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Playing with the social network: Social cohesion in resettled and non-resettled communities in Cambodia

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Playing with the social network:
Social cohesion in resettled and non-resettled communities in Cambodia

Simone Gobien*[a,] Björn Vollan[b]

ABSTRACT

Mutual aid among villagers in developing countries is often the only means of insuring against economic shocks. We use "lab-in-the-field experiments" in Cambodian villages to study social cohesion in established and newly resettled communities. Both communities are part of a land distribution project. The project participants all signed up voluntarily, and their socio-demographic attributes and pre-existing network ties are similar. We use a version of the "solidarity game" to identify the effect of voluntary resettlement on willingness to help fellow villagers after an income shock. We find a sizeable reduction in willingness to help others. Resettled players transfer on average between 47% and 74% less money than non-resettled players. The effect remains large and significant after controlling for personal network and when controlling for differences in transfer expectations. The costs of voluntary resettlement, not only monetary but also social, seem significantly higher than is commonly assumed by development planners.

JEL classification: C93, O15, O22, R23

Keywords: Voluntary resettlement, Social cohesion, Risk-sharing networks, Monetary transfers, "Lab-in-the-field" experiment, Cambodia

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1. Introduction

Most studies of resettlement do not pay sufficient attention to social consequences, but rather focus on monetary issues related to income (Cernea and Schmidt-Soltau, 2006; Dekker and Kinsey, 2011; Karanth, 2007; Margolius et. al, 2002; Tefera, 2009; Webber and McDonald, 2004; Wilmsen et. al, 2011). Those studies which do examine the social aspects focus on interventions where resettlement is involuntary (Abutte, 2000; Berg, 1999; Colchester, 2004; Goodall, 2006; Lam and Paul, 2013), probably because voluntary resettlement is believed to deliver unequivocal positive effects and at the same time to compensate for historical injustices. However, the few available studies of social consequences of voluntary resettlement, which concentrate mainly on redistributive land reform in Zimbabwe, suggest that this is not necessarily the case even 20 years after resettlement (Barr, 2003; Barr et. al, 2010; Dekker, 2004). In this study we therefore further analyze and quantify the social loss caused by voluntary resettlement. We measure "social cohesion" by implementing a "lab-in-the-field" experiment with farmers in rural Cambodia participating in a land distribution project, comparing voluntarily resettled farmers with established (non-resettled) farmers.[1]

The negative consequences of leaving one's birthplace may be underestimated both by the people who are resettled and by the project staff. Geographic proximity is one of the main determinants of social networks (Fafchamps and Gubert, 2007, Fafchamps and Lund, 2003). Dekker (2004) finds evidence that while non-resettled households in Zimbabwe rely on their network and solidarity in the village, voluntarily resettled households are more likely to rely on individual risk-coping strategies.[2] Even when well intended and well planned, resettlement often requires people to leave a well-functioning, cohesive community that has served them in many ways. Among the many direct benefits of a functioning community or neighborhood are risk-coping strategies such as easier access to credit and mutual aid (Attanasio et. al, 2012; Dinh et. al, 2012; Okten and Osili, 2004), and there are indirect benefits such as good institutions (Easterly

[1] We use the term "social cohesion", broadly following Emile Durkheim, to mean a "social order [which] results from interdependence, shared loyalties and solidarities" (Jenson, 1998).

[2] Somewhat related to the topic of resettlement is the experimental literature on "social distance", which captures people's increased willingness to give when they have clues about nationality, occupation, race, religion (e.g. Charness and Gneezy, 2008), or friendship and kinship (e.g. Vollan, 2011).

et. al, 2006), low levels of violence (Sampson et. al, 1997), provision of local public goods through collective action (Narayan and Pritchett, 1999), more accountable politicians (Tsai, 2007), and greater capacity to enforce norms (Miguel and Gugerty, 2005).[3]

While some other authors rely on self-reported information on trust and solidarity to measure social cohesion (Sampson et al., 1997), we believe that incentive based measures give a more reliable picture. The seminal study by Barr (2003) explores the implications of resettlement on trust in Zimbabwe using a standard trust experiment. Her findings show that resettled players trust each other significantly less than non-resettled players even 20 years after resettlement, and that the players' responsiveness to expected trustworthiness is lower in resettled communities. Barr (2003) argues that this lower level of trust is mainly the result of missing altruism.[4] We broaden the view by implementing a version of a solidarity experiment (Selten and Ockenfels, 1998) which captures transfers motivated by a set of pro-social concerns including altruism and inequity aversion. The experimental game consists of two stages in which participants interact only with randomly chosen players from the same village. In the first stage all participants play a risk game. Then winners of the risk game make a one-shot decision on whether to transfer payments to anonymous losers in their group or not. This experimental set-up makes it possible to reduce disparities by equalizing game outcomes through the transfer of money. Thus, the set-up of the solidarity experiment resembles risk-sharing situations where pro-social preferences are relevant, which may be more pronounced in non-resettled villages where people have a stronger feeling of belongingness and commitment. The solidarity experiment further includes elements of trust, since transfers depend on expectations about the solidarity of others (Selten and Ockenfels, 1998), but it does not have the strategic investment considerations included in the trust game which provoke selfish motives. Interactions are between anonymous villagers, there are no future interactions, and monetary transfers are not revealed. Thus, our experiment eliminates the

[3] In his theoretical model of displacement and reconstruction, Cernea (1997, 2000) discusses the risks involved in resettlement, using the term "social disarticulation". He observes that planners of resettlement schemes often neglect these risks. Schmidt-Soltau (2003) and Rogers and Wang (2006), among others, use this model as a basis for their empirical analysis of the social impacts of involuntary resettlement.

[4] Barr and Genicot (2008) construct a game in which participants form risk-sharing groups to insure against income shocks. This study does not explicitly test an effect of resettlement. The authors do not find a significant difference between resettled and non-resettled players' willingness to share risks, but they do find that resettled villagers form significantly larger risk-sharing groups.

possibility of reciprocal risk-sharing and captures a village norm of social cohesion expressed in the willingness to transfer payments to anonymous villagers.[5]

In our study, farmers in the control group (non-resettled players) received only agricultural land and still live in their village of origin, whereas farmers in the treatment group (resettled players) received agricultural *and* residential land. The resettled players moved to a newly founded village about one year prior to our behavioral experiment, whereas non-resettled farmers have to commute to their new plots. The new village is composed only of project farmers who come from different villages in the region. The agricultural land is of a similar size for both groups.

Our study provides new evidence on the short-term social cost of voluntary resettlement. It differs from Barr (2003) in several ways. Firstly, we measure rather short-term effects of resettlement. This is relevant since agricultural risk is highest immediately after obtaining agricultural land, when farmers are still inexperienced. Secondly, we use an experimental design that mimics real-world risk-sharing situations and measures willingness to transfer resources that is motivated by pro-social preferences as a proxy for social cohesion on the village level. Thirdly, we measure and control for risk aversion which might influence the settlement decision. Fourthly, our treatment and control groups are closely homogeneous samples due to the enforcement of eligibility criteria. We also exploit ex ante data showing that the groups did not differ in social embeddedness in their village of origin. Lastly, we enrich our experimental results with survey data on income before and after resettlement to provide evidence of the welfare effects of the land distribution program.

We find a sizeable reduction in the willingness to help others. Resettled players transfer on average between 47% and 74% less money than non-resettled players. This effect remains large and significant after controlling for personal network and when controlling for differences in transfer expectations. At the same time, there is a greater need for support in the new village. Resettled farmers in the new village made 36% less income, (but since they received subsidies their overall income was 20% lower). Since both groups obtained land of a similar size in the

[5] While reciprocal, incentive-based risk-sharing motives also play a role, altruism seems to explain the largest part of transfers in previous lab-in-the-field experiments (Leider et. al, 2009; Ligon and Schechter, 2012).

same area, the income differences are not due to weather effects or different soil productivity. The costs of voluntary resettlement, not only monetary but especially social, seem significantly higher than is commonly assumed by development planners. People who have been resettled will therefore need not only longer and more intensive external support but inevitably also adequate micro-insurance and better access to credit.

2. Background information

Land scarcity, environmental degradation and unequal distribution of productive land prevent the economic development of the many people living in rural areas who rely on agriculture as their main source of income. In Cambodia (our study region) more than 50% of the rural population are land-poor, with less than half a hectare of land, and about 20% are landless (MoP and UNDP, 2007).[6] These land-poor and landless rural people constitute the poorest and most vulnerable part of the population.

2.1 Resettlement context: The LASED project

The experiment was carried out in the context of the Land Allocation for Social and Economic Development (LASED) project. This pilot project of the Royal Government of Cambodia, supported by the German Agency for International Co-operation (GIZ) and the World Bank, allocates one to three hectares of agricultural land to land-poor and landless people and supports them in starting to farm on the land.[7] The project is most advanced in Kratie Province, where we carried out our research. Applicants could apply for residential or agricultural land parcels. It was also possible to apply for both types of land. All those who received residential land migrated permanently to a newly founded village. All the agricultural plots are around this new village. Non-resettled farmers have to commute to their agricultural plots. The project beneficiaries are the neediest people in the communities: to qualify they had to be landless or land-poor (i.e. having less than half a hectare of agricultural land). As there was more demand for

[6] Furthermore, the risk of losing land mainly through forced eviction because of large infrastructure development projects is substantial. Amnesty International (2008) estimates that at least 150,000 Cambodians (1% of the rural population) are living at risk of forced eviction.

[7] The average land parcel in Cambodia is 0.69 hectares and small-scale farming is common, with 68% owning less than 0.5 hectares (MoP and UNDP, 2007). Since the yearly average rice yield between 2000 and 2008 was 2.26 ton/ hectare (Yu and Fan, 2011), the distributed land parcels provide a good opportunity for the project participants.

both agricultural and residential land than could be supplied, applicants were selected according to the degree of neediness.[8]

Agricultural and residential land was allocated by lottery to the selected applicants. In Kratie Province, land had been distributed to 525 households by the end of 2008 as a pilot project. Land recipients obtained either only agricultural land (44%), agricultural and residential land (52%) or only residential land (4%). We excluded households who received only residential land from our sample as conclusions about this group of 20 households are not reliable. At the time of writing, around 10,000 hectares had been allocated to approximately 5,000 households.

