

Minority Status and Investment: Evidence from Natural and Lab Experiments in Bosnia and Herzegovina¹

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Abstract: This study explores how minority status influences individual decisions about investment in a post-conflict society. The study is based on multiple sources of evidence from Bosnia and Herzegovina. First, we exploit an exogenous imposition of minority and majority positions by an as-if random adjustment of an administrative boundary and analyze household and business surveys. Second, we run a “lab-in-the field” experiment. The analysis shows that both actual and experimentally induced minority statuses are associated with lower levels of investment. Evidence suggests the perception of discrimination by the government, and not actual discrimination, as the plausible cause of such behavior. Several implications follow: emergence and persistence of segregated ethnic businesses, underinvestment and a basis for horizontal inter-group inequality that could increase the probability of a conflict.

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Introduction

This study explores the effect of belonging to an ethnic minority group on individual decisions to invest in a post-conflict society. Recent literature on the link between ethnicity and economic outcomes has mostly sought to explain variation in levels of public goods provision (Easterly and Levine 1997; Miguel and Gugerty, 2005; Montanalvo and Reynal-Querol 2005; Habyarimana et. al. 2007, 2009; Esteban et al. 2011; 2012). This is an important, but only partial outcome of the economic behavior. Little attention has been given to explaining variations in savings and investment patterns, which economists consider crucial to economic growth (Acemoglu 2008; Banerjee and Duflo 2005). Our research aims to fill this gap and thus contribute to the studies of the phenomena that lay both on the right and the left-hand sides of the equation of interest, namely investment and ethnicity.

In the standard political economy literature, investment is modeled as a function of credit constraints, market competition, security of property rights, risk preferences and time horizon (see the review in Dixit and Pindyck 1994). These studies do not explicitly consider social and political factors of investment, which include networks, trust and other-regarding preferences, even though these factors play a crucial role in shaping investment decisions in the developing world (Banerjee and Duflo 2005, De Mel et al. 2008, Breza et al. 2013). One important exception is a study by Voors et al. (2012) who explored the role of ethnic conflict on saving and investment decisions. They found that exposure to violence leads to more altruistic behavior and increases risk seeking. However, their scope is limited to the effects of extreme shocks rather than more fundamental persistent factors of economic behavior. We argue that ethnic identity is one such factor.

The meaning and interpretation of ethnic identity has been contested (see Chandra 2004, Laitin 1998, Fearon and Laitin 2000). Some scholars argue that ethnic identity cannot be used as an independent variable since ethnic identities are social constructs and therefore are endogenous factors. Yet, following van Evera (2001), we argue that ethnic identities can be taken as independent variables particularly in the case of post-conflict societies where such identities are highly salient and stable. In

such contexts, ethnic identities can be considered exogenous variables, minimizing potential problems stemming from reverse causality.

Our contribution to understanding ethnicity begins with our departure from a common approach in the literature, which focuses on the effect of membership in a particular ethnic group (Habyarimana et al. 2007; Chandra 2012). We instead investigate the dynamic between majority and minority identities, a powerful division in many multi-ethnic societies. In doing so, we also diverge from studies on ethnic politics that both theoretically and empirically compare ethnic groups solely on the basis of ethnic differences rather than also considering the groups' differences in terms of size, social status, wealth, and political power. In divided societies, these characteristics are especially pronounced between ethnic majorities and minorities.

History is replete with stories of successful entrepreneurs who were ethnic minorities in their host countries (Fafchamps 2000). Maghribi traders, Jewish merchants in Medieval Europe, and Chinese merchants in Southeast Asia are among the most colorful cases (Greif 1993; Stow 1994; Chirot and Reid 1997; Jesudason 1989). However, anecdotal evidence also reveals many stories of disadvantaged minorities group with Blacks in the US as the most obvious reference (Myrdal 1944; Becker 1957; Light 1972). Between-group inequality has profound effect on political and economic development, but studying its causes is a very difficult task. The fundamental problem is that minorities are unlike majorities in many unobservable ways. Identities are deeply embedded in societies, and group positions are contextual and path dependent. Therefore, isolating the effect of ethnic identities is hard, but is also a very important endeavor for better understanding economic and political development.

The first attempt to study the implications of this dimension of ethnic identity was done by Gurr (1995) with Minorities at Risk Project. More recent studies based on the new dataset on Ethnic Power Relations find relative group positions, especially in access to political power, as strong predictors of civil wars, coups and economic growth (Wimmer et al. 2009; Cederman et. al 2010). However, these studies look only at the outcomes of the group positions on the aggregate (usually national) level and do not explore the individual effects. In contrast, we follow the strategy of social psychology literature that systematically explores the ethnic minority-majority asymmetry in beliefs, attitudes and behavior (Staerke et al. 2010).

We hypothesize that identification with an ethnic minority leads to preferences for consumption instead of investment either due to the lack of trust in government institutions, which are controlled by “another” ethnic group or due to negative inter-ethnic attitudes.

We test our ideas with evidence from Bosnia and Herzegovina (hereafter BiH) – one of the classical examples of divided societies.⁴ First we look at the large-N survey data collected in BiH from 2000 to 2010 by the UNDP. The data indicate that there is a negative correlation between minority status and expectations to save money, which is the necessary precondition for investment.⁵ This evidence gives tentative support to our logic, but one can hardly make any causal inferences from these data because majority and minority positions are confounded by many important contextual factors, such as well being or education.

To isolate the role of minority status we rely on naturally occurring and experimentally induced exogenous variations in the ethnic group status. The natural experiment we exploit is the result of the as-if random imposition of the Inter-Entity Boundary Line (IEBL) – a boundary between two autonomous entities of Bosnia and Herzegovina – the Federation of the Bosnia and Herzegovina (hereafter FBiH) and Republika Srpska (hereafter RS). First, we restrict the UNDP data to the municipalities adjacent to the IEBL and reanalyze the relationship between minority status and expectations on savings. Second, we conduct an original household survey, (N = 350) which contains questions about preferences for investment, in close proximity to the boundary in two municipalities where the adjustments were especially important. Third, we conduct 64 in-depth interviews with Bosniak entrepreneurs, who operate in FBiH (where Bosniaks are majority) and in RS (where Serbs are majority) to understand the investment behavior on the firm level and uncover the motivation for it. Finally, to isolate the causal effects of co-ethnicity bias, minority status and perceptions of discrimination we constructed a novel lab-in the

⁴ Previous studies in the Bosnian context have already provided interesting findings on behavior in divided societies: Whitt and Wilson (2007) using dictator game showed that 10 years after the end of the war there is a strong tendency to fairness in inter-ethnic interactions, and Alexander and Christia (2011) using public goods experiments evidenced that the introduction of institutions of integration positively affects cooperation between ethnic groups.

⁵ See Appendix A for the description of the data and analysis of it.

field experiment, based on the modified Investment Game (Berg, Dickhaut and McCabe 1995).⁶ Analyzing the experimental data we follow a conservative estimation strategy, proposed by Green and Tusicisny (n.d) that allows us to diminish potential statistical biases, largely ignored by the previous studies.

Results gathered from the analysis of the different sources of evidence showed that ethnic identity indeed has a profound effect on economic behavior. Surveys revealed that minorities are less likely to save and invest and that minority businessmen are less likely to expand their businesses. Both household and business surveys indicated that the main driver of this behavior is lack of trust in governmental institutions, but not a distrust of the majority ethnic group. Results from the lab-in-the field experiment validate these findings: individuals have no difference in investment behavior playing with co-ethnics and non-co-ethnics, except under the condition when an ethnically biased institution puts them in the minority position.

Hypotheses

As it was proposed by Akerlof and Kranton (2000), we incorporate ethnic identity in the utility function to model economic behavior of people in divided societies.⁷ We assume that a person's expected returns from investment is the function of the objective economic indicators of the household, including capital and credit constraints; personal preferences towards investment and consumption, including risk preferences; and identity, which in our study is a dichotomous variable that distinguishes between belonging to a majority ethnic group and being a member of a minority group.

Our main hypothesis states, that *ceteris paribus*:

H(1) minorities are less likely to invest in economic assets than majorities;

The mechanisms that link minority ethnic identity and underinvestment in productive activity are hypothesized to be in the dimension of trust. Trust is an important factor of economic behavior because it affects individuals' time-horizon, risk preferences and ultimate sense that their investments are secure, as well as a

⁶ Both surveys and experiment were implemented in January of 2013.

⁷ Important applications of Akerlof and Kranton model in political science include Penn (2008), Shayo (2009) and Dickson and Scheve (2010).

willingness to cooperate with other potential investors and government (Greif 1993). We distinguish between in-group and out-group trust and trust in governmental institutions. We formulate two competing hypotheses:

H (2) minorities have less trust in the out-group;

H (3) minorities have less trust in governmental institutions controlled by the out-group.

Identification strategy

We test our ideas with multiple sources of evidence from Bosnia and Herzegovina (BiH) – a classic example of divided societies.⁸ The site selection was driven not only by substantial interest, but also by important methodological reasons. The effect of belonging to a minority ethnic group on investment behavior is difficult to estimate with observational data due to the omitted variables problem and self-selection. Indeed, belonging to an ethnic group, as well as states' and communities' ethnic compositions, are not assigned randomly and are associated with many important characteristics that might or might not be observed by a researcher.

