



The effect of redistribution on migration: Evidence from the Israeli kibbutz [☆]

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ABSTRACT

This paper tests a key theoretical prediction of public finance, that local redistribution induces sorting of the population so that less productive individuals are located in communities with more redistribution. Specifically, I use a longitudinal data set to test whether and to what extent the intensive redistribution practiced by Israeli kibbutzim encourages exit of more productive individuals and entry of less productive ones. The findings support the theoretical prediction. Kibbutz-leavers are more skilled than both stayers and other rural migrants and they earn higher wages upon exit than observably similar city natives and other migrants. In contrast, individuals who earn lower wages in the city are more likely to enter a kibbutz, but they are not more likely to move to other rural areas. These findings also support Borjas' hypothesis that migrants' self-selection depends on the difference in returns to skills between the origin and the destination.

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1. Introduction

This paper tests an important theoretical insight, that redistribution discourages the participation of productive individuals. The public finance literature predicts that individuals move between states to take advantage of or avoid redistributive policies and that such mobility limits redistribution.¹ Similarly, a well-known and much-disputed hypothesis in the migration literature (Borjas' selection hypothesis) is that positive self-selection of migrants is expected when the place of origin has lower returns to skill (more redistribution) than the destination, while negative self-selection is expected when the place of origin has higher returns to skill.²

Specifically, I test whether and to what extent the intensive redistribution practiced by Israeli kibbutzim (plural of kibbutz), which are communities that offer their members equal sharing of output, encourages the exit of more productive individuals and entry of less productive ones. To do so, I use a longitudinal data set of individuals linked across population censuses that allows me to compare migrants with non-migrants. To tell apart the effect of redistribution on mobility from other factors that affect rural-to-

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¹ See, for example Epple and Romer (1991), Feldstein and Wrobel (1998) and Cremer and Pestieau (2004).

² This model of self-selection originated with Roy (1951) and was first explicitly applied to migration by Borjas (1987, 1991, 1994).

city and city-to-rural migration, I compare the selection patterns into and out of kibbutzim with the selection patterns into and out of other rural locations that do not engage in intensive redistribution.

The findings support the theoretical prediction. Individuals who leave a kibbutz are more skilled than both stayers and other rural-to-city migrants (i.e. positively selected over observable characteristics) and they earn higher wages upon exit than observably similar city natives and other-rural-to-city migrants (i.e. positively selected over *ex ante*-unobservable characteristics). The latter is mainly driven by less-educated kibbutz-to-city movers, who earn substantially more than average less-educated workers. In contrast, individuals who earn lower wages in the city are more likely to enter a kibbutz, but they are not more likely to move to other rural areas.

This paper contributes to the public finance literature, which views the threat of out-migration as a main constraint on the amount of redistribution that states and local governments can undertake. [Epple and Romer \(1991\)](#) hypothesize that the threat of mobility limits redistribution because local redistribution induces sorting of the population so that the poorest households are located in the communities with the most redistribution. [Feldstein and Wrobel \(1998\)](#) support the idea that individuals' ability to avoid an unfavorable tax by migrating to jurisdictions with a more favorable tax constrains the ability of local governments to redistribute. Unfavorable tax rates will cause out-migration and favorable tax rates will attract in-migrants, until the gross wage converges to the level at which there is no net advantage to moving. This paper tests whether the intensive redistribution in kibbutzim indeed induces in and out migration as predicted by this literature. In a companion paper, I show that kibbutzim eventually shifted away from equal sharing to avoid out-migration of productive individuals ([Abramitzky, 2008](#)), illustrating that mobility limits redistribution.

This paper also contributes to the migration literature by addressing some of its main questions. Are migrants positively or negatively selected from their source country? How do migrants perform in terms of their earnings as compared with the native population? This paper is among the first to test Borjas' selection hypothesis based on the Roy model.³ While very influential, the empirical relevance of Borjas' conjecture has been questioned ([Chiswick 1999, 2000](#); [Liebig and Sousa-Poza, 2003](#); [Chiquiar and Hanson, 2005](#)). First, in most papers migrants are observed only at the destination, but to measure self-selection migrants should be compared with non-migrants in their place of origin.⁴ Second, the measures of income inequality often used "may be poorly related to relative skill differentials" ([Chiswick 1999, p. 184](#)). Third, few studies have found evidence of negative selection of migrants, regardless of whether the migrants come from countries with high or low income inequality.

The longitudinal data allow me to test Borjas' hypothesis directly while avoiding the above-mentioned critiques. First, I observe migrants at both the origin and the destination and thus can compare them both to non-migrants and to the population of the destination. Second, in the period of study (1983–1995), kibbutzim offered equal sharing and, as such, they offered lower skill premia than did Israeli cities. Thus, kibbutz-to-city migrants were moving from an origin with low return to skills to a destination with high return to skills, and city-to-kibbutz migrants were moving from a high return to skills origin to a low return to skills destination. This paper provides empirical support at the individual level for Borjas' hypothesis. However, the finding that only the less-educated migrants earn higher post-exit wages than the population of the destination suggests that selection over unobservable characteristics may vary by education level, and that selection with respect to the population of the origin (i.e. when comparing movers with stayers) may differ from selection with respect to the population of the destination (i.e. comparing movers with the population at the destination).

Finally, this paper contributes to contract theory, which predicts that equal sharing, or team-based pay, encourages free-riding (the incentive effect) and discourages participation of high-ability individuals (the selection effect).⁵ For example, in professional partnerships such as law firms, which are often based on revenue-sharing, high-ability partners may exit to earn a wage premium for their ability outside of the partnership. Yet there is little empirical work on the selection effect, mainly because of data limitations.⁶ This paper contributes to the literature by empirically addressing the question of whether, and to what extent, equal sharing discourages participation of high-ability individuals. Specifically, I address the questions of whether individuals who leave equal-sharing arrangements are positively selected, and whether individuals who enter equal-sharing arrangements are negatively selected. Moreover, following the approach developed in [Finkelstein and McGarry \(2006\)](#) and [Finkelstein and Poterba \(2006\)](#), I rely on observable characteristics that were not used by the kibbutz in the application process, namely individuals' pre-entry wages. I then document the presence of adverse selection that may be partially attributable to asymmetric information between the applicant and the kibbutz.

The rest of the paper is organized as follows. Section 2 provides a brief theoretical framework. The environment and data sources used in the analysis are described in Section 3. Section 4 tests the hypothesis that kibbutz-to-city migrants are positively selected compared with non-migrants in their observable skills. Section 5 tests for positive selection of kibbutz-

³ The classical Roy self-selection model has also served as the framework of studying other labor market choices (see [Heckman and Honore, 1990](#)). Examples include women's labor force participation ([Gronau, 1974](#); [Heckman, 1974](#)), self-selection of workers into unions ([Lee, 1978](#)), selection of schooling levels ([Willis and Rosen, 1979](#)), and self-selection across industries and occupations ([Heckman and Sedlacek, 1990](#)). Other migration studies that use the Roy framework include [Robinson and Tomes \(1982\)](#), [Ferrie \(1999\)](#), [Chiquiar and Hanson \(2005\)](#), [Borjas, Bronars, and Trejo \(1992\)](#), [Ramos \(1992\)](#) and [Abramitzky and Braggion \(2006\)](#).

⁴ See, for example, [Chiswick \(1978\)](#), [Carliner \(1980\)](#), [Borjas \(1987\)](#), [Chiquiar and Hanson \(2005\)](#), and the surveys by [Borjas \(1994\)](#), [Chiswick \(1999\)](#), [Burda, Härdle, Müller, and Werwatz \(1998\)](#) and [Liebig and Sousa-Poza \(2003\)](#).

⁵ A classic reference for the incentive effect of equal-sharing is [Holmstrom \(1982\)](#). [Lazear \(1986, 2000a,b\)](#) highlights the selection effect of pay schemes.

⁶ The (scant) evidence provides a mixed answer to this question. [Weiss \(1987\)](#) finds that, in the context of workers in a pharmaceutical company, both high-ability and low-ability workers are more likely to leave than medium-ability workers. [Lazear \(2000a\)](#) finds that the average quality of workers in an auto glass company increased after the introduction of piece-rate pay. See also [Prendergast \(1999\)](#) for a survey of the literature on the provision of incentives in firms.

leavers on *ex ante*-unobservable skills. Section 6 tests the hypothesis that entrants to the kibbutzim are negatively selected compared with non-entrants in terms of their pre-entry earnings. Section 7 concludes.

