard. As a result, kibbutzim have an incentive to instill ideology through education, which they attempted to do. Kibbutzim put in place a collective education system promoting altruism and socialism, as well as encouraging high work ethics and norms, cooperation, an extended-family approach, caring about the collective more than about oneself, and having meaningful service in the army. The collective, rather than parents, was responsible for raising children, who originally lived together in special residences in which they learned to live communally, take responsibility, help the weak, and to value cooperation over competition. A key goal was to train children to believe in the collective way of life their parents had chosen. On the other side, those criticizing the traditional kibbutz education system claim that it educated for conformism and mediocrity, pulling up those behind but pushing down those with high individual aspirations (Spiro, 1958; Bettelheim, 1969). However, each kibbutz generation has become less ideological than the previous one (Rosner, Ben David, Avnat, Cohen, and Leviatan, 1990), in large part because, for more-recent generations, living in a kibbutz was a default choice into which they were born rather than an active choice.<sup>5</sup>

Any community that organizes itself around achieving a high degree of equality—for whatever mixture of ideological and risk-sharing reasons—still faces incentive-based constraints: participation constraints, or the desire of some participants to exit; adverse selection constraints, or the desire of less-productive people to enter; and incentive compatibility constraints that lead to shirking. An equal-sharing community also faces the danger that exogenous factors will shift in a way that makes its institutions harder to sustain. The following sections discuss these issues in turn.

<sup>5</sup> A similar decrease occurred in the attachment of later generations of Israelis to Israel. Another parallel between Israel as a whole and kibbutzim is that the increase in outside options for Israelis might have been a contributing factor in the brain drain from Israel.

## Participation Constraints and Brain Drain

Exit at will is a key feature of kibbutzim. It reflects the desire of the founders to combine the equality they valued in socialism with the free exit they valued in free societies and democracies. Nevertheless, exit at will makes it challenging for kibbutzim to maintain equal sharing because productive members have incentives to leave for places with less-equal compensation schemes.<sup>6</sup> The constraints that exit places on the degree of equality provide one rationale for why societies aiming at equal sharing, such as communist countries, often limit exit substantially. Despite the existence of outside options, many members decided to stay in their kibbutzim. This is reflected in the steady growth of the number of kibbutz members until the 1990s and the only moderate decline since then.

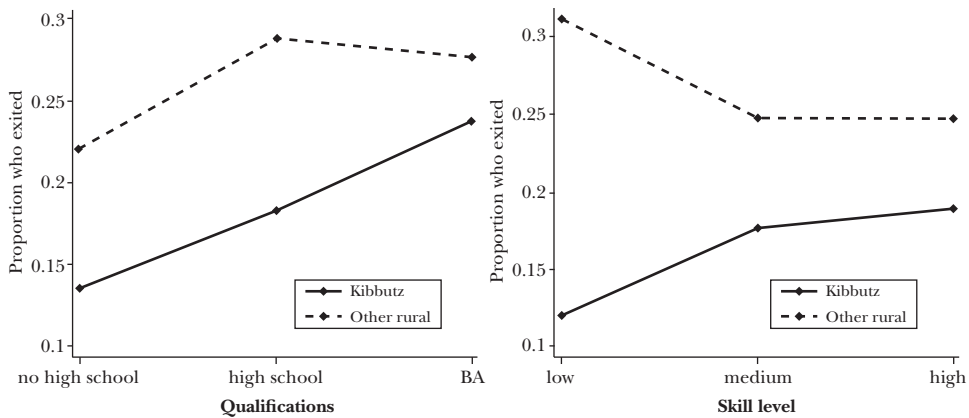
To what extent is exit of high-productivity workers a problem for kibbutzim? In Abramitzky (2009a), I use a panel dataset of individuals linked across the population censuses of 1983 and 1995 to test how redistribution affected mobility patterns in kibbutzim. These data include all Israeli citizens who answered the “extensive questionnaire” in both years: at each census, this questionnaire was given to 20 percent of households in a way that adequately represented the entire population. Thus, the matched sample accounts for a representative 4 percent of the Israeli population in general and of the kibbutz population in particular. To make the comparisons between kibbutz members and nonmembers meaningful, I concentrate on Jewish individuals who were between the ages of 21 and 54 in 1983 (and thus between the ages of 33 and 66 in 1995). A total of 343 out of the 1,577 individuals in the sample who lived in a kibbutz in 1983 left the kibbutz between 1983 and 1995, over 20 percent of the sample.

If equal compensation schemes discourage participation of productive individuals, we expect high-ability members to be more likely to exit kibbutzim. Figure 2 shows that more-educated and -skilled individuals were indeed more likely to exit kibbutzim. Because kibbutzim involve rural living, and rural-to-urban migrants might be positively selected regardless of equal sharing, Figure 2 also shows migration by education and skill of other rural-to-urban migrants. This figure indicates that positive selection of movers from kibbutzim is more pronounced than that of other rural-to-urban migrants. Also, notice that overall exit rates from kibbutzim are lower than exit rates from other rural areas, probably because of the various lock-in devices used by kibbutzim (and discussed later in this section). Presumably, there would be more exit without these devices.

An interesting direction for future research is to test whether, as theory predicts, kibbutzim that shifted away from equal sharing experienced earlier declines in brain drain. While anecdotal evidence supports this hypothesis, it

<sup>6</sup>The ability of individuals to leave at will is a potential challenge for all modern democracies and is more severe in societies with greater redistribution, kibbutzim being the extreme example. However, the costs of leaving a country are much greater than those of moving from a kibbutz to a city, and foreign countries place limits on entry. In contrast, movement from kibbutzim to Israeli cities is unrestricted.

Figure 2

**More-Educated and More-Skilled Kibbutz Members Were More Likely to Exit**

Source: Linked censuses of 1983 and 1995.

Notes: The left-hand panel shows the proportion of kibbutz members (solid line) and individuals from other rural areas (dashed line) who moved to the city between 1983 and 1995 by level of qualifications in 1983, while the right-hand panel shows this by the skill level of the member's occupation in 1983. To make these comparisons meaningful, I concentrate on Jewish individuals who were between the ages of 21 and 54 in 1983 (and thus between the ages of 33 and 66 in 1995). A total of 343 out of the 1,577 individuals in the sample who lived in a kibbutz in 1983 left the kibbutz between 1983 and 1995, over 20 percent. "High-skilled" are individuals working in either academic or managerial occupations. "Low-skilled" are individuals working in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations.

will only be possible to test it systematically after the next population census is released in late 2010.