We argue that the political history of BiH presents an opportunity to partially solve this problem by studying the exogenous imposition of majority and minority statuses in a situation that can be considered a natural experiment. In 1992-1995 the country experienced a full-fledged ethnic civil war (see Peterson 2002; Weidmann 2011; Christia 2012; Novta 2013). The war ended with an internationally assisted peace settlement that resulted in the creation of two self-governing entities: the Federation of the Bosnia and Herzegovina (Bosniak-Croat Federation) and Republika Srpska (a predominantly Serbian entity) within one federation state. The central government in the new state is only responsible for foreign policy, foreign trade, customs, immigration, monetary policy, defense and communications. The entities' governments have de facto authority over taxation, health, internal affairs, justice, energy and industry, education, spatial planning, natural resources and the environment (Constitution of Bosnia and Herzegovina: Article III). Although on the *federal* level all three main ethnic groups (Bosniaks, Serbs and Croats) are

⁸ Bosnia and Herzegovina is characterized by the highest in Europe indexes of ethnic (0.63), language (0.67) and religious (0.68) fractionalization (Alesina et al. 2001).

represented equally, ethnic dominance of the majorities on the *entity* level creates interesting within-country variation in ethnic identities repertoire. Considering that after the war all ethnic groups have been in a similar economic situation without noticeable inequality⁹, the effect of this variation in ethnic identities can be isolated from the wellbeing on the group level.

The Inter-Entity Boundary Line (IEBL) that separates FBiH and RS was demarcated at the Dayton Peace conference. Its adjustments from the latest cease-fire frontline were driven by a pure political reason: it was a plan to divide the territory by the *Sacred Percentage* (Holbrook 1998, 299) – 51% to Federation and 49% to RS. To do so, at some segments the politicians drew the boundary line almost arbitrarily, without regard for the ethnic composition. This process of boundary imposition is perfectly illuminated by a quote from Slobodan Milošević, the wartime president of Yugoslavia: “Give me anything... rocks, swamps, hills – anything, as long as it gets us to 49-51%” (quoted in Holbrook 302). As a result of this approach, the IEBL boundary has right angles and sometimes even divides private property between the two entities. Dividing communities and municipalities in the historically highly ethnically mixed country, the line also divides ethnicities into minorities and majorities, which presents a natural experiment (Posner 2004b; Miguel 2004; Peisakhin 2012; Berger n.d). For example, when the line cuts through a prewar municipality, people left on one side of it became a majority in their entity, but people (of the same ethnicity) who are left on the other side became a minority in their new constructed municipalities, although they live in neighboring villages and there is no actual border on the ground.¹⁰

The fact of this exogenous separation of the communities presents a great opportunity to study identity formation and its consequences that took part simultaneously with state-building processes and therefore helps to isolate most of the contextual factors. Although we admit the possibility of a bias introduced by sorting

⁹ World Bank 2001 Living Standards Measurement Survey

¹⁰ Today the IEBL between RS and the FBiH is no longer controlled by the military and is not policed. There are no border controls, and crossing the IEBL is akin to crossing a U.S. state or Schengen state boundary. One of the locals describe crossing IEBL as follows: “I do not know when I am crossing to another entity before I see signs in different script”.

and self-selection, especially since the war led to mass displacement¹¹, we argue that this concern is partially mitigated by the policy of reclaiming property after the war.¹² Nearly half of all returning to their prewar municipalities are minorities (Tuathail and O’Loughlin 2009); this fact helps alleviate the self-selection bias. Furthermore, minorities and majorities in our data do not differ on such indicators as length of residence and percentage of majorities and minorities living in the same place now as they did before the war (see Table 2 in the APPENDIX B). In addition, we argue that potential sorting and self-selection are most likely to drive the results of the test of our hypothesis to zero or in the opposite direction of what we predict. It seems plausible that minorities who stay in the areas, which they could easily leave, are more comfortable under these conditions.

Household surveys

After the war Bosnia and Herzegovina was subjected to intense monitoring by different international organizations and NGO’s. As a result we have a rich description of economic and political developments in the country. Arguably, the most comprehensive quantitative portrayal of the country’s socio-economic and political characteristics is provided by the Evaluation Office of the United Nations Development Program (UNDP). Since 2000, UNDP has commissioned quarterly surveys of perceptions and opinion of a cross-section of the Bosnian population in different parts of the country. The surveys span questions on politics, institutions, the business environment, income and social welfare, social inclusion, ethnic relations and public and personal safety. The data, which is probably the largest database of evolving public opinion in BiH history, recently became public and we start our analysis with it.

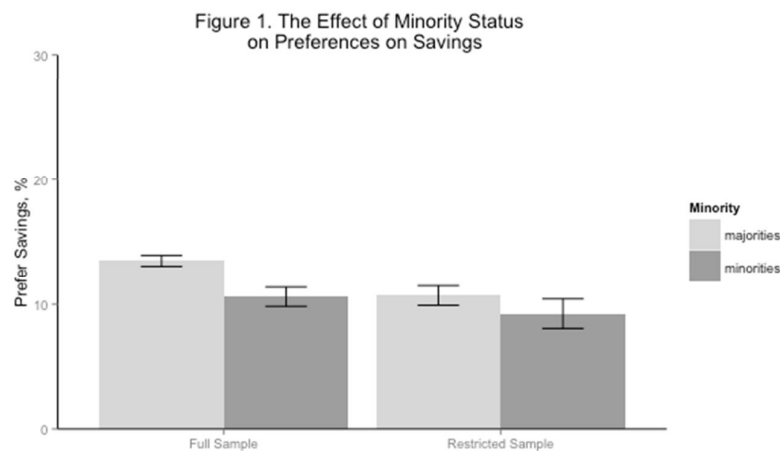
¹¹ The war led to the displacement of over a million people among whom an estimated 110,000 people remained internally displaced by 2013.

¹² Annex VII of the Dayton Peace Accords outlined principles for the potential reversal of the demographic consequences of the conflict. Paragraph one of article one declared: “All refugees and displaced persons have the right freely to return to their homes of origin. They shall have the right to have restored to them property of which they were deprived in the course of hostilities since 1991 and to be compensated for any property that cannot be restored to them.”

The data of more than 66,000 observations contain several indicators important to our study. First and foremost, the data explicitly identify majority/minority status of the respondents. This variable indicates whether an ethnic group to which a respondent belongs is in the numerical majority on the municipal level. We use it as an independent variable. As the main outcome variable we use the measure that comes from the question as to whether the household plans to save money in the next year. Savings are the necessary preconditions for investment and therefore preferences for savings would tell us about the potential for investment.

As we noted in the introduction, analysis indicates that there is a negative correlation between minority status and expectations to save money. The relationship holds after we control for entity, ethnicity, employment status¹³, education, gender, age, settlement type (i.e., rural or urban) and time effects.

However, as we also stated before, minority status can be confounded by the unobservable characteristics. To isolate the effect of minority status we restrict the data to the municipalities adjacent to the IEBL and run all models again. Analysis of the restricted data with plausibly exogenous minority status also produces negative relationship between minority status and expectations on savings (see Figure * and Table 1 in the Appendix A).



Because municipalities are relatively large units, majorities and minorities even in this geographically restricted data are different on many observable characteristics.

¹³ We use employment as a measure for income, since income measure is unreliable

In order to provide stronger and more conservative identification we conduct an additional original household survey, which specifically addressed the questions about investment preferences.

To minimize the difference between two groups we surveyed respondents in locations closest to each other on both sides of the IELB in two particular municipalities – Sanski Most and Prijedor, where adjustment of the administrative divisions after the war was especially intense.¹⁴ During the course of the war these territories were under Serbian control, but in the very end of the war, Bosniak forces took Sanski Most under their control (see the change in the frontline in Figure 1 in Appendix B). During the Dayton conference the fate of these two municipalities – whether they would belong to RS or FBiH – was a highly contested issue and the location of the borderline was uncertain (Belloni 2005). We build our sample for an original household survey in close proximity to this fragment of the boundary line. See map of the research site in the Figure 2 in Appendix B.¹⁵

The survey relied on a sample (N=350) blocked by majority/minority statuses and the ethnicity of the respondents.¹⁶ Balance tests on the observables between minority and majority groups in our sample are presented in Table 1 in Appendix B in Supporting Information.

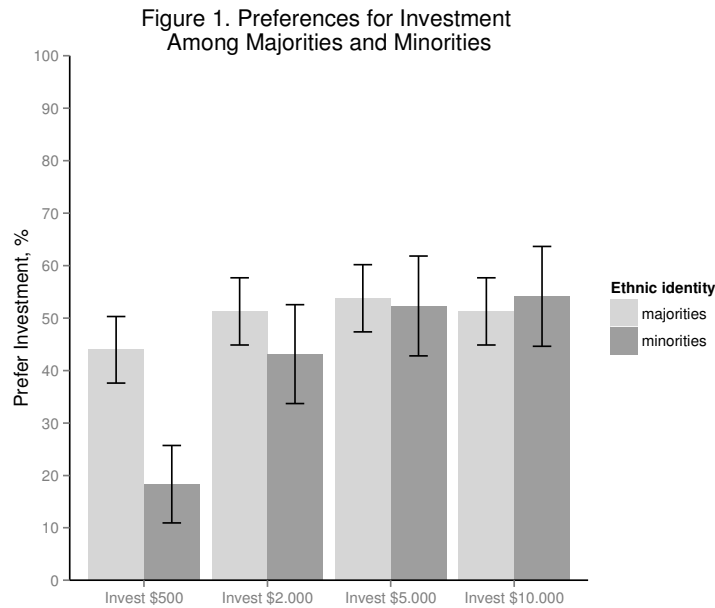
The survey contains 72 questions on a household's economy, respondents' attitudes towards different ethnic groups, their political preferences, war experience and basic demographic information. The main explanatory variable of our study – belonging to a minority versus majority ethnic group -- is embedded in the design. Relying on the highlighted empirical strategy we test the effect of nearly random imposition of minority statuses on the outcomes of interest. The main dependent variable of the study is the preference for investment over consumption. We measured this with a set of hypothetical questions about respondents' behavior if he

¹⁴ The survey was conducted in Sanski Most, Prijedor, Koprivna, Lusci Polanka, Donja Puharska, Podlug and Kozarac situated along one segment of IEBL both in Federation of BiH and RS. See map of the locations in the Figure 3 in Supporting Information.

