Rationality and Society
XX(X):1–19

Reprints and permission:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/ToBeAssigned
ijr.sagepub.com/
SAGE

Social Capital and Mobility: An Experimental Study

Ondřej Krčál, Štěpán Mikula and Rostislav Staněk [1]
Department of Economics, Masaryk University, Czech Republic

Abstract
Theoretical models of local social capital predict that communities may find themselves in one of two equilibria: one with a high level of local social capital and low migration or one with a low level of local social capital and high migration. There is empirical literature suggesting that immigrants who join communities high in social capital are more likely to invest in local social capital and that the whole community will then end up in the equilibrium with high local social capital and low migration. However, this literature suffers from the selection of immigrants, which makes the identification challenging. In order to test the causal influence of the initial level of local social capital, we take the setup used in the theoretical models into the laboratory. We treat some communities by increasing the initial level of social capital without affecting the equilibrium outcomes. We find that while most communities end up in one of the two equilibria predicted by the theoretical models, the treated communities are more likely to converge to the equilibrium with a high level of local social capital and low migration.

Keywords
Social capital, Integration, Equilibrium selection, Laboratory experiment

Introduction

Migratory movements are driven by a desire for a better future or simply by force. Irrespective of their motives, migrants lose many of the social connections they had

[01]Department of Economics, Masaryk University, Czech Republic
[0]
Corresponding author:
Ondřej Krčál, Faculty of Economics and Administration, Masaryk University, Lipov 41a, 602 00 Brno, Czech Republic
[0]Email: ondrej.krcal@econ.muni.cz

in their communities of origin and need to integrate into the social networks of their receiving communities by investing in local social capital (SC).[1] Investments in social capital may yield considerable returns, as social capital has been shown to be correlated for example with labour market outcomes (Freitag and Kirchner 2011) as well as with physical and mental health (Costa and Kahn 2007; Folland 2007; d'Hombres et al. 2010).

Theoretical models of local social capital accumulation (David et al. 2010; Bräuninger and Tolciu 2011) have described individual investments in social capital as a function of a community-level stock of social capital. Higher stock brings higher returns to those who (a) previously invested and (b) stay in the community. These models typically produce two stable equilibria: a community with high social capital and low mobility (high-SC equilibrium) and a community with low social capital and high mobility (low-SC equilibrium). The theory does not provide any guidance about which equilibrium a particular community will end up in, or how that outcome depends on the initial level of social capital in the community.[2] In this paper, we address whether immigrants who come into a community that is already high in local social capital are more likely to invest more in that local social capital than immigrants who come into a community that is low in local social capital.

Empirical evidence drawn from historical events following World War II suggests that communities affected by migration may end up in one of the two equilibria described in the theory.[3] In the aftermath of the Second World War, ethnic Germans were expelled from Central and Eastern European countries and forced to move to Germany and Austria. Their expulsion resulted in a sudden inflow of 8 million people into West Germany alone. These immigrants *(expellees)*, who moved into established communities,

[1]In line with Bräuninger and Tolciu (2011), we define social capital as "a resource that actors derive from specific social structures and then use to pursue their interests" (Baker 1990, p. 619), and we focus on the geographical dimension of SC, which "arises from the fact that the value of social capital depends on the physical distance between the location where an individual resides and the location where he possesses social ties." (Bräuninger and Tolciu 2011, p. 435) In our experimental design, we model social capital as an investment whose return depends on the investment made by other community members. This approach is much closer to the perspective on social capital represented by Nan Lin, who defines social capital as "investment in social relations with expected returns in the marketplace" (Lin 2002, p. 19) than it is to Putnam's view of social capital as "features of social life—networks, norms and trust—that enable participants to act together more effectively to pursue shared objectives" (Putnam 1995, pp. 664-5). The crucial difference is that in our model, an individual can benefit from social capital only if he/she contributes to it, while in Putnam's concept a community member may benefit from a high level of social capital (e.g. because of efficient local political processes) without contributing to it at all.

[2]The model by Bräuninger and Tolciu (2011) also includes a third unstable equilibrium at an intermediate level of social capital; the authors postulate that once the social capital surpasses this intermediate level the community will converge to the high-SC equilibrium, and vice-versa. However, the existence of this unstable equilibrium depends on the assumption that individuals must commit to move or to stay in the community before they realize the value of such a move. Unlike Bräuninger and Tolciu (2011), our experimental design does not require players to make the moving decision ex-ante and therefore our model includes only two stable equilibria. Therefore, their argument about convergence is not applicable in our case.

[3]The convergence to one of these equilibria is less likely if racial or ethnic differences prevent the immigrants from investing or tapping into social capital available in local communities (Algan et al. 2010; Dancygier and Laitin 2014).

were similar to the domestic population of those communities in terms of language, culture and human capital, but were substantially poorer (Bauer et al. 2013). Chevalier et al. (2018) use municipality-level data from West Germany to show that the expellees eventually succeeded in becoming politically integrated, with their higher taste for wealth redistribution and preferences for different political parties disappearing in the mid-1960s. The voter turnout in municipal elections, often used as a proxy for SC levels (e.g. Knack 1992; Hotchkiss and Rupasingha 2021), converged even sooner, in 1950.

The expulsion of the ethnic German population did not only affect the receiving communities in Germany and Austria. On the other side of the border, in what is now the Czech Republic, the ethnic Germans had lived in the Sudetenland, a highly ethnically segregated region close to the border, for centuries. Their expulsion emptied whole municipalities and completely destroyed the region's local social capital. The empty settlements they left behind were swiftly resettled by volunteers who sought to improve their economic and social status by acquiring a house, a piece of land or a better job (see e.g., Wiedemann 2016). These settlers were homogeneous in terms of language and culture but they had little or no social connections prior to the resettlement. The new communities they created therefore, presumably, had low initial levels of local social capital. Guzi et al. (2021) show that the resettlement increased the population churn in resettled municipalities and that this effect has persisted to the present day. They also document that to this day the resettled municipalities still report lower voter turnout in local elections and lower civic participation in local clubs – i.e., in local social capital.

The established communities in West Germany which experienced an inflow of expellees maintained their high level of SC, while the municipalities in the Czech Republic that suffered the destruction of their SC are still lower in SC. However, the evidence that empirical research can deliver is limited due to the self-selection of immigrants and their unobserved characteristics. Migration is typically a matter of choice, and migrants are usually free to choose their country or municipality of destination. The observed effects could be therefore driven by self-selection rather than by the local social capital levels in the receiving communities. To tackle this concern, we simulate the process of migration and investment in local social capital in a laboratory experiment.

We propose an experimental design that follows theoretical models of local social capital accumulation (David et al. 2010; Bräuninger and Tolciu 2011). A community is modelled as a group of experimental subjects, who make two choices. First, they decide how much to invest in SC and second, they choose whether to stay in the community or to move elsewhere. People who stay enjoy the return from their SC investments. People who leave receive a reward (e.g. a better job or lower housing costs), but lose the benefits of their local social network.

The experiment enables us to examine whether community members' choices and the equilibrium the community ends up in depend on the community's initial level of SC. An exogenous shift in the initial level of SC is modelled through an *investment leader*. This is a player who always invests as much as possible in local SC and never leaves the community. Since returns from SC investment depend also on other players' investments, the investment leader increases the lower bound return from SC investment for the other community members. For this reason, we hypothesise that communities with an investment leader are more likely to end up in the high-SC equilibrium than communities without such a leader. Our experimental results confirm this hypothesis.