2. Theoretical framework

The simple theoretical framework in this section is intended to illustrate the migration responses that are expected to be induced by intensive redistribution schemes. It is worth noting that this insight is used in the context of the selection of migrants to and from origins with different returns to skills (e.g. Chiquiar and Hanson, 2005). Migrants from origins with low returns to skill are expected to be positively selected, i.e. have higher-than-average skill; migrants from origins with high returns to skill are expected to be negatively selected, i.e. have lower-than-average skill. Equal sharing is a limit case where returns to skills are zero. To illustrate, assume that individuals from the kibbutz (indexed by 0) choose whether to migrate to an Israeli city (indexed by 1). The wage of a kibbutz member is:

$$\ln(w_0) = \mu_0 \quad (1)$$

where w_0 is the wage in the kibbutz and μ_0 is a constant. If a kibbutz member with skill s was to migrate to the city, he would earn a wage w_1 defined by

$$\ln(w_1) = \mu_1 + \delta_1 s \quad (2)$$

where μ_1 is the base wage in the city, and δ_1 is the return to skill in the city. A kibbutz member will migrate to the city if

$$I = \ln(w_1) - \ln(w_0 + C) \approx \mu_1 + \delta_1 s - \mu_0 - c > 0 \quad (3)$$

where C represents migration costs and $c = \frac{C}{w_0}$ represents the “time equivalent” measure of the cost of migrating from the kibbutz to the city. The cost of migrating from the kibbutz includes both direct costs and indirect costs attributable to the fact that migrants cannot take with them all their physical assets (e.g., their house and their share of the public goods). Eq. (3) defines a cutoff skill level above which kibbutz members will migrate to the city, and below which they will stay in their kibbutz. That is, we expect kibbutz-to-city migrants to be positively selected from the kibbutz population.⁷

The city-to-kibbutz migration can be described similarly. Because the kibbutz offers lower returns to skill, we expect city-to-kibbutz migrants to be negatively selected from the city population.

3. Data

In the period of study, kibbutzim were communities based on full income-sharing across members.⁸ Between 80% and 95% of kibbutz members worked inside their kibbutz in the period of study (1983–1995).⁹ Each member was paid an equal wage, regardless of her contribution to the collective. Kibbutz members who worked outside their kibbutz brought their salaries in, and the salaries were split equally among members.

Each kibbutz member could leave the kibbutz and earn a premium for ability and effort outside the kibbutz, but the movers could not take with them all their share of the kibbutz assets (house, plants, public goods). This made moving costly. Most kibbutz members who wished to stay were allowed to do so.¹⁰ Individuals from outside the kibbutz could apply for membership, and had to go through a screening process.

The data set used here is a random representative sample of individuals linked between the 1983 and the 1995 Israeli Censuses of Population (the link was done by the Israeli Central Bureau of Statistics). The data include all Israeli citizens who answered the “extensive questionnaire” in both years: at each census, this questionnaire was given to 20% of households in a way that adequately represented the entire population. Thus, the matched sample accounts for a representative 4% of the Israeli population (including a representative 4% of kibbutz members). The data identify individuals who live in “a cooperative rural settlement, in which production, marketing, and consumption are organized in a cooperative manner.” This uniquely defines kibbutz members. For this study, I employ three main sub-samples:

- (1) 1983 kibbutz members and other rural residents also observed in 1995. This sample allows me to compare kibbutz-to-city migrants both with kibbutz members who stayed in their kibbutz and with other rural-to-city migrants.

⁷ Chiquiar and Hanson (2005) show that the above-mentioned type of selection might change when migration costs vary with skill. However, because the wage in the kibbutz is not a function of skills, $\mu_1 + \delta_1 s - c$ and μ_0 will only cross once, regardless of whether c is constant or decreasing in the level of skill, s . This result only holds for a constant $\ln(w_0)$; it is a special case of Chiquiar and Hanson (2005).

⁸ While kibbutzim had equal sharing with respect to income, there were probably still some non-monetary returns to skills, such as being appreciated and serving in leadership positions.

⁹ See the Central Bureau of Statistics (2000).

¹⁰ Before the 1950s, a main source of population growth was net migration to the kibbutz through youth movements from Israel and abroad. Since then, however, the main source of population growth has been internal, i.e. kibbutz-born individuals who have stayed in their kibbutz. This implies that a kibbutz's ability to retain its members is critical to its stability and population growth.

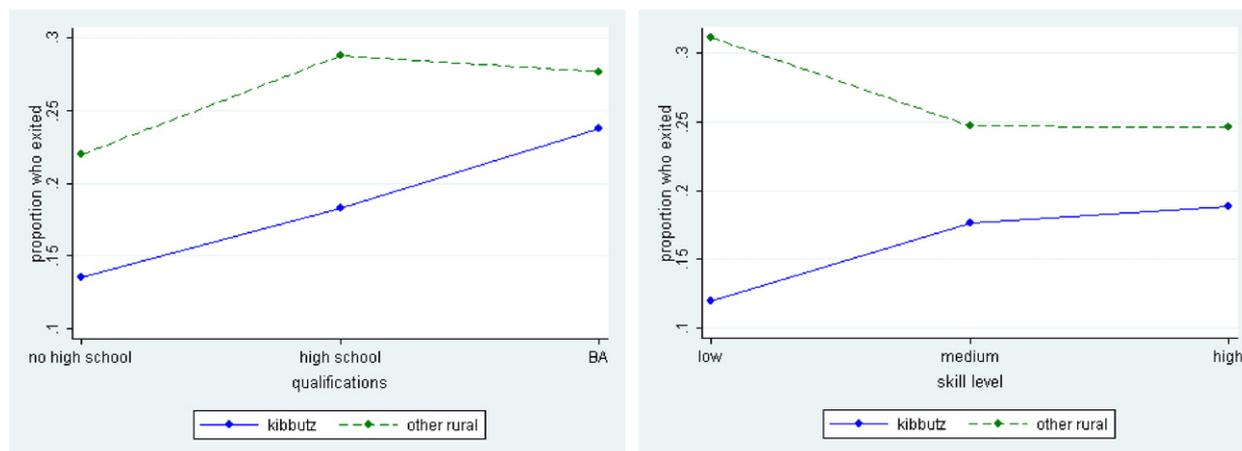


Fig. 1. Exit from kibbutzim and other rural areas, 1983–1995. Notes: The left hand panel shows the proportion of kibbutz members (solid line) and individuals from other rural areas (dashed line) who moved to the city between 1983 and 1995 by level of qualifications in 1983. The right hand panel shows the same, but broken down by the skill level of the member's occupation in 1983.

- (2) City residents observed in 1995, including individuals who migrated from the kibbutz and from other rural areas between 1983 and 1995. This sample allows me to analyze the earnings of kibbutz-to-city migrants in the city labor market compared with earnings of city natives and other rural-to-city migrants.
- (3) City residents observed in 1983, including individuals who would migrate to the kibbutz or to other rural localities between 1983 and 1995. This sample allows me to compare the pre-entry earnings of city-to-kibbutz migrants with the earnings of city stayers and city-to-other rural migrants.

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 1577 individuals in the sample who lived in a kibbutz in 1983 left the kibbutz between 1983 and 1995, over 20%. 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 in this period, about 0.5%. Entry is low in part because kibbutzim are well aware of the tendency of low-ability individuals to apply; they engage in centralized screening to mitigate adverse selection. Note that this makes it more difficult to document negative selection in entry, because actual entrants are probably less negatively selected than applicants.

An important shortcoming of the data is that, because of confidentiality concerns of the Israeli Central Bureau of Statistics, I cannot identify in which kibbutz an individual lives (I can only control for the kibbutz location). A second shortcoming is that wages inside the kibbutz are not recorded in my data, and they anyway do not reflect rewards for personal characteristics. Thus, when examining kibbutz-to-city migrants, I must compare movers to stayers in their education and skills rather than in their wages.

4. Positive selection in exit: Observables

To compare movers from kibbutzim with stayers and to test whether they are positively selected, I examine individuals who lived in a kibbutz in 1983 and either stayed or left by 1995. I compare the skill levels of movers with those of stayers. I also compare this skill bias in moving from kibbutzim with the skill bias in moving from other rural locations. The two panels of Fig. 1 illustrate the key results: more educated members and those with higher-skill occupations were more likely to leave kibbutzim, and this skill bias in out-migration is stronger in kibbutzim than in other rural localities. These results suggest a positive selection away from redistribution. The rest of this section subjects these basic patterns to regression analyses.

The main proxy for skill used in the regressions is the predicted log of earnings upon moving, which is the 1995 city log of earnings expected by a mover with certain 1983 observable characteristics (obtained from an OLS regression of 1995 city log of earnings on education, high and low skill occupations, and controls).¹¹ I run logit regressions that take the value 1 if the individual left the kibbutz between 1983 and 1995, and I test whether higher skill individuals are more likely to leave their kibbutz, and whether they are more likely to move than higher skill individuals in other rural areas.