Before the allocation of land by the project, there was no significant difference in average annual household income between the two groups in our study. We refer to these two groups as the "non-resettled" group: those who were already resident in the established villages and were given agricultural land by the project, and the "resettled" group: those who were given both residential and agricultural land by the project and were resettled in the new village near the established villages. (See Table 1.)

2.2 Some evidence on ex ante differences of project members

The advantage of this set-up for our experiment is that our two groups have many similarities: they come from adjacent villages, have obtained agricultural land of a similar size and thus similar potential income, have a similar ex ante status of poverty, and are similarly motivated to farm as they all signed up voluntarily for a development project to obtain agricultural land.[9] A possible difference between our samples could be their risk preferences. Applying for residential land and ultimately moving to the LASED village is a voluntary migration decision. The individual migration decision is based on a personal evaluation of the characteristics of the area of origin, the area of destination, and intervening obstacles such as travel costs, physical barriers, or immigration laws (Lee, 1966). One major migration determinant is personal attitude towards risk (Barsky et. al, 1997; Heitmueller, 2005; Jaeger et al., 2007; Massey et al., 1993). Uncertainty about the area of destination, especially uncertainty about

[8] Out of 1,139 applicants 525 households were selected as land recipients.
[9] There is thus no influence of social distance due to variation in nationality, education, occupation, race, or religion between the two groups.

potential profits, hinders the migration of risk-averse individuals.[10] We therefore measure risk-taking in our experiment and control for differences in all subsequent multivariate analyses of willingness to transfer money.

Most importantly, social capital at the place of origin may influence the decision to resettle. Haug (2008) discusses the possible effects of social ties on the decision to migrate and finds that these ties can both reduce the likelihood of migration ("affinity hypothesis") and increase it ("conflict hypothesis" and "encouraging hypothesis"). We do not have completely reliable information on the social capital of our study group before resettlement. The available data originate from a random survey conducted with 84 project households in 2008 before the allocation of land by the project and retrospective data from 2010 which provide information on the situation of 106 project households before resettlement (Table 1). In both samples around 55% of the households received both residential and agricultural land and 45% received only agricultural land. We use membership in formal groups, participation in prominent social events (number of wedding celebrations and frequency of visiting the pagoda), and availability of informal credit, which is based on trust and a reputation for being trustworthy, as proxy variables for social capital. High values point in the direction of the "affinity hypothesis" and low values in the direction of the "conflict hypothesis". All social variables remain insignificant between the resettled and non-resettled groups in our study. There is also no significant difference in terms of education, age, and gender of the household head, and in household income in 2008.[11] We estimate a multivariate probit regression that includes those proxies that are available for 2008 and socio-demographic information about the households (Table A.1 in the appendix). None of the social variables is found to be significant. Furthermore, we find only a weakly significant correlation between resettlement and house size (see also Table 1 for descriptive results).

[10] Risk-averse individuals may also be more likely to migrate when the area of origin is highly insecure (Jaeger et al., 2007). Data from our post-game questionnaire suggest, however, that before resettlement resettled players experienced fewer economic shocks than non-resettled players. Thus, it is unlikely that the resettled people left because their area of origin was risky.

[11] We also do not find any difference at the village level between the non-resettled villages and the newly founded village with regard to availability of credit, types of shocks, fluctuation inside the villages, income composition, market integration, living conditions in the village relative to the rest of the country, collective action on the village level, presence of minorities including religious differences, or availability of insurance.

Table 1: Household characteristics before the allocation of land by the project (data from a random household survey of project members in September 2008)

	Resettled			Non-resettled			Difference in means[b]
	N	Mean	Std dev	N	Mean	Std dev	Significance level
Member of self-help group[+]	63	0.12	0.33	43	0.11	0.32	n.s.[a]
Number of wedding celebrations	43	7.97	15.14	41	6.14	5.42	n.s.
Times of visiting the pagoda	43	7.53	9.61	41	7.68	7.43	n.s.
Credit from money lender	43	42.47	103.61	41	64.40	164.76	n.s.
Credit from friends and family	43	55.43	142.46	41	35.25	73.99	n.s.
Credit from employer	43	0.52	2.75	41	0.77	4.95	n.s.
Total credit	43	169.04	226.59	41	192.80	242.11	n.s.
Yearly household income (USD)	43	1479.62	1886.76	41	1341.28	1282.46	n.s.
Size of the house[++]	43	1.46	0.59	41	1.68	0.72	n.s.
Household head is a farmer[+++]	43	0.37	0.49	41	0.63	0.47	1 %
Small business[+++]	43	0.16	0.37	41	0.16	0.36	n.s.
Household head is a worker[+++]	43	0.30	0.46	41	0.12	0.33	5 %
Gender of head of household (1= female, 0= male)	43	0.21	0.41	41	0.41	0.50	5 %
Age of household head	43	41.37	9.43	41	42.17	10.85	n.s.
Savings[+++]	43	0.60	0.49	41	0.59	0.50	n.s.
Nutrient provision[++++]	43	5.40	0.53	41	4.80	0.55	n.s.
Household head is married[+++]	43	0.81	0.06	41	0.71	0.07	n.s.
Years of education of household head	43	4.02	0.49	41	3.78	0.48	n.s.
Household size	43	6.06	2,73	41	5.48	1.92	n.s.

Notes: [a] n.s. not significant
[b] Wilcoxon-Mann-Whitney, t-test, or test of proportions for difference in means between resettled and non-resettled players
\+ Dummy variable: (1= yes, 0= no) taken from ex-post data from a random household survey in 2010
++ 20 square meters or less (1) / 21–50 square meters (2) / 51 square meters or more (3)
+++ Dummy variable: (1= yes, 0= no)
++++ Months enough to eat during the last year

In our data we find no differences between our two groups in social ties or social cohesion. Of course, unobserved factors correlated with both resettlement and willingness to

transfer money, such as a lack of prospects in the original village, variations in self-confidence, and different ways of dealing with unknown situations and people, could influence our results. A further robustness test is to estimate a difference-in-difference regression that mimics random assignment and to compare the obtained coefficient to the resettlement coefficient of simple ex post estimation. A significant different coefficient highlights potential ex ante differences. Although we cannot do this for our experimental measure of willingness-to-transfer, we can test for potential bias in related variables of social ties and income. Tables A.2 and A.3 in the appendix show that the coefficients of a difference-in-difference estimation and a "naïve" ex post estimation for 2010 do not differ for a range of relevant variables.[12] Hence, we believe that our experimentally measured effect of resettlement on monetary transfer is very unlikely to be heavily biased in any way.

3. Methods

Those who had received only agricultural land played the game with other project members from their old community, and those who had received both agricultural and residential land played it with members of their new community. In both cases the participant pool was restricted to project members.

3.1 The risk and solidarity experiments

We conducted a set of three independent experiments. The first is a simple risk game where participants can choose between three different options. The second is the same risk game followed by a solidarity game in the second stage, consisting of transferring money in anonymous groups of three. The third game replaces the random winning mechanism in the risk game with a task involving skill and is again followed by the solidarity game. (See Table 2.)

The participants were aware of whether they had won or lost in one of the three risk games, but we did not reveal transfer decisions. We informed participants that after all the games had been played we would randomly select one of the three games and pay out the earnings for that game. Earnings were paid out privately after a questionnaire had been completed. On

[12] The same holds true if we restrict the sample to those households with panel data.

average, a player earned 4,020 riel (KHR), which is about 1 USD and equals the salary for half a day's wage labor. We also offered a free meal instead of a show-up fee.[13]

Our risk game is adapted from Binswanger (1980, 1981).[14] The risk lottery follows an ordered lottery selection design (see Table 2). We reduced the risk choices to three lotteries instead of eight. This was necessary to reduce complexity once the risk game was combined with the strategy method in the solidarity game. In the event of losing, the payoff is zero to activate pro-social motives in the following stage. The outcome of the gamble is decided by the participant rolling a die. Option A provides a small but secure payoff (0.50 USD). Options B and C offer a higher expected payoff than option A, but also incorporate the risk of getting zero payoff. Option B has a winning probability of 2/3 and appeals to players who will accept a moderate risk, whereas option C with a winning probability of 1/3 is most attractive for risk-loving players willing to venture a higher risk.

We were interested in measuring social cohesion at the village level independent of reputation and reciprocal network ties. Therefore we implemented an anonymous one-shot solidarity experiment in the second stage of game 2. Decisions to transfer money were taken after the risk choice only by winners of the game. We believe that this increases the validity of the transfers, since players already knew that transfers were going to be made in the event of there being losers in their three person group. Players were asked to make transfer decisions for different possible combinations of

a) the number of players with zero payoff in the player's group (1 or 2) and

b) the risk choice of these players (B or C).

This leads to a total number of six decisions per player (two transfer decisions with one loser in the group, and four transfer decisions with two losers in the group). To avoid strategic giving, players were not told about other players' transfer decisions.

[13] The experimental protocol, including the posters that were used for visualization, are available from the authors on request.
[14] This game was also used by Barr and Genicot (2008) in Zimbabwe.