¹⁵ The map was drawn with the data from Nils B. Weidmann, "Replication data for: Violence "from above" or "from below"? The Role of Ethnicity in Bosnia's Civil War", <http://hdl.handle.net/1902.1/16335> V1 We are thankful to Nils Weidemann for making the data available.

¹⁶ The sample was not random, since we do not have reliable information on the general population. The response rates were about 80% for majorities and about 60% for minorities. In our sample we have only Serbs and Bosniaks and excluded Croats.

or she were given \$500, \$2,000, \$5,000 and \$10,000: consume or invest. Figure 1 depicts the means for all four outcomes.¹⁷



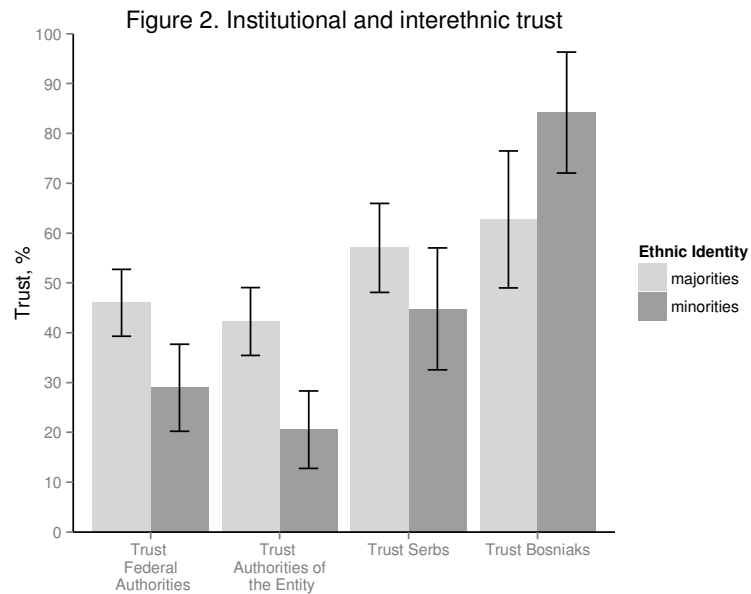
The analysis shows that belonging to a minority ethnic group is a strong predictor of respondents' preference for consumption over investment for the sums of \$500 and \$2,000. Moreover, ethnic identity has the highest predictive power in the models that include basic socio-demographic and economic variables. To check for robustness of the effect we use the matching technique (Ho et al. 2007), which aims to minimize the difference between groups in the most important observable characteristics, including gender, age, education, nationality, employment status, income, time of residence and exposure to violence (see Table 2b in the Appendix B)¹⁸. Analysis of the matched data confirmed the results gained from baseline estimation: minorities are more likely to spend the hypothetical sum of money of \$500, \$2,000 and \$10,000.

To test the two hypotheses of the lack of interethnic and institutional trust as the main determinants of underinvestment in productive activity, we estimate the effect of

¹⁷ Results of the estimation of the full models of the predictors of investment decisions are presented in Table 2 in the Appendix B in Supporting Information.

¹⁸ Most importantly, matching highlights that minorities and majorities do not differ in terms of time of residence – most of them were born in the locations where they are currently living, that partially mitigates the concern of sorting.

belonging to the minority on trust in federal and entity governmental bodies and towards another ethnic group (Figure 2).

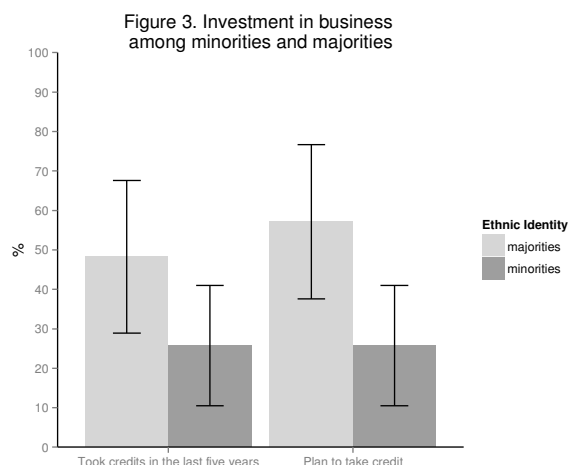


Testing the predictors of institutional trust shows that belonging to the minority has a strong negative effect on support for authorities both on the federal and entity level of government. Distrust of the authorities on the federal level is especially striking because in contrast to ethnically dominated governments on the entity level, all federal bodies of government equally represent all three ethnicities of Bosnia and Herzegovina and are extensively monitored by the international organizations (Constitution of Bosnia and Herzegovina: Article III). In turn, contrary to our hypothesis, analysis does not show inter-ethnic distrust among minorities – the negative effect of minority status on trust in Serbs vanishes when adjusted for controls and estimated with matched data. Moreover, Serbs who are in the minority have higher out-group trust, even adjusted for covariates and matching (see Tables 3 and 3b in the Appendix B).

Business Survey

We next explore the link between belonging to a minority and underinvestment among people who are actually involved in entrepreneurship and for whom questions about investment are not just hypothetical. In order to do this, we conduct an additional detailed business survey. Our sample consists of 64 entrepreneurs (Bosniaks) lived in the town of Prijedor¹⁹ before the war, some of whom returned after the war to the town, which became part of RS, and some stayed in FBiH.²⁰ Table 1 in Appendix C shows that the two groups of respondents are balanced on the key observable characteristics.

The main outcome measures of the survey were the record of their credit history and their plans to take on additional credit in the future. We found a clear pattern of underinvestment among minorities: controlling for the income level and other relevant predictors, Bosniak businessmen in RS, where they are the minority, are less likely to have taken credit in the past and are less likely to take on credit to expand their business in the future (see Figure 3 and Table 2 in the Appendix C).

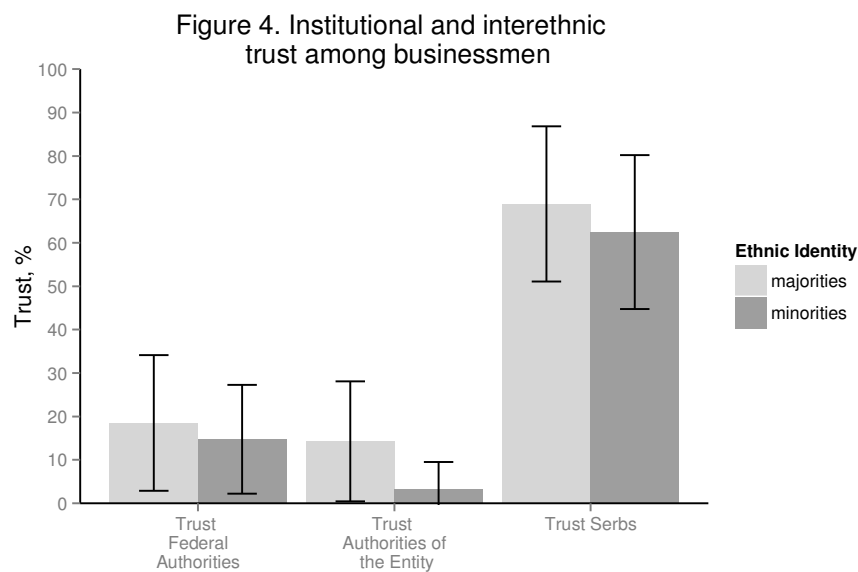


In the interviews with entrepreneurs, none of the minority respondents acknowledged any actual cases of ethnic discrimination by the authorities against

¹⁹ Respondents for this survey were recruited through the procedure of snowball sampling. All respondents were asked the questions from the standard household survey plus specific questions on their business.

²⁰ On 30 April 1992, after Serb forces took control over Prijedor, thousands of non-Serb civilians were confined in concentration camps. Source: The International Criminal Tribunal for the former Yugoslavia (ICTY).

them or their business.²¹ At the same time, many of them still named the unfriendly environment as the main factor of why they do not expand their businesses. Analysis of the determinants of trust in authorities shows that belonging to a minority ethnic group significantly reduces trust in the government, especially on the majority-dominated entity level. And again analysis shows that distrust in the authorities is not accompanied by anti-Serbian sentiment – Bosniak entrepreneurs in RS do not differ in their views towards Serbs from their counterparts in FBiH. Results are presented in Figure 4.



Experiment

Setup

Both the household and business surveys conducted along the as-if random boundary line dividing RS and FBiH indicate that belonging to a minority is associated with lower probability of investment, measured with hypothetical questions and actual reported behavior. To provide an additional test of our hypotheses we experimentally induced minority status with a lab-in the field experiment²², based on

²¹ This fact is validated by the reports of OSCE on the enforcement of the State Law on the Prohibition of Discrimination.

<http://www.mhrr.gov.ba/PDF/LjudskaPrava/ZakonOZabraniDiskriminacijaNacrt.pdf>

²² Experimental protocols are presented in the Appendix D.

the modified Investment Game (Berg, Dickhaut and McCabe 1995), which serves as a good predictor of financial decisions (Karlan 2005).