The first three columns of Table 1 show the mean characteristics of individuals who stayed in their kibbutz, left their kibbutz for a city, and left their kibbutz for another rural location, respectively. The table shows that kibbutz movers are more educated (over 61.5% of kibbutz movers have at least a high school diploma compared with 50% of stayers), more likely to work in a high-skill occupation (9.9% as compared with 8.4%), and less likely to work in a low-skill occupation (less than 14.9% as compared with 22.6%). Also, the average kibbutz mover in 1983 (before migration) is younger (less than 30 years old) than the average stayer (36 years old).

¹¹ The coefficients of interest from this regression are: 0.352 on education, 0.360 on high-skill, and 0.216 on low-skill. This suggests that having at least a high school diploma increases predicted outside-of-kibbutz earnings by 35.2%; having a high-skill occupation increases expected earnings by 36.0%, and having a low-skill occupation decreases expected earnings by 21.6%. The controls are the same as those I later use in the logit regression.

Table 1
Summary statistics

Variable	(1) Stayed in Kibbutz	(2) Kibbutz-to-city migrants	(3) Kibbutz-to-other rural migrants	(4) City natives	(5) City-to-kibbutz migrants	(6) City-to-other rural migrants
1983 monthly earnings	–	–	–	32,120 (20,276)	25,877 (18,168)	31,211 (20,111)
At least high school diploma	0.500 (0.500)	0.615 (0.488)	0.630 (0.486)	0.507 (0.500)	0.642 (0.481)	0.692 (0.462)
High-skill	0.084 (0.278)	0.099 (0.300)	0.099 (0.300)	0.141 (0.348)	0.066 (0.250)	0.149 (0.357)
Low-skill	0.226 (0.418)	0.149 (0.357)	0.086 (0.283)	0.084 (0.277)	0.073 (0.261)	0.061 (0.239)
Age	36.295 (8.719)	29.500 (7.900)	29.963 (7.279)	33.327 (8.719)	26.570 (5.998)	28.434 (6.574)
Age squared	1393.3 (648.8)	932.4 (532.0)	950.1 (477.6)	1186.7 (618.1)	741.7 (363.4)	851.7 (423.5)
Male	0.494 (0.500)	0.550 (0.498)	0.543 (0.501)	0.576 (0.494)	0.556 (0.498)	0.533 (0.499)
Married	0.796 (0.403)	0.523 (0.500)	0.704 (0.459)	0.743 (0.437)	0.344 (0.477)	0.641 (0.480)
Family Size	3.570 (1.627)	2.576 (1.663)	3.136 (1.730)	4.068 (1.506)	3.311 (1.588)	3.687 (1.528)
Born in Israel	0.669 (0.471)	0.752 (0.433)	0.654 (0.479)	0.538 (0.499)	0.775 (0.419)	0.731 (0.444)
Israel's north region	0.524 (0.500)	0.508 (0.501)	0.568 (0.498)	0.072 (0.259)	0.066 (0.250)	0.105 (0.307)
Israel's south region	0.199 (0.400)	0.256 (0.437)	0.259 (0.441)	0.118 (0.323)	0.139 (0.347)	0.105 (0.307)
Observations	1234	262	81	20,617	151	610

Notes: This table presents the means of the explanatory variables for different groups of individuals. All variables are measured in 1983, i.e. prior to exit/entry. "High-skill" are individuals working in either academic or managerial occupations. "Low-skill" are individuals working in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations. "Israel's north region" includes the following districts: Sefad, Kinneret, Yizrael, Akko and Golan. "Israel's south region" includes Ashkelon and Beer-Sheva districts. A third omitted group contains all other regions. The numbers of observations for 1983 monthly earnings are fewer than for the other variables: 15,456 observations in column (4); 77 in (5); and 415 in (6). Standard errors are given in parentheses.

Table 2, the first column of which is also presented in Abramitzky (2008), suggests that kibbutz leavers are more educated, more skilled, and have higher expected earnings upon exit than stayers. The first two columns present the results from alternative specifications of the logit regression. In column 1, the coefficient on having at least a high school diploma is 0.656, suggesting that having at least a high school education increases the probability of exit by 9.4 percentage points, which is more than 50% of the average probability of exit, 17.5%. Members with high-skill occupations are over 8.2 percentage points more likely to exit than members with medium-skill occupations, and low-skill members are 8.7 percentage points less likely to exit.¹² The second column shows that the coefficient on predicted log of earnings is 1.92, suggesting that kibbutz members with a standard deviation higher log of expected earnings (which, at the mean, corresponds to 2400 Shekels) are 12 percentage points more likely to exit.¹³

Since kibbutzim are located in rural areas, a possible concern is that kibbutz movers are positively selected because rural-to-urban migrants tend to be positively selected rather than because of the intensive redistribution in kibbutzim. To account for this possibility, I test whether kibbutz members who move to other rural locations that do not engage in intensive redistribution are also positively selected on observable characteristics. Specifically, I run a multinomial logit regression that allows individuals to stay in their kibbutz, move to a city, or move to another rural location. Column 3 of Table 2 suggests that kibbutz members with higher skills are more likely to exit, both to cities and to rural locations where earnings are not based on equal sharing. As a robustness check, to account for the possibility that non-kibbutz rural areas also include rural communities that might be more similar to suburbs of major cities than to rural areas, I also categorize such rural communities as cities rather than as rural areas. The results (not presented) remain the same under this specification.¹⁴ These findings support the idea that equal sharing, rather than preferences of productive individuals for living in the city, discourages kibbutz participation among productive individuals.

A related possible concern is that more educated and skilled individuals are more likely to move simply because they are more mobile. To address this concern, I test whether kibbutz members with higher observable skills are more likely to move than high skill individuals from other rural locations that do not engage in intensive redistribution. Specifically, I examine individuals who

¹² When the regression uses either education or high/low-skill occupations (but not both), the coefficients on education and skill are even larger in magnitude. When the regression uses the eight occupation categories provided by the census instead of dummies for high, low and medium-skill occupations, the regression shows that kibbutz members with academic occupations are the most likely to exit and that unskilled industrial workers are the least likely to exit. Finally, results are similar when using a BA degree instead of a high school diploma as the measure of education.

¹³ A coefficient of 1.92 corresponds to a marginal probability of 0.279. An increase in a standard deviation in predicted log of earnings (which is 0.425) thus corresponds to 0.279*0.425, which is 0.12.

¹⁴ The coefficients on "Predicted 1995 log of earnings" in a regression similar to column 3 are 1.945 (city) and 1.826 (rural), and they have the same significance level as those in column 3.

Table 2
Exit from kibbutzim and other rural areas (logit and multinomial logit regressions), 1983–1995

Variable	(1)	(2)	(3)		(4)	(5)	(6)	(7)
	Logit of exit from kibbutz		Multinomial logit of exit from kibbutz to		Logit of exit to city of kibbutz members relative to residents of		Other non-metropolitan rural	
			City	Other rural	Other rural areas			
Kibbutz*Predicted 1995 log earnings					0.777** (0.326)	0.413* (0.223)	0.965*** (0.334)	0.461** (0.229)
Kibbutz					-6.863** (2.772)	-3.602* (1.900)	-8.396*** (2.838)	-3.920** (1.954)
Predicted 1995 log earnings		1.922*** (0.284)	1.900*** (0.314)	1.986*** (0.500)	0.177 (0.225)	1.306*** (0.222)	-0.01 (0.237)	1.238*** (0.232)
At least high school diploma	0.656*** (0.144)							
High-skill	0.502** (0.233)							
Low-skill	-0.682*** (0.197)							
Age (/10)	-2.416*** (0.744)	-3.901*** (0.797)	-3.843*** (0.865)	-4.224*** (1.550)		-3.095*** (0.517)		-3.035*** (0.536)
Age squared (/100)	0.201* (0.103)	0.410*** (0.110)	0.413*** (0.120)	0.414* (0.218)		0.329*** (0.073)		0.311*** (0.076)
Male	0.137 (0.144)	-0.980*** (0.224)	-0.982*** (0.247)	-0.958** (0.399)		-0.894*** (0.146)		-0.854*** (0.149)
Married	-0.391* (0.228)	-0.478** (0.229)	-0.608** (0.253)	0.035 (0.410)		-0.753*** (0.124)		-0.760*** (0.126)
Family Size	-0.002 (0.071)	0.027 (0.071)	-0.002 (0.079)	0.119 (0.124)		0.041 (0.027)		0.051* (0.027)
Born in Israel	-0.297* (0.157)	-0.492*** (0.160)	-0.382** (0.180)	-0.798*** (0.268)		-0.506*** (0.112)		-0.494*** (0.116)
Region dummies	Yes	Yes	Yes	Yes		Yes		Yes
Predicted probability	0.175	0.176	0.134	0.039		0.212		0.202
Observations	1577	1577	1577		3091	3091	3044	3044