Table 2: Payoffs in the risk experiment

Player's choice	Probability of high payoff	Die numbers assigned to high payoff	High payoff in KHR (USD)	Low payoff in KHR (USD)	Expected payoff in KHR (USD)
Option A	1	1, 2, 3, 4, 5, 6	2,000 (0.5)	2,000 (0.5)	2,000 (0.5)
Option B	2/3	3, 4, 5, 6	6,600 (1.65)	0	4,400 (1.10)
Option C	1/3	5, 6	18,000 (4.50)	0	6,000 (1.50)

In the third game, we replaced the random winning mechanism of the risk game with a skilled task to enhance external validity. Following Gneezy et al. (2009), we set the task of throwing a ball into a bucket.[15] After we had pre-tested the task, we set winning probabilities and the resulting payoffs equal to those of the risk game (option A: at least 0 out of 10, option B: at least 4 out of 10, option C: at least 7 out of 10). Hence, overall changes in risk behavior and transfer payments can be attributed to the change from a random lottery to a test of skill. Again, the winners of the skilled task subsequently played the solidarity game.

3.2 Experimental procedure and participants

Experimental sessions were carried out in April and May 2010 in four randomly chosen non-resettled project villages and in the newly founded village. In total, we conducted 16 sessions (two sessions in each of the four non-resettled village and eight sessions in the resettled village) with 225 participants (127 resettled players and 98 non-resettled players). Participants in the experiment were randomly chosen from a complete list of project participants (around 35% of all project households). Household members who were at least 18 years old were eligible for the experiment. Only one person per household could take part in each session and a maximum of two players per household were allowed to participate in total. A few days in advance, the village

[15] Gneezy et al. (2009) do not find any gender differences. In our task men performed slightly better than women (mean value men: 4.38, mean value women: 3.92) but the difference is only significant at the 10% level. We also do not find a correlation between performance in the task and age.

chief informed the people that they could participate in an activity in which they could earn money.[16]

Sessions were conducted by the same research team in each case. Instructions were read out loud to all players in the common room of the village community centre. All decisions took place in private. We illustrated the risk decision during the instruction by showing posters and reading out examples for gambling choices. Every player practiced throwing the die three times. Each time a different gambling choice was assumed and the players verified that they understood the outcomes of the game. When they were making their decisions, posters of the different gambling choices were available to the players. In games 2 and 3 we explained money transfer decisions in the same way: firstly, in the common room with examples and posters for different numbers and types of losers and secondly in private with test questions about the solidarity game.

Table 3: Number of participants (number of observations) in each game

	1st game	**2nd game**		**3rd game**	
	Risk	**Risk**	**Solidarity**	**Skilled task**	**Solidarity**
Resettled	127	127	76 (456)	67	34 (204)
Non-resettled	98	98	50 (300)	49	30 (180)
Total	**225**	**225**	**126 (756)**	**116**	**64 (384)**

As Table 3 shows, all participants played the risk game in game 1 and game 2 (N= 225). The transfer decisions in the second stage of game 2 were only recorded for those players who won the risk game in the first stage of game 2 (N= 126, 76 resettled and 50 non-resettled players). Each player made six transfer decisions, leading to 756 observations in game 2. For game 3, we randomly determined half of the sessions for each group that played the game involving a skilled task (N= 116). Finally 64 subjects won the skills game and made transfer decisions (34 resettled and 30 non-resettled players).

[16] Originally, we planned for 15 players per session. In reality the number of players per session varied and we include session size in our estimations. Sessions were smaller in the non-resettled villages because of poor infrastructure connecting the community center to the outskirts of the village, problematic information flow from the village chief to the chosen players, and higher costs for the players to reach the meeting point. Recruitment was in general easier in the LASED village, since the whole village consists of project participants who worked closely together with the project staff.

Table 4: Individual characteristics of the experimental participants from the post-game questionnaire

	Resettled, N= 127		Non-resettled, N= 98		Difference in means[b]
	Mean	**Std. err.**	**Mean**	**Std. err.**	**Significance level**
Age	37.08	10.66	41.14	12.31	1 %
Gender (1= female, 0= male)	0.58	0.49	0.58	0.49	n.s.[a]
Years of education	3.92	2.75	3.95	2.28	n.s.
Income per month	124.40	101.89	113.52	85.71	n.s.
Married[+]	0.77	0.41	0.81	0.38	n.s.
Head of household[+]	0.48	0.50	0.50	0.50	n.s.
Spouse[+]	0.41	0.49	0.36	0.48	n.s.
Relative number of friends[++]	10.54	1.06	19.71	2.23	1 %
Relative number of family members[++]	2.24	0.49	7.47	1.16	1 %
Years living in the village	1.15	0.51	33.45	13.92	1 %
Household size	5.46	0.17	5.74	0.19	n.s.
Nutrient provision[+++]	2.65	0.04	2.63	0.05	n.s.
Household has some savings[+]	0.27	0.04	0.40	0.05	5 %

Notes: [a] n.s. not significant
[b] Wilcoxon-Mann-Whitney, t-test, or test of proportions for difference in means between resettled and non-resettled players
+ Dummy variable: (1= yes, 0= no)
++ In relation to the session size
+++ Number of meals with enough food per day

Although we chose participants randomly from a homogeneous group, there was a small difference between the two groups in terms of age, which we control for in our regression (Table 4). There are also more households who have some savings in the non-resettled group, which might be a consequence of resettlement, since resettled farmers have higher investment needs. Furthermore, as expected, the non-resettled players reported on average significantly more

friends and family members than the resettled players in the experimental sessions.[17] However, this difference is not very large (the average percentage of friends in the session is 10% for resettled players and 20% for non-resettled players). Also, 30% of players in both samples reported having no friends taking part in the session. In our analysis we control for the network a person had within the experimental session.

3.3 Hypotheses

Selten and Ockenfels (1998) find that what they call "giving behavior" in a solidarity game depends on one's expectations about the giving behavior of others. As our groups are anonymous, expectations about transfers at the village level are relevant. Coming into a new community leads to uncertainties about other people's behavior. Moreover, as solidarity can be unconditional and based on feelings of togetherness and cohesion, resettlement may have an effect on transfer sending beyond rational expectations. We expect a negative effect of resettlement on solidarity as a result of i) lower expectations that others would have helped, ii) lower desire to support fellow villagers stemming from lower social cohesion, and iii) fewer family members and friends taking part in the session.

In the third game, players could actively influence the outcome of the game, which induced a stronger feeling of being entitled to the money. As Cherry et al. (2002) and Hoffman et al. (1994) show for an ultimatum game, subjects transfer substantially lower amounts if they earn their winnings or earn the right to be the first mover. This effect is in part attributed to a difference in performance or "status" (Cox et. al, 2007), "mental accounting" (Cherry and Shogren, 2008), or a reduction of the supply effect in experimental economics (Carpenter et. al, 2010). Furthermore, losers in the skilled task are responsible for their failure because they misjudged their skills. According to Trhal and Radermacher (2009), self-inflicted neediness reduces solidarity payments. Therefore, when it comes to the skilled game we expect a reduction of transfers in both resettled and non-resettled groups and maybe even an increase in the difference between resettled and non-resettled players.

[17] The non-resettled players also reported a slightly higher number of players they disliked in their session. As there were only three non-resettled and two resettled players who disliked other players, we do not discuss the possible consequences of this.

4. Results

4.1 Risk

Our analysis of the risk choices in game 1 confirms our expectation that resettled players would choose on average riskier gambles than non-resettled players.[18] We find a significant difference in means between the risk choices of the players in game 1 at the 5% significance level (resettled players: 2.35, non-resettled players: 2.19).[19] Figure 1 shows that in the group of non-resettled players the mode lies with 58% of all players at option B, whereas in the group of resettled players the mode lies with 48% at option C.

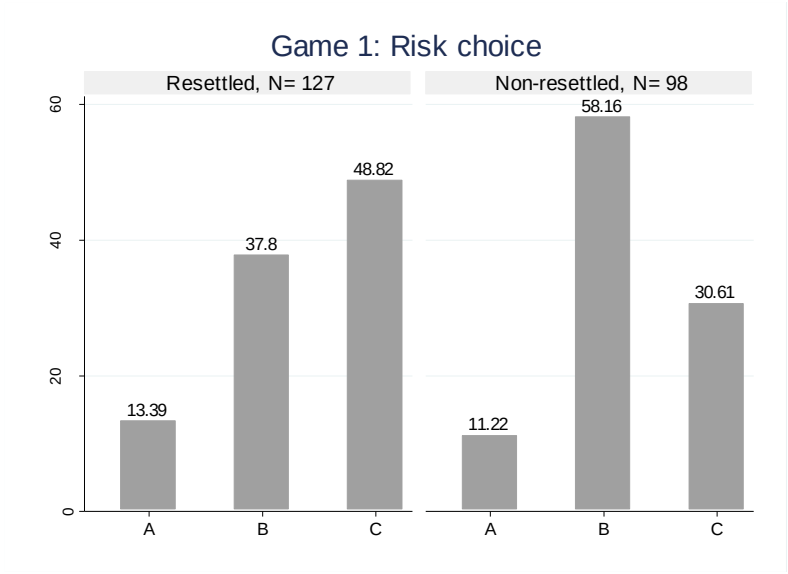

Fig. 1: Risk choice of non-resettled and resettled players in game 1

4.2 Transfer decisions

In game 2, and game 3 with the skilled task, winners of the risk game could transfer money to losers of the risk game in anonymous three-player groups. Table 5 shows that the mean

[18] We use the Wilcoxon-Mann-Whitney test, t-test, or test of proportions to compare resettled and non-resettled players and the Wilcoxon signed rank sum test to compare the behavior of players over the three games.
[19] We assume an ordinal scale: option A=1, option B= 2, and option C= 3.

transfers of resettled players are significantly lower. The average transfers of the resettled players are only 62% of the average transfers of non-resettled players. Transfer sending decreases with the skill driven winning mechanism.[20] However, the decrease is larger in the resettled village (22%) than in the non-resettled villages (11%). Thus, individualistic motives of "earning" and "skill" are more important in the resettled village, while transfers are more unconditional in the non-resettled villages. These findings were confirmed through qualitative interviews after the experiment. Resettled players reported that norms of sharing are not present in the new community; as a resettled participant remarked, "Giving nothing is just the way people behave in this village" (4 April 2010 session).