This effect is not due to the leader's impact on equilibrium payoffs; if anything the introduction of the leader should lead to the opposite effect, because the leader does not affect the payoff in the high-SC equilibrium, but increases the expected payoff in the low-SC equilibrium. The leader impacts the search for an equilibrium, which is modelled by repeating the same experimental game in the same group of players. Two mechanisms are possible: the leader either impacts community members' expectations, so that communities with a leader invest more and expect others to invest more, in the first round of the game, or, alternatively the higher prevalence of the high-SC equilibrium in leaders' communities may stem from players (with the same initial choices and expectations) receiving higher payoffs in the treatment with the investment leader, and therefore moving towards the high SC equilibrium in the second round of the game, through feedback and learning. Our experimental results provide evidence in support of the former explanation. We find that in the treatment with the investment leader, community members expect others to invest more in SC, and invest more themselves, and that this already happens in the first round of the game, before any feedback is given. This finding suggests initial expectations about the behavior of other community members are an important mechanism that can explain differences in communities' levels of social capital and migration.

The rest of this study has the following structure: in the following section we present the experimental design and formulate hypotheses, then we describe the experimental procedures and data, and in final section we present and discuss the results.

Experimental design

Our experimental design consists of 10 rounds of a game that follows the logic of the models of local social capital (SC) and mobility by David et al. (2010) and Bräuninger and Tolciu (2011). These models consider an individual living in two periods. In period 1, individuals work and invest in their SC. At the beginning of period 2, some individuals receive job offers from a company located in a different community. Workers who accept the new jobs receive a mobility bonus but lose all their SC. On the other hand, individuals who are not offered new jobs or who reject their offers do not receive any bonus but retain their SC. The return the individuals derive from their SC depends not only on their SC in period 2, but also on the SC of the other people living in the same community. So their level of SC might provide a positive externality to other individuals in the same community.

In our experiment, each community is inhabited by four players. At the beginning of period 1, each player receives an endowment $I = 80$ CZK[4] and chooses the amount to invest in SC $n_i \in (0, 80)$. In period 2, three out of four group members receive new job

[4]At the time of the experiment, 1 USD equaled 23 Czech Crowns (CZK) and 1 EUR equaled 26 CZK. A standard wage for an hour of unqualified student labor was approx. 100 CZK.

offers. If they accept, they lose all their SC, i.e. $s_i = 0$, but receive a mobility bonus b. The size of the bonus is uncertain. There is a 10% probability of a bonus of 80 CZK, and a 90% probability of a bonus of either 25 CZK in the low-bonus treatment or 40 CZK in the high-bonus treatment.[5] Participants see whether they get the 80-CZK or 25/40-CZK bonus offer before deciding whether to accept or reject the offer. Players who either receive no job offer or reject the offer received have a level of SC in period 2 of $s_i = n_i$. The return from SC is calculated as the investment of player i times the rate of return as determined by the sum of SC of other players in the group:

$$r_i = s_i \sum_{j=-i} \frac{s_j}{120}.$$ [6]

The payoff to each player equals $I - n_i + r_i$ if they receive no offer or reject one, or $I - n_i + b$ if they accept a job offer.

The game is repeated 10 times in partner matching, so the experiment consists of 10 consecutive rounds with two periods per round. The experiment investigates equilibrium selection in a one-shot game as in David et al. (2010) and Bräuninger and Tolciu (2011). We repeated the game 10 times to facilitate learning by the players, and convergence of the community to an equilibrium. At the end of period 1 of each round, players receive feedback about the other players' investment. This information is anonymized to limit reputation effects that might result from repeated interaction in partner matching (see Figure 5 for the screen shown after period 1). At the end of each round, players also learn how many players accepted job offers, the rate of return, the return from SC, and their payoff in that round.

We look at how the initial level of SC influences the outcome. We implement a novel procedure in which one of the community members is a computerized investment leader. In the treatment with no investment leader (T0), all four players participate in the experiment, and three of them receive job offers in period 2. In the treatment with the investment leader (T1), one group member, the investment leader, is played by a computer algorithm that always chooses $n_i = 80$, and never receives an offer in period 2. In order to keep the same number of players without the job offer, all three "human" players receive job offers with probability 1. The players are all made aware of the existence and choices of the robot player in T1, as well as the fact that the three remaining players will all receive job offers.

Both treatments lead to two subgame-perfect equilibria in pure strategies: In the high-SC equilibrium, all players in a given group choose $n_i = 80$, and do not accept

[5] We varied the 90%-probability bonus to test the sensitivity of our results to the size of this parameter. We expect that a higher bonus will encourage participants to accept job offers more frequently and discourage investments in SC.

[6] This formulation follows the logic of the model by Bräuninger and Tolciu (2011), who see the rate of return as a function of aggregate investment in the community. We offer one possible intuitive interpretation of the formula: Suppose player i needs specialized assistance. If he/she asks members of her social network whether they can help or know someone else who can, then the likelihood of receiving help depends not only on the size of i's network, but also on the number of unique links her contacts have.

any job offers. In the low-SC equilibrium, the players choose $n_i = 0$, and accept job offers. In both treatments the maximum payoffs in both equilibria is 160 CZK. While any individual with $n_i = 0$ receives the maximum payoff with an exogenously given probability, the payoff of any player with $n_i > 0$ depends on the other players' choices. Since the expected payoff in a high-SC equilibrium exceeds that in a low-SC equilibrium, players are motivated to invest in SC. The presence of an investment leader reduces the risk of the investment, because it changes the support of the rate of return $\frac{s_j}{120}$. Compared to the treatment without the investment leader (T0), where the rate of return ranges from 0 to 2, the lowest rate in T1 equals 2/3, as the investment leader always has $s = 80$.[7] This reasoning leads to the following hypothesis:

Hypothesis 1. H1. *A higher proportion of groups will converge to the high-SC equilibrium in T1 than in T0. Hence investment and SC will be higher in T1 (investment leader) than in T0, and the job acceptance ratio, which measures the share of subjects that accepted the job offered to them in period 2, will be lower in T1 than in T0.*

If we find support for H1, it would be interesting to see whether it can be attributed to different ex-ante expectations or whether the presence of the investment leader affects learning. To test these mechanisms, we elicit expectations about the investments that other "human" players will make in each of the ten rounds. In the treatment with no investment leader, players guess what the average investment chosen by the three remaining players will be. In the treatment with the investment leader, they estimate the choices the two remaining "human" players will make. In the results section, we also test a second hypothesis, as follows.