Notes: Columns 1 and 2 present logit regressions on the sample of kibbutz members where the dependent variable is equal to 1 if the individual left his kibbutz between 1983 and 1995. Column 3 presents a multinomial logit regression on the sample of kibbutz members, where the base category is remained in the kibbutz, and the other options are moved to a city or moved to another rural area. Columns 4 to 7 present logits of moving to the city using the sample of individuals living in either a kibbutz or other rural area in 1983. All explanatory variables are measured in 1983, i.e. prior to exit. "High-skill" are individuals working in either academic or managerial occupations. "Low-skill" are individuals working in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations. "Region dummies" include dummy variables for Israel's north region and Israel's south region, and a third omitted group that contains all other regions. Standard errors are given in parentheses. Asterisks indicate the coefficient is significant at: ***1% **5% *10%.

lived in either a kibbutz or other rural area in 1983 and either stayed or left by 1995. I run a logit regression where the dependent variable takes the value 1 if the individual moved to a city between 1983 and 1995, and the main explanatory variable of interest is an interaction term of whether the individual lived in a kibbutz in 1983 and had high skills.

Columns 4 and 5 of Table 2 present the regression results. The regressions suggest that kibbutz members with higher skills are more likely to move than are high-skill people living in other rural areas. The coefficient on the interaction term in the logit regression is 0.413 (0.777 in the regression without controls), suggesting that a one standard deviation increase in expected log earnings increases the probability of moving by 3 percentage points more for kibbutz members than for other rural people.¹⁵ Specifically, kibbutz members whose expected log earnings upon moving are a standard deviation higher are 12 percentage points more likely to exit than their lower-earning counterparts; this difference is only 9 percentage points for similar non-kibbutz individuals. This difference between the effect of expected earnings on the exit probabilities of kibbutz members and of non-kibbutz individuals, which is statistically significant at the 10% level (5% in the regression without controls), amounts to 15% of the average predicted probability of moving, 21%. As a robustness check, I restrict the sample of rural areas to only include individuals who in 1983 lived in rural areas outside of metropolitan areas. Columns 6 and 7 of Table 2 suggest that results are similar when looking at this comparison group.

5. Positive selection in exit: Unobservables

The previous section provided evidence of positive selection on observable ability of kibbutz-to-city migrants compared both with members who stayed in the kibbutz and with other rural-to-city migrants. This section tests whether kibbutz-to-city migrants are positively selected in their *ex ante*-unobservable ability by comparing the post-exit earnings of kibbutz-leavers with the earnings of both the city labor force and other rural-to-city migrants. Specifically, I evaluate how former kibbutz members who

¹⁵ A coefficient of 0.413 corresponds to a marginal probability of 0.069. A one standard deviation (which is 0.425) increase in predicted log of earnings thus corresponds to 0.069*0.425, which is 0.03.

Table 3
Earnings in 1995 of kibbutz-to-city migrants vs. other rural-to-city migrants (OLS regressions)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Comparing kibbutz migrants with					
	City natives		Other rural migrants		Other rural migrants from outside metropolitan areas	
Kibbutz migrant	0.068 (0.043)	0.181*** (0.068)	0.098* (0.054)	0.170** (0.086)	0.110** (0.055)	0.169* (0.087)
Kibbutz migrant*At least high school diploma		-0.184** (0.086)		-0.113 (0.111)		-0.088 (0.112)
Any migrant			-0.032 (0.035)	0.011 (0.054)	-0.044 (0.037)	0.012 (0.055)
Any migrant*At least high school diploma				-0.073 (0.071)		-0.099 (0.073)
At least high school diploma	0.357*** (0.010)	0.359*** (0.010)	0.357*** (0.010)	0.361*** (0.010)	0.358*** (0.010)	0.362*** (0.010)
High-skill	0.363*** (0.015)	0.362*** (0.015)	0.363*** (0.015)	0.362*** (0.015)	0.363*** (0.015)	0.362*** (0.015)
Low-skill	-0.226*** (0.017)	-0.226*** (0.017)	-0.226*** (0.017)	-0.226*** (0.017)	-0.226*** (0.017)	-0.226*** (0.017)
Age (/10)	0.870*** (0.042)	0.871*** (0.042)	0.869*** (0.042)	0.871*** (0.042)	0.869*** (0.042)	0.871*** (0.042)
Age squared (/100)	-0.121*** (0.006)	-0.121*** (0.006)	-0.121*** (0.006)	-0.121*** (0.006)	-0.121*** (0.006)	-0.121*** (0.006)
Male	0.600*** (0.010)	0.600*** (0.010)	0.601*** (0.010)	0.601*** (0.010)	0.601*** (0.010)	0.601*** (0.010)
Born in Israel	0.113*** (0.010)	0.113*** (0.010)	0.113*** (0.010)	0.113*** (0.010)	0.113*** (0.010)	0.113*** (0.010)
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.264	0.264	0.265	0.265	0.265	0.265
Observations	21,150	21,150	21,132	21,132	21,132	21,132

Notes: Each column in this table presents an OLS regression of log earnings in 1995 for individuals living in the city in 1995. "Kibbutz migrant" is a dummy variable for individuals who lived in a kibbutz in 1983. "Kibbutz migrant*At least high school diploma" is a dummy variable for people who lived in a kibbutz and had at least a high school diploma in 1983. "Any migrant" is a dummy variable for people who lived in either a kibbutz or a non-kibbutz rural area in 1983, and lived in a city in 1995. "Any migrant*At least high school diploma" is the interaction of the previous variable with a dummy for having at least a high school diploma in 1983. All the other explanatory variables are measured in 1983 (before exit). "High-skill" are individuals who worked in either academic or managerial occupations. "Low-skill" are individuals who worked in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations. "Region dummies" include dummy variables for Israel's north region and Israel's south region, and a third omitted group that contains all other regions. Standard errors are given in parentheses.

left their kibbutz between 1983 and 1995 perform, in terms of their earnings, in the city in 1995 relative to similar individuals already in the city and relative to other rural-to-city migrants.¹⁶ The main findings are that kibbutz leavers earn higher wages than both city natives and other rural-to-city migrants.

I then test how the selection patterns over unobserved abilities (measured by post-exit wage) vary by education. Less-educated workers who were willing to leave the kibbutz and forgo sharing their income with more-educated workers are expected to be more talented and thus earn more than average less-educated workers. Following the same logic, more-educated workers who leave the kibbutz are not expected to be more talented and earn more than average more-educated workers.

I note that the analysis in this section is related to an important issue in migration, namely the extent to which positive selection with respect to the population of origin implies positive selection with respect to the population at the destination. Specifically, I examine both the selection of movers vs. stayers at the origin (previous section), and how these movers perform in terms of their earnings compared with the population at the destination (this section).

To test how kibbutz-to-city migrants perform in the city labor market, I run the following OLS regressions of 1995 city earnings on characteristics in 1983 and dummy variables for whether the individual exited from a kibbutz, and whether he exited with a high level of education (I run these regressions with and without the interaction of exit with education):

$$\ln(\text{Wage}_i^{95}) = \alpha + X_i^{83}\beta + \delta_1 \text{KibbutzMigrant}_i + \delta_2 \text{EducatedKibbutzMigrant}_i + \varepsilon_i \quad (4)$$

where Wage_i^{95} is the 1995 wage of individual i in the city; X_i^{83} is individual i 's characteristics in 1983 that are expected to affect her wage; KibbutzMigrant_i is a dummy variable that equals 1 if individual i left her kibbutz between 1983 and 1995; and $\text{EducatedKibbutzMigrant}_i$ is a dummy variable that equals 1 if individual i left her kibbutz between 1983 and 1995 and had at least a high school diploma in 1983. In the absence of the interaction with education, the coefficient δ_1 tests whether kibbutz-to-city migrants have *ex ante*-unobservable characteristics that are associated with higher post-exit wages than city natives. When the interaction with education is added, the coefficient δ_1 tests whether less-educated kibbutz-to-city migrants earn higher wages than less-educated city natives, and δ_2 tests the hypothesis that this effect is smaller for more-educated migrants.

¹⁶ A similar regression model was analyzed in the work of Chiswick (1978) and Carliner (1980).