To maintain equal sharing while mitigating brain drain, theory suggests that members can be required to make sunk contributions before their productivities are revealed that cannot be recovered upon exit. Such sunk contributions increase the cost of exit and thus facilitate equal sharing. This offers one reason why kibbutzim abolished private property, meaning that all assets belonged to the kibbutzim. Kibbutz members did not own their houses and could enjoy their share of the community assets only as long as they stayed in the commune. Although kibbutz-born individuals don't literally have property to give to the kibbutz as a sunk contribution, this lock-in mechanism operated on them as well. They could not receive bequests or other financial support from their parents, who had no private property. In effect, their entire family savings was sunk in the kibbutz, which implied a substantial cost of exit. Explicit statements in kibbutz bylaws (again, my own translation from the Hebrew) make it clear that exit was intended to be costly, such as "each kibbutz member must live inside the kibbutz, bring to the possession of the kibbutz his full working power and any income and assets he owns and/or receives from any source"; "the property of the kibbutz cannot be distributed



among members, both when the kibbutz persists and when it is dissolved”; “the kibbutz does not distribute profits in any way, and every surplus goes to the kibbutz.”

Besides communal ownership of property, kibbutzim also set up other mechanisms that served as “lock in” devices and increased the cost of exit. First, the provision of local public goods such as swimming pools, basketball and tennis courts, cultural centers, and parks was much higher in kibbutzim than in most other communities. Local public goods raise the cost of exit because only members can enjoy them.<sup>7</sup> Second, the use of cash was abolished, which meant members could not save individually (for bad times and for old age) or make bequests. Instead, goods were distributed in kind by category (food, clothes, travel, and so on) according to need.

A complementary way to create lock-in devices is to limit members’ outside options, which also increases the cost of exit. Members were encouraged to work inside their kibbutz, which increased the cost of exit by tying the place of residence and the workplace, and by limiting knowledge about work outside the kibbutz.

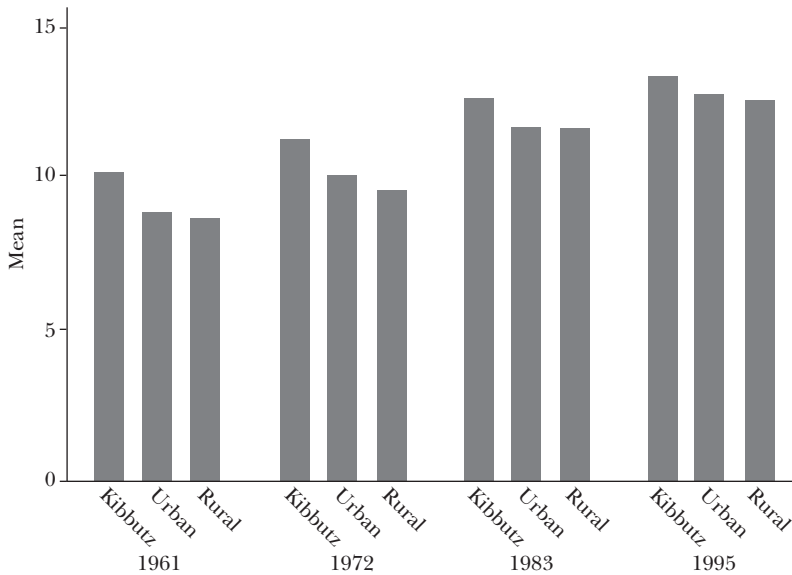
To be clear, lock-in of personal assets is not complete. Members who exit do receive modest amounts. More important, members who exit take their human capital with them and of course cannot be deprived of their future earnings after they exit. However, a member’s earning potential outside the group, and thus the outside option, can be affected by the accumulation of human capital while with the group. This gives kibbutzim incentives to influence the extent and type of education their members receive. Basic education was always encouraged in kibbutzim and illiteracy was eliminated. But beyond that level, kibbutz members were encouraged to acquire kibbutz-specific human capital, which limited their outside options. Specifically, for many years, higher education was discouraged and members were even discouraged from attaining *bagrut* (the Israeli high school diploma). College education was not allowed. By the 1970s, kibbutz members were allowed to study fields that were “in need” for kibbutzim. Kibbutz-specific human capital and fields such as agronomy were encouraged, while fields that represented more-general human capital, such as law, were not permitted. Later, members pushed to be allowed to study any subject they chose.

Thus, kibbutzim had conflicting incentives to invest in members’ human capital. On the one hand, a kibbutz had an incentive to encourage human capital acquisition both because it received the full returns to the human capital of its members and because universal human capital acquisition increases homogeneity, which facilitates equal sharing. On the other hand, providing too much human capital, or human capital that is too general, risks violating the participation constraint. Of course, not allowing general education could also trigger members to leave so that they could acquire this education.

From the individual members’ perspective, if people acquire education as investment in their human capital that is expected to yield a return, full equal

<sup>7</sup> One interesting explanation for the decline of kibbutzim is that rising incomes made public goods a lower percentage of total consumption for the average person living in Israel, rendering living in a kibbutz less attractive (Keren, Levhari, and Byalski, 2006).

Figure 3

**Kibbutz Members Are More Educated than the Non-Kibbutz Israeli Population**

*Notes:* This figure shows the average years of schooling of kibbutz members (“kibbutz”), the Jewish city population (“urban”), and the Jewish population in other non-kibbutz rural areas (“rural”). The sample is individuals aged 25 to 64. The data give categories for years of education, for example 6–10, 10–14, etc. Instead, I use averages: 8 (average of 6–10), 12 (average of 10–14), etc. Data are from the Population Censuses of 1961, 1972, 1983, and 1995. The urban and rural samples are limited to Ashkenazi or Israeli-born Jews.

sharing is expected to discourage investment in education because it eliminates the returns to education. Nevertheless, Figure 3 shows that kibbutz members have actually always been *more* educated than the Ashkenazi Jewish population on average in both rural and urban localities. (The comparison group of Ashkenazi Jews is used here because they are more educated than the average Israeli citizen, and they are a more comparable group to kibbutz members, who are mostly of Ashkenazi origin.) I note that this higher education in kibbutzim is mainly due to the fact there are almost no illiterate kibbutz members and almost everyone gets primary and high school educations. However, kibbutz members are somewhat less likely than the average population to get a post-high school academic degree.

This high education level in kibbutzim could exist for several reasons. First, education is not only an investment good but also a consumption good. Second, it could reflect members’ wish to have the option of leaving the kibbutz and earning a premium. Third, almost everyone having a high school education probably helps increase output of the kibbutz, compared with a situation with greater illiteracy.