Table 5: Mean transfers in game 2 and game 3 with the skilled task

	Resettled players			**Non-resettled players**			
	Obs.	**Mean transfers**	**Standard deviation**	**Obs.**	**Mean transfers**	**Standard deviation**	**Significance level[a]**
Game 2 (risk)	456	490.79	711.84	300	792.33	689.49	1 %
Game 3 (task)	204	381.37	337.54	180	703.61	640.05	1 %

Note: [a] Wilcoxon-Mann-Whitney test for difference in means between resettled and non-resettled players

When we analyze transfers with respect to how much money a potential sender has at hand (whether he chose option A or won option B or C) and how high a risk the potential receiver(s) took (lost option B or option C), we observe the following patterns (see Table C.1 in the appendix). Firstly, transfer senders sent lower transfers per person to two losers in their group than to one loser (except the few C-senders who transferred similar amounts no matter whether one or two other players lost). Secondly, even though absolute transfers increased with the available budget, A-senders were willing to give, with an average of 14.19%, the highest

[20] As there is no significant difference between the mean risk choices of resettled and non-resettled players in game 2 and in the skilled task, we only report mean solidarity transfers independent of the risk choice. But also comparing those players who made the same risk choice in game 2 and in the skilled task shows a significant reduction in transfer sending (N= 21, game 2: 638.89, task: 607.14, p-value: 0.02). Regression analysis controls for the type of sender. Graphs of the transfer difference between resettled and non-resettled players in game 2 and in the skilled task are shown in Figures C.1, C.2 and C.3 in the appendix. In all risk groups in game 2, considerably more resettled players sent no transfer than non-resettled players.

proportion of their earning (283.76 KHR), followed by B-senders (9.52%, 628.26 KHR) and C-senders (6.94%, 1,250 KHR).[21] Higher relative contributions of less wealthy people are also found in public good games (Buckley and Croson (2006), Hofmeyr et al., 2007).[22] Thirdly, there is no evidence that senders discriminate over the risk choice of the loser.

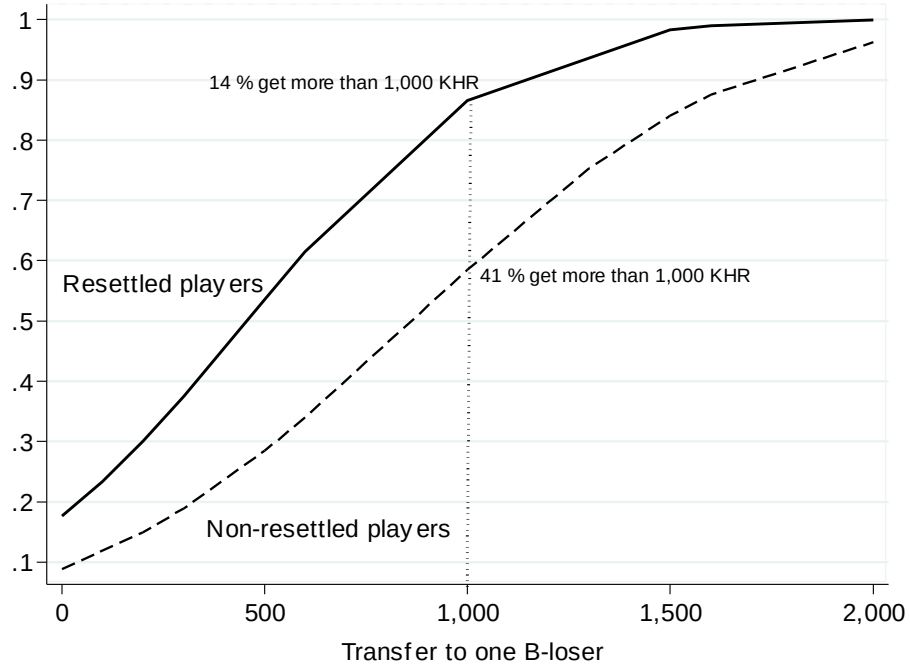

Fig. 2: Transfer payments to one B-loser in game 2

Figure 2 shows the cumulated density function of potential transfers to one B-loser for resettled and non-resettled players. The curve for the resettled players lies entirely above that for the non-resettled players. Hence, for the whole distribution of transfers, resettled players were more likely to receive lower transfers. In the non-resettled group the probability of getting no transfers is less than 10%, whereas for the resettled players it is close to 20%. Taking a transfer of 1,000 KHR as an example, only 14% of the resettled players received a higher transfer. The

[21] Figure C.1 in the appendix shows a Gaussian probability curve for the relative transfers from the three risk groups. Even though A-senders have the highest probability of sending no transfer, the above described order of relative transfers becomes evident for transfers bigger than 0.3% of the payoff.

[22] Winning in game 1 and game 2 does not have a significant influence on solidarity transfers in our multivariate analysis.

proportion of players receiving a transfer of more than 1,000 KHR increases to 41% in the group of non-resettled players.

4.3 Adaptation of risk due to experience and transfer possibility

In the solidarity game (game 2) a player might expect a non-zero payoff in the event of losing the game (depending on the player's expectation of transfers from fellow villagers). Hence the risk of losing can be partly shared within the solidarity group and transfers can be interpreted as an informal insurance mechanism. People might want to avoid being a burden to anyone and thus play the safe lottery more often. This is, however, an unrealistic interpretation since the choices were anonymous, and thus humility, shame or other motives cannot be involved. With informal insurance, players might rather choose a higher risk option as they do not have to bear the cost of losing alone. Choosing a higher risk is also more efficient for the group of three, provided that redistribution among them takes place.

A significant increase in higher risk choices in game 2 is seen only for those players who won game 1, while those players who lost game 1 significantly decrease their higher risk choices (see Table B.1 and Fig. B.1 in the appendix). Therefore, players' reasoning processes about what level of risk to take is influenced between game 1 and 2 by the introduction of transfer possibilities, but also (and maybe more) by previous experience in game 1. Given our limited set of choices, with one safe and two risky options, players might be indifferent to the two risky choices in the first game, but their consequent success or failure is likely to influence their choices in the second game. The non-resettled players show a stronger increase in cases where they win in the first game, and a weaker decrease in cases where they lose, than the resettled players.[23] This different adjustment magnitude can be explained by differences in transfer expectations. For players who were at risk of losing the game (option B or C), we find that higher transfer expectations go along with taking higher risks (mean expectation of players who chose option B: 643.91 KHR, mean expectation of players who chose option C: 838.81 KHR, p-value

[23] Players who won the risk game in game 1: resettled players: game 1: 2.00, game 2: 2.15, p-value: 0.03; non-resettled players: game 1: 1.93, game 2: 2.29, p-value: 0.00. Players who lost the risk game in game 1: resettled players: game 1: 2.76, game 2: 2.13, p-value: 0.00; non-resettled players: game 1: 2.53, game 2: 2.07, p-value: 0.00. There is no significant difference between the mean risk choices of players who won the risk game in game 1: resettled players: game 1: 2.00, non-resettled players: game 1: 1.93, p- value: 0.56.

0.02). Mean expectations differ at the 1% significance level between resettled and non-resettled players (resettled players: 584.28 KHR, non-resettled players: 905.55 KHR, p-value: 0.00). Non-resettled players expected higher transfers because of stronger social cohesion and therefore may have been willing to react more strongly to the introduction of informal insurance in game 2.

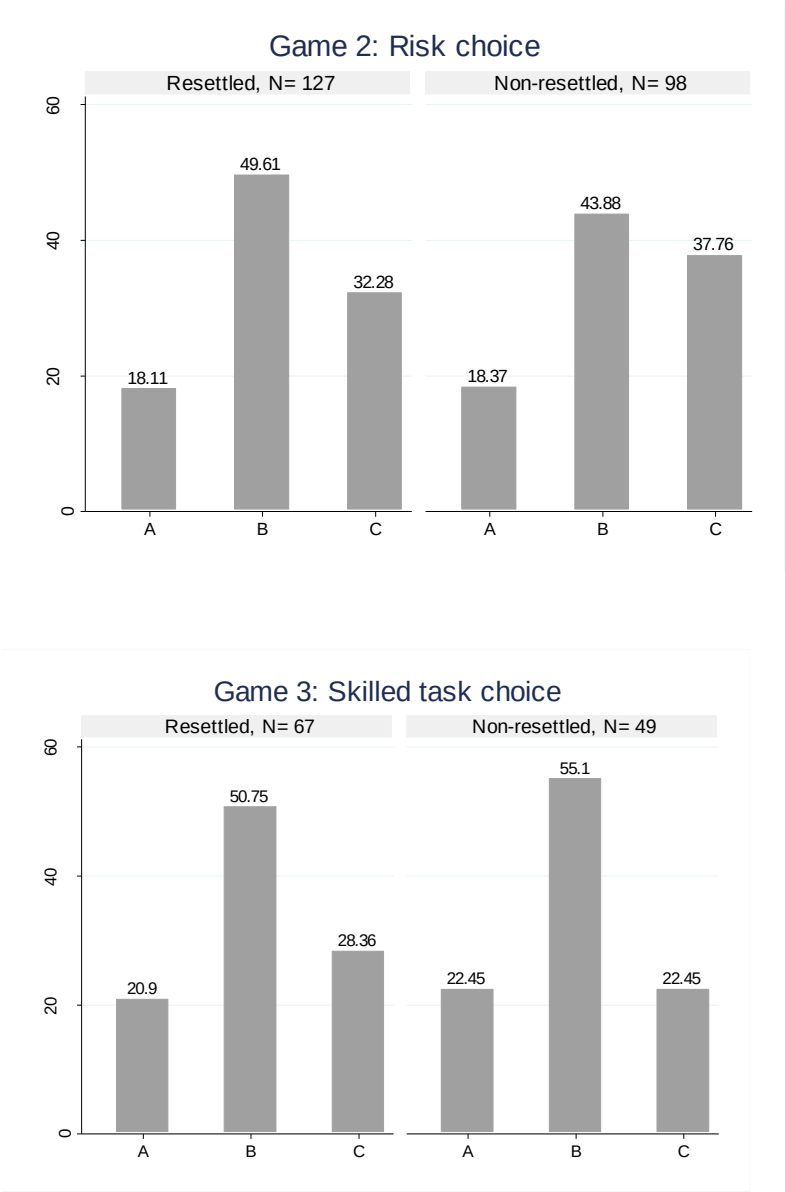

Fig. 3: Risk choice of non-resettled and resettled players in game 1 and game 3

In game 3, the average risk choice in the skilled task is significantly lower than the average risk choice in game 2 (game 2: 2.19, game 3: 2.04, p-value: 0.05, see also Fig. 3). This