According to the first mechanism, the presence of the investment leader with high SC in T1 affects players' expectations about their fellow players' investments, and consequently affects their own investment choices. Hence, we test whether the treatment affects the expectations measured in round 1, i.e. before players received any feedback, and whether these ex-ante expectations explain the treatment differences in round 10 of the experiment. According to the second mechanism, the presence of the investment leader affects learning. Participants may learn by comparing the end-of-round feedback about the average investment choices of the other group members with their expectations. We use these data to test whether participants in the treatment with the investment leader

[7] Let's assume no other player invests ($s_i = 0$) and all accept job offers (low-SC equilibrium). Then the return to investment is equal to 2/3 in the treatment with the investment leader (T1) and only equal to 0 in the treatment without the investment leader (T0). While the best response in T1 is still to invest 0 and leave, a lower average contribution from other players is necessary to make positive investment worthwhile than in T0. Conversely, if all other players invest and do not leave (high-SC equilibrium), the payoffs conditional on individual investment are equal in both treatments (as the rate of return is equal to 2). Apart from the difference in lower bound of the rate of return, our experimental design and procedures aimed to minimize the effect of the difference in the number of human players (4 in T0 and 3 in T1) on individual player's incentives in both treatments. This is why both treatments have the same number of group members and job offers, which leads to the same incentives and payoffs assuming that the player who did not receive the job offer in the treatment without the investment leader invests fully. Furthermore, participants are not informed about the identity of other participants in their group, they usually do not know each other, and they are not allowed to communicate during the experiment.

react differently to expectation errors compared to participants in the treatment without the investment leader.

Hypothesis 2. H2. *The expected investment by other "human" players is higher in T1 (investment leader) than in T0.*

Experimental procedures and data

The experiment was conducted in November 2018 at the Masaryk University Experimental Economics Laboratory (MUEEL) in Brno, Czech Republic. In total, we recruited 324 student subjects using hroot (Bock et al. 2014). Our participants provided informed consent when they registered to our database as potential subjects. The experiment environment was programmed in zTree (Fischbacher 2007). At the beginning of the experiment, an experimenter read the instructions aloud, while students followed on paper copies (see Appendix for the experimental instructions). At the end of the experiment, one round was randomly selected for payment. Subjects received their payoffs from that round and an additional bonus of 30 CZK if the difference between the estimated and actual average investment was less than or equal to 5 CZK. Each experimental session contained a second part, administered after this experiment, which is not related to this paper. The whole experimental session which included this experiment (Experiment 1) and Experiment 2 containing money-burning games took approximately 70 minutes. Participants did not get any information about Experiment 2 before Experiment 1 was over. The average payoff for the whole session equaled 280 CZK. The average payoff for Experiment 1 was 137 CZK.

We conducted 14 experimental sessions (each with 24 or 18 participants) with a total of 324 participants: 7 sessions of T0 with a total of 168 subjects (42 groups of four) and 7 sessions of T1 with a total of 156 subjects (52 groups of three). We also varied the mobility bonus to test the robustness of our results: This was 40 CZK in 8 sessions (192 subjects, 56 groups) and 25 CZK in 6 sessions (132 subjects, 38 groups). Table 1 shows that all four treatment combinations are balanced in terms of the proportion of female subjects, age and the share of business studies students.[8] Each session contained 10 rounds of the same game. In our analysis of the expectations and investments in the first round, we take the choices of all 324 participants as independent. Once we are interested in the outcomes in the last round, the independent observations are the 94 groups. Figure 1 presents the histogram of the group level average SC in round 10. It is clear that most groups converged to one of the equilibria, i.e. the level of SC in period 2 equals either 0 or 80. Only 6 out of 94 groups have an average SC between 10 and 70. The graph also shows that in line with Hypothesis 1 the relative share of groups in the high-SC equilibrium is higher with the investment leader.

[8]314 participants study at one or more schools at Masaryk University, the remaining 10 participants do not study at Masaryk University. We counted all 209 students who study only business or combine business with another field of study as 'Business studies students'. The other three most common fields of study among the participants are medicine (39), social studies (21), and natural sciences (15).

Table 1. Descriptive statistics

	Total	No investment leader		Investment leader	
		Low bonus	High bonus	Low bonus	High bonus
Subjects	324	72	96	60	96
Groups	94	18	24	20	32
Female	52.8%	52.8%	53.1%	55.0%	51.0%
Mean age (St. Dev.)	21.8 (2.1)	21.7 (2.3)	22.0 (2.0)	21.6 (2.0)	21.8 (2.0)
Business studies students	64.5%	61.1%	66.7%	70.0%	61.5%

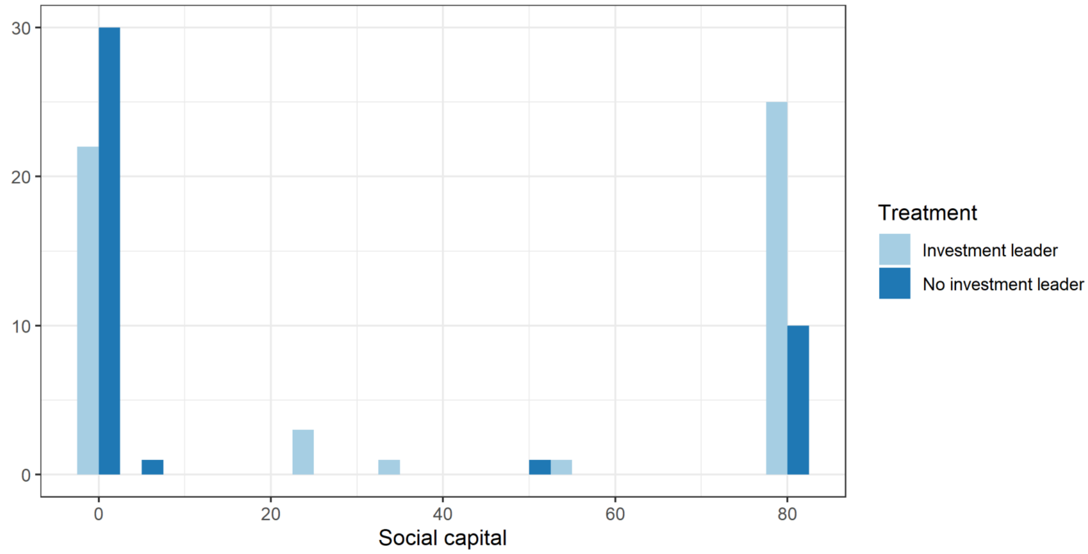


Figure 1. Histogram of group averages of SC in round 10 of the experiment.

Results

Our main results are summarized in Figure 2, which shows the group averages for SC and job acceptance ratio in round 10 split by the value of the mobility bonus. The job acceptance ratio measures the share of subjects that accepted the job offered to them in period 2. In line with Hypothesis 1 the treatment increases SC and reduces job acceptance. A lower mobility bonus increases the share of groups in the high-SC equilibrium because it reduces the incentives to accept the job offer in period 2.