The kibbutzim's asymmetric shift away from equal sharing after the 1990s, an episode discussed in more detail later in this paper, provides an opportunity to test whether and to what extent human capital in kibbutzim responded to changes in returns. In Abramitzky and Lavy (2010), my coauthor and I use comprehensive data on high school students in kibbutzim and show that students began to take school more seriously—as measured by higher grades and a lower likelihood of dropping out—once their kibbutzim shifted away from equal sharing.

### Adverse Selection among Entrants

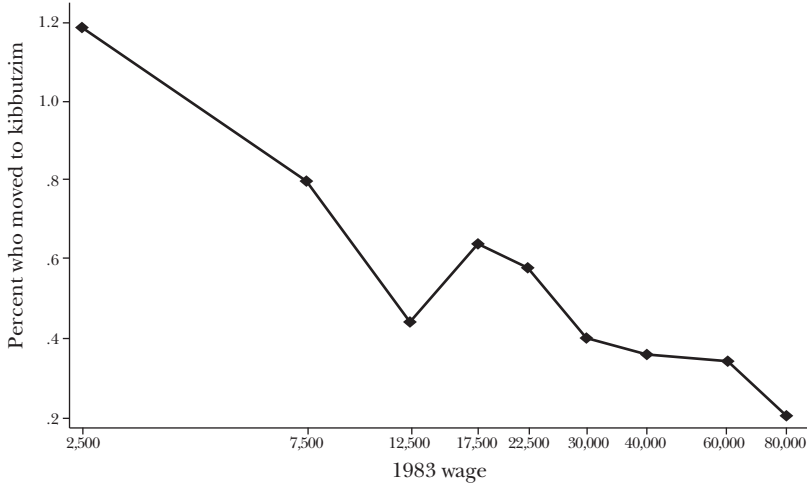
At the time kibbutzim were established, their founders were relatively similar in their expected abilities (Talmon, 1972). The main sources of entry after the founding of kibbutzim and before the 1970s were youth movements from Israel and abroad, and the army, through service in units called *Nahal*, all of which typically consisted of individuals who were young and similar in their expected productivity. Economic theory suggests that individuals who are similar in their expected productivity would find equal sharing attractive, because it provides full insurance. This can help explain why the founders of kibbutzim chose equal sharing, especially since they had just immigrated to a place full of uncertainty.

However, when institutions that promise equal sharing admit individual applicants from the outside world over time, they should expect to be sought out by low-ability individuals. Figure 4, which again uses the merged 1983 and 1995 population censuses and examines Jewish individuals who were between the ages of 21 and 54 in 1983, shows that individuals with lower earnings were more likely to enter a kibbutz in the period between 1983 and 1995, which suggests a process of negative selection in those entering the kibbutzim. An entrant to kibbutzim earned on average about 20 percent less than a non-entrant (25,877 versus 32,120 old Israeli shekels).

In the beginning of the 1980s, many kibbutzim experimented with a more “open door” policy. During this time, many individuals entered and anecdotally many members complained that these entrants had lower abilities (although no data are easily available to test this). To minimize adverse selection in entry, the kibbutzim can seek to admit groups of entrants who are homogenous in their expected productivity, and to screen individual entrants who already know their productivities.

Since the mid-1980s, kibbutzim have had a special centralized organization that screens entrants, and they have not accepted individuals with especially low education or skills. A total of 90 out of the 16,789 individuals in the sample who lived outside of kibbutzim in 1983 (with non-missing earnings) entered a kibbutz between 1983 and 1995, about 0.5 percent. Entry in this period is low in part because kibbutzim are well-aware of the tendency of low-ability individuals to apply; indeed, the negative selection evident in Figure 4 is likely a lower bound because applicants are even more negatively selected than entrants. Indeed, in Abramitzky (2009a), I show that less-educated and less-skilled individuals are *not* more likely to enter a kibbutz (likely because such individuals are screened out); however, entrants still

*Figure 4*  
**People with Lower Wages Were More Likely to Enter Kibbutzim**  
*(for the period 1983–1995)*



*Source:* Linked censuses of 1983 and 1995.

*Notes:* This figure shows the proportion of people living in cities in 1983 who entered kibbutzim between 1983 and 1995, broken down by wage categories in 1983. The numbers on the *x*-axis are plotted on a log scale. A total of 90 out of the 16,789 individuals in the sample who lived outside of kibbutzim in 1983 (with non-missing earnings) entered a kibbutz between 1983 and 1995, about 0.5 percent.

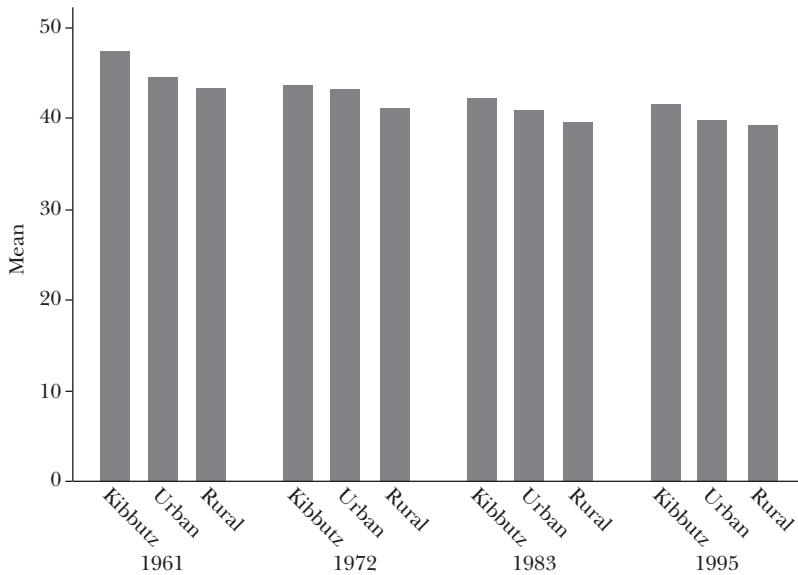
had significantly lower earnings pre-entry than did similar individuals who did not enter, perhaps because earnings are less observable and verifiable by kibbutzim than education and skills.

Such concerns about adverse selection probably help explain why since the 1960s the main source of population growth has been internal, from kibbutz-born individuals staying in their kibbutz. Young kibbutz-born individuals can also be regarded as homogeneous in their expected ability. The main concern of kibbutzim with respect to kibbutz-born individuals is how to retain them, especially the ones who prove more productive.

Concerns about adverse selection also rationalize various costly signals of commitment to the kibbutz such as communal rituals and norms of serving in combat units in the army,<sup>8</sup> and explain why individual applicants have to live in the kibbutz for a “trial period” of one or two years, at the end of which members vote on whether to accept them as members.

<sup>8</sup> Norms of serving in combat units in the army can also signal a commitment not to free ride. It would be interesting to study the military careers of kibbutz members over time.