The game was played online on a Z-Tree interface in specially organized computer laboratories in two locations – Sanski Most, FBiH with a predominantly Bosniak population and Koprivna, RS with a predominantly Serbian population.²³ Thus we only have majorities as the subject of the experiment. The sample of subjects consisted of 240 people, recruited randomly on the streets.²⁴

The basic setup of the game is as follows: a player A is given an initial endowment²⁵ and must decide what portion of it to send to a counterparty and what portion to keep. Subjects are informed that the amount sent is multiplied by four and then given to a recipient – player B, who then himself decides how much money to keep and how much money to return. All subjects are divided into groups of 8 players. Each subject plays four rounds of the game with randomly selected counterparts²⁶. And counterparts change every round to diminish the effect of reputation and endowment in repeated interactions.

The experiment was conducted for two groups – ethnically homogenous and ethnically mixed, i.e. half of the subjects played with their co-ethnics (Bosniaks play with Bosniaks) and half played with the representatives of another ethnic group (Bosniaks play with Serbs). In all cases subjects understand each other's ethnicity by randomly assigned fictional last names with clear ethnic connotation.²⁷ This set up aims to test the presence of co-ethnic bias established in many behavioral experiments (Fershtman and Gneezy 2001; Habyarimana et al. 2007).

Our experimental manipulation is based on the random assignment of the groups of subjects to three conditions.²⁸ Players who were assigned to the control group played the standard version of the investment game. Two “sanctioning” treatments introduced a third-party player who was said to be able to punish other players for “non-fair” behavior (Charness et al., 2008). The two treatments differed

²³ Before the war both places were belonging to one municipality, but after the imposition of the IEBL one of them remained in the municipality Sanski Most and another became a part of Ostra Luka.

²⁴ Agreement to participate was very high (more than 90%). We attribute this to the monetary incentives – all subjects received a show-up payment that equals 3KM, which is equivalent to the average hourly salary in the region.

²⁵ The players were given points that were later changed for the local currency KM at a fixed rate.

²⁶ Participants do not know the exact number of rounds they are going to play.

²⁷ All names were pre-tested by native speakers, to ensure their ethnic identifiability. The first names were not used to avoid gender-bias. Here we follow the experimental protocols from Alexander and Christia (2011).

²⁸ Random assignment of the groups to the treatments was provided via a computer algorithm.

only in third party identity. In the neutral treatment, the enforcer was anonymous, and in the biased-third party treatment, an enforcer's fictional name had an obvious cue to ethnicity²⁹. In fact, the “third party” had no discretionary power – under both conditions it invariably punished the players if they sent or returned less than 40% of the amount. Nevertheless, in the mixed setting the introduction of the ethnically biased enforcer allows us to induce the majority/minority statuses, because under this treatment one of the players faces not only a counterpart from a different ethnicity, but also an enforcer from the same opposite ethnicity and therefore the game can be seen by the player as 1 against 2, with the first player in minority and the second in majority. In this setting under the biased enforcer treatment with a cue to Serbian name, Bosniaks become the minority and Serbs the majority. This can be considered as a hard test for our hypotheses, since in real life all players are ethnic majorities in their respective entities, and only the experimental manipulation puts them into a minority position.

In the context of the game we expect the players randomly assigned to the minority position, i.e. play with non-co-ethnics under non-co-ethnic supervision, to invest at the medium rate that will be considered “fair”, but not to reach the optimal investment level due to the fear that the discriminatory behavior of their counterpart won't be punished by his or her co-ethnic. As a result we expect “minorities” to invest less than the people, who were assigned to be supervised by the neutral enforcer. The outline of the experiment is depicted in Table 2.

Table 2. Experimental Setup

	Control group (No Enforcer)	Neutral Enforcer	Biased Enforcer
Bosniaks vs Bosniaks (4 rounds)	Co-ethnicity	The effect of enforcement for co- ethnics	Minority is playing with minority
Bosniaks vs Serbs (4 rounds)	Non- Co- ethnicity	The effect of enforcement for non- co-ethnics	Bosniaks in minority / Serbs in majority

²⁹ We used a typical Serbian last name Dushanić whose ethnic identifiability was pre-tested by native speakers.

Analysis

Usually analysis of the average treatment effects in behavioral games is based on a difference-in-means estimation or regression of the outcomes of the treatment. However, for identifying the treatment effects in sequential games and repeated games, which we are using for our experiment, such approach might lead to bias (see Green and Tuscisny n.d. for a comprehensive critique).

Establishing the treatment effects in the sequential game is a challenging task, because the second mover (player B) is in fact presented with two treatments, an assigned treatment, introduced by a researcher, and the amount that the first mover sends, which a researcher could not control. This situation violates the excludability assumption because the treatment effect of interest is confounded by the amount that the first player contributes. Therefore, in order to recover the true ATE for the behavior of the second player we use the fully saturated models that include the constant, an indicator for the treatment (which in our case affects both the first and second mover because the assignment of treatment was provided on the group level), the indicator of the amount sent by the first player and all possible interactions between them.

We focus our analysis on the percentages of sent amounts of money in the first round of the game, which are the clearest outcomes of the experimental treatments.³⁰ For these outcomes we estimate the saturated models. Then we turn to the analysis of the other three rounds of the game that is based on simple OLS regressions adjusted for covariates³¹. Finally, since the randomization was provided on the group level we use clustered robust standard errors. Results of the estimation of the full models are presented in Appendix E.

To establish the effect of the induced minority and majority statuses we estimate the difference-in-means between the amounts of money sent and returned under two third-party treatment groups in the mixed setting. Results of the analysis shows that

³⁰ We use percentages rather than amounts of money sent and returned as the main outcome variables because it is easier to interpret them.

³¹ The fully saturated model in this case would include the constant, an indicator for the treatment, the amount of send and return in all the previous rounds and all interactions between them. Estimation of such model is associated with an extremely high number of degrees of freedom and is impossible with the size of our sample.

the inducement of minority status produces an approximately 6.5 percentage point decrease in money sent in the first round. (Results are presented in Table 3).

Table 3. Experimental Results

	A. Control group (no enforcer)	B. Neutral Enforcer	C. Biased Enforcer	Difference of Means C-B
D. Bosniaks vs Bosniaks	41.45	50.60	49.74	-0.86 (1.77)
E. Bosniaks vs Serbs	48.06	61.58	55.02	-6.58** (2.41)
Difference of means D-E	-6.6 (5.89)			

Note: The table contains the results of the difference-in-means estimations of the average treatment effects on the percentage of money sent in the first round of the Investment game across different experimental conditions by Bosniak players. Matrix cell CE contains the result of the induced minority status, which is contrasted with the effect of the biased enforcer for subjects who play with non-co-ethnics. Robust standard errors are presented in parentheses. (Std. Err. adjusted for clusters in experimental groups); *** p<0.01, ** p<0.05, * p<0.1

Results of the test of the main hypotheses for all four rounds with adjustment to covariates show that the pattern holds: minorities send from 6 to 10 percentage points less than subjects who just played with non-co-ethnics with the unbiased enforcer (Table 5 in the Appendix E).

The impact of minority identity is especially striking if we compare it to the average treatment effects for the full sample. Except in the settings that introduce minority and majority positions, the ethnically biased enforcer has no statistically significant influence on players' behavior. In contrast, the neutral enforcer has a consistent positive effect that is especially pronounced for the ethnically mixed groups where the treatment causes an increase in 5 percentage points for sending money (significant at 10% level) and almost 20 percentage points increase in returning money (significant at 5% level). See Tables 6 and 7 in the Appendix E.

For the descriptive purposes we also compare the means of the main outcomes for ethnically homogenous and mixed groups. Surprisingly, we find that playing with co-ethnics is associated with lower percentage of money sent (-11.5; $p < 0.01$ for the full sample and also negative, though insignificant for Bosniak players; see Table 8 in the Appendix E) in the first round and is not related to the percentage of money returned in the first round. In other words, we do not observe co-ethnicity bias; moreover regarding trust we see positive discrimination of the out-group.³²

Discussion

The analysis of the multiple sources of data has established a strong relationship between ethnic minority status and underinvestment in Bosnia and Herzegovina. The large-N survey conducted by the UNDP indicated that there is a negative correlation between minority status and expectations to save. The analysis of the restricted data from the ethnically mixed areas divided by the exogenously imposed boundary, provides evidence that this relationship might be causal. Additional original survey around the same boundary showed that people who hold a minority status tend to prefer consumption to investment, perceiving the business environment as hostile and distrusting authorities. Interviews with the businessmen, half of whom returned after the war to their hometown, which had become part of the Serbian entity, and therefore turned to be minorities, and half of whom stayed in the Bosniak-majority entity, gives us additional insights into the link between ethnic identity and economic behavior. We found that despite the absence of any actual discrimination against them, minorities tend to perceive the business environment as discriminatory. The attitudes are accompanied by actual reported behavior: minorities took on less credit for the expansion of their business and were also less likely to plan to take on credit in the future. As a result, minorities' businesses only provide subsistence for their households. Further, we found that distrust in the government, but not out-group hostility (in our case anti-Serbian sentiment), is a plausible mechanism that linked ethnic identity to economic behavior. The lab-in-the-field experiment confirmed the results of our observational studies. Most importantly, we found that even artificially

³² Since our research focuses on the effect of belonging to a minority rather than the effect of playing with co-ethnics, we do not randomize which players assign to what condition. Therefore, we do not pretend to give any causal interpretation of the co-ethnicity factor, but rather assess the effects of our treatments for both ethnically homogenous and mixed conditions.

induced minority identity leads to a decrease in the amount of money transfers, which are understood as a measure of trust. Because there was no difference in third-party behavior between neutral and biased treatment, we argue that main driver of distrust and underinvestment is the *perceived discrimination or alienation from the state*. This finding contributes to our understanding of the importance of institutions for the establishment of cooperation in divided societies (Lijphart 1977; Miguel and Gugerty 2005; Elkins and Sides 2007; Alexander and Christia 2011) and the role of the sense of security for development (Bates 2001).