Table 2 tests Hypothesis 1. Column 1 shows the logit model explaining whether a group converged to a high-SC equilibrium at the end of the experiment. Here we assume that a group has converged to a high-SC equilibrium if the average level of SC exceeds 70, and to a low-SC equilibrium if it is below 10; we exclude the six groups whose average SC was between 10 and 70. Columns 2-4 present OLS regressions of the group averages of investment, SC, and the job acceptance ratio. In all the models, the treatment with the investment leader changes the average size of the variable in the direction

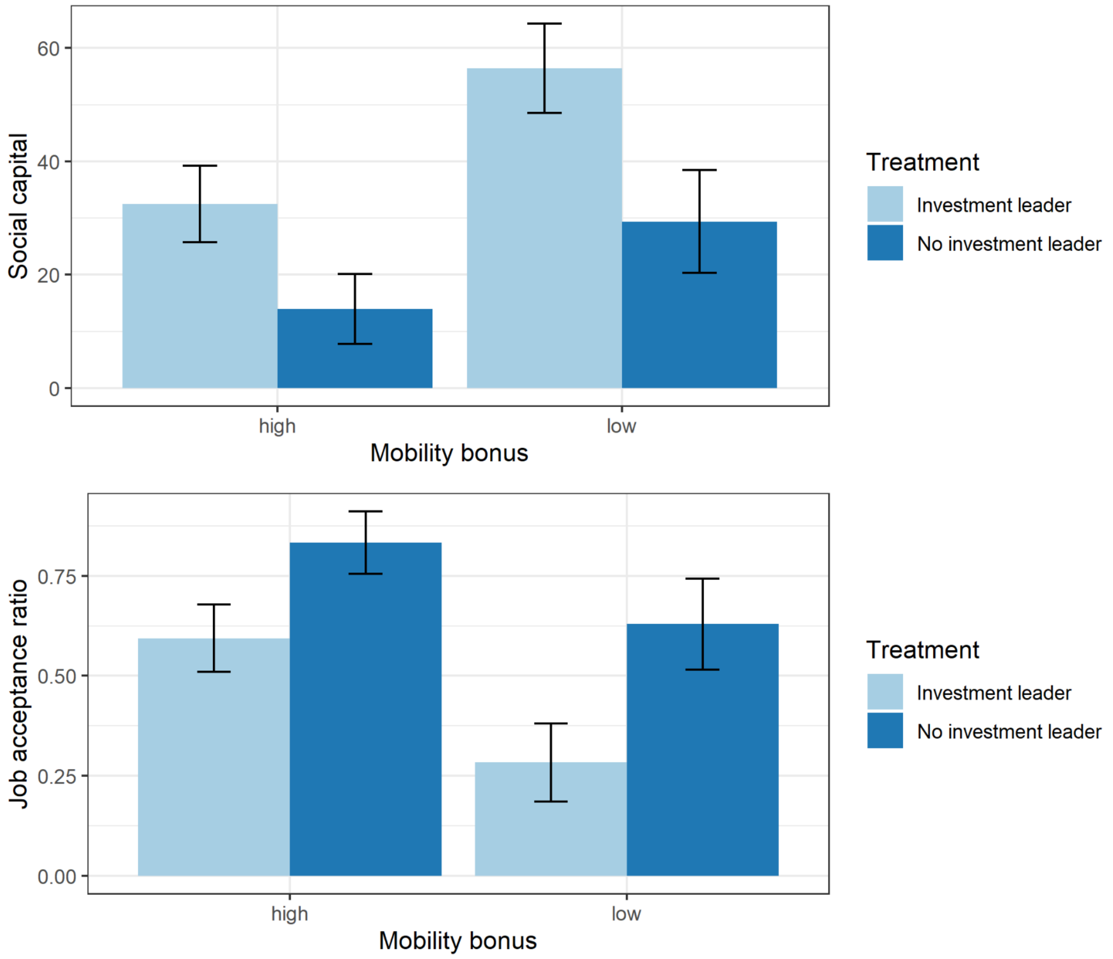


Figure 2. SC and job acceptance ratio in T0 (no investment leader) and T1 for high and low mobility bonus

predicted by H1 by about 28% of the maximum value[9], and these changes are highly statistically significant. As expected, a low mobility bonus moves all the variables in the same direction as the investment leader. This is because the low bonus makes players less likely to accept job offers, and therefore more likely to invest in social capital and converge to the high-SC equilibrium.

We can see that participants end up in a different equilibrium in the treatments with and without the investment leader. In the following analysis, we provide some evidence on the process by which a community converges to an equilibrium. We investigate two possible mechanisms. First, we test whether the presence of the investment leader changes ex-ante expectations about other players' behavior. Then we study whether our treatments affect the learning process (i.e. reactions to feedback) during the 10 rounds of the experiment.

[9]The average marginal effect of the treatment with the investment leader in the logit model is 0.285. The maximum level of investment and SC is 80.

Table 2. Treatment effects in the last round

	Dependent variable:			
	High-SC equilibrium	Investment	Social capital	Job acceptance
	logistic	*OLS*	*OLS*	*OLS*
	(1)	(2)	(3)	(4)
Investment leader	1.400^{***}	21.224^{***}	22.008^{***}	-0.283^{***}
	(0.494)	(7.227)	(7.391)	(0.092)
Low mobility bonus	1.177^{**}	19.201^{**}	20.053^{***}	-0.262^{***}
	(0.488)	(7.322)	(7.487)	(0.094)
Constant	-1.705^{***}	14.539^{**}	11.971^{*}	0.858^{***}
	(0.464)	(6.220)	(6.360)	(0.080)
Observations	88	94	94	94
R^2		0.140	0.144	0.153
Adjusted R^2		0.121	0.126	0.135
Log Likelihood	−52.200			
Akaike Inf. Crit.	110.400			
Residual Std. Error (df = 91)		34.802	35.588	0.445
F Statistic (df = 2; 91)		7.422^{***}	7.681^{***}	8.231^{***}

Note: S.E. in parentheses. Significance: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Table 3 shows treatment differences between expectations and investment decisions in round 1 of the experiment. The players had not received any feedback about the other players' choices, so the independent observations are their individual choices. This allows us to control for individual characteristics: age and dummy variables for gender and all 22 combinations of their fields of study. The table provides evidence in support of Hypothesis 2. The treatment with the investment leader increases both expectations about the average investment of the other "human" players in the group and actual investments, both by roughly similar values. Interestingly, Table 3 shows that the low mobility bonus has no impact on expectations or levels of investment.

Table 4 provides additional evidence about the impact of players' initial expectations on the equilibrium in round 10. This table adds first-round expectations to the models from Table 2. The players' initial expectations have a positive and highly significant impact on the share of groups that end up in high-SC equilibrium in round 10. This shows that the initial expectations triggered by the presence of the investment leader are important for reaching a high-SC equilibrium.

The equilibrium selection might be impacted by differences in learning, too. We use the following empirical strategy to test the presence of this mechanism. For rounds 2–10 we estimate regressions

$$Y_i = \beta_0 + \beta_1 * SRP + \beta_2 * SRP * LMB +$$

$$\beta_3 * SRP * IL + \beta_4 * LMB + \beta_5 * IL + \epsilon_i.$$

Y_i shows how individuals update their beliefs or how they adjust their investments. It is calculated as the difference in the beliefs or investments reported in the current

Table 3. The effect of treatment on expectations and investment choices in round 1

	Dependent variable:	
	Expectations	Investment
	(1)	(2)
Investment leader	8.321^{***}	9.465^{***}
	(2.309)	(3.172)
Low mobility bonus	−1.751	1.607
	(2.364)	(3.248)
Age	0.095	−0.663
	(0.615)	(0.845)
Female	-5.355^{**}	−4.607
	(2.356)	(3.237)
Field of study	Yes	Yes
Observations	324	324
R^2	0.139	0.084
Adjusted R^2	0.067	0.007
Residual Std. Error (df = 298)	20.232	27.797
F Statistic (df = 25; 298)	1.924^{***}	1.097