reduction is driven by the less confident non-resettled players who decreased their risk significantly (non-resettled: game 2: 2.24, game3: 2.00, p-value: 0.02; resettled: game 2: 2.14, game 3: 2.07, p-value: 0.54). There is no significant difference in risk choice in the skilled task between resettled and non-resettled players in this game (resettled: 2.07, non-resettled: 2.00, p-value: 0.56), but actual skills are significantly higher in the non-resettled group (mean times a player got the ball into the bucket: resettled: 3.79, non-resettled: 4.51, p-value: 0.02). This means that 10% of the resettled players underestimated their skill and 48% overestimated it, whereas 16% of the non-resettled players underestimated their skill and only 37% overestimated it. These findings, in addition to higher risk preferences, hint at overconfidence especially among the resettled players.

4.4 Transfer differences contingent on risk choice and expectations

Since transfer decisions depend on own and others' risk choices, simple descriptive analysis can be misleading. We estimate solidarity conditional on a specific risk choice, to control for potentially higher transfers made by risk-loving individuals, by including dummy variables for the type of sender and the type of receiver of the transfer.[24] We also control for the payoffs in game 1 since they might generate some unwanted learning effects. Table 6 contains the results of Tobit regressions on the six transfer choices that every winner of a risk game made for all possible types of losers in that person's group. Individual socio-demographic controls, session size, and group characteristics are included in all regressions.

We focus on the transfer difference between resettled and non-resettled players. We start by analyzing only the transfer decisions in game 2 (regression (1), N= 126, observations= 756). Here, the resettlement dummy is negative and significant at the 5% level. In a second step, we estimate a random effects Tobit regression which also includes the transfer decisions in game 3 with the skilled task (regression (2), N= 156, observations= 1,140). The resettlement dummy increases in magnitude and remains negatively significant at the 1% level.

[24] In total 17 dummies are considered. The coefficients of the dummies and other control variables are presented in Tables C. 2 and C. 3 in the appendix.

Table 6: Multivariate analysis explaining transfers (marginal effects)

	(1)	(2)	(3)	(4)	(5)
	Tobit regression[+]	**Random-effects Tobit regression[++]**	**Random-effects Tobit regression[++]**	**Random-effects Tobit regression[++]**	**Random-effects Tobit regression[++]**
VARIABLES	**Transfers game 2 (risk choice)**	**Transfers game 2 and 3 (skilled task)**	**Transfers game 2 and 3 (skilled task)**	**Transfers game 2 and 3 (skilled task)**	**Transfers game 2 and 3 (skilled task)**
Resettlement	-375.8**	-546.9***	-537.0**	-585.5***	-558.6***
	(176.0)	(172.7)	(222.8)	(158.4)	(182.6)
Skilled task		-99.27***	-184.7***	-98.40***	-106.3***
		(28.99)	(40.55)	(28.99)	(30.06)
Transfer expectations			0.440***		
			(0.140)		
Controls for session network	Yes	Yes	Yes	No	Yes
Controls for sender and receiver type	Yes	Yes	Yes	Yes	No
Individual controls	Yes	Yes	Yes	Yes	Yes
Observations	756	1,140	810	1,140	1,140
Number of individuals	126	156	112	156	156

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
+ Standard errors are clustered on the individual level
++ Random effects are implemented on the individual level

The individual covariates used in the regressions can be seen in Table C.2 and the dummies for different sender and receiver combinations in Table C.3 in the appendix. It seems that players who have some savings and those who live in bigger households tend to give less. In addition, players with higher education and those who enjoy regular meals tend to give more.

To separate the effects of social cohesion from reciprocal motives, we include transfer expectations in regression (3) (N= 112, observations= 810).[25] These have a significant positive

[25] Data on expectations are only available for players who were at risk of losing the risk game (risk option B or C)

influence on transfers, confirming the results of Selten and Ockenfels (1998). The more interesting finding, however, is that resettlement remains negatively significant. That is, lower transfers are driven not only by lower expectations about the support of others, but also by a preference for not helping people in the resettled village.

In regression (4) (N= 156, observations= 1,140) we exclude the controls for the network of family and friends in the session. The negative coefficient of the resettlement dummy increases, as it now also accounts for the loss of social relations in the new village (compare regressions (2) and (4)). The increase in the coefficient is merely -38.6 KHR. Thus, we believe that the anonymity of our experiment cancelled out the effect of familiarity in the session. As a robustness check, we estimate the average treatment effect on the treated using the relative number of family members and friends with regard to session size as matching variables to estimate the propensity score (Table C.4 in the appendix). With all different matching methods we still find a significant negative coefficient of the resettlement dummy ranging from -163 to -391 KHR. These results show that unconditional giving is driven not so much by the presence of a personal social network as by social cohesion at the village level. Furthermore, the relatively small influence of number of family members and friends in the session suggests that anonymity, independence of games and no communication successfully removed personalized trust motivations from the experiment.

Lastly, we estimate transfers without controlling for the risk choices of senders and receivers, which gives us the total effect of voluntary resettlement taking into account that there is more risk taking among resettled participants (regression (5), N= 156, observations= 1,140). Since the resettled players adjusted their risk choice after game 1 we find hardly any differences between regressions (2) and (5).

Applying regression analysis, taking the risk choice and variation in control variables into account, the resettlement dummy is significant in all the specifications with a magnitude from -375.8 KHR to -585.5 KHR. Thus, resettled players transfer between 47% and 74% lower amounts than non-resettled players in game 2 (792.3 KHR). The difference between the two groups is larger than that found by a simple descriptive analysis (38%). Regressions (2) to (5)

show a significant negative coefficient for the skilled task, which confirms our hypothesis that effort and accountability for the game outcome reduces transfers.[26] The magnitude of this coefficient with -99.27 KHR in regression (2) is more than five times smaller than the resettlement effect.[27] It was interesting to note that households that have some savings transfer significantly lower amounts in all regressions. This is in line with findings that individuals with financial resources face heavy demands from relatives and friends to share their fortune and therefore use saving schemes to hide their wealth. In Africa, for example, women especially are willing to entrust their money to "susu men" in order to withdraw it from their network (Besley, 1995, p. 2150) or to put it into formal saving accounts with effectively negative interest rates (Dupas and Robinson, 2009). Since non-resettled households are significantly more likely to have savings, these findings reduce the magnitude of our resettlement effect.

Considering the non-random nature of the resettlement choice, the work of McKenzie et al. (2010) provides a conservative measure of the resettlement effect. Comparing income improvements after migration, McKenzie et al. find a 25–35% bias in OLS regressions with non-experimental data in comparison to experimental migration data. But even then, the resettlement effect identified in regression (2), with -355.5 KHR and 45% of the average transfer payment of the non-resettled players in game 2 (792.3 KHR), is still substantial.

4.5 Ex post survey data on the importance of network support

When we consider the prevalence of various types of shock – such as bad weather conditions, livestock disease, severe illness of a household member, or fire or theft destroying a household's property – the importance of risk-sharing for our sample becomes evident. About two-thirds of the players reported having experienced at least one severe shock during the last two years, and more than 28% reported several shocks. Furthermore, 97% of these players had experienced difficulties in coping with these shocks. Taking the monetary transfers in the games as an indicator of general willingness to support fellow villagers, coping with these shocks in the resettled community is clearly more difficult.

[26] We test also for heterogeneity of treatment effects for resettlement by stepwise including interaction terms between resettlement status and all socio-demographic variables included in our regression. We also test an interaction term between resettlement and the ability task. All interaction terms turn out to be insignificant.
[27] The resettlement effect remains significant and similar in size when we use OLS estimations.

The importance of social cohesion becomes even more pronounced when we look at the poverty status before and after resettlement of project participants. Before resettlement in 2008, about 85% of the project households earned less than 1.25 USD per day. In 2010, the proportion increased in the group of resettled participants to 88%, whereas it decreased in the group of non-resettled participants to 79%. Similarly, there were no income differences in 2008 between the households applying for resettlement and those who did not apply (see Table 1). After resettlement in 2010, the yearly household income of resettled beneficiaries was on average about 20% lower than that of non-resettled participants (resettled participants: 1,130.61 USD, non-resettled participants: 1,429.09 USD, p-value: 0.09). Nevertheless, in our specific case, project transfers could compensate for the greater vulnerability of resettled players. On average 33.5% of the yearly income of resettled participants came from project transfers, while in the group of non-resettled participants project transfers account only for 18% of the average yearly income. Considering the yearly income per household without transfers, participants in the resettled village had a 36% lower income than non-resettled participants (resettled participants: 751.19 USD, non-resettled participants: 1,175.55 USD, p-value: 0.02). Here, 98% of the resettled participants would have fallen below the poverty line and 86% of the non-resettled beneficiaries. Furthermore, resettled participants' income was lower in 2010 than it had been in 2008, whereas for non-resettled participants it was higher. The resettled participants' income was probably lower because of time lost building a new home and new community facilities, lower knowledge transfer from experienced farmers, and the side effects of missing social cohesion. One year after the land distribution, in both groups agricultural income accounted for only a minor share of their income. Nonetheless, non-resettled participants were earning significantly more income with agricultural production in 2010 (resettled participants: 230.89 USD, non-resettled participants: 164.89 USD, p-value: 0.08).