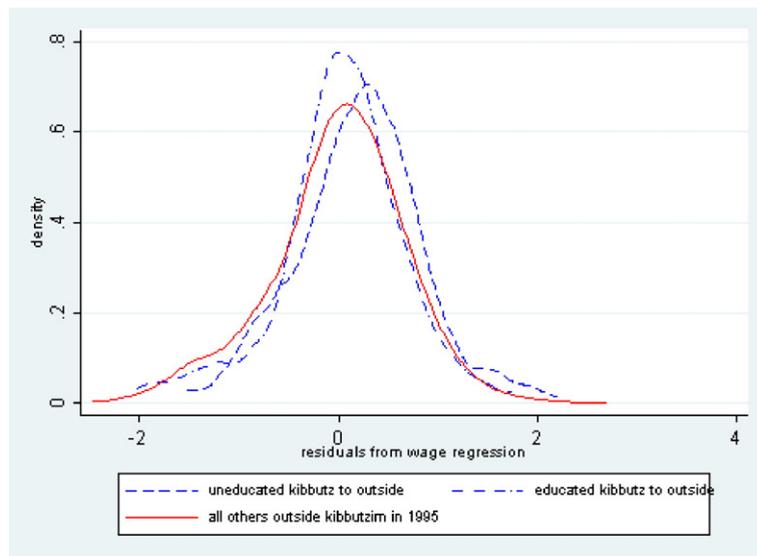


Fig. 2. Kernel densities of 1995 wages of kibbutz-to-outside movers and others outside, 1995. Notes: This figure plots kernel densities of residuals from an OLS regression of log earnings in 1995 on a dummy variable for having at least a high school diploma, dummies for having a high-skill or low-skill occupation, age and age squared, dummies for being male and for being born in Israel, and region dummies. The sample is Jewish people living outside kibbutzim in 1995. All explanatory variables are measured in 1983. The line uneducated kibbutz to outside is for people without high school diplomas who exited a kibbutz between 1983 and 1995. The line educated kibbutz to outside is for people with at least high school diplomas who exited a kibbutz between 1983 and 1995. The line all others outside kibbutzim in 1995 is for Jewish individuals who lived outside kibbutzim in both 1983 and 1995.

The first two columns of [Table 3](#) present the results of OLS regressions of 1995 city earnings on 1983 (pre-moving) characteristics. The regressions suggest that the average kibbutz mover earns higher wages than the average city native, indicating that kibbutz leavers have unobservable characteristics that are associated with higher wages in the outside labor market. Kibbutz members without high school diplomas who moved to cities earned 18% more than others with their education level living in the city, but educated kibbutz leavers did not earn higher wages than similar city natives (i.e. δ_2 is negative and similar in magnitude to δ_1).¹⁷

Another way of illustrating that kibbutz leavers, especially the less educated, are positively selected on unobservable abilities, is to compare the density of the OLS residuals from the regression of 1995 earnings on skill level of occupation, education, and other controls for kibbutz-leavers with the density for the rest of the population (along the lines of [Dinardo et al., 1996](#)). [Fig. 2](#) shows that the kernel density of the residuals for more-educated kibbutz leavers largely overlaps with the density for others, while the density for less-educated kibbutz-leavers is shifted to the right of the density of others.

Next, I test whether kibbutz-to-city migrants are more positively selected on unobservable abilities than other rural-to-urban migrants. Specifically, I test whether the wages of kibbutz-to-city migrants are higher than the wages of other rural-to-city migrants, and whether this wage premium is higher for less-educated kibbutz members. I run the following OLS regressions (with and without the interactions of moving with education):

$$\left\{ \begin{aligned} \ln(\text{Wage}_i^{95}) = & \alpha + X_i^{83}\beta + \delta_1(\text{KibbutzMigrant})_i + \delta_2(\text{EducatedKibbutzMigrant})_i + \delta_3(\text{AnyRuralMigrant})_i \\ & + \delta_4(\text{EducatedAnyRuralMigrant})_i + \varepsilon_i \end{aligned} \right\} \quad (5)$$

where Wage_i^{95} is the 1995 wage of individual i in the city; X_i^{83} is individual i 's 1983 characteristics expected to affect her wage; $(\text{KibbutzMigrant})_i$ is a dummy variable that equals 1 if individual i left her kibbutz between 1983 and 1995; $(\text{EducatedKibbutzMigrant})_i$ is a dummy variable that equals 1 if individual i left her kibbutz between 1983 and 1995, and had at least a high school diploma in 1983; $(\text{AnyRuralMigrant})_i$ is a dummy variable that equals 1 if individual i left either a kibbutz or any other rural location between 1983 and 1995; and $(\text{EducatedAnyRuralMigrant})_i$ is a dummy variable that equals 1 if individual i left either a kibbutz or any other rural location in the same period and had at least a high school diploma in 1983.

In the absence of interactions with education, the coefficient δ_1 tests whether kibbutz-to-city migrants earn higher wages than other rural-to-city migrants. When interactions with education are added, the coefficient δ_1 tests whether less-educated kibbutz-to-city migrants earn higher wages than less-educated other rural-to-city migrants, and δ_2 tests whether this effect is smaller for more-educated migrants.

The OLS regression results are shown in columns 3 and 4 of [Table 3](#). Column 3 shows that kibbutz-to-city migrants earn higher wages than other rural-to-city migrants. Column 4 shows that this result is mainly driven by the less-educated kibbutz-to-city

¹⁷ A similar regression of 1995 rural earnings shows that kibbutz-to-rural migrants earn higher wages than rural natives, and that this premium is also mainly driven by less-educated kibbutz leavers, who earned 37% more than similar rural natives.

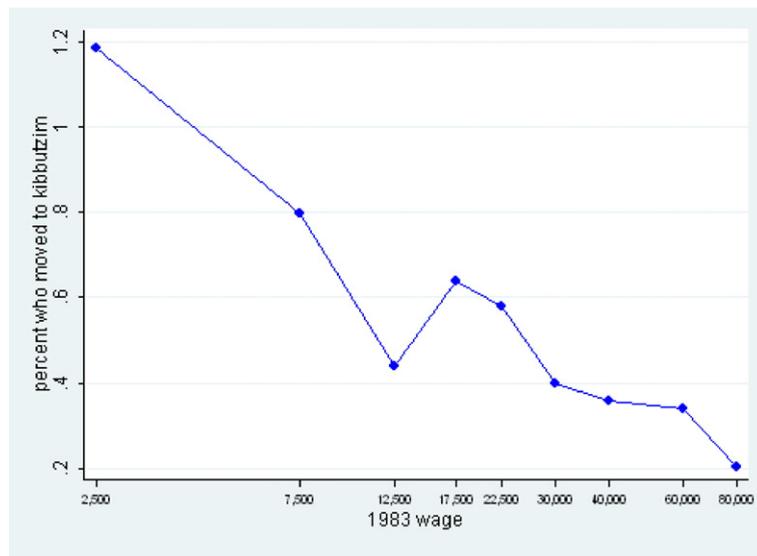


Fig. 3. Entry to kibbutzim from cities by wages. Notes: This figure shows the proportion of people living in cities in 1983 who entered kibbutzim between 1983 and 1995, broken down by wage categories in 1983. The numbers on the x-axis are plotted on a log scale.

migrants, who earn higher wages than other less-educated rural-to-city migrants. This earnings premium is smaller for more-educated kibbutz-to-city migrants, though the coefficient on the interaction of a kibbutz migrant with at least high school education (δ_2) is not statistically significant.¹⁸ Columns 5 and 6 show that these results are robust when comparing kibbutz-to-city movers to individuals who moved to a city from other rural areas located outside of metropolitan areas.

The results of positive selection corroborate the observation made by a secretary of kibbutz Givat Brenner in 2001. He summarizes the process that has taken place in his kibbutz during the last two decades:¹⁹

I don't want to shout it out loud, but there is a negative selection process at work here. We have lost some of the best and brightest of our young adults....We do not have enough members in the twenty-five to forty age group, and frankly, those who have stayed are not the best.

6. Negative selection in entry

In this section, I test whether entrants to kibbutzim are negatively selected compared with non-entrants, and compared with city-to-other rural migrants. Fig. 3 illustrates the key point: individuals with lower wages are more likely to enter a kibbutz. The rest of this section subjects this simple pattern to regression analysis.

Even if kibbutz officials are well aware of the tendency of less-productive individuals to enter, adverse selection might still transpire because individuals who seek to enter may have private information regarding their productivity. The census data contain information on individuals' pre-entry wages. However, wage was not used as a criterion in the application process. One reason why wages are not used is that they might be difficult to verify, but another possible reason is that kibbutzim may care more about entrants' skills and education than their wages. Note that whether or not the negative selection documented here can be interpreted literally as adverse selection due to asymmetric information depends on which is the true reason.