Note: S.E. in parentheses. *p<0.1; **p<0.05; ***p<0.01

Table 4. Initial expectations determine equilibrium type

	Dependent variable:			
	High-SC equilibrium	Investment	Social capital	Job acceptance
	logistic	*OLS*	*OLS*	*OLS*
	(1)	(2)	(3)	(4)
Investment leader	0.498	10.195	10.494	−0.141
	(0.565)	(7.003)	(7.127)	(0.089)
Low mobility bonus	1.389^{***}	21.498^{***}	22.451^{***}	-0.292^{***}
	(0.557)	(6.668)	(6.786)	(0.085)
Initial expectation	0.094^{***}	1.214^{***}	1.268^{***}	-0.016^{***}
	(0.025)	(0.269)	(0.274)	(0.003)
Constant	-5.658^{***}	-34.078^{***}	-38.783^{***}	1.487^{***}
	(1.246)	(12.164)	(12.380)	(0.155)
Observations	88	94	94	94
R^2		0.299	0.309	0.313
Adjusted R^2		0.276	0.286	0.290
Log Likelihood	−42.434			
Akaike Inf. Crit.	92.868			
Residual Std. Error (df = 90)		31.602	32.161	0.403
F Statistic (df = 3; 90)		12.788^{***}	13.412^{***}	13.645^{***}

Note: S.E. in parentheses. Significance: *p<0.1; **p<0.05; ***p<0.01

and the previous round. The variable SRP measures *surprise* which is equal to the difference between the actual investment behavior of other group members shown in the feedback after the previous round and the belief about the average investment elicited in the previous round. The levels of the variable SRP do not differ substantially between treatments. The mean surprise in periods 2 and 3 where most of the convergence takes place (over 75 % of groups reached an equilibrium in period 4) is not statistically different (mean difference=-1.38, p-value 0.74 in period 2; mean difference=5.57, p-value 0.14 in period 3). The variables LMB and IL are indicator variables for low mobility and for the treatment with the investment leader.

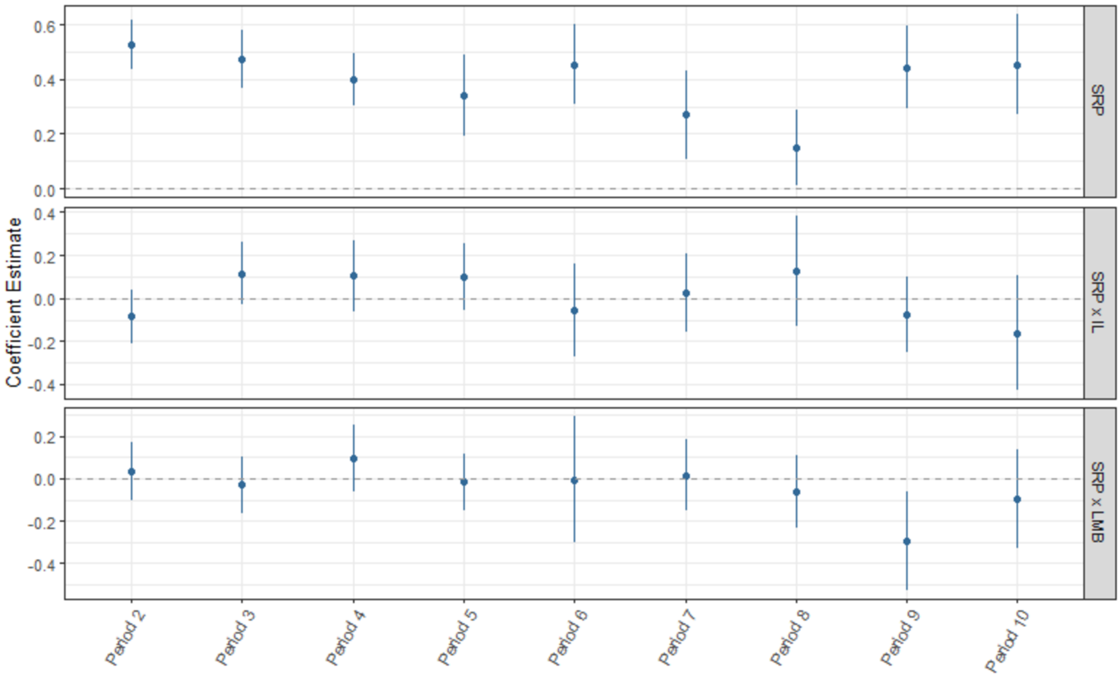
Panel A in Figure 3A documents the effect of surprise (SRP) on beliefs in the next round: The upper figure shows that higher than expected investments from the other group members lead to upward updating of beliefs in all 9 rounds. More importantly, the interaction between surprise and both treatments (investment leader, low mobility bonus), as shown in the following two figures, is not significantly different from zero in most rounds. This suggests that learning does not differ between the treatments. Panel B presents similar patterns for investment behavior. Learning that others invested more than expected induces more investment in the subsequent round, but the process is similar in treatments with and without the investment leader, as well as in treatments with high and low mobility bonus. The analysis does not provide any evidence that subjects' reactions to feedback are influenced by the presence of the investment leader or the size of the mobility bonus.

In sum, the analyses suggest that the different dynamics observable in the treatments with and without the investment leader should be attributed to participants' reactions to different initial expectations about the other players' actions, and not to different reactions to feedback.

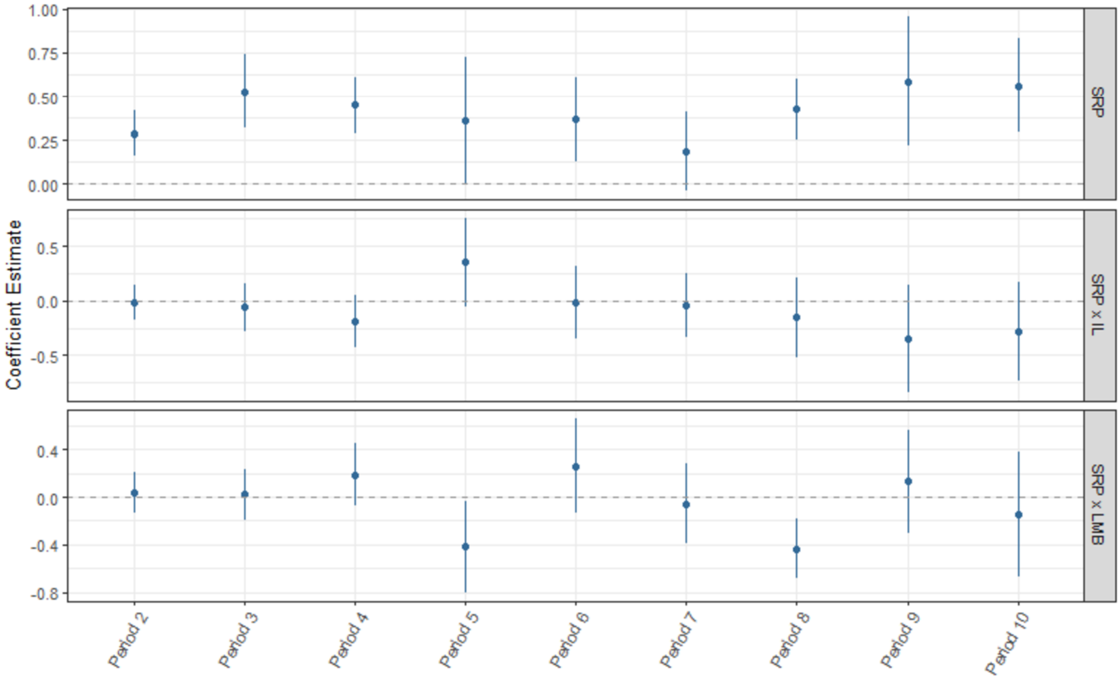
Conclusion

This paper has studied how the initial level of social capital in a community influences the integration of new inhabitants. The theoretical models of local social capital accumulation (David et al. 2010; Bräuninger and Tolciu 2011) show that the community may end up in one of two stable equilibria (a high-SC or a low-SC equilibrium), but do not study the factors that determine which of these outcomes will materialize. The use of data from observational studies is problematic, because the results can be driven by self-selection or subjects' unobserved characteristics. For these reasons we have used a laboratory experiment to address our research question.