Figure 5

**Kibbutz Members Worked Longer Hours than Nonmembers**

Source: Data are from the Population Censuses of 1961, 1972, 1983, and 1995.

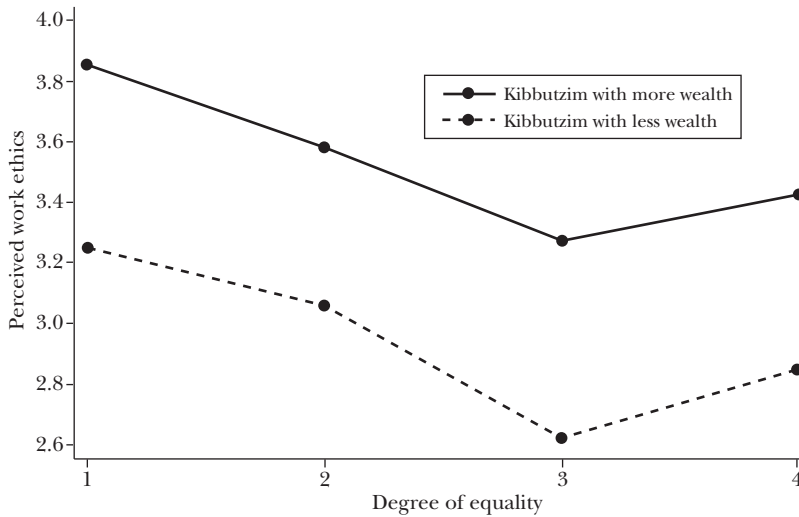
Notes: This figure shows the average weekly hours worked by kibbutz members (“kibbutz”), the Jewish city population (“urban”), and the Jewish population in other non-kibbutz rural areas (“rural”). The sample is individuals aged 25 to 64 who worked non-zero hours (because labor force is near universal on the kibbutz). Numbers along the y-axis are average of categories, for example, the category 1–14 hours of work was counted as 7.5 hours, 15–34 hours was counted as 24.5 hours, and so on.

### Incentive-Compatibility Constraints and the Problem of Shirking

If equal sharing encourages moral hazard, we would expect kibbutz members to shirk and to free ride on others. Measuring shirking is challenging, and the evidence regarding whether and to what extent kibbutz members free ride on others by shirking is mixed. Kibbutz members have always worried about the free rider problem, but case studies have found kibbutz members to have higher work motivation than nonmembers (for example, Palgi, 1984; Shimony, Goldemberg, Gluck, and Rosner, 1994).

In an attempt at a more quantitative approach, I examine two aspects of shirking. First, I examine the average hours worked by kibbutz members relative to Jewish individuals living in cities and other rural areas. I examine the four Israeli population censuses conducted between 1961 and 1995, a period in which all kibbutzim were based on full equal sharing. I compare the weekly hours worked by kibbutz members aged 25–64 with those worked by the rest of the Jewish population. Figure 5 reveals a surprising result: in all years, kibbutz members work *longer* hours than the population average in both urban and rural

Figure 6

**Kibbutzim with Greater Equality Had Lower Work Ethics**

Source: Survey of Public Opinions in Kibbutzim 2005 (Palgi and Orchan, 2005).

Notes: The solid line gives average reported work ethics for kibbutzim with high levels of wealth; the dashed line gives average reported work ethics for kibbutzim with low levels of wealth. Kibbutz members were asked about how they perceive the level of work ethics in their kibbutz. The graph shows the average response to this question (1 is the lowest and 4 is the highest), by kibbutz compensation scheme and economic condition. The x-axis gives the degree of equality in the kibbutz, where 1 corresponds to a low level of equality (“safety net” model) and 4 corresponds to full equal sharing.

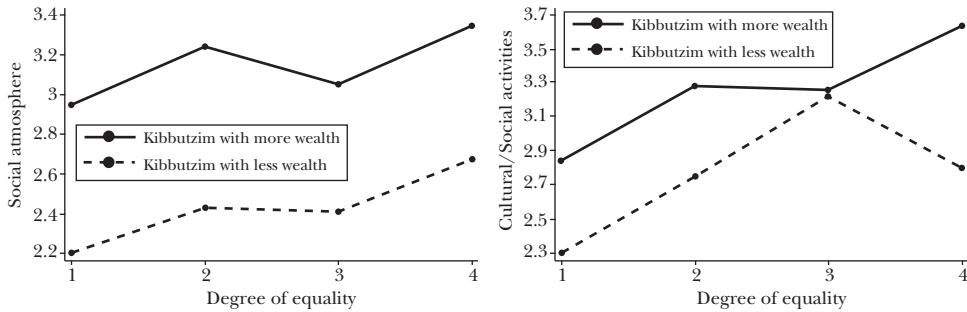
areas, suggesting that at least in the quantity of hours devoted to work, kibbutz members do not free ride.

However, the number of hours worked obviously does not capture free riding entirely, because there can be on-the-job shirking such as low work quality. One way to shed light on motivation and work quality is to compare survey data on the perceived work ethics of kibbutz members with those of city natives, but such data do not exist for cities. However, Surveys of Public Opinion conducted in kibbutzim in 2003 and 2005, after many kibbutzim had already shifted away from equal sharing after the “kibbutz crisis” of the 1980s (discussed further in the next section), asked kibbutz members about the work ethic in their kibbutz. These survey data identify whether the respondent lives in a full equal-sharing kibbutz or in a reformed kibbutz<sup>9</sup> and thus can be used to compare perceived work ethics in kibbutzim with different degrees of equal sharing. If equal sharing encourages shirking as incentive theory predicts, we expect lower work ethics in kibbutzim with higher degrees of equality (more-equal compensation schemes). Figure 6 illustrates that this is indeed the case.

<sup>9</sup>The scale for the kibbutz degree of equality is 1–4, where 4 is the full equal sharing category and 1 is the least equal safety net category (which still involve more redistribution than outside kibbutzim).

Figure 7

### Social Atmosphere and Cultural Activities in Kibbutzim Increase with Level of Equality



Source: Survey of Public Opinions in Kibbutzim 2005 (Palgi and Orchan, 2005).

Notes: The left-hand panel shows the reported quality of the social atmosphere in kibbutzim with high and low wealth levels, by their degree of equality. The right-hand panel shows the reported quality of cultural and social activities. In each case, the solid line gives averages for kibbutzim with high levels of wealth, and the dashed line gives averages for kibbutzim with low levels of wealth. The survey response scale ranges from 1 to 4, with 4 being the best. For instance, a rating of 4 for social atmosphere corresponds to great social atmosphere. The x-axis gives the degree of equality in the kibbutz, where 1 corresponds to a low level of equality ("safety net" model) and 4 corresponds to full equal sharing.