These findings illustrate the heavy dependence of resettled participants on transfers mainly coming from the project. It is therefore not surprising that perceived 'future security' in 2010 was weaker in the group of resettled participants (p-value: 0.07). We anticipated that especially after the end of the project in 2013, when no more transfer could be expected, social cohesion and solidarity inside the new village would become essential for the farmers if they are to succeed.

5. Conclusions

We conducted a lab-in-the-field experiment comparing voluntarily resettled and non-resettled participants of a land allocation project. Farmers in our control group (non-resettled players) received only agricultural land and were still living in their villages of origin. Our treatment group (resettled players) also received residential as well as agricultural land and moved to a newly founded village about one year prior to our behavioral experiment. We conducted a solidarity experiment measuring willingness to transfer money to anonymous community members and then compared transfer differences between the resettled village and the non-resettled villages.

We found that resettled players in the experimental game transferred on average between 47% and 74% lower amounts than non-resettled players. Close to 20% of the losers in the resettled group received no transfers at all, whereas less than 10% of the non-resettled group received no transfers. One might argue that non-resettled farmers are richer (given the survey data) and therefore more likely to transfer money. However, this income effect was not significant for our experimental participants. On the contrary, we suggest that our analysis estimates a lower bound of the "social effect of resettlement". This is because we would expect even less giving if (i) resettlement was forced instead of voluntary, (ii) no project support was offered, (iii) we included a measure for reciprocal ties, (iv) savings were equally distributed, or (v) village composition in the non-resettled villages was taken into account, instead of including only the poorest individuals, since richer community members often constitute the main source of financial and technological assistance and share their agricultural equipment with poorer neighbors (Lin, 2001). A survey carried out before resettlement indicates that there were no observable differences regarding social integration predating resettlement. Consequently, the transfer difference is probably caused by voluntary resettlement. We further find that the resettlement effect remains large and significant when we match participants with respect to their network size and when we include expectations. Both results support our view that transfer difference is the result of lower social cohesion in resettled communities and that this difference is not mainly driven by the specific network people have and goes beyond consideration of reciprocity. We do not find that people "punish" high risk taking (or inability); instead, the norm of solidarity applies similarly to everyone and is on average 10% of available income.

Considering the low income level of project participants, especially in the resettled community, network support plays a vital role. Two-thirds of all players in our experiment reported experiencing substantial shocks such as bad harvests or illness since receiving the land from the project. Hence, besides support from their network of family and friends, willingness to support each other inside the village is a major source of help at the moment. At the time of our study, reciprocal ties of friendship in the resettled village were not yet established and social cohesion was very low. With the loss of social cohesion, our study identifies an important effect of voluntary resettlement that has not been fully explored up to now. We deliver a more complete picture of the costs and benefits of voluntary resettlement programs and underline the importance of counteracting negative social consequences even of voluntary resettlement projects. Our findings are relevant for resettlement policies based on the "economics of compensation", which often neglect these and other social costs. Furthermore, our study can offer help in understanding the difficulties of migrants who leave their village to find a job in the metropolitan areas or the difficulties faced by climate refugees who will be forced to resettle in the coming decades.

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Appendix A: Information before resettlement

Table A.1: Probit regression on resettlement

Y= resettlement	**Coefficient**	**Standard error**
Income per year	6.19e-05	(0.000119)
Education of head of household in years	-0.0232	(0.0574)
Gender of head of household (1= female, 0= male)	-0.527	(0.652)
Married (1= yes, 0= no)	0.00975	(0.665)
Age of head of household	-0.00949	(0.0188)
Nutrient provision	-0.0304	(0.0545)
Size of the house	-0.464*	(0.274)
Condition of the house.	-0.160	(0.332)
Credit from money lender	-0.00164	(0.00134)
Credit from friends and family	0.000751	(0.00180)
Wedding invitations	0.0171	(0.0195)
Pagoda visits	0.00981	(0.0207)
Head of household owns a business (1= yes, 0= no)	0.165	(0.489)
Household owns some savings (1= yes, 0= no)	0.0976	(0.394)
Land size in hectare	0.0932	(0.270)
Constant	1.538	(1.266)
Observations	68	

Notes: Standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

Table A.2: Difference-in-difference and ex-post (2010 after resettlement) estimations for indicators of social integration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	D-i-d+	Ex-post	D-i-d+	Ex-post	D-i-d+	Ex-post	D-i-d+	Ex-post	D-i-d+	Ex-post
VARIABLES	Wedding celebrations	Wedding celebrations	Pagoda visits	Pagoda visits	Credit from friends and family	Credit from friends and family	Income per year	Income per year	Income per year without transfers	Income per year without transfers
Interaction resettlement and ex-post dummy	-2.706		-1.427		-14.60		-253.0		-370.0	
	(2.703)		(2.765)		(29.20)		(446.7)		(444.6)	
Resettlement dummy	1.830	-0.876	-0.148	-1.575	20.18	5.584	138.3	-114.6	143.3	-226.7
	(2.003)	(1.353)	(2.049)	(1.968)	(21.64)	(16.87)	(331.0)	(282.7)	(329.5)	(281.3)
Ex-post dummy	-0.588		0.178		-12.10		87.80		-126.9	
	(2.003)		(2.049)		(21.64)		(331.0)		(329.5)	
Constant	6.146***	5.558***	7.683***	7.860***	35.25**	23.15*	1,341***	1,429***	1,302***	1,176***
	(1.433)	(1.043)	(1.466)	(1.517)	(15.48)	(13.01)	(236.8)	(217.9)	(235.7)	(216.9)
Observations	190	106	190	106	190	106	190	106	190	106
R-squared	0.018	0.004	0.005	0.006	0.014	0.001	0.002	0.002	0.016	0.006

Notes: Standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

+ D-i-d= difference-in-difference estimation

Table A.3: Test for equality of the coefficients of the difference-in-difference and the ex-post estimation

	Interaction resettlement and ex-post dummy of d-i-d estimation	Resettlement dummy of ex-post estimation	Significance level of test for equality
Wedding celebrations	-2.706	-0.876	n.s.[a]
Pagoda visits	-1.427	-1.575	n.s.
Credit from friends and family	-14.60	5.584	n.s.
Income per year	-253.0	-114.6	n.s.
Income per year without transfers	-370.0	-226.7	n.s.

Notes: [a] n.s. not signifcant

Appendix B: Additional analyses on risk

Table B.1: Difference in means of gamble choice in game 1 and game 2 split according to gamble outcomes

	Resettled players		Non-resettled players	
	Winning	**Loosing**	**Winning**	**Loosing**
Observations	68	59	55	43
Game 1	2.00	2.76	1.92	2.53
Game 2	2.14	2.13	2.29	2.07
Significance level[b]	1 %	1 %	1 %	1 %

Notes: [b] Wilcoxon-Mann-Whitney, t-test, or test of proportions for difference in means between game 1 and game 2

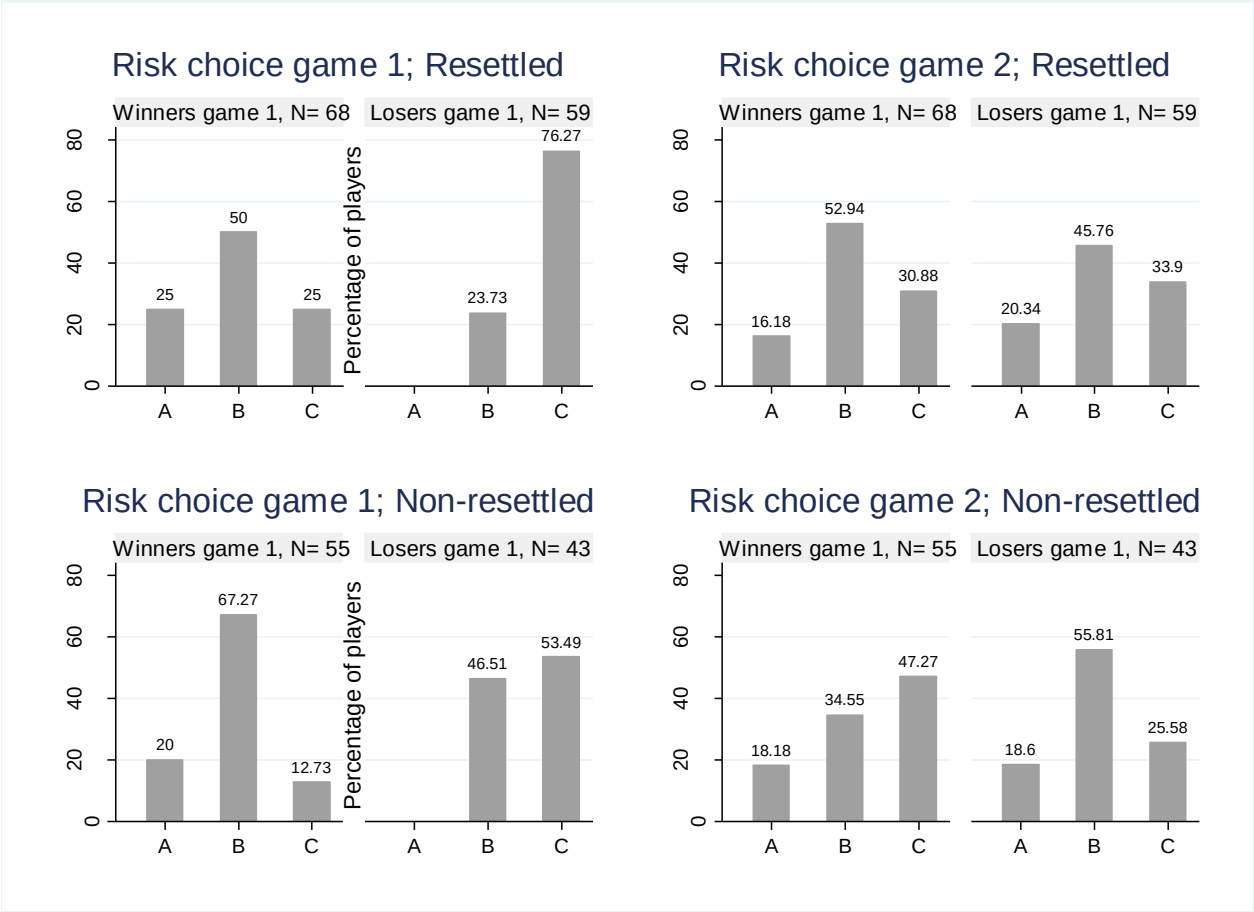

Fig. B.1: Gamble choice in game 1 and game 2 split according to gamble outcomes

Appendix C: Additional analyses on transfer sending

Table C.1: Mean transfer per person dependent on risk choices of winners and losers in the solidarity game