We have found that experimental communities that include an investment leader, who invests highly in SC and never moves, are more likely to end up in the high-SC equilibrium. In addition, we provide some evidence of the process by which a community converges to an equilibrium. We find that the presence of an investment leader increases ex-ante expectations about other inhabitants' SC investments. Beyond ex-ante expectations, the treatment effect could also have been influenced by learning, i.e. how participants react to end-of-round feedback information about the choices their group members made. We find that the difference between expectations and feedback do explain how participants react in the following round, but that this reaction does not differ among treatments. We also find that once participants initial expectations are included in our main regression, the treatment effect due to the presence of the investment



Panel A: The effect of surprise (SRP) on updating beliefs



Panel B: The effect of surprise (SRP) on investment adjustment

Figure 3. We estimate regression $Y_i = \beta_0 + \beta_1 * SRP + \beta_2 * SRP * LMB + \beta_3 * SRP * IL + \beta_4 * LMB + \beta_5 * IL + \epsilon_i$ for rounds 2–10. Y_i is equal to the difference in beliefs (Panel A) or investments (Panel B) between the current and previous round. Variables LMB and IL are indicator variables for low-mobility-bonus and investment-leader treatments. SRP measures how surprising the previous observation was as the difference between the average investment made by the other players in the previous round and the players beliefs in the previous round. The graph plots 95 % CI. Errors are clustered at the group level.

leader disappears. We therefore do not confirm any learning effect in our main results. Hence, in this paper, we have not only shown that the presence of inhabitants committed to investing in local SC positively influences the outcome of the integration process, but have also documented the role of community members' ex-ante expectations in this process.

Studying the integration processes in the laboratory does not only come with benefits, such as the exogenous assignment to treatment groups and possibility of measuring expectations, but also brings some limitations. These are primarily related to the external validity of laboratory experiments (Levitt and List 2007a,b). There are clear limits about what can be learned about real-life integration processes from a laboratory experiment featuring a stylized game with low stakes. A complementary source of data, which could help establish the current findings as a robust phenomenon, would be natural experiments in which immigrants are randomly allocated to municipalities or regions with different initial levels of social capital. For example, Martén et al. (2019) use exogenous assignment in Switzerland, where refugees with subsidiary protection have to live and work in their exogenously selected canton for at least five years, to provide complementary evidence on the effect of social networks on labor market outcomes. They find that refugees randomly assigned to locations with higher concentrations of refugees of the same nationality are more likely to be employed three years later. However, random allocation typically occurs at the level of regions (rather than municipalities), which are unlikely to differ substantially in local social capital. Even if the variation in social capital was sufficient, it would be hard to disentangle the effect of social capital from that of other factors correlated with social capital. We therefore consider the laboratory experiment a valuable method for addressing this important research topic.

Acknowledgments

Financial support from the Czech Science Foundation through Grant GA18-16111S is gratefully acknowledged. This output was also supported by the NPO "Systemic Risk Institute" (LX22NPO5101).

References

Algan Y, Dustmann C, Glitz A and Manning A (2010) The economic situation of first ans second-generation in france, germany, and the united kingdom. *Economic Journal* 120(542): F4–F30.

Baker WE (1990) Market networks and corporate behavior. *American journal of sociology* 96(3): 589–625.

Bauer TK, Braun S and Kvasnicka M (2013) The economic integration of forced migrants: Evidence for post-war germany. *The Economic Journal* 123(571): 998–1024.

Bock O, Baetge I and Nicklisch A (2014) hroot: Hamburg registration and organization online tool. *European Economic Review* 71: 117–120.

Bräuninger M and Tolciu A (2011) Should i stay or should i go? regional mobility and social capital. *Journal of Institutional and Theoretical Economics JITE* 167(3): 434–444.

Chevalier A, Elsner B, Lichter A and Pestel N (2018) Immigrant voters, taxation and the size of the welfare state. *IZA discussion paper* (11725). URL https://ftp.iza.org/dp11725.pdf.

Costa DL and Kahn ME (2007) Surviving andersonville: The benefits of social networks in pow camps. *American Economic Review* 97(4): 1467–1487.

Dancygier RM and Laitin DD (2014) Immigration into europe: Economic discrimination, violence, and public policy. *Annual Review of Political Science* 17: 43–64.

David Q, Janiak A and Wasmer E (2010) Local social capital and geographical mobility. *Journal of Urban Economics* 68(2): 191–204.

d'Hombres B, Rocco L, Suhrcke M and McKee M (2010) Does social capital determine health? evidence from eight transition countries. *Health Economics* 19(1): 56–74.

Fischbacher U (2007) z-tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics* 10(2): 171–178.

Folland S (2007) Does community social capital contribute to population health? *Social Science & Medicine* 64(11): 2342–2354.

Freitag M and Kirchner A (2011) Social capital and unemployment: A macro-quantitative analysis of the european regions. *Political Studies* 59(2): 389–410.

Guzi M, Huber P and Mikula S (2021) The long-term impact of the resettlement of the sudetenland on residential migration. *Journal of Urban Economics* 126: 103385.

Hotchkiss JL and Rupasingha A (2021) Individual social capital and migration. *Growth and Change* 52(2): 808–837.

Knack S (1992) Civic norms, social sanctions, and voter turnout. *Rationality and Society* 4(2): 133–156.

Levitt SD and List JA (2007a) On the generalizability of lab behaviour to the field. *Canadian Journal of Economics/Revue canadienne d'économique* 40(2): 347–370.

Levitt SD and List JA (2007b) What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic perspectives* 21(2): 153–174.

Lin N (2002) *Social capital: A theory of social structure and action*, volume 19. Cambridge university press.

Martén L, Hainmueller J and Hangartner D (2019) Ethnic networks can foster the economic integration of refugees. *Proceedings of the National Academy of Sciences* 116(33): 16280–16285.

Putnam RD (1995) Tuning in, tuning out: The strange disappearance of social capital in america. *PS: Political science & politics* 28(4): 664–683.

Wiedemann A (2016) *"Poj s nmi budovat pohrani!": osdlovn a promna obyvatelstva bvalch Sudet 1945–1952*. Prague: Prostor.

Experimental instructions (translation from Czech)

Introduction [same for T0 and T1]

Welcome to the experiment. The aim of the study is to understand how people make decisions in certain situations. You will be able to earn money for your participation in the experiment, depending on your decisions and the decisions of the other participants in the experiment. You will receive payment at the end of this session in cash and in private. Other participants will not be informed about your payment.