Interestingly, however, Figure 6 may suggest that work ethics do not decline monotonically with the degree of equality as suggested by theory, although further research is required to test and understand more fully this possible nonmonotonicity. One possible concern is that kibbutzim with different compensation schemes may have different levels of wealth (indeed I show in the next section that this is the case) so kibbutz wealth rather than degree of equality could drive shirking behavior. Unsurprisingly, individuals in richer kibbutzim report higher work ethics. However, Figure 6 shows that, even when comparing kibbutzim with similar wealth levels, the reported work ethic is lower in kibbutzim with more-equal compensation schemes. However, as shown in Figure 7, individuals in more-equal kibbutzim also report better social atmospheres and better cultural activities. These patterns could suggest that equality in kibbutzim has certain benefits, but that work ethic suffers.

The findings that equal sharing does not necessarily discourage the numbers of hours worked but does discourage work motivation could suggest that monitoring and social sanctions are more effective in improving work quantity than they are in improving work quality—perhaps because it is easier to observe work quantity than work quality.

In kibbutzim, not only do wages not reward effort, but firing is not a realistic threat and members are rarely expelled (although the traditional "work organizer" could assign members to less-desirable jobs). However, the kibbutzim's institutional design shows an active attempt to mitigate the shirking problem by supporting social

sanctions and reducing monitoring costs.<sup>10</sup> The importance of social sanctions in kibbutzim has been highlighted by many authors, including Lieblich (1981), Barkai (1986), and Keren, Levhari, and Byalski (2006). The kibbutz can improve the effectiveness of its social monitoring system in several ways: make effort more observable (so an individual can see if another shirks); improve information flows among members (so everyone else finds out if someone shirked); and maximize interactions between members (so social sanctions can be more unpleasant for the shirker). I will discuss these approaches in turn.

First, kibbutzim instituted various mechanisms to facilitate monitoring by making effort observable. Typical tasks in kibbutzim were observable to others, such as working in the kitchen and milking cows. Members were also expected to live and work inside the kibbutz, making their effort or its lack more obvious to their colleagues. Finally, industries in kibbutzim were often “easy-to-monitor” industries. For instance, the classic job of orange picking in kibbutzim is observable, as each member can count the number of bags that a co-worker fills.

Second, various mechanisms were used to facilitate monitoring by improving information flows among members. Privacy was severely limited as a member’s colleagues were also neighbors, their children attended the same schools, and they ate in a communal dining hall. The close proximity of members and their repeated interaction—coupled with the fact that gossip was rampant—facilitated information transmission and increased the effectiveness of social sanctions.

Third, the limited population size of kibbutzim increased interactions between members and made social sanctions more effective. In the early days of kibbutzim, there was an ideological debate over whether the goal of kibbutzim should be to create one big kibbutz. This was never attempted and likely would not have been successful. Social sanctions are much more effective in small communities, where people know each other well, there is plenty of social interaction, and reputation matters. Indeed, all kibbutzim are small and consist of between fewer than 100 and just over 1,000 members, with an average of 440 members. Interestingly, I find that (after controlling for other kibbutz characteristics) it is not the case that smaller kibbutzim are more likely to maintain equal sharing, suggesting that all kibbutzim are small enough to deal with moral hazard in similar ways (Abramitzky, 2008).

A veteran of Degania, the first kibbutz, describes how peer pressure was implemented when a member shirked: “[N]obody said a word to him. But in the evening, in the dining hall, the atmosphere around him was such that the following morning he got up and left the kvutza [kibbutz]” (Near, 1992).

A focus on social monitoring and sanctions is just one way to help align incentives under equal sharing. There may be alternatives. For example, another solution to the shirking problem is to exclude individuals who put in low effort. Alternatively, shirkers can be penalized monetarily. These solutions are rarely used in kibbutzim. One reason for not excluding members could be that, unlike a firm,

<sup>10</sup> Social sanctions may be effective in inducing members to work hard, but are likely to be less effective at preventing brain drain, because once a member exits, he will form a new social group outside the kibbutz.



a kibbutz contains whole families and excluding a shirking member would mean excluding an entire family even if other family members did not shirk. The option of excluding members or punishing them monetarily could also open the door for decisions to exclude members on more arbitrary grounds, which reduces the insurance value of a kibbutz. Alternatively, excluding members and using monetary punishments may be ruled out by kibbutzim on ideological grounds.

Another possibility used in kibbutzim is to offer nonmonetary rewards to high performers. For example, leadership positions such as the kibbutz secretary, treasurer, and farm manager were rotated among members believed to be the highest contributors and the prestige of these positions served as a nonmonetary reward for effort (Gavron, 2000).

One final manifestation of the free rider problem under a collective system like the kibbutz could be in members' fertility decisions. The cost of raising children in the traditional kibbutz was divided among all members, creating a potential free rider problem. This was especially true in the period when children all lived together and outside of parents' homes. We thus expect fertility in kibbutzim to be higher. A casual examination of the censuses between 1961 and 1995 suggests that the average number of children of women aged 30–44 in kibbutzim is indeed higher than in cities. Moreover, consistent with members not internalizing the full costs of raising children, Ben-Porath (1972) finds that parents' education has little effect on fertility in kibbutzim, compared with a negative effect outside kibbutzim. Danziger and Neuman (1993) find, using the 1983 census, that parents' predicted wages (based on personal characteristics) had a smaller positive effect on fertility in cities relative to kibbutzim, implying a smaller substitution effect between wage and fertility in kibbutzim (assuming a similar income effect). A promising line of research would be to test whether the number of children declined after kibbutzim moved their children home, and whether it further declined in kibbutzim that introduced reforms relative to those that maintained the traditional model.

### **The Limits of Equal Sharing: Lessons from a Financial Crisis and a High-Tech Boom**

Major upheavals in the 1980s tightened the incentive constraints facing kibbutzim, making equal sharing difficult to sustain. As a result, over 20 percent of individuals left their kibbutzim in the period between 1983 and 1995 (Abramitzky, 2009a). A few years later, some kibbutzim introduced major reforms such as abolishing the traditional dining hall and hiring outside managers to run the kibbutz. Most significantly, many kibbutzim introduced reforms that decreased their degree of equality, allowing them to restore equilibrium, albeit with a lower degree of sharing. Even the first kibbutz, Degania, introduced major reforms and shifted away from the full equal sharing model. The degree of reform varied across kibbutzim, from small deviations to dramatic changes that essentially transformed some of the kibbutzim into capitalist neighborhoods. There were at least six reasons underlying these changes.