Substantively large and statistically significant positive effects of the introduction of the neutral third-party for trust and trustworthiness in ethnically mixed groups also gives support to the idea of the principal role of institutions that can solve the credible commitment problem between ethnic groups (Fearon 1998).

The experiment elicited another interesting pattern: we found no co-ethnicity bias, which has been established in other settings (Fershtman and Gneezy 2001; Habyarimana et al. 2007). Moreover, we even provide some evidence that there exists positive discrimination against out-groups. This can be interpreted either as a manner of enforcing of the norm of fairness across ethnic lines (Whitt and Wilson 2007), or, alternatively, or an expression of social desirability bias. This finding corresponds to the absence of any difference in ethnocentrism and out-group hostility between minorities and majorities from the household and business surveys. Thus, we can conclude that minority ethnic identity affects economic behavior not through other regarding preferences, including inter-ethnic trust, but rather through institutional trust.

The similar results from our analysis of observational and experimental data allow us to overcome the problems related to both of them. The experimental test of the relationship between ethnic identity and investment behavior observed in the surveys provides grounds for the causal claims; in turn real-world patterns assure the ecological validity of the findings obtained in the lab.

The implications of the findings call for the need to incorporate ethnic identity into the models of occupational choice and investment (Banerjee and Newman 1991; Banerjee and Duflo 2005). It also contributes to the scholarship on the effects of ethnic diversity by highlighting the role of a previously understudied dimension of it, namely, minority group position. Our study provides micro-evidence for the patterns of the effects of majority-minority relations on politics and economy generated by the

cross-country research (Wimmer et al. 2009; Cederman et. al 2010). It also highlights the additional channel that links ethnic diversity and “growth tragedy” (Easterly and Levine 1998; Alesina 2001; Esteban et al. 2011; 2012).

Our study treats minority ethnic identities as fixed attributes, due to the specific post-conflict context (van Evera 2001). Thus the potential extensions of our analysis might include the factors that make the minority identity more or less salient and the attributes of minorities that might affect its political and economic decisions. Recent studies by Adida et al. (2012) and Jha and Wilkinson (2012) made important moves in this direction. The former analyzed the effects of the minority size on discrimination among French Christian majority against Muslims, and the latter explored the effects of minorities’ organizational skills on violence and migration patterns during the partition of Pakistan. These studies among others show the importance of studying minority-majority divides, and our study is the first one that isolates the causal effect of minority status on economic behavior and political attitudes.

Conclusion

Using the mixed methods approach that combined the household surveys, business survey and the novel lab-in-the-field experiment, our study found that in the post-conflict setting, minority ethnic identity undermines investment and this effect is driven primarily by the perceptions of discrimination and alienation from the state. Although the study was conducted in Bosnia and Herzegovina – in many ways a unique country -- we believe that the implications of it will be useful for understanding of the link between politics and economic development across other divided and post-conflict countries.

The broad implications of our findings include undermining growth due to underinvestment, persistence of ethnic businesses and horizontal inequality. Furthermore, asymmetry in economic strategies that leads to increased inequality between majority and minority groups may have serious negative externalities such as segregation, (Alesina and Zhuravskaya 2011) underprovision of public goods (Baldwin and Huber 2010) and violent conflicts (Cederman et.al 2011, Esteban et al. 2011).

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APPENDIX A. Analysis of the UNDP Household Survey

Table 1. The Effect of Minority Status on Plan to Save Money

VARIABLES	(Full sample) Plan to save money	(Full Sample) Plan to save money	(Restricted Sample) Plan to save money	(Restricted Sample) Plan to save money
minority	-0.278*** (0.0456)	-0.329*** (0.0616)	-0.158* (0.0825)	-0.192* (0.106)
unemployed		-0.509*** (0.0419)		-0.568*** (0.0873)
Serb		-0.342*** (0.0993)		-0.315 (0.219)
RS		0.0431 (0.0958)		-0.148 (0.225)
rural		-0.0682* (0.0407)		-0.250*** (0.0848)
male		0.0535 (0.0405)		0.194** (0.0833)
age		-0.389*** (0.0253)		-0.440*** (0.0525)
education		0.0435*** (0.00518)		0.0277*** (0.0105)
idp		-0.175** (0.0722)		0.143 (0.139)
returnee		-0.135** (0.0654)		-0.175 (0.107)
wave1	-0.0320*** (0.00319)	-0.0163*** (0.00388)	-0.0279*** (0.00661)	-0.0209*** (0.00790)
Constant	-1.001*** (0.0863)	-0.618*** (0.152)	-1.372*** (0.180)	-0.440 (0.308)
Observations	29,727	23,613	8,353	7,021

We use binary logistic regressions. Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

APPENDIX B. ANALYSIS OF THE HOUSEHOLD SURVEY AND ROBUSTNESS CHECKS

Figure 1. Frontline adjustment during the Bosnian War



Source: Christia, Fotini (2012). Alliance Formation in Civil Wars. Cambridge University Press.

Figure 2. Research Sites

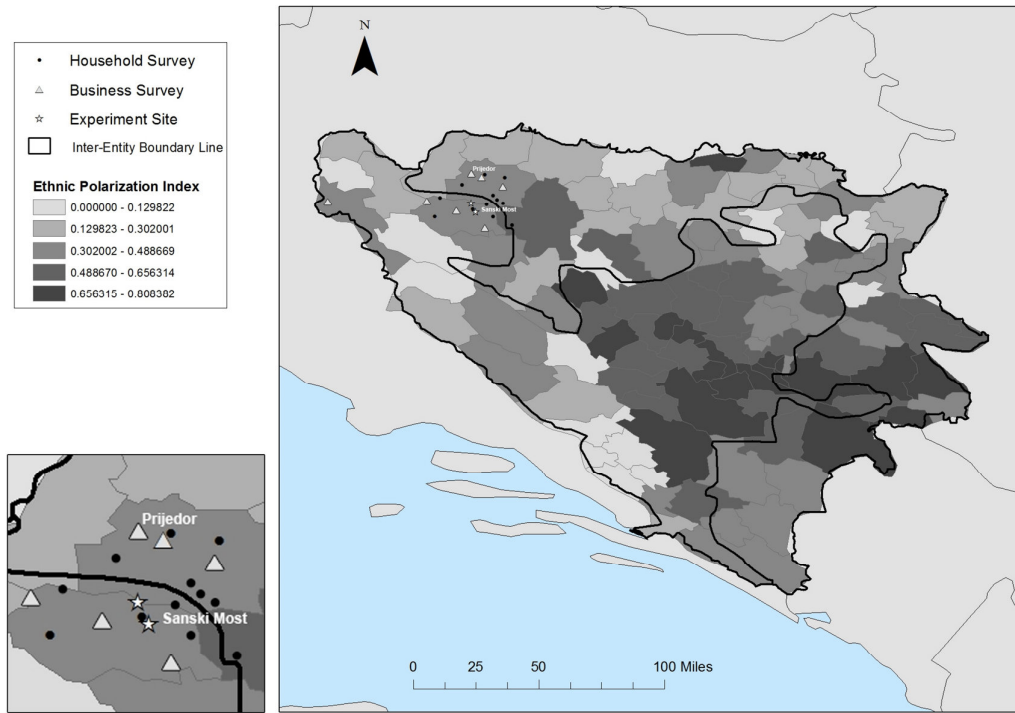


Table 1. Balance Test for Minority and Majority Observable Characteristics in the Household Survey

	Age	Gender (Male)	Education	Nationality (Serb)	Employment	Times of Residence	Military Service
Minority N=103	42.5 (1.6)	1.3 (0.5)	4.52 (0.13)	1.34 (0.04)	11.9 (5.9)	1.73 (0.11)	0.70 (0.04)
Majority N=216	31.08 (0.8)	0.7 (0.02)	4.92 (0.12)	1.32 (0.03)	10.1 (1.4)	1.80 (0.06)	0.66 (0.03)
F-test	0.00	0.07	0.10	0.79	0.68	0.57	0.45

Note: Table presents means with std. errors in parentheses and the p-values of F-test

Table 2. Binary Logistic Regression of the Determinants of Investment

VARIABLES	(1) Invest \$500	(2) Invest \$2000	(3) Invest \$5000	(4) Invest \$10.000
minority	-1.932*** (0.402)	-1.023*** (0.340)	-0.415 (0.340)	-0.371 (0.321)
Gender (male)	-0.0320 (0.101)	0.512* (0.281)	0.704** (0.315)	-0.0220 (0.0539)
Age	0.0209* (0.0114)	0.0210* (0.0109)	0.00873 (0.0110)	0.0102 (0.0106)
Education	-0.00570 (0.0805)	0.0518 (0.0786)	-0.0260 (0.0793)	-0.0341 (0.0779)
Employment	0.0100 (0.0139)	0.0282 (0.0173)	0.0306 (0.0327)	0.00711 (0.0105)
Nationality (Serb)	0.840*** (0.321)	0.628** (0.320)	1.349*** (0.342)	1.074*** (0.313)
Income	-0.0915 (0.0618)	-0.121** (0.0611)	-0.0886 (0.0650)	-0.0293 (0.0586)
Military service	-0.214 (0.301)	0.296 (0.293)	0.276 (0.295)	0.421 (0.291)
Time of residence	0.0346 (0.138)	-0.0538 (0.133)	-0.0631 (0.133)	-0.0394 (0.128)
Observations	258	257	257	257