A central body in the country, the kibbutzim's Department of Absorption and Demographic Growth, coordinates the screening process of individual applicants to most kibbutzim and imposes strict rules on entry.²⁰ Kibbutzim prefer applicants who are between twenty and fifty years old, have finished high school, have served in the army, and have an occupation that will allow them to "find a job within the kibbutz or its area immediately." Moreover, applicants have to go through a lengthy interview, to fill out forms about their and their children's physical and mental health, and to write a Curriculum Vitae, which is tested by a graphologist. They also have to answer a long questionnaire meant to check whether they are personally suited to living in a kibbutz.

¹⁸ I note that while I can reject the hypothesis that less-educated kibbutz-to-city migrants earn the same as less-educated other rural migrants (i.e. δ_1 is positive and significant), I cannot reject the hypothesis that more-educated kibbutz-to-city migrants earn the same as other more-educated rural-to-city migrants (i.e. that $\delta_1 + \delta_2 = 0$).

¹⁹ Gavron (2000, p. 68)

²⁰ This section draws on the application forms and interviews with the members of the Kibbutz's Department of Absorption and Demographic Growth conducted in 2002. I am grateful to them, especially to Theo Kaminer, for sharing their data and ideas with me.

Table 4

Entry to kibbutz vs. moving from city to other rural areas (logit and multinomial logit regressions), 1983–1995

Variable	(1)		(2)		(3)		(4)	
	Logit of moving to kibbutz from either city or other rural area		Multinomial logit of moving from city to		Kibbutz	Other rural area	Kibbutz	Other rural area
Pre-entry (1983) log wage (/10)	-4.285*** (1.241)	-2.678* (1.381)	-4.240*** (1.335)	-0.941 (0.649)	-2.073 (1.506)	0.215 (0.769)		
At least high school diploma		0.842*** (0.246)			0.692*** (0.265)	0.785*** (0.118)		
High-skill		-0.556 (0.373)			-0.396 (0.379)	0.151 (0.140)		
Low-skill		0.164 (0.362)			0.181 (0.386)	0.002 (0.198)		
Age (/10)		2.406* (1.436)			2.614 (1.626)	-0.584 (0.605)		
Age squared (/100)		-0.410* (0.221)			-0.466* (0.253)	-0.027 (0.089)		
Male		0.363 (0.225)			0.209 (0.241)	0.173 (0.110)		
Married		-0.891*** (0.244)			-0.855*** (0.264)	0.214* (0.128)		
Family size		-0.205*** (0.074)			-0.245*** (0.083)	-0.107*** (0.038)		
Born in Israel		1.010*** (0.288)			0.866*** (0.300)	0.377*** (0.116)		
Region dummies	No	Yes	No	No	Yes	Yes		
Predicted probability	0.005	0.003	0.005	0.026	0.002	0.019		
Observations	16,789	16,789	15,948		15,948			
Chi-squared for same effect of wage			5.00**		1.87			

Notes: Columns 1 and 2 present logit regressions on the sample of people living outside kibbutzim in 1983, where the dependent variable is equal to 1 if the individual moved to a kibbutz between 1983 and 1995. Columns 3 and 4 present multinomial logit regressions on the sample of people living in the city in 1983, where the base category is remained in the city, and the other options are moved to a kibbutz or moved to another rural area. All explanatory variables are measured in 1983, i.e. prior to exit. "High-skill" are individuals working in either academic or managerial occupations. "Low-skill" are individuals working in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations. "Region dummies" include dummy variables for Israel's north region and Israel's south region, and a third omitted group that contains all other regions. Standard errors are given in parentheses. The row chi-squared for same effect of wage reports the chi-squared from the test that the coefficient on wage in the equation predicting moving to a kibbutz is the same as in the equation predicting moving to another rural area. Asterisks indicate significance at: ***1% **5% *10%.

Only about one third of the kibbutzim absorbed new members from the outside during the period of study. These kibbutzim are typically neither rich nor poor, and they are more likely to be located in Israel's far south or far north.²¹ Some kibbutzim require an entry fee, but this can often be recovered in part upon leaving. Applicants can list their preferences to join particular kibbutzim, but the decision takes into account both applicants' preferences and kibbutzim's needs.

Columns 4–6 of Table 1 present the mean characteristics of individuals who lived in the city in both 1983 and 1995, city-to-kibbutz movers, and city-to-other rural location movers, respectively. Note that the average individual who entered a kibbutz earned a wage that is substantially lower than that of non-entrants (25,877 Shekels vs. 32,120 Shekels). In contrast, Table 1 shows that city-to-other rural migrants earned a similar wage to city natives who did not move (31,211 Shekels vs. 32,120 Shekels). The average individual who entered a kibbutz was also younger than the average Israeli who did not move (26.5 vs. 33.3 years old) and was more likely to have at least a high school diploma than non-movers (64% vs. 51% in the general population). He or she was less likely to work in a high-skill occupation than the average city worker, and was somewhat less likely to work in a low-skill occupation.

I first test the hypothesis that entrants to the kibbutz are negatively selected in terms of their pre-entry wage. More specifically, I conduct a logit regression analysis of entry to the kibbutz in the period 1983–1995, in which I evaluate whether individuals who earned lower wages were more likely to enter, controlling for their observable characteristics (age, gender, family size, education, occupation, marital status, previous residence (south/north)).

The logit regression results of entering a kibbutz are presented in columns 1 and 2 of Table 4. The regressions provide little evidence of negative selection over characteristics that were observable to the kibbutz. While high skill workers were less likely to enter and low skill workers were more likely to enter (both coefficients are not significant), more-educated individuals were actually significantly more likely to enter kibbutzim than were less-educated individuals. At the same time, the regressions provide evidence of adverse selection. Specifically, individuals with lower wages were more likely to enter. The negative coefficient on wage declines somewhat in magnitude but remains significant when controls are added for individual characteristics that are

²¹ Poor kibbutzim often cannot absorb outsiders because they lack the resources to build new apartments for children who decide to stay – still the main source of population growth. Poor kibbutzim also face unemployment, which prevents them from absorbing new individuals from the outside. Rich kibbutzim often also do not accept outsiders, as they face high demand for apartments by their own children. Kibbutzim in the center of Israel and those close to the sea are crowded with members and often do not have room for new housing.

observable to the kibbutz, such as education and age. The table in Appendix A shows how the magnitude of the wage coefficient changes with different subsets of the control variables. The magnitude of the wage coefficient does not decrease when controlling for the level of education, but is halved when age and marital status are added. The reason for this is that younger and single individuals are more likely to enter, but also earn lower wages. This is natural and does not imply adverse selection, which is small but significant after adding such observable controls.

I test whether this negative selection on wage holds for migrants from the city to other rural locations that do not engage in redistribution. Specifically, I run a multinomial logit that allows individuals who lived in the city in 1983 to stay in the city, move to a kibbutz, or move to another rural location. The results are presented in column 3 (without controls) and column 4 (with controls) of Table 4. The regressions suggest that although individuals who earned lower wages were more likely to enter a kibbutz, similar individuals were not more likely to move to non-kibbutz rural localities, although the multinomial results with controls are not measured precisely.

As an alternative test for negative selection in entry, more parallel to the test for positive selection conducted in Section 5 (if less natural than the previous test because wages are observed pre entry), I test whether city-to-kibbutz migrants are more negatively selected on *ex ante*-unobservable abilities than both city stayers and city-to-other rural migrants. Entrants to a kibbutz, *ceteris paribus*, are expected to have earned lower pre-entry wages than both non-entrants and entrants to other rural areas. I run the following OLS regressions (with and without the interactions of moving with education):

$$\ln(\text{Wage}_i^{83}) = \alpha + X_i^{83}\beta + \delta_1(\text{KibbutzEntrant})_i + \delta_2(\text{EducatedKibbutzEntrant})_i + \varepsilon_i \quad (6)$$

$$\left\{ \begin{array}{l} \ln(\text{Wage}_i^{83}) = \alpha + X_i^{83}\beta + \delta_1(\text{KibbutzEntrant})_i + \delta_2(\text{EducatedKibbutzEntrant})_i + \delta_3(\text{AnyRuralEntrant})_i \\ \quad + \delta_4(\text{EducatedAnyRuralEntrant})_i + \varepsilon_i \end{array} \right\} \quad (7)$$

where Wage_i^{83} is the individual's wage earned outside the kibbutz in 1983; X_i^{83} is a vector of characteristics believed to affect wages and including age, age squared, gender, a dummy for Israeli born, region dummies, education, and occupation; $(\text{KibbutzEntrant})_i$ is

Table 5

Pre-entry earnings of city-to-kibbutz migrants, city-to-other rural migrants, and non-migrants (OLS regressions), 1983