First, concerns arose in a number of kibbutzim in the early 1980s that the existing system of communal child-raising, in which parents and children would meet for a couple of hours every day, imposed emotional costs on children and parents. The evidence on this point was mixed: some kibbutz children reported positive experiences, while others reported developing deep complexes as adults (Spiro, 1975, Liebllich, 1981). In the years prior to the crisis, many kibbutzim enlarged members' homes to accommodate the move of children from the special communal residences into their parents' homes.

Second, many kibbutzim came under severe financial stress in the late 1980s. Some contributing reasons were a decline in world prices of agricultural goods and bad financial management. But perhaps the biggest problem was that many kibbutzim borrowed heavily earlier in the 1980s, both to expand their housing stock and to expand their industry. In the early 1980s, it was easy and cheap for kibbutzim to borrow money because inflation in Israel was very high at this time and loans were often not indexed to inflation. However, the Israeli government eventually decided to take action to halt the inflation and, as part of the stabilization program, lifted interest rates to high levels. Kibbutzim, like many other businesses in Israel, found themselves with huge debts they could not repay. Eventually, some of the loans were erased and others were rescheduled, but living standards in many kibbutzim still fell substantially.

Third, Israel experienced a high-tech boom during the mid-1990s, which increased members' outside options considerably, especially the outside options of high-ability individuals. Specifically, technology-oriented growth in Israel dramatically increased the premium high-ability members could earn for their labor in cities, and this made equal sharing in kibbutzim less sustainable. The earlier discussion of brain drain pointed out that kibbutz leavers from 1983 to 1995 were mainly the more-productive individuals, who benefited less from equal sharing.

Fourth, with the development of insurance markets in Israel, individuals gained alternative ways to insure their incomes against shocks to health and unemployment, and kibbutzim lost some of their appeal. Moreover, the general rise in incomes in Israel improved the ability to accumulate assets and to self-insure against unemployment outside the kibbutz. At the same time, Israel became less of a welfare state, decreasing the social insurance offered outside kibbutzim and thus increasing the insurance value of living in a kibbutz. Overall, kibbutzim continued to provide more-effective income insurance than living outside a kibbutz—but the gap narrowed.

Fifth, the kibbutz movement had been supported for many years by public institutions such as the Israeli government and the Jewish Agency, but this support declined in the 1980s. As a result, kibbutzim went from facing a soft budget constraint to a hard budget constraint (Rosolio, 2000). The extent of this effect is controversial. On one side, Near (1997) and others have claimed that government support was at the center of the kibbutz movement's success.<sup>11</sup> However, governmental subsidies to

<sup>11</sup> Here's a representative comment from Near (1997, p. 317): "Without the support of the Zionist movement and, later, the state of Israel, it is quite possible that the kibbutzim would have been no more than a handful of eccentric communities, eking out a living in a hostile or indifferent environment—like

the kibbutzim had already begun to play a lesser role since the 1960s, when the Labor party began to encourage private investment. Such subsidies weakened further with the election of the right-wing Likud government in 1977, which was a first in Israel's history. This election was a sign of a change in economic and social values in Israel, toward a greater emphasis on free market ideas. The new government viewed the kibbutzim as the creation of the previous Labor government and stopped treating them as such important institutions. Despite this, the late 1970s and early 1980s were probably the most prosperous decade in kibbutz history (thanks in part to the unsustainably cheap borrowing mentioned earlier).

Finally, it is possible that the disillusionment with socialism around the world in the late 1980s trickled down to kibbutzim, weakening members' ideology.

Taken together with the conceptual framework for the equality–incentives trade-off outlined throughout this paper, these changes suggest that it should have become harder for kibbutzim to sustain equal sharing during this time. Along with the overall drop in kibbutz membership, it's possible to examine this question by looking at variation across kibbutzim.

Theory predicts that kibbutzim that were hit less by the financial stress and remained wealthier would be less likely to reform and to shift away from equal sharing. This prediction is borne out by experience: kibbutzim with lower assets and fixed capital per member, those that were assigned a lower credit rating by Dunn and Bradstreet,<sup>12</sup> and those whose financial stress was rated as severe by the government were the most likely to shift away from equal sharing (Abramitzky, 2008).

Thus, the changes that occurred in kibbutzim's environment since the 1980s can account for the decline over time of the kibbutz population as a percentage of the total population, for the timing of their shift away from equal sharing, and for the degrees to which different kibbutzim shifted away from equal sharing.

## Beyond Kibbutzim

The persistence of equal sharing in kibbutzim has long seemed like a challenge to the selfish *homo economicus*. Nevertheless, the research described here suggests that an economic approach to the study of kibbutzim goes a long way: it is consistent in many ways with the creation of kibbutzim, with their long survival, and with their recent asymmetric shift away from equal sharing. A high degree of ideology served as extra "glue" that alleviated brain drain and moral hazard and facilitated equality.

most communal societies the world over. That they were so much more than this stems from a contract between them and the Zionist/Israeli authorities, whereby they played a major part in the struggle for national objectives—primarily settlement, immigration and its absorption, and defense—and in return received various types of support. The contract was not always official or explicit, nor were the rewards consistent in character or quantity, but its existence was not in doubt."

<sup>12</sup> After the financial stress, each kibbutz was assigned a credit rating by Dunn & Bradstreet in an attempt to evaluate the economic value of kibbutzim. The rating was based on the following parameters: economic strength; debt per member; ability to repay debt as reflected by economic forecasts of the kibbutz Arrangement Board; type and diversification of industries; and kibbutz's land value.

The study of kibbutzim suggests that equal-sharing arrangements are indeed likely to dull incentives, but that the resulting incentive problems involving brain drain, entry of low-productivity members, and shirking can be mitigated to some extent by instituting lock-in and screening mechanisms, and by facilitating monitoring and social sanctions. For example, common ownership of property can serve as a “bond” that increases the cost of exit and thus reduces brain drain; living in a society without private property rights also entails a sacrifice that is more likely to be made by committed individuals who do not plan to free ride. However, common property can become more problematic when equality is no longer an objective, as revealed in recent debates in privatized kibbutzim about whether members should be allowed to own their houses.

The general framework presented in this paper for thinking about the trade-offs between equal sharing and incentives also applies, sometimes in different ways, to other organizations and communities aiming at the sharing of output, including historical hunter-gatherer societies, communes, and certain village economies in developing countries. For example, the lack of ability of individuals in village economies to commit to share their incomes if they turn out to have high incomes is believed to be the key reason why full insurance is not observed in these communities (Coate and Ravallion, 1993; Ligon, 1998; Ligon, Thomas, and Worrall, 2002). Similarly, kibbutzim’s institutional design to deal with the moral hazard and adverse selection problems may shed light on micro finance organizations in developing economies, such as consumer credit markets for high-risk borrowers (Karlan and Zinman, 2009), group lending institutions (Stiglitz, 1990; Varian, 1990; Besley and Coate, 1995; Giné, Jakiela, Karlan, and Morduch, 2010); and rotating savings institutions (for example, Besley, Coate, and Lury, 1993; Calomiris and Rajaraman, 1998). For a comparison with other communes, see Abramitzky (2009b).