	1 B-loser	1 C-loser	2 B-losers	2 C-losers	2 losers: 1 B- and 1 C-loser; transfer to the B-loser	2 losers: 1 B- and 1 C-loser; transfer to the C-loser	Average over receivers
A-sender	328.21	323.08	255.13	264.38	264.10	266.67	283.76
B-sender	752.17	692.75	581.16	569.57	605.80	568.12	628.26
C-sender	1,222.22	1,277.78	1,277.78	1,194.44	1,250.00	1,277.78	1,250.00
Average over senders	688.09	661.90	579.76	564.68	592.06	576.19	-
Significance level[b]	n.s.		n.s.		10 %		-

Notes: [b] Wilcoxon-Mann-Whitney, t-test, or test of proportions for difference in means between resettled and non-resettled players

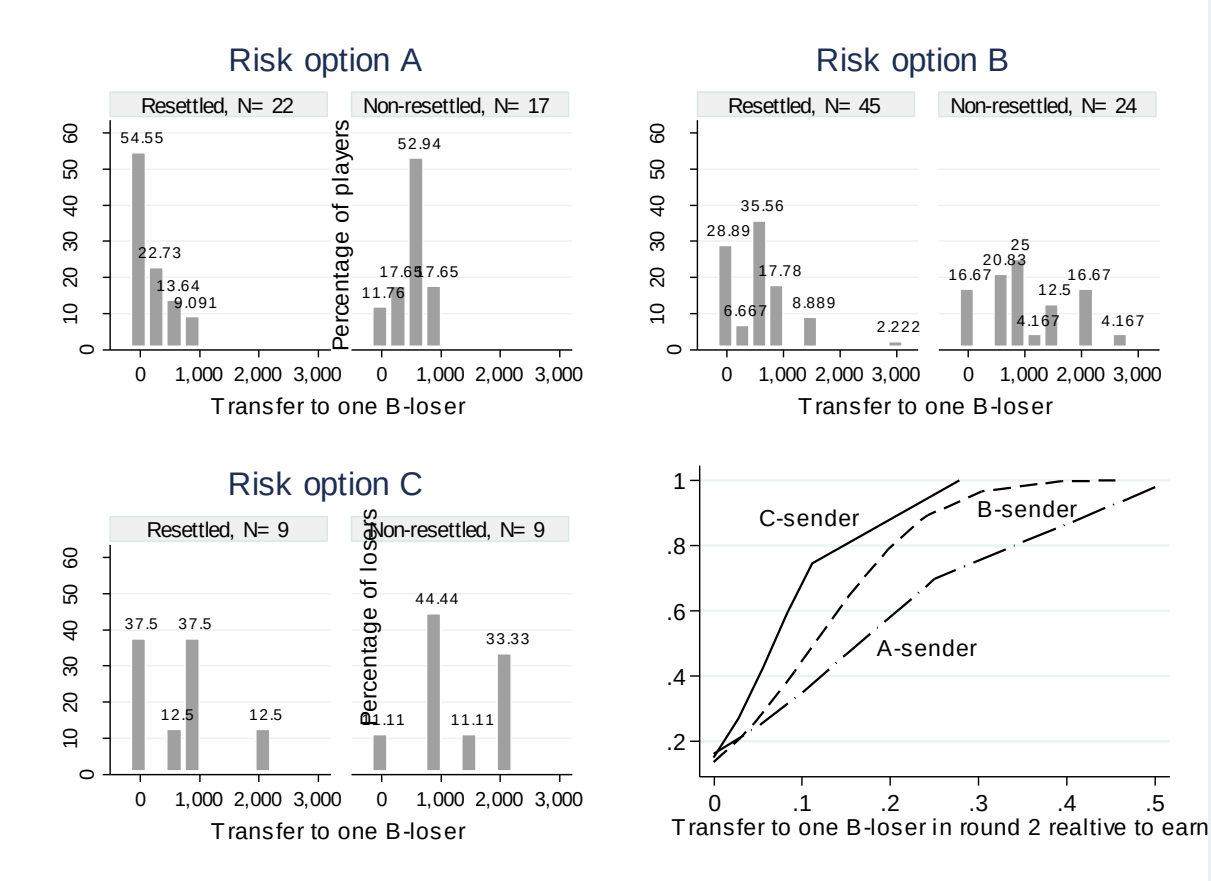

Fig. C.1: Transfer payments according to gamble choices in game 2

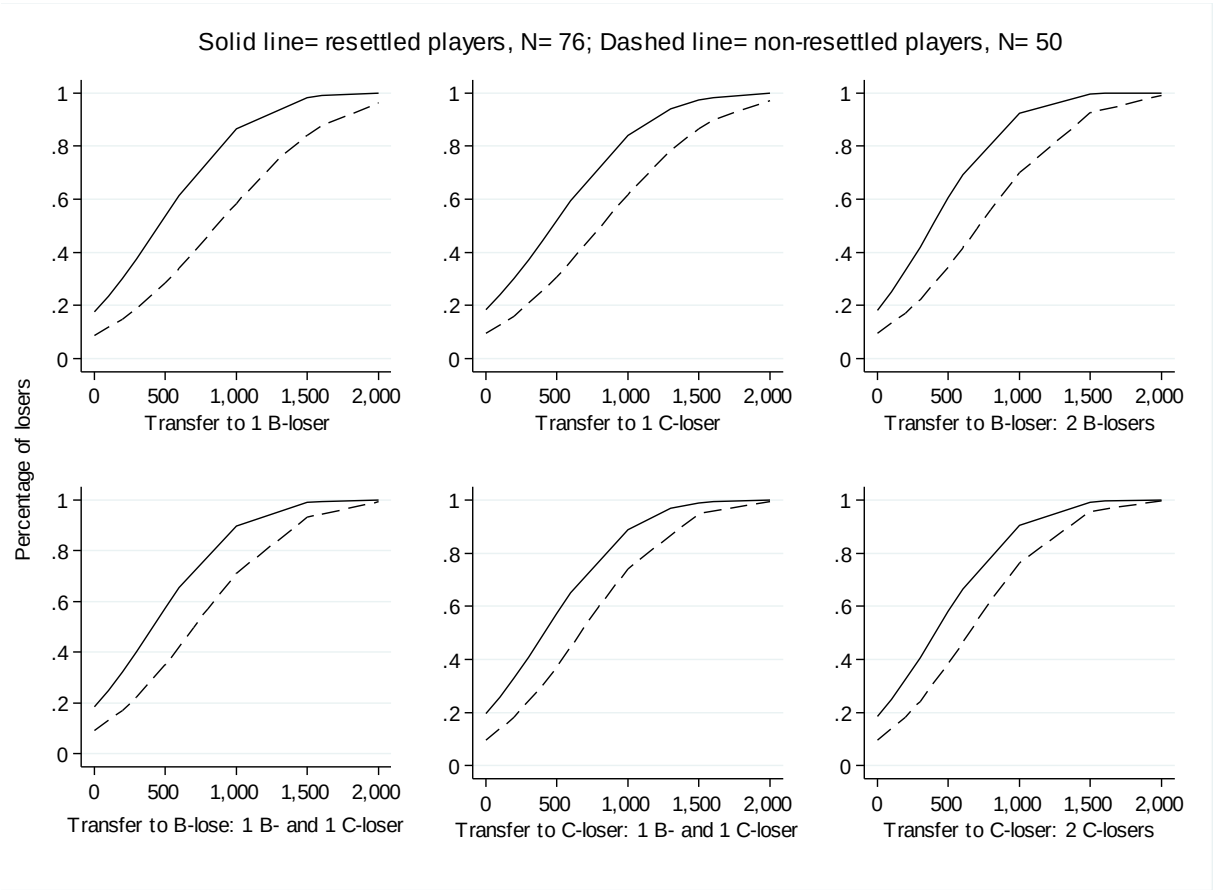

Fig. C.2: Gaussian probability curves of transfer payments in game 2 of resettled and non-resettled players