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Comparing kibbutz entrants with					
	Non-entrants			City-to-other rural migrants		
Entered kibbutz	-0.027*** (0.009)	-0.016** (0.007)	0.003 (0.013)	-0.022** (0.009)	-0.016** (0.008)	-0.016 (0.014)
Entered kibbutz* At least school diploma			-0.028* (0.016)			-0.000 (0.017)
Any migrant				-0.005 (0.004)	-0.000 (0.003)	0.019*** (0.006)
Any migrant* At least high school diploma						-0.028*** (0.007)
At least high school diploma		0.0206*** (0.0011)	0.0208*** (0.0011)		0.0206*** (0.0011)	0.0214*** (0.0011)
High-skill		0.0277*** (0.0015)	0.0277*** (0.0015)		0.0277*** (0.0015)	0.0277*** (0.0015)
Low-skill		-0.0266*** (0.0018)	-0.0266*** (0.0018)		-0.0266*** (0.0018)	-0.0265*** (0.0018)
Age		0.1120*** (0.0049)	0.1121*** (0.0049)		0.1120*** (0.0049)	0.1122*** (0.0049)
Age squared		-0.0128*** (0.0007)	-0.0128*** (0.0007)		-0.0128*** (0.0007)	-0.0128*** (0.0007)
Male		0.0538*** (0.0010)	0.0538*** (0.0010)		0.0538*** (0.0010)	0.0539*** (0.0010)
Born in Israel		0.0068*** (0.0011)	0.0068*** (0.0011)		0.0068*** (0.0011)	0.0069*** (0.0011)
Region dummies	No	Yes	Yes	No	Yes	Yes
R ²	0.001	0.279	0.279	0.001	0.279	0.280
Observations	15,948	15,948	15,948	15,948	15,948	15,948

Notes: Each column in this table presents an OLS regression of the log of earnings in 1983 (scaled by 1/10) for individuals living in a specified type of area outside kibbutzim at the time. "Entered kibbutz" is a dummy variable that equals 1 if the individual moved to a kibbutz between 1983 and 1995. "Entered kibbutz* At least high school diploma" is the interaction of "Entered kibbutz" with a dummy variable that equals 1 if the individual had at least a high school diploma in 1983. "Any migrant" is a dummy variable that equals 1 if the individual moved from a city to either a kibbutz or a non-kibbutz rural location between 1983 and 1995. "Any migrant* At least high school diploma" is the interaction of "Any migrant" and a dummy variable that equals 1 if the individual had at least a high school diploma in 1983. All other explanatory variables are measured in 1983 (before exit). "High-skill" are individuals who worked in either academic or managerial occupations. "Low-skill" are individuals who worked in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations. "Region dummies" include dummy variables for Israel's north region and Israel's south region, and a third omitted group that contains all other regions. Standard errors are given in parentheses.

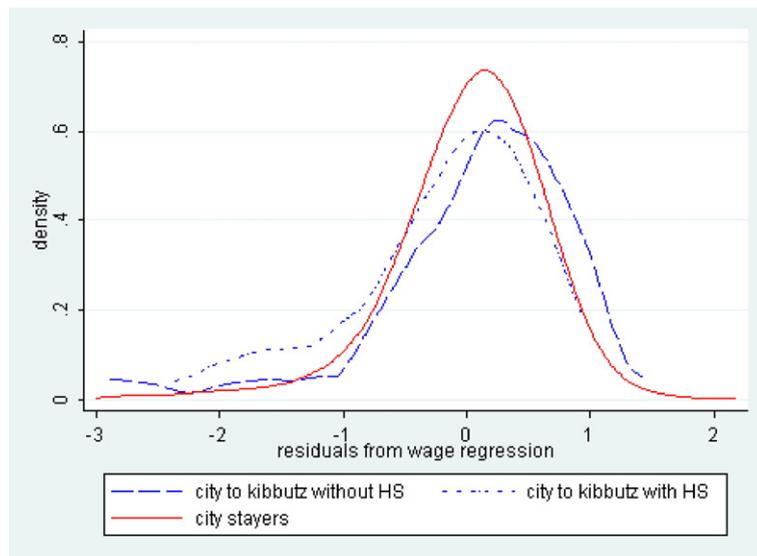


Fig. 4. Kernel densities of 1983 wages of kibbutz entrants and city stayers. Notes: This figure plots kernel densities of residuals from an OLS regression of log earnings in 1983 on a dummy variable for having at least a high school diploma, dummies for having a high-skill or low-skill occupation, age and age squared, dummies for being male and for being born in Israel, and region dummies. The sample is Jewish individuals living in cities in 1983. All explanatory variables are measured in 1983. The line city to kibbutz without HS is for people without high school diplomas who moved to a kibbutz between 1983 and 1995. The line city to kibbutz with HS is for people with at least high school diplomas who moved to a kibbutz between 1983 and 1995. The line city stayers is for people who were still living in a city in 1995.

a dummy indicating whether the individual entered a kibbutz between 1983 and 1995; (*EducatedKibbutzEntrant*), is a dummy that equals 1 if individual *i* entered a kibbutz between 1983 and 1995 with at least a high school diploma (in 1983); (*AnyRuralEntrant*), is a dummy that equals 1 if individual *i* entered either a kibbutz or another rural location; (*EducatedAnyRuralEntrant*)_{*i*} is a dummy that equals 1 if individual *i* entered either a kibbutz or another rural location and had at least a high school diploma in 1983.

In regression 6, the earnings of city-to-kibbutz entrants are compared with the earnings of city stayers, and in regression 7 the earnings of kibbutz entrants are compared with the earnings of city-to-other rural migrants. If redistribution in kibbutzim discourages participation of high earners, then I expect kibbutz-entrants to earn less than both city stayers and city-to-other rural migrants, i.e. I expect δ_1 to be negative in both regressions. The coefficient δ_2 in both regressions tests whether these lower earnings are more pronounced for more-educated kibbutz entrants.

Table 5 presents the main results of selection in entry to the kibbutz. The regression results suggest that city-to-kibbutz migrants are negatively selected. Columns 1–3 present the results of the regression corresponding to Eq. (6) with and without controls. The coefficient on “entering a kibbutz” (δ_1) is negative, large and significant, suggesting that entrants to the kibbutz earn lower wages prior to entry than non-entrants. Column 3 reveals that the negative selection is coming from the more-educated entrants (δ_1 is close to zero and δ_2 is negative and large). In particular, individuals who entered a kibbutz with at least a high school diploma earn lower pre-entry wages than similar city stayers. The results from the regressions corresponding to Eq. (7), presented in columns 4–6, suggest that city-to-kibbutz migrants are more negatively selected than city-to-other rural migrants (i.e. δ_1 is negative). However, column 6 suggests that this negative selection is not more pronounced for more-educated kibbutz entrants.

As with exit, another way of illustrating that educated entrants to kibbutzim are negatively selected in their pre-entry wages is to compare the density of their residuals from an OLS regression of earnings on education, skill level and controls with the density for non-entrants. Fig. 4 shows that the kernel density of the residuals for highly educated entrants to kibbutzim is shifted to the left of the density of others, whereas the residuals of less-educated entrants to kibbutzim lie to the right of the density for others.

Note that I only observe individuals who actually entered, rather than all applicants. However, this should make it harder to document negative selection, because it includes only applicants who were accepted by the kibbutz. Hence, my results are likely to provide a lower bound on the negative selection of people who wish to enter kibbutzim. Although I find significant evidence of negative selection in entry, it should be noted that the size of the sample of entrants is very small.

7. Conclusion

This paper provides a case study of how redistribution affects mobility patterns. Specifically, I use a unique data set of individuals entering and exiting Israeli kibbutzim to test whether and to what extent the intensive redistribution reflected in equal sharing discourages participation of productive individuals.

I find strong positive selection in exit and negative selection in entry. Kibbutz leavers were more skilled than both stayers and other rural-to-city migrants. Moreover, kibbutz leavers earned higher wages upon exit than both observably similar city natives

and other rural-to-urban migrants. Conversely, entrants to kibbutzim earned lower wages than both observably similar city stayers and city-to-other rural migrants. These findings support the idea that redistribution encourages exit of productive individuals and entry of less productive ones.

The redistribution in kibbutzim is more intensive than in other states and local governments. Members of kibbutzim in the period of this study essentially faced a 100% income tax. In this sense, the findings of this paper probably present an upper bound on the negative selection expected to result from redistributive schemes. Nevertheless, it illustrates that mobility and selection may be important factors to take into account when designing tax policy.