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Ordered Logistic Regression of the Determinants of Institutional and Inter-Ethnic Trust

VARIABLES	Trust authorities of BiH	Trust authorities of Entity	Trust to Serbs among Bosniaks	Trust to Bosniaks among Serbs
Minority	-0.784** (0.371)	-0.817*** (0.311)	-0.576 (0.403)	1.308* (0.671)
Gender (Male)	-0.182 (0.277)	-0.357 (0.268)	-0.0663 (0.0693)	-0.513 (0.596)
Age	-0.000406 (0.0112)	0.00248 (0.00978)	0.00501 (0.0128)	0.0100 (0.0199)
Education	-0.183** (0.0826)	-0.141* (0.0747)	0.0400 (0.0883)	0.0512 (0.207)
Nationality (Serb)	-0.960*** (0.346)	-0.491* (0.294)	-	-
Employment	-0.0748 (0.0658)	-0.0522 (0.0563)	-0.0370 (0.0744)	-0.0153 (0.0221)
Strata	0.0307 (0.0748)	0.0441 (0.0635)	0.0196 (0.0924)	0.103 (0.136)
Military service	-0.165 (0.317)	0.0913 (0.265)	0.135 (0.343)	0.158 (0.615)
Time of residence	-0.00143 (0.162)	0.209* (0.122)	0.0607 (0.150)	-0.661** (0.269)
Observations	186	235	152	61

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 1b. Difference-in-means on Matched Data

Variable	Minority	Majority	Bias	t	p-value
Age	43.1	43.09	0.2	.01	.991
Gender	1.1	0.61	16.2	.98	.331
Education	4.5	4.2	20.5	1.2	.227
Employment	12.5	10.9	3.2	0.19	.850
Nationality	0.27	0.30	-6.1	-0.36	.717
Income	4.42	3.83	7.1	0.43	.667
Military Service	0.75	0.68	-14.9	0.92	.361
Time of Residence	1.72	1.58	3.7	0.23	.818

Note: Table presents the results of full Mahalanobis matching that adjusts observable differences between minority and majority groups.

Table 2b. Binary Logistic Regression of the Determinants of Investment (Matched Data)

VARIABLES	(1) Invest \$500	(2) Invest \$2000	(3) Invest \$5000	(4) Invest \$10.000
Minority	-2.011*** (0.556)	-0.927* (0.519)	-0.569 (0.543)	-1.032** (0.511)
Gender (male)	-0.548 (0.578)	0.569 (0.366)	0.827* (0.465)	1.191** (0.504)
Age	-0.00191 (0.0205)	0.000172 (0.0193)	-0.00681 (0.0189)	0.0134 (0.0181)
Education	0.0190 (0.168)	0.150 (0.151)	0.225 (0.155)	0.307* (0.157)
Employment	0.00582 (0.0186)	0.0686*** (0.0261)	0.0775** (0.0370)	-0.00985 (0.0148)
Nationality (Serb)	1.567** (0.654)	1.676*** (0.520)	1.828*** (0.564)	1.796*** (0.614)
Income	-0.0466 (0.114)	0.0393 (0.122)	0.163 (0.126)	0.0679 (0.0926)
Military service	0.459 (0.615)	1.032* (0.533)	0.417 (0.522)	0.836 (0.542)
Time of residence	0.0376 (0.253)	0.156 (0.242)	-0.0218 (0.243)	0.00444 (0.283)
Observations	116	116	116	116

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3b. Ordered Logistic Regression of the Determinants of Institutional and Inter-Ethnic Trust (Matched Data)

VARIABLES	Trust authorities of BiH	Trust authorities of Entity	Trust to Serbs among Bosniaks	Trust to Bosniaks among Serbs
Minority	-0.816 (0.727)	-1.507*** (0.569)	-0.799 (0.797)	1.735 (1.166)
Gender (male)	-0.470 (0.351)	-0.797* (0.469)	1.020** (0.484)	0.428 (1.024)
Age	0.0116 (0.0183)	-0.00711 (0.0167)	0.0162 (0.0184)	0.0375 (0.0367)
Education	-0.0902 (0.212)	-0.102 (0.155)	0.0503 (0.199)	0.298 (0.288)
Serb	-1.864*** (0.641)	-1.382** (0.559)	-	-
Employment	-0.0553** (0.0255)	-0.0518** (0.0203)	0.0531 (0.187)	-0.0312 (0.0626)
Strata	0.299* (0.154)	0.268** (0.122)	0.118 (0.172)	0.217 (0.398)
Military service	0.0501 (0.583)	0.552 (0.506)	-0.421 (0.711)	-1.118 (0.952)
Time of residence	0.335 (0.308)	0.454** (0.187)	0.234 (0.204)	-1.083* (0.617)
Observations	79	108	71	30

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

APPENDIX C. ANALYSIS OF THE BUSINESS SURVEY

Table 1. Balance Test for Minority and Majority Observable Characteristics in the Business Survey

	Age	Gender (Male)	Education	Income
Minority N=34	44.3 (1.5)	1.3 (0.6)	5.48 (0.23)	636.3 (47.4)
Majority N=29	42.4 (1.8)	1.14 (0.6)	5.03 (0.29)	744.6 (88.3)
F-test	0.43	0.91	0.23	0.26

Note: Table presents means with std. errors in parentheses and the p-values of F-test

Table 2. Binary Logistic Regression of the Determinants of Taking Credit

VARIABLES	(1) Credit for the last 5 years	(2) Plan to take credit
Minority	-1.089* (0.602)	-1.654*** (0.609)
Gender	0.471 (0.801)	0.245 (0.825)
Age	0.0267 (0.0327)	0.0424 (0.0324)
Education	-0.508** (0.257)	-0.209 (0.205)
Income	0.000559 (0.000796)	-0.000342 (0.000801)
Observations	61	60

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Ordered Logistic Regression of the Determinants of Institutional and Inter-Ethnic Trust

VARIABLES	Trust authorities of BiH	Trust authorities of Entity	Trust to Serbs
Minority	-1.163* (0.595)	-2.745*** (0.878)	-0.392 (0.581)
Gender	0.233 (0.783)	1.349 (0.855)	0.107 (0.766)
Age	-0.00322 (0.0295)	-0.0323 (0.0344)	-0.00150 (0.0307)
Education	0.219 (0.212)	0.0584 (0.252)	0.350* (0.185)
Income	0.000407 (0.000698)	0.00144* (0.000854)	0.000958 (0.000812)
Observations	59	58	59

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

APPENDIX D. EXPERIMENTAL PROTOCOLS

BEFORE THE SESSION

1. Local Administrator and Assistant rehearse the script, and prepare the session room. There must be sufficient space to accommodate participants and to assure that each participant has enough space to work in comfort and relative privacy. One person per table or desk. Do not crowd subjects!
2. The Administrator prepares the forms.

CHECK-IN

1. As participants arrive, they are greeted at the entrance to the session room. They are asked to show their letter of invitation [FORM “LETTER OF INVITATION”] to participate in the session. Because this letter will have been hand delivered by either the administrator him/herself or one of the other local interviewers, someone will be able to guarantee that the person with the letter is, in fact, the person who received the letter.
2. The administrator will then give each respondent a consent form to read. [FORM “LETTER OF CONSENT”] The respondent may then choose to leave, indicating lack of consent. Respondents who stay have consented to participate by agreeing to stay.
3. The administrator assigns each respondent who has agreed to stay a unique ID number printed on an index card, and assigns them to a seat. Each person should have their own separate table to work.

INTRODUCTION

Welcome. Thank you for coming today. My name is ***. Thank you for agreeing to participate in this study. Your participation in this study is voluntary. As you know you will receive a payment of 3KM today for your participation. You also have the opportunity to receive up to 20 KM based on the tasks involved in today’s activity. Please understand that we will be providing all money and at no time will we ask you for money so do not worry.

Now, let me tell you a little about this research project. This is an international scientific research project, and the questions that you will answer and the tasks you will perform have been asked of people all over the world. The purpose of the project is to understand how people of different cultures, and backgrounds make decisions, interact with other people, and how their decisions are affected by the conditions where they live. We are going to ask you to make decisions about money. These decisions will involve not only you but also other people in Bosnia and Herzegovina.

In this project, I will serve not only as the administrator of this session, but also as your local contact, in case you ever have questions about the progress of the study or your involvement. Standing over there is my assistant. He/she will pass out the forms and materials that you will use.

You will participate in two main types of tasks today. You will receive different forms for each task. In one task, you will be asked to make several decisions about how to allocate money. In each of these tasks, you will have to decide how to allocate a sum of money between yourself and someone else or a group of people. These other people will not be in this room, but they will be future participants in this study, and they will all be from Bosnia and Herzegovina.

The other task will be to complete a survey, which asks questions from general international social surveys on public opinion, attitudes, and basic social data. Rest assured that we will not ask you to provide any information that could be used to identify you as a participant in this study.

Before we begin there are several rules we would like you to keep in mind:

First, you should not talk with one another or look at anyone else's work.

Second, please listen to all instructions that I give you. This is very important. If you follow the instructions carefully you might make a considerable sum of money.

Third, we will be handing out many different forms to you. Please do not begin filling out or looking at those forms until I ask you to do so.

Finally, you just received a card with an ID number on it. Please turn it upside down. Do not show that number to anyone else except myself or one of my assistants.

Do you have any questions? If not, let's begin!