Do not communicate with other participants during the entire experiment, do not use a mobile phone or other electronic devices except the computer at which you are seated, and pay your attention exclusively to the experiment. In case of disobedience, you will be excluded from the experiment without any payment. If you have a question while reading the instructions or later during the game itself, please raise your hand and the research assistant will come to you and answer the question.

Today's session consists of two parts. We will refer to them as Experiment 1 and Experiment 2. We will now read the instructions for Experiment 1. Please listen carefully.

Experiment 1 [T0]

Experiment 1 consists of 10 identical rounds. In each round, you will play in a group with three other players who will be randomly selected from the participants in the experiment in this room. You will not receive any information about the identity of the players in your group throughout the experiment. The composition of the groups remains the same during experiment 1.

Each round of the experiment consists of two periods. In period 1, you will receive 80 CZK, from which you can invest 0 to 80 CZK in the so-called *social capital*. In period 2, three randomly selected members of your group will receive an *offer* to receive a bonus of 40 CZK ***(25 CZK) [in the low-bonus treatment]***, or 80 CZK. If they accept this offer, they get a bonus, but their social capital is lost. If they do not accept it, their payment from this round will depend on their level of social capital and also on the social capital of the other members of the group. We will explain everything in detail in the following text.

Period 1: All players in the group choose their investment in social capital in round 1. You can invest any amount from 0 to 80 CZK in social capital. If in period 2 you do not receive a bonus offer or do not accept, then the amount invested equals the level of your social capital.

The return on social capital is calculated as your *social capital* $*$ *rate of return*. The rate of return depends on the level of social capital of the other three members of the group and is calculated *as the sum of the social capital of the other three members of the group* /120. The rate of return ranges from 0 if the social capital level of the other players is zero, to 2 if the social capital level of the other two players is 80 (a total of 240).

In period 1, we will also ask you to tell us how much you think, on average, the other players in the group invest in social capital.

At the end of period 1, you will find out how much other players have invested in social capital and which player did not receive the bonus offer. The order of the players will be random for this information and will be drawn again in each round. Therefore, you will not be able to track how a particular player made decisions in each round of the experiment.

Period 2: Randomly selected three of the four players in the group will receive an offer to receive a bonus. The bonus has a value of 40 CZK ***(25 CZK)*** with a 90% probability and a value of 80 CZK with a 10% probability. If the player accepts the offer, then his social capital is lost, i.e. the level of his social capital is zero. In this case, the player in period 2 will receive a bonus of 40 CZK or 80 CZK, and his return on social capital is zero. If the player does not accept the offer, then (s)he receives a return on social capital in period 2.

Payoffs The player's payoffs from each round are therefore calculated as follows:

1. The player invests x in social capital and does not receive the offer. The player gets the rest of the amount, i.e. $80 - x$ CZK, and the return on social capital, which is calculated as $x*$ *rate of return*. The rate of return is given as the *sum of the social capital of the other three members of the group*$/120$. Social capital of the other players is equal to their investment if they did not receive the offer or rejected it, and 0 if they accepted the offer.
2. The player invests x in social capital and receives and rejects the offer. In that case, his payment is the same as in the previous point.
3. The player invests x in social capital, receives an offer of 40 CZK ***(25 CZK)*** and accepts it. The gets the rest of the amount, i.e. $80 - x$ CZK, and a bonus of 40 CZK ***(25 CZK)***. In total, (s)he receives $80 - x + 40$ CZK ***(25 CZK)***.
4. The player invests x in social capital, receives an offer of 80 CZK and accepts it. The gets the rest of the amount, i.e. $80 - x$ CZK, and a bonus of 80 CZK. In total, (s)he receives $80 - x + 80$ CZK.

At the end of each round, you will find out how many of the other players accepted the bids, what was the rate of return, what was the income from social capital and what was your payoff in that round.

Out of 10 rounds of experiment 1, one round will be drawn at random and the amount you earned in this round will be paid to you. If your estimate in the given round was 5 CZK or less from the actual average invested amount of the other two players in your group, then you will get an additional 30 CZK.

Experiment 1 [T1]

Experiment 1 consists of 10 identical rounds. In each round, you will play in a group with one computer player and two other players who will be randomly selected from the participants in the experiment in this room. You will not receive any information about the identity of the players in your group throughout the experiment. The composition of the groups remains the same during experiment 1. The computer player uses the same strategy throughout the experiment, which is common knowledge to all players.

Each round of the experiment consists of two periods. In period 1, you will receive 80 CZK, from which you can invest 0 to 80 CZK in the so-called *social capital*. In period 2, all three members of your group will receive an *offer* to receive a bonus of 40 CZK ***(25 CZK) [the low-bonus treatment]***, or 80 CZK. If they accept this offer, they get a bonus, but their social capital is lost. If they do not accept it, their payment from this round will depend on their level of social capital and also on the social capital of the other members of the group. The computer player will never receive an offer. We will explain everything in detail in the following text.

Period 1: All players in the group choose their investment in social capital in period 1. You can invest any amount from 0 to 80 CZK in social capital.

If in period 2 you do not accept the bonus offer, then the amount invested equals the level of your social capital. A computer player always invests 80 CZK in social capital and never receives an offer, so his level of social capital is always 80.

The return on social capital is calculated as your social capital * rate of return. The rate of return depends on the level of social capital of the other three members of the group (i.e. the computer player and two other players) and is calculated as the *sum of the social capital of the other three members of the group* $/120$. Because the computer always has a social capital level of 80, the rate of return ranges from $2/3$ $(80/120)$ if the social capital level of the other two players is zero, to 2 if the social capital level of the other two players is 80 (together with the computer player would therefore be a total of 240).

In period 1, we will also ask you to tell us how much you think, on average, the other two players in the group (i.e. everyone but you and the computer player) invest in social capital.

At the end of period 1, you will find out how much other players have invested in social capital. The order of the players will be random for this information and will be drawn again in each round. Therefore, you will not be able to track how a particular player made decisions in each round of the experiment.

Period 2: All players except the computer player will receive an offer to receive the bonus in period 2. The bonus has a value of 40 CZK ***(25 CZK)***) with a 90% probability and a value of 80 CZK with a 10% probability. If the player accepts the offer, then his social capital is lost, i.e. the level of his social capital is zero. In this case, the player in period 2 will receive a bonus of 40 CZK ***(25 CZK)*** or 80 CZK, and his return on social capital is zero. If the player does not accept the offer, then (s)he receives a return on social capital in period 2.

Payoffs The player's payoffs from each round are therefore calculated as follows:

1. The player invests x in social capital and rejects the offer. The player gets the rest of the amount, i.e. $80 - x$ CZK, and the return on social capital, which is calculated as $x*$ *rate of return*. The rate of return is given as the *sum of the social capital of the other three members of the group* $/120$. Social capital of the other players is equal to their investment if they did not receive the offer (computer player) or rejected it, and 0 if they accepted the offer.
2. The player invests x in social capital, receives an offer of 40 CZK ***(25 CZK)*** and accepts it. The gets the rest of the amount, i.e. $80 - x$ CZK, and a bonus of 40 CZK ***(25 CZK)***. In total, (s)he receives $80 - x + 40$ ***(25)*** CZK.
3. The player invests x in social capital, receives an offer of 80 CZK and accepts it. The gets the rest of the amount, i.e. $80 - x$ CZK, and a bonus of 80 CZK. In total, (s)he receives $80 - x + 80$ CZK.