Partnerships, cooperatives, labor-managed firms and academic departments, which are based on some degree of equality, may also face moral hazard, adverse selection, and brain drain (for example, Craig and Pencavel, 1992; Kandel and Lazear, 1992; Kremer, 1997; Levin and Tadelis, 2005; Abramitzky, Frank, and Mahajan, 2010). Like kibbutzim, they use social sanctions to mitigate moral hazard, as well as various lock-in devices to avoid brain drain. For example, members in German cooperatives used monitoring and social sanctions to enforce the return of loans by fellow members, and this made them better than banks at supporting loans to risky individuals (Guinnane, 2001). In law firms, which are often based on revenue sharing, lawyers often are not allowed to take their customers with them if they leave, making exit costly. In academic departments, where tenure prevents universities from firing professors, peer pressure and monitoring are used (not always successfully) to discipline and limit shirking.

Finally, communist countries and even European welfare states are based on a higher degree of equality than more-capitalist countries like the United States. It is often suggested that the comparatively high level of redistribution in these countries provides a safety net, but encourages shirking, adverse selection, and brain drain, just like in kibbutzim. The lack of private property (in communist countries) and the high provision of local public goods (in welfare states) may reflect attempts

to mitigate the brain drain problem by increasing the cost of exit; of course, many communist countries did not allow exit at all.

The study of kibbutzim also supports the highly debated Borjas (1987, 1994) selection hypothesis, which is in turn based on the Roy (1951) model, that the type of selection, whether positive or negative, depends on the relative returns to skills in the origin and destination. Specifically, negative selection is expected in migration from origins with less redistribution to destinations with more redistribution, and thus it is expected that countries with more redistribution are likely to engage in stronger screening of entrants. Moreover, one insight from kibbutzim is that mobility of high-ability individuals is an important limiting factor for equal sharing. This insight applies to U.S. states and local governments, whose ability to redistribute is limited by the fact that people may move from one state to another to take advantage of a redistribution scheme that is more favorable to them (Epple and Romer, 1991; Feldstein and Wrobel, 1998; Cremer and Pestieau, 2004).

Kibbutzim are rare. This paper illustrates that there is a cost to living in such equal-sharing communities. Specifically, mitigating incentive and selection problems under equal sharing requires a lack of privacy and small group size that facilitate social sanctions, and strong limits on private ownership of property. For most of us, such social arrangements are too high a price to pay for insurance.

■ *I am grateful to the editors David Autor, Chad Jones, James Hines, and Timothy Taylor for extremely helpful suggestions and editorial advice, and to Nick Bloom, Liran Einav, Avner Greif, Seema Jayachandran, Shirlee Lichtman, Joel Mokyr, and especially Izi Sin for most useful discussions and suggestions.*

## References

- Abramitzky, Ran. 2008. "The Limits of Equality: Insights from the Israeli Kibbutz." *Quarterly Journal of Economics*, 123(3): 1111–59.
- Abramitzky, Ran. 2009a. "The Effect of Redistribution on Migration: Evidence from the Israeli Kibbutz." *Journal of Public Economics*, 93(3–4): 498–511.
- Abramitzky, Ran. 2009b. "On the (Lack of) Stability of Communes: An Economic Perspective." [http://www.stanford.edu/~ranabr/Abramitzky\\_handbook.pdf](http://www.stanford.edu/~ranabr/Abramitzky_handbook.pdf). (Forthcoming in the 2010 *Oxford Handbook of Economics of Religion*).
- Abramitzky, Ran, Zephyr Frank, and Aprajit Mahajan. 2010. "Risk, Incentives and Contracts: Business Partnerships in Rio De Janeiro, 1870–1891." *Journal of Economic History*, 70(3): 686–715.
- Abramitzky, Ran, and Victor Lavy. 2010. "How Responsive is Investment in Schooling to Changes in Returns? Evidence from an Unusual Pay Reform in Israel's Kibbutzim." Unpublished paper.
- Abramitzky, Ran, and Isabelle Sin. 2010. "Book Translations as Idea Flows: The Effects of the Collapse of Communism on the Diffusion of Knowledge." <http://www.stanford.edu/~ranabr/AS.pdf>.