Instructions group 1

Before each task you (person A) will receive 3 points in your account and need to decide how much of this money you want to send to your counterpart B (you could send from nothing to the whole amount- from 0 points to 3 points). Each amount sent will be multiplied 4 times by the time it reaches him/her (if you send 2 points, your counterpart would receive 8 points). After that, he/she decides how much of that money to keep and how much to return to you (he/she could also return you from nothing to the whole amount). So here your earning depends not only on your decision, but also on your counterpart's decision. The money that you did not send and the money that you receive will be added to your account.

Example: You are keeping 1 point and sending 2 points to person B. He is receiving 8 points and sending you back, for example, 4 points. So, in your account you would have $1+4=5$ points.

At the same time in another task you are paired with a different person B. In this task, the roles are reversed, which means person B will also send you money from his/her account, which will be multiplied 4 times, and you will have to decide how much to return, and how much to keep (you could return from nothing, to the whole sum).

Example: Person B decided to send you 1 point from his/her account and you received 4 points. After that you decided to send back 1 point. Your profit is going to be 3 points.

It is important to emphasize that you could send nothing to your counterpart in both tasks and leave all the money to yourself, if you think that by doing that you are going to profit the most.

All this money (that you did not send from your account, that you received back from the person you sent money to, and the money that you decided to keep that someone sends you) will be added up on your account.

Example: In the first part of the task (when you are sending money) you earned 5 points and in the second part (when you received money) 3 points; so in sum, at the end of the task you would have 8 points on your account

In the next part of the task, you again receive 3 points in your account and play the same task, but with a different counterpart (in every task you are working with a different person).

All the money that you receive will be added to your account.

Example: money that you receive in the second part of the task will be added to the 8 points that you had in your account from the first part of the task.

Instructions group 2

Rules:

Before each task you (person A) will receive 3 points in your account and need to decide how much of this money you want to send to your counterpart B (you could send from nothing to the whole amount- from 0 to 3 points). Each point sent will be multiplied 4 times by the time it reaches him/her (if you send 2 points, your counterpart would receive 8 points). After that, he/she decides how much of that money to keep and how much to return to you. But while making your decision, you should take into account that there will be an unbiased Third party (he/she will not know any of your personal information other than a number assigned to you) who will be monitoring your transaction and will be able to punish you or your counterpart if he/she thinks that the transaction is not fair.

So here your earning depends not only on your decision, but also on your counterpart's decision, and the actions of the third party who could intervene if he/she thinks that transaction is unfair.

The money that you did not send and the money that you receive will be added to your account.

Example 1: From your 3 point endowment, you decide to keep 1 point and send 2 points to person B. The 2 points are multiplied by 4 so Person B receives 8 points and decides to send you back, for example, 4 points. The third party says that the transaction is fair, so in your account you would have $1+4=5$ points and person B would get 4 points.

Example 2: You decide to keep 1 point and send 2 points to the person B. The 2 points are multiplied by 4 so Person B receives 8 points and decides to send you back 2 points. The third party in this case decides that the second transaction is not fair and decides to punish person B by taking 2 points from his/her account and giving it to

you. So, as a result you will receive $1+2+2=5$ points, and person B will get $8-2-2 = 4$ points.

Example 3: You decided to keep all your 3 points and send nothing to person B. The Third party decides that transaction is unfair and punishes you by taking 1 point from your account and giving it to your counterpart. So by the end of the task you have just 2 points in your account and person B has 1 point.

At the same time in another task the roles are reversed and you are acting as person B, which means- someone also will send you money from his/her account, that would be multiplied by 4, and you will have to decide how much of it to return and how much to keep. Here also, the third party is present to monitor the fairness of the transaction.

Example: Person C decided to send you 1 point from his/her account, which is multiplied by 4 and so you received 4 points. After that you decided to send back 1 point. The third party considers transaction fair. This means you will get 3 points and person C is getting $2+1=3$ points.

Example 2: Person C decided to send you 2 points from his/her account, which is multiplied by 4 and so you received 8 points. After that you decided to send back 1 point. The third party considers this transaction unfair and punishes you by taking 3 points from your account. And as a result at the end of the task, instead of earning 7 points, you would only get 4 points and Person C will get $1(\text{that he kept and did not send you})+1+3=5$ points.

All this money (that you did not send from your account, that you received back from the person you sent money to, and the money that you decided to keep that someone sends you) will be added up on your account.

Consider another example where in the first part of the task (when you are sending money) you get 5 points and in the second part (when you received money) 3 points; so in total, at the end of the task you would have 8 points in your account

In the next task, you again receive 3 points in your account from a different counterpart (every task you are paired with a different person), but with the same third party.

All the money that you receive will be added to your account.

Example: money that you receive in the second part of the task will be added to the 8 points that you had in your account from the first part of the task.

(Repeat Instructions as necessary using different examples)

Instructions group 3

Before each task you (person A) will receive 3 points in your account and need to decide how much of this money you want to send to your counterpart B (you could send from nothing to the whole amount- from 0 to 3 points). Each point sent will be multiplied 4 times by the time it reaches him/her (if you send 2 points, your counterpart would receive 8 points). After that, he/she decides how much of that money to keep and how much to return to you. But while making your decision, you should take into account that there will be a Third party (Mr. Dusanic) who will be monitoring your transaction and will be able to punish you or your counterpart if he/she thinks that the transaction is not fair.

So here your earning depends not only on your decision, but also on your counterpart's decision, and the actions of Mr. Dusanic who could intervene if he/she thinks that transaction is unfair.

The money that you did not send and the money that you receive will be added to your account.

Example 1: From your 3 point endowment, you decide to keep 1 point and send 2 points to person B. The 2 points are multiplied by 4 so Person B receives 8 points and decides to send you back, for example, 4 points. Mr. Dusanic says that the transaction is fair, so in your account you would have $1+4=5$ points and person B would get 4 points.

Example 2: You decide to keep 1 point and send 2 points to the person B. The 2 points are multiplied by 4 so Person B receives 8 points and decides to send you back 2 points. Mr. Dusanic in this case decides that the second transaction is not fair and decides to punish person B by taking 2 points from his/her account and giving it to you. So, as a result you will receive $1+2+2=5$ points, and person B will get $8-2-2=4$ points.

Example 3: You decided to keep all your 3 points and send nothing to person B. Mr. Dusanic decides that transaction is unfair and punishes you by taking 1 point from your account and giving it to your counterpart. So by the end of the task you have just 2 points in your account and person B has 1 point.

At the same time in another task the roles are reversed and you are acting as person B, which means- someone also will send you money from his/her account, that would be

multiplied by 4, and you will have to decide how much of it to return and how much to keep. Here also, Mr. Dusanic is present to monitor the fairness of the transaction.

Example: Person C decided to send you 1 point from his/her account, which is multiplied by 4 and so you received 4 points. After that you decided to send back 1 point. The third party considers transaction fair. This means you will get 3 points and person C is getting $2+1=3$ points.

Example 2: Person C decided to send you 2 points from his/her account, which is multiplied by 4 and so you received 8 points. After that you decided to send back 1 point. The third party considers this transaction unfair and punishes you by taking 3 points from your account. And as a result at the end of the task, instead of earning 7 points, you would only get 4 points and Person C will get 1(that he kept and did not send you)+1+3=5 points.

All this money (that you did not send from your account, that you received back from the person you sent money to, and the money that you decided to keep that someone sends you) will be added up on your account.

Consider another example where in the first part of the task (when you are sending money) you get 5 points and in the second part (when you received money) 3 points; so in total, at the end of the task you would have 8 points in your account

In the next task, you again receive 3 points in your account from a different counterpart (every task you are paired with a different person), but with the same third party.

All the money that you receive will be added to your account.

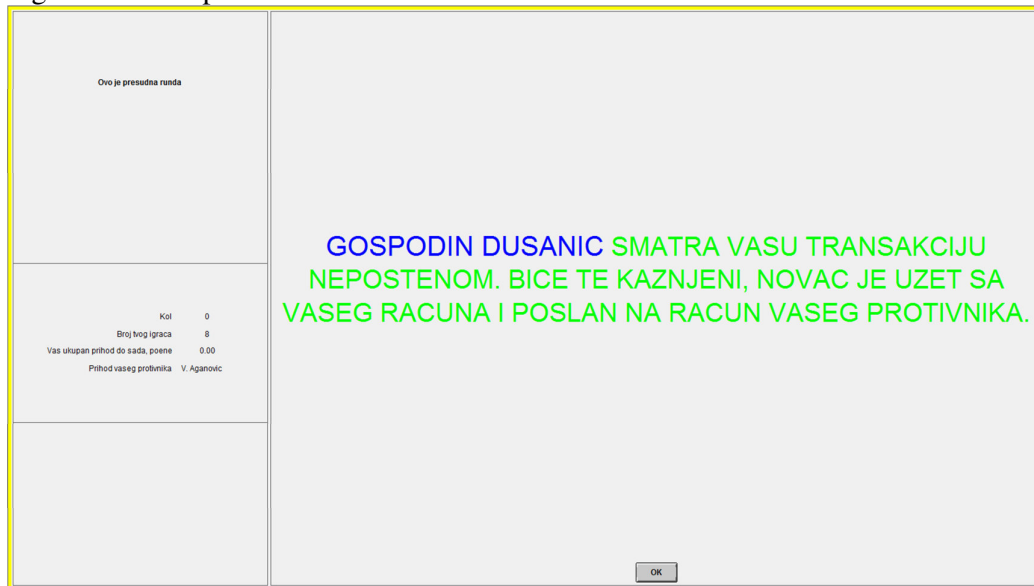
Example: money that you receive in the second part of the task will be added to the 8 points that you had in your account from the first part of the task.