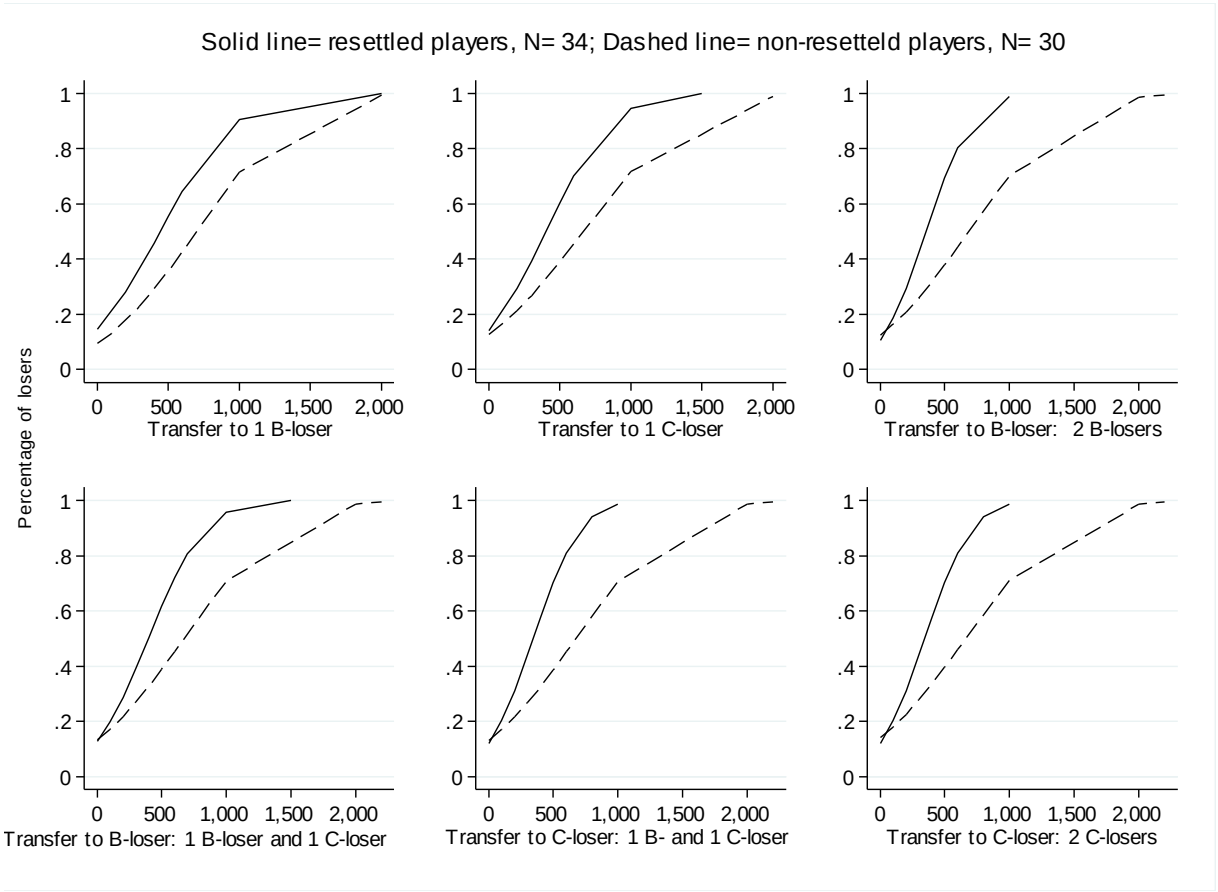

Fig. C.3: Gaussian probability curves of transfer payments with the skilled task of resettled and non-resettled players

Table C.2: Individual control variables for the transfer regressions in table 6

VARIABLES	(1)	(2)	(3)	(4)	(5)
Gender (1= female, 0= male)	-131.3	-168.9	-310.2*	-179.6	-157.5
	(158.6)	(137.8)	(180.2)	(136.4)	(146.5)
Age	3.743	2.727	1.959	2.456	2.185
	(7.276)	(6.345)	(8.252)	(6.354)	(6.698)
Years of education	60.90**	39.09	31.78	38.92	49.24*
	(25.87)	(26.67)	(33.62)	(26.76)	(28.24)
Household size	-54.58	-83.16**	-41.19	-77.76**	-85.20**
	(38.04)	(34.47)	(45.61)	(34.20)	(36.53)
Income per month	-0.0316	0.242	-0.430	0.161	0.0958
	(0.646)	(0.712)	(1.011)	(0.709)	(0.755)
Nutrient provision^{+}	417.4**	341.5**	264.9	320.6**	367.6**
	(173.9)	(143.9)	(189.4)	(140.8)	(152.3)
Savings^{++}	-425.5***	-385.5***	-454.5**	-366.7***	-394.7***
	(158.4)	(140.3)	(190.5)	(138.8)	(148.7)
Credit^{++}	78.15	203.8	279.1	195.8	246.4
	(153.6)	(144.2)	(195.9)	(144.7)	(153.1)
Shock during the last 3 years^{+++}	-57.71	1.064	86.68	15.61	-11.77
	(137.8)	(143.1)	(176.0)	(142.3)	(151.8)
Shocks of friends or family^{+++}	250.6	123.9	205.8	122.4	104.8
	(153.1)	(136.4)	(170.4)	(136.1)	(145.0)
Relative number of friends^{++++}	1.608	3.476	0.0884		4.198
	(4.131)	(3.883)	(5.252)		(4.119)
Relative number of family members^{++++}	1.563	0.843	-7.553		0.0915
	(7.068)	(7.523)	(10.51)		(7.958)
Responsibility for own fate^{+++++}	154.4	132.8	107.3	130.0	149.2
	(112.8)	(122.0)	(157.0)	(122.2)	(129.6)
Always somebody in the village who helps $^{+++++}$	-127.4	-105.4	-131.0	-101.0	-95.84
	(116.1)	(113.7)	(141.8)	(113.9)	(121.0)
Payoff game 1	-0.0232	-0.0132	-0.0142	-0.0119	-0.00752
	(0.0188)	(0.0137)	(0.0168)	(0.0137)	(0.0143)
Session size	-6.121	14.05	-8.623	18.32	9.430

	(36.22)	(28.29)	(34.80)	(27.96)	(30.09)
Average age per session	0.870	8.275	-18.18	8.908	7.223
	(23.18)	(23.12)	(32.12)	(22.64)	(24.56)
Average number of female participants	-35.42	342.1	1,025	398.4	444.2
per session	(412.6)	(486.1)	(643.4)	(479.9)	(514.4)

Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
+ Months enough to eat during the last year
+++ Dummy variable: (1= yes, 0= no)
+++ "Shock" refers to illness, accident, fire, theft, natural disaster
++++ In relation to the session size
+++++ 1= strongly agree - 4= strongly disagree

Table C.3: Sender and receiver dummies for the transfer regressions in table 6

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Sender A & receiver C	-5.945	-30.45	-70.46	-30.44	
	(34.53)	(56.95)	(119.0)	(56.95)	
Sender A & 2 receivers B B - receiver B	-85.14***	-91.98	-99.79	-91.94	
	(29.66)	(57.16)	(119.2)	(57.15)	
Sender A & 2 receivers B C - receiver B	-74.63**	-88.54	-116.6	-88.50	
	(29.80)	(57.15)	(119.3)	(57.14)	
Sender A & 2 receivers - B C receiver C	-71.63**	-88.54	-125.1	-88.50	
	(34.37)	(57.15)	(119.4)	(57.14)	
Sender A & 2 receivers C C - C receiver	-73.13**	-89.68	-125.1	-89.65	
	(30.97)	(57.15)	(119.4)	(57.14)	
Sender B & receiver B	438.8***	323.2***	247.8**	324.0***	
	(151.5)	(68.03)	(125.0)	(68.02)	
Sender B & receiver C	374.5**	266.6***	191.6	267.4***	
	(150.1)	(68.08)	(125.0)	(68.07)	
Sender B & 2 receivers B B - receiver B	253.0*	141.6**	54.29	142.3**	
	(140.1)	(68.18)	(125.1)	(68.17)	
Sender B & 2 receivers B C - receiver B	279.9*	173.5**	91.76	174.3**	
	(143.4)	(68.15)	(125.1)	(68.14)	
Sender B & 2 receivers B C - receiver C	238.7*	127.2*	38.55	128.0*	

	(143.0)	(68.19)	(125.1)	(68.18)
Sender B & 2 receivers C C - receiver C	240.3*	122.4*	40.97	123.2*
	(142.4)	(68.20)	(125.1)	(68.19)
Sender C & receiver B	976.0**	257.5**	166.4	260.8**
	(379.2)	(129.3)	(174.5)	(129.3)
Sender C & receiver C	1,034***	306.4**	218.1	309.8**
	(392.4)	(129.2)	(174.4)	(129.2)
Sender C & 2 receivers B B - receiver B	1,034**	311.8**	223.8	315.2**
	(408.6)	(129.2)	(174.4)	(129.1)
Sender C & 2 receivers B C - receiver B	1,005**	284.7**	195.1	288.0**
	(414.6)	(129.2)	(174.5)	(129.2)
Sender C & 2 receivers B C - receiver C	1,034**	311.8**	223.8	315.2**
	(413.7)	(129.2)	(174.4)	(129.1)
Sender C & 2 receivers C C - receiver C	946.9**	230.2*	137.5	233.5*
	(414.5)	(129.4)	(174.6)	(129.3)

Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table C.4: Transfer differences based on matching results according to the network size in the session

	Obs. resettled players	**Ob. non-resettled players**	**Average treatment effect on the treated***	**Std. err.**	**T-value**
Stratification method	456	294	-283.07	58.20	-4.86
Nearest neighbour (random draw)	456	180	-391.62	81.88	-4.78
Kernel matching (with bootstrapping ,repetitions 50)	456	300	-314.59	145.34	-2.16
Radius matching (0.01)	390	192	-163.20	72.33	-2.26

Notes: * If the common support option is specified the average treatment effect on the treated is also significant for all matching methods.

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Playing with the social network: Social cohesion in resettled and non-resettled communities in Cambodia

Abstract
Mutual aid among villagers in developing countries is often the only means of insuring against economic shocks. We use "lab-in-the-field experiments" in Cambodian villages to study social cohesion in established and newly resettled communities. Both communities are part of a land distribution project. The project participants all signed up voluntarily, and their socio-demographic attributes and pre-existing network ties are similar. We use a version of the "solidarity game" to identify the effect of voluntary resettlement on willingness to help fellow villagers after an income shock. We find a sizeable reduction in willingness to help others. Resettled players transfer on average between 47% and 74% less money than non-resettled players. The effect remains large and significant after controlling for personal network and when controlling for differences in transfer expectations. The costs of voluntary resettlement, not only monetary but also social, seem significantly higher than is commonly assumed by development planners.

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