- Barkai, Haim.** 1977. *Growth Patterns of the Kibbutz Economy*. Amsterdam and New York: North-Holland.
- Barkai, Haim.** 1986. "Kibbutz Efficiency and the Incentive Conundrum." *Economic Quarterly*, vol. 129, pp 666–88. (The article and journal are in Hebrew.)
- Benabou, Roland.** 1996. "Inequality and Growth." In *NBER Macroeconomics Annual 1996*, vol. 11, pp. 11–92. National Bureau of Economic Research.
- Ben-Porath, Yoram.** 1972. "Fertility in Israel, An Economist's Interpretation: Differentials and Trends, 1950–1970." In *Economic Development and Population Growth in the Middle East*, ed. C. A. Cooper, and S. S. Alexander. New York: Elsevier.
- Besley, Timothy, and Stephan Coate.** 1995. "Group Lending, Repayment Incentives and Social Collateral." *Journal of Development Economics*, 46(1): 1–18.
- Besley, Timothy, Stephan Coate, and Glenn Loury.** 1993. "The Economics of Rotating Savings and Credit Associations." *American Economic Review*, 83(4): 792–810.
- Bettelheim, Bruno.** 1969. *The Children of the Dream*. Simon & Schuster, New York.
- Borjas, George.** 1987. "Self-Selection and the Earnings of Immigrants." *American Economic Review*, 77(4): 531–53.
- Borjas, George.** 1994. "The Economics of Immigration." *Journal of Economic Literature*, 32(4): 1667–1717.
- Calomiris, Charles, and Indira Rajaraman.** 1998. "Lumpy Durables or Event Insurance? The Role of Roscas." *Journal of Development Economics*, 56(1): 207–16.
- Chiappori, Pierre-Andre, and Bernard Salanie.** 2000. "Testing for Asymmetric Information in Insurance Markets." *Journal of Political Economy*, 108(1): 56–78.
- Coate, Stephen, and Martin Ravallion.** 1993. "Reciprocity without Commitment: Characterization and Performance of Informal Insurance Arrangements." *Journal of Development Economics*, 40(1): 1–24.
- Craig, Ben, and John Pencavel.** 1992. "The Behavior of Worker Cooperatives: The Plywood Companies of the Pacific Northwest." *American Economic Review*, 82(5): 1083–1105.
- Cremer, Helmuth, and Pierre Pestieau.** 2004. "Factor Mobility and Redistribution." Chapter 57 in *The Handbook of Regional and Urban Economics*, ed. J. Vernon Henderson and Jacques-Francois Thisse. Amsterdam: North-Holland.
- Danziger, Leif, and Shoshana Neuman.** 1993. "Equality and Fertility in the Kibbutz." *Journal of Population Economics*, 6(1): 57–66.
- Dror, Yuval.** 2001. *The History of Kibbutz Education: Practice into Theory*. Peter Lang Publishing Inc.
- Epple, Dennis, and Thomas Romer.** 1991. "Mobility and Redistribution." *Journal of Political Economy*, 99(4): 828–58.
- Feldstein, Martin, and Marian Vaillant Wrobel.** 1998. "Can State Taxes Redistribute Income?" *Journal of Public Economics*, 68(2): 369–96.
- Fehr, Ernst, and Simon Gächter.** 2000. "Cooperation and Punishments in Public Goods Experiments." *American Economic Review*, 90(4): 980–94.
- Gavron, Daniel.** 2000. *The Kibbutz: Awakening from Utopia*. Lanham, MD: Rowman & Littlefield.
- Giné, Xavier, Pamela Jakiela, Dean Karlan, and Jonathan Morduch.** 2010. "Microfinance Games." *American Economic Journal: Applied Economics*, 2(3): 60–95.
- Guinnane, Timothy.** 2001. "Cooperatives as Information Machines: German Rural Credit Cooperatives, 1883–1914." *Journal of Economic History*, 61(2): 366–89.
- Holmstrom, Bengt.** 1982. "Moral Hazard in Teams." *Bell Journal of Economics*, 13(2): 324–40.
- Kandel, Eugene, and Edward P. Lazear.** 1992. "Peer Pressure and Partnerships." *Journal of Political Economy*, 100(4): 801–17.
- Karlan, Dean, and Jonathan Zinman.** 2009. "Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment." *Econometrica*, 77(6): 1993–2008.
- Keren, Michael, David Levhari, and Michael Byalski.** 2006. "On the Stability and Viability of Co-operatives: The Kibbutz as an Example." *Acta Oeconomica*, 56(3): 302–21.
- Knez, Marc, and Duncan Simester.** 2001. "Firm-Wide Incentives and Mutual Monitoring at Continental Airlines." *Journal of Labor Economics*, 19(4): 743–71.
- Kremer, Michael.** 1997. "Why Are Worker Cooperatives So Rare?" NBER Working Paper w6118.
- Lazear, Edward.** 1986. "Salaries and Piece Rates." *Journal of Business*, 59(3): 405–31.
- Lazear, Edward P.** 2000a. "Performance Pay and Productivity." *American Economic Review*, 90(5): 1346–61.
- Lazear, Edward P.** 2000b. "The Power of Incentives." *American Economic Review*, 90(2): 410–14.
- Levin, Jonathan, and Steven Tadelis.** 2005. "Profit Sharing and the Role of Professional Partnerships." *Quarterly Journal of Economics*, 120(1): 131–71.
- Lieblich, Amia.** 1981. *Kibbutz Makom: Report from an Israeli Kibbutz* (in Hebrew). Jerusalem: Shoken.
- Ligon, Ethan.** 1998. "Risk-Sharing and Information in Village Economies." *Review of Economic Studies*, 65(4): 847–64.

- Ligon, Ethan, Jonathan P. Thomas, and Tim Worrall.** 2002. "Informal Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies." *Review of Economic Studies*, 69(1): 209–44.
- Munshi, Kaivan, and Mark Rosenzweig.** 2009. "Why Is Mobility in India So Low? Social Insurance, Inequality, and Growth." NBER Working Paper 14850.
- Near, Henry.** 1992. *The Kibbutz Movement: A History*, Vol. 1: *Origins and Growth, 1909–1939*. Oxford: Oxford University Press.
- Near, Henry.** 1997. *The Kibbutz Movement: A History*, Vol. 2: *Crises and Achievements, 1939–1995*. London: Valentine Mitchell.
- Palgi, Michal.** 1984. "Theoretical and Empirical Aspects of Workers' Participation in Decision Making—A Comparison between Kibbutz and Non-kibbutz Industrial Plants in Israel." Ph.D. dissertation, Hebrew University.
- Palgi, Michal, and Eliat Orchan.** 2005. "Surveys of Public Opinion in the Kibbutzim in 2005." Report (in Hebrew). Institute for Research of the Kibbutz and the Cooperative Idea, University of Haifa.
- Pavin, Avraham.** 2001. "The Kibbutz Movement: Fact and Figures." Report (in Hebrew). Yad Tabenkin, the Research and Documentation Center of the Kibbutz Movement.
- Prendergast, Canice.** 1999. "The Provision of Incentives in Firms." *Journal of Economic Literature*, 37(1): 7–63.
- Prendergast, Canice.** 2002. "The Tenuous Trade-off between Risk and Incentives." *Journal of Political Economy*, 110(5): 1071–1102.
- Rosner, Menachem, Itzhak Ben David, Alexander Avnat, Neni Cohen, and Uri Leviatan.** 1990. *The Second Generation: Continuity and Change in the Kibbutz*. New York, NY: Greenwood Press.
- Rosolio, Daniel.** 2000. *System and Crisis: Crisis, Adjustments and Changes in the Kibbutz Movement*. Tel Aviv: Am Oved.
- Roy, A. D.** 1951. "Some Thoughts on the Distribution of Earnings." *Oxford Economic Papers*, 3(2): 135–46.
- Shimony, Uzi, Hana Goldemberg, Yaacov Gluck, and Menachem Rosner.** 1994. "The Kibbutz Industry Motivation and Management Models." Discussion Paper (in Hebrew). Institute for Research of the Kibbutz and the Cooperative Idea, University of Haifa.
- Spiro, Melford.** 1958. *Kibbutz: Venture in Utopia*. Harvard University Press.
- Spiro, Melford.** 1975. *Children of Kibbutz*. Harvard University Press.
- Stiglitz, Joseph.** 1990. "Peer Monitoring and Credit Markets." *World Bank Economic Review*, 4(3): 351–66.
- Talmon, Yonina.** 1972. *Family and Community in the Kibbutz*. Cambridge, MA: Harvard University Press.
- Varian, Hal.** 1990. "Monitoring Agents with Other Agents." *Journal of Institutional and Theoretical Economics*, 146(1): 153–74.