Points exchange table

Points	KM
0 - 18 Points	7 KM
19- 23 Points	8 KM
24- 27 Points	9 KM
28-31 Points	10 KM
32-37 Points	12 KM
38-43 Points	15 KM
44-48 Points	17 KM

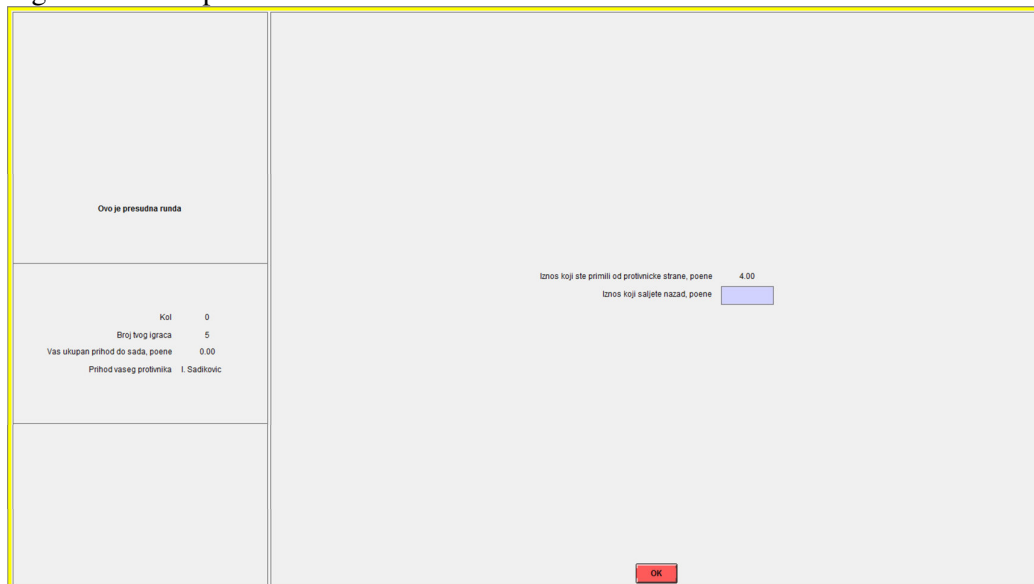
Below there are print screens of the game that illustrate the process of the game.

Figure 1. Game print screen



Note: Screenshot of the notification to a player that “Mr Dusanic considers your transaction to be unfair. You would be punished. Money would be taken from your account and send to your counterparty “. This is an example of the biased enforcer action.

Figure 2. Game print screen



Note: Screenshot of the option to choose how much money to return to a counterparty.

SURVEY TASK

Now we would like you to answer a few questions about your background and opinions on a wide range of issues. The assistant will come around to each of you and hand you a survey booklet. The first thing you will need to do is to copy the ID number on the card you were given on the front of the survey booklet. Do not open the booklet until I instruct you to do so. We will go through each question together as a group. I will read each question aloud and you will circle the appropriate answer. Please do not read ahead. Answer only the question that I am reading to you, and be patient if others take more time. If you have questions, please raise your hand, and I will come to you. Please do not say your answers to questions aloud, because it will influence what others think. And you may all disagree about the answers to some of the questions. When everyone is finished, the assistant will collect the survey booklets and we will call you one at a time to receive your payment for participating in this project.

CONCLUSION

This concludes our study. I want to thank everyone for your participation. The tasks that you engaged in here are valuable for our research. You are now free to leave. Please leave all materials here including all pens and paper. We thank you for participating in our study, and please feel free to contact us in the future if you have any questions. Our contact information is provided on your invitation letter and consent form. However, please feel free to stay if you have any further questions. Thank you again and have a good day.

APPENDIX E. ANALYSIS OF THE EXPERIMENT AND ROBUSTNESS CHECKS

Table 1. Balance Checks for Homogenous and Ethnically Mixed Groups

	Age	Gender (male)	Education	Nationality (Bosniak)	Income	Employment	Military Service
Playing with co-ethnic (Bosniaks-Bosniaks) N=120	39.2 (2.75)	5.2 (1.7)	8.18 (1.56)	3.97 (1.3)	185.7 (18.7)	9.7 (1.9)	9.6 (2.6)
Playing with non co-ethnic (Bosniaks-Serbs) N=120	35.8 (1.9)	2.1 (0.81)	8.16 (1.55)	1.93 (0.81)	168.2 (21.7)	10.5 (2.02)	11.3 (2.8)
F-test	0.32	0.11	0.99	0.2	0.54	0.79	0.66

Note: means of the key covariates for different treatments (std. errors in parentheses)

Table 2. Balance Checks for Treatment and Control Groups for the Neutral Enforcer Treatment

	Age	Gender (male)	Education	Nationality (Bosniak)	Income	Employment	Military Service
1 N=80	39.4 (3.09)	2.4 (1.22)	9.6 (2.3)	2.53 (1.22)	181.8 (22)	10.5 (2.5)	10.5 (3.3)
0 N=160	36.5 (1.9)	4.2 (1.34)	7.4 (1.17)	3.16 (1.05)	174 (18.4)	9.9 (1.6)	10.4 (2.3)
F-test	0.42	0.38	0.34	0.71	0.84	0.83	0.99

Note: means of the key covariates for different treatments (std. errors in parentheses)

Table 3. Balance Checks for Treatment and Control Groups for the Biased Enforcer Treatment

	Age	Gender (male)	Education	Nationality (Bosniak)	Income	Employment	Military Service
1 N = 80	40.47 (3.05)	4.8 (2.09)	9.8 (2.31)	3.77 (1.71)	201 (26.1)	9.1 (2.3)	11.7 (3.5)
0 N=160	36.07 (2)	3.08 (1.05)	7.3 (1.17)	2.54 (.86)	164.9 (17.02)	10.6 (1.7)	9.8 (2.2)
F-test	0.21	0.41	0.27	0.47	0.23	0.63	0.63

Note: means of the key covariates for different treatments (std. errors in parentheses)

Table 4. Effect of the Minority Status (Biased Enforcer for Bosniaks in Mixed Groups)

VARIABLES	%Send (1 Round)	%Return (1 Round)
Biased enforcer	-6.583** (2.419)	-11.35 (24.53)
% send 1 Round		-0.00824 (0.233)
% send 1 Round * Biased		0.198 (0.421)
Constant	61.58*** (2.203)	55.51*** (14.63)
Observations	40	40
R-squared	0.063	0.003

Robust standard errors in parentheses. (Std. Err. adjusted for 5 clusters in groups)

*** p<0.01, ** p<0.05, * p<0.1

Table 5. The Effect of Minority Status on Sending per Round

VARIABLES	%Send (1 Round)	%Send (2 Round)	%Send (3 Round)	%Send (4 Round)
Biased Enforcer	-7.503** (3.457)	-6.827** (3.191)	-10.25** (3.263)	-7.931** (2.700)
Return(1 Round)		-0.00423 (0.191)		
Return(2 Round)			0.00738 (0.163)	
Return(3 Round)				0.483*** (0.0998)
Age	-0.0161 (0.0323)	0.0272 (0.0334)	0.0267 (0.0386)	0.00195 (0.0360)
Education	-0.136*** (0.0330)	-0.174*** (0.0400)	-0.296*** (0.0459)	-0.211*** (0.0363)
Income	-0.0101 (0.00816)	0.00247 (0.00522)	-0.0135 (0.0137)	0.00338 (0.0108)
Constant	65.55*** (4.438)	61.83*** (12.59)	69.50*** (9.766)	38.80*** (7.206)
Observations	40	40	40	40
R-squared	0.130	0.176	0.309	0.525

Robust standard errors in parentheses. (Std. Err. adjusted for 10 clusters in groups)

*** p<0.01, ** p<0.05, * p<0.1

Table 6. Average Treatment Effects for the Full Sample

VARIABLES	%Send (1 Round)	%Return (1 Round)	%Send (1 Round)	%Return (1 Round)
Neutral Enforcer	5.840* (3.315)	9.878 (6.524)		
Biased enforcer			3.721 (3.365)	-1.781 (10.43)
% send 1 Round		0.527*** (0.0900)		0.505*** (0.0690)
% send 1 Round * Neutral		-0.0863 (0.134)		0.0550 (0.195)
Constant	51.11*** (2.261)	19.51*** (4.554)	51.82*** (2.340)	21.87*** (3.584)

Observations	240	240	240	240
R-squared	0.022	0.303	0.009	0.287

Robust standard errors in parentheses (Std. Err. adjusted for 30 clusters in groups)
*** p<0.01, ** p<0.05, * p<0.1

Table 7. Average Treatment Effect of the Neutral Enforcer in the Ethnically Mixed Groups

VARIABLES	%Send (1 Round)	%Return (1 Round)
Neutral Enforcer	6.671* (3.736)	19.11** (8.640)
% send 1 Round		0.608*** (0.119)
% send 1 Round * Neutral		-0.204 (0.164)
Constant	56.62*** (3.024)	13.63* (6.646)
Observations	120	120
R-squared	0.023	0.338

Robust standard errors in parentheses. (Std. Err. adjusted for 15 clusters in groups)
*** p<0.01, ** p<0.05, * p<0.1

Table 8. Saturated Regression Model of the Effect of Coethnicity

VARIABLES	%Send (1 Round)	%Return (1 Round)
Coethnicity	-11.57*** (2.861)	6.804 (6.881)
% send 1 Round		0.567*** (0.0894)
% send 1 Round * Coethnicity		-0.105 (0.127)
Constant	58.84*** (2.265)	18.09*** (5.291)
Observations	240	240
R-squared	0.095	0.289

Robust standard errors in parentheses (Std. Err. adjusted for 30 clusters in groups)
*** p<0.01, ** p<0.05, * p<0.1