Figure 4. Screenshot 1 – investment choice

At the end of each round, you will find out how many of the other players accepted the bids, what was the rate of return, what was the income from social capital and what was your payoff in that round.

Out of 10 rounds of experiment 1, one round will be drawn at random and the amount you earned in this round will be paid to you. If your estimate in the given round was 5 CZK or less from the actual average invested amount of the other two players in your group, then you will get an additional 30 CZK.

Screenshots

Each round consisted of three screens: investment choice, choice to accept or reject the job offer, and feedback. The screens in Figures 4, 5, and 6 were shown to participants who received job offers and were selected to the treatment without the investment leader. The experimental environment was in Czech. The English translation in square brackets was not part of the original screens.

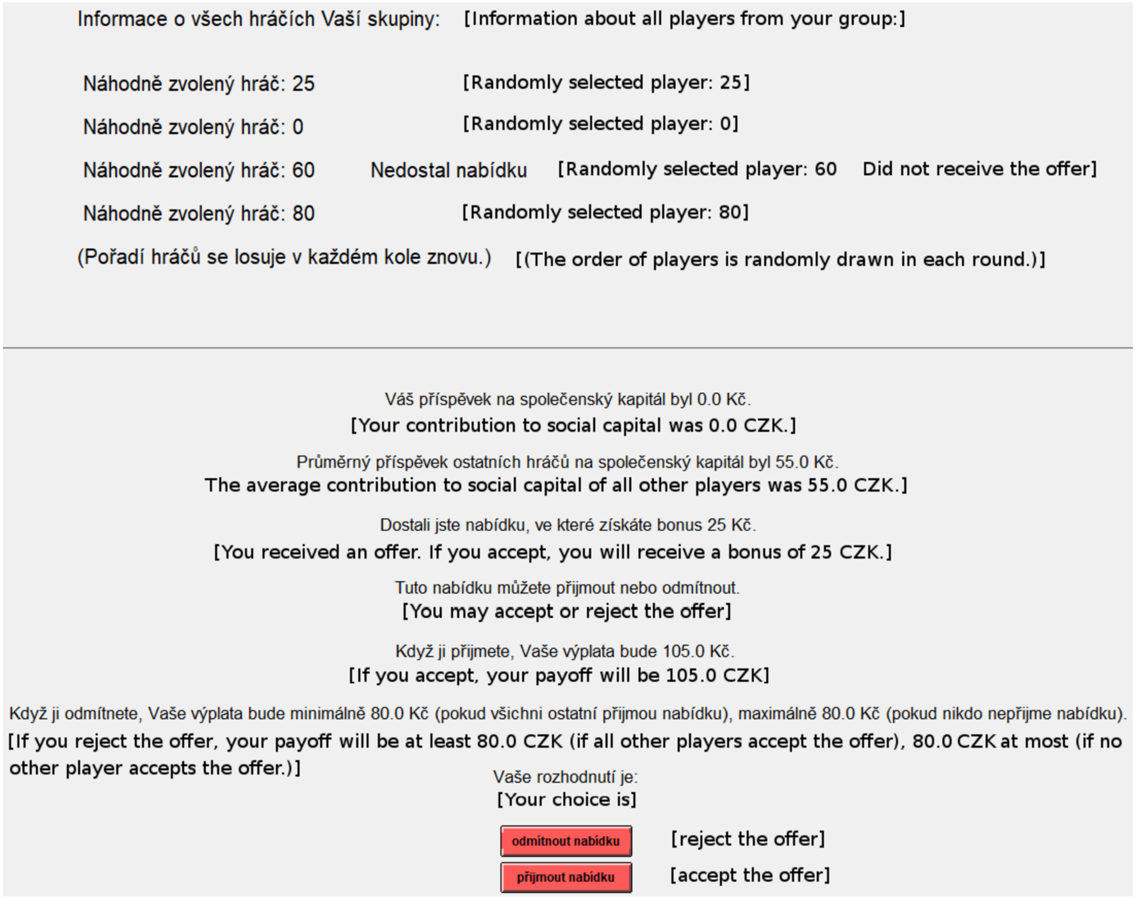


Figure 5. Screenshot 2 – job offer

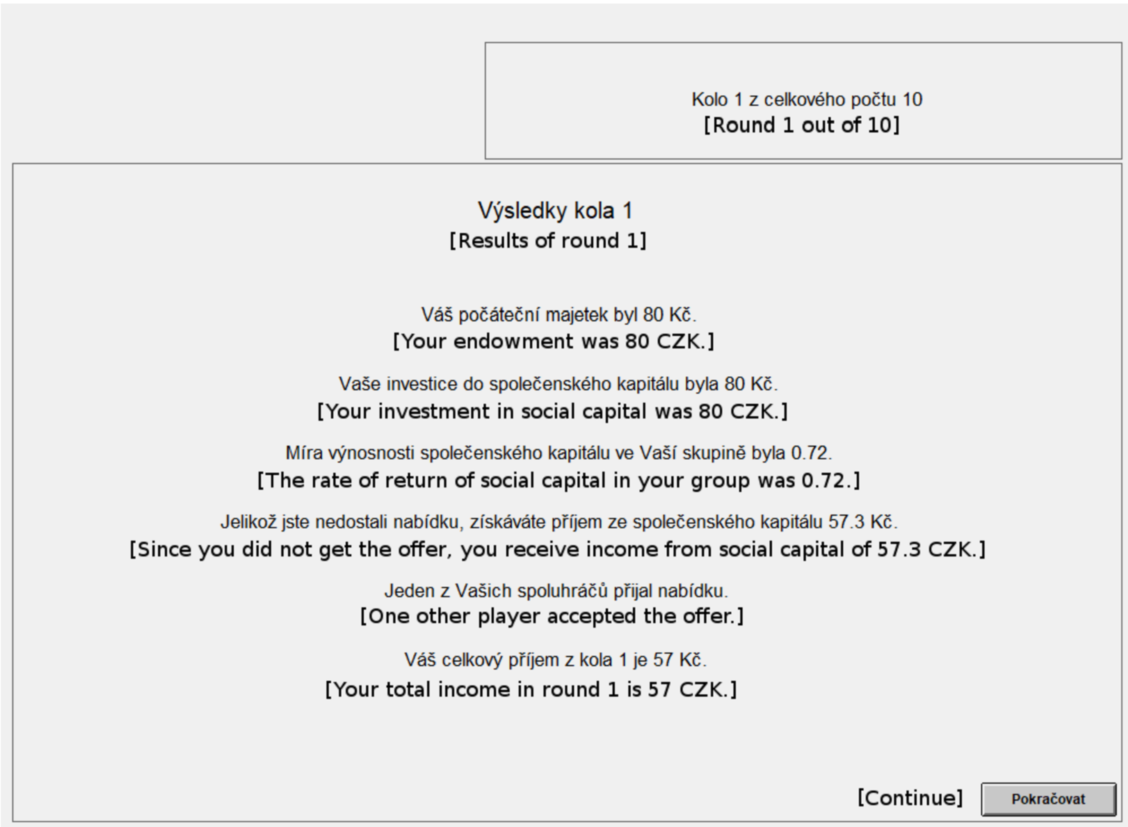


Figure 6. Screenshot 3 – feedback