The selection effect also forms the basis for Borjas' hypothesis that selection of migrants (either positive or negative) depends on the relative returns to skills of the origin and destination. This paper provides empirical support for the selection hypothesis. According to Borjas, migrants tend to come from the "lower tail of the home country's income distribution" (Borjas 1987, p. 534) if the place of origin has a more unequal income distribution (resulting from higher returns to skill) than the destination. On the contrary, much of the literature postulates that migrants always will be positively selected regardless of income distribution of origin and destination. The positive selection hypothesis has it that migrants are "more able and more highly motivated" than natives (Chiswick 1978, p. 900). If motivation and ability are positively correlated with both propensity to migrate and labor market outcome, then one expects to observe that potential migrants *ceteris paribus* earn more than individuals who do not migrate. This paper does not support this claim in the context of entering kibbutzim.

At the same time, the results reveal the limitations of looking for a uniform pattern of selection. I find that selection varies across education levels. Whereas less-educated kibbutz-to-city movers earned higher wages upon exit than the average less-educated individuals, more-educated movers did not earn such a wage premium. In contrast, more-educated entrants earned lower wages prior to entry than observably similar non-entrants, but less-educated entrants did not.

Appendix A

Entry to kibbutz (logit), 1983–1995

Variable	(1)	(2)	(3)	(4)	(5)
	Logit of entering kibbutz from city or other rural area				
Pre-entry (1983) log wage (/10)	-4.285*** (1.241)	-4.760*** (1.205)	-4.189*** (1.263)	-4.014*** (1.286)	-2.678* (1.381)
At least high school diploma		0.852*** (0.232)	0.959*** (0.239)	0.894*** (0.246)	0.842*** (0.246)
High-skill			-0.630* (0.366)	-0.676* (0.368)	-0.556 (0.373)
Low-skill			0.146 (0.364)	0.211 (0.362)	0.164 (0.362)
Age (/10)					2.406* (1.436)
Age squared (/100)					-0.410* (0.221)
Male				0.460** (0.226)	0.363 (0.225)
Married					-0.891*** (0.244)
Family size				-0.295*** (0.079)	-0.205*** (0.074)
Born in Israel				1.275*** (0.276)	1.010*** (0.288)
Israel's north region				0.467 (0.361)	0.457 (0.363)
Israel's south region				0.870*** (0.287)	0.863*** (0.291)
Predicted probability	0.005	0.005	0.005	0.003	0.003
Observations	16,789	16,789	16,789	16,789	16,789

Notes: Each column in this table presents a logit regression on the sample of people living outside kibbutzim in 1983, where the dependent variable is equal to 1 if the individual moved to a kibbutz between 1983 and 1995. All explanatory variables are measured in 1983, i.e. prior to exit. "High-skill" are individuals working in either academic or managerial occupations. "Low-skill" are individuals working in either unskilled occupations in industry or as service workers. A third omitted group contains all other occupations. "Israel's north region" includes the following districts: Sefad, Kinneret, Yizrael, Akko and Golan. "Israel's south region" includes Ashkelon and Beer-Sheva districts. A third omitted group contains all other regions. Standard errors are given in parentheses. Asterisks indicate the coefficient is significant at: ***1% **5% *10%.

References

- Abramitzky, R., 2008. The limits of equality: insights from the Israeli kibbutz. *Quarterly Journal of Economics* 123 (3), 1111–1159.
- Abramitzky, R., Braggion, F., 2006. Migration and human capital: self selection of indentured servants to the Americas. *Journal of Economic History* 66 (4), 882–905.
- Borjas, G.J., 1987. Self-selection and the earnings of immigrants. *The American Economic Review* 77 (4), 531–553.
- Borjas, G.J., 1991. Immigration and self-selection. In: Abowd, J., Freeman, R. (Eds.), *Immigration, Trade and the Labor Market*. The University of Chicago Press, Chicago.
- Borjas, G.J., 1994. The economics of immigration. *Journal of Economic Literature* 32 (4), 1667–1717.

- Borjas, G.J., Bronars, S.G., Trejo, S.J., 1992. Self-Selection and Internal Migration in the United States. *Journal of Urban Economics* 32 (2), 159–185.
- Burda, M., Härdle, W., Müller, M., Werwatz, A., 1998. Semiparametric analysis of German East–West migration intentions: facts and theory. *Journal of Applied Econometrics* 13 (5), 525–541.
- Carliner, G., 1980. Wages, earnings, and the hours of first, second and third generation American males. *Economic Inquiry* 18 (1), 87–102.
- Chiquiar, D., Hanson, G.H., 2005. International migration, self-selection, and the distribution of wages: evidence from Mexico and the United States. *Journal of Political Economy* 113 (2), 239–281.
- Chiswick, B., 1978. The effect of Americanization on the earnings of foreign-born men. *Journal of Political Economy* 86 (5), 897–921.
- Chiswick, B., 1999. Are immigrants favorably self-selected? *American Economic Review* 89 (2), 181–185.
- Chiswick, B., 2000. Are immigrants favorably self-selected? An economic analysis. In: Brettell, C.D., Hollifield, J.F. (Eds.), *Migration Theory: Talking Across Disciplines*. Routledge, New York, pp. 61–76.
- Cremer, H., Pestieau, P., 2004. Factor mobility and redistribution. *Handbook of Regional and Urban Economics* 4, 2530–2555.
- Dinardo, J., Fortin, N., Lemieux, T., 1996. Labor market institutions and the distribution of wages, 1973–1992: a semiparametric approach. *Econometrica* 64 (5), 1001–1044.
- Epple, D., Romer, T., 1991. Mobility and redistribution. *Journal of Political Economy* 99 (4), 828–858.
- Feldstein, M., Wrobel, M., 1998. Can state taxes redistribute income? *Journal of Public Economics* 68, 369–396.
- Ferrie, J.P. (1999). “How Ya Gonna Keep ‘Em Down on the Farm [When They’ve Seen Schenectady]?: Rural to Urban Migration in Nineteenth Century America, 1850–70.” Working paper.
- Finkelstein, A., McGarry, K., 2006. Multiple dimensions of private information: evidence from the long-term care insurance market. *American Economic Review* 96 (4), 938–958.
- Finkelstein, A., Poterba, J.M., 2006. Testing for Adverse Selection with “unused observable”. NBER Working Papers 12112. National Bureau of Economic Research, Cambridge, MA.
- Gavron, D., 2000. *The Kibbutz: Awakening from Utopia*. Rowman & Littlefield Publishers, Lanham, MD.
- Gronau, R., 1974. Wage comparisons — a selectivity bias. *Journal of Political Economy* 82 (6), 1119–1143.
- Heckman, J., 1974. Shadow prices, market wages and labor supply. *Econometrica* 42, 679–694.
- Heckman, J., Honore, B., 1990. The empirical content of the Roy model. *Econometrica* 58 (5), 1121–1149.
- Heckman, J., Sedlacek, G., 1990. Self-selection and the distribution of hourly wage. *Journal of Labor Economics* 8, 329–363.
- Holmstrom, B., 1982. Moral hazard in teams. *Bell Journal of Economics* 13 (2), 324–340.
- Lazear, E., 1986. Salaries and piece rates. *Journal of Business* 59 (3), 405–431.
- Lazear, E., 2000a. Performance pay and productivity. *American Economic Review* 90 (5), 1346–1361.
- Lazear, E., 2000b. The power of incentives. *American Economic Review* 90 (2), 410–414.
- Lee, L.-F., 1978. Unionism and wage rates: a simultaneous equations model with qualitative and limited dependent variables. *International Economic Review* 19 (2), 415–433.
- Liebig, T., Sousa-Poza, A., 2003. How does income inequality influence international migration? ERSA conference papers ersa03p472, European Regional Science Association.
- Prendergast, C., 1999. The provision of incentives in firms. *Journal of Economic Literature* 37 (1), 7–63.
- Ramos, F., 1992. Out-Migration and Return Migration of Puerto Ricans. In: Borjas, G., Freeman, R. (Eds.), *Immigration and the Work Force*. Chicago, NBER and University of Chicago Press, pp. 49–66.
- Robinson, C., Tomes, N., 1982. Self-selection and interprovincial migration in Canada. *Canadian Journal of Economics* 15 (3), 474–502.
- Roy, A.D., 1951. Some thoughts on the distribution of earnings. *Oxford Economic Papers* 3 (2), 135–146.
- State of Israel, 2000. Qibbuzim and Their Population: Selected Findings, No. 5. Central Bureau of Statistics, Jerusalem, Israel. In Hebrew.
- Weiss, A., 1987. Incentives and Worker Behavior. Rowan and Littlefield.
- Willis, R.J., Rosen, S., 1979. Education and self-selection. *Journal of Political Economy* 87 (5), S7–S36 Part 2.