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IT'S NO SPRING BREAK INCANCUN: THE EFFECTS OF EXPOSURE TO VIOLENCE ON RISK PREFERENCES, PRO-SOCIAL BEHAVIOR, AND MENTAL HEALTH

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IT'S NO SPRING BREAK IN CANCUN: THE EFFECTS OF EXPOSURE TO VIOLENCE ON RISK PREFERENCES, PRO-SOCIAL BEHAVIOR, AND MENTAL HEALTH[#]

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Abstract

Exposure to violence has been found to affect behavioral parameters, mental health and social interactions. The literature focuses on large scale political violence. The effects of high levels of criminal violence – a common phenomenon in Latin America and the Caribbean – are largely unknown. We examine drug violence in Mexico and, in particular, the effects of exposure to high municipal levels of homicides on risk aversion, mental health and pro-social behavior. Using a nonlinear difference-in-differences (DID) model and data from the 2005-06 and 2009-12 waves of the Mexican Family Life Survey, we find that the surge in violence in Mexico after 2006 significantly increased risk aversion and reduced trust in civic institutions while simultaneously strengthening kinship relationships. Although the deterioration of mental health due to violence exposure has been hypothesized to explain changes in risk aversion, we find no such effect. This suggests that the literature may be potentially missing out on other relevant channels.

Keywords: violence, risk aversion, social capital, trust, mental health, depression, nonlinear difference-in-differences, Mexico

JEL Classification: A12, D03, D81, O12

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1. INTRODUCTION

There exists an emerging but substantive body of work in development economics that causally links exposure to violence to long run changes in behavioral parameters, mental health and social interactions; factors which are believed to explain much of the heterogeneity of economic outcomes. This micro-conflict literature focuses on episodes of large-scale political violence such as genocides and civil wars. While important, these sources of violence are (thankfully) decreasing in frequency. In many areas of Latin America and the Caribbean (LAC), however, these have been replaced by high levels of criminal violence by gangs and drug traffickers. While the levels of deaths from criminal violence can approach and exceed those from conflicts, the nature of the underlying violence, motivations and effects are often very different (World Bank 2011; Kan 2012). It is therefore unclear whether exposure to criminal violence has similar effects on outcomes as do the other forms of violence studied by the micro-conflict literature.

Using data from the surge in drug violence in Mexico, we study the effects of exposure to criminal violence on three key outcomes from the micro-conflict literature: risk aversion, mental health and pro-social behavior. The Mexican setting offers several advantages. First, following President Calderon's election in 2006 and his subsequent crackdown on drug traffickers, homicide rates surged from the relatively stable pre-crackdown levels. Consequently, there is a clear start to the "treatment", the abrupt increase in rates of homicides. Second, the location and levels of violence were not determined by individual or local characteristics (Brown 2015; Velásquez 2015). Rather, as arrests and deaths weakened drug trafficking organizations, rival organizations and internal factions fought for control of territory and drug routes (Guerrero 2012b). This exogenous spatial and temporal variation in the levels of violence allows for the identification of treatment effects from changes in the local homicide rate. Third, the Mexican Family Life Survey, a high quality panel survey, was fielded immediately preceding the violence (2005-6) and during the peak levels of violence (2009-12). Consequently, while other studies typically assume that there are no systematic differences in the distribution of potential outcomes across treatment and comparison groups due to unobserved confounders, we are able to employ the weaker assumption of requiring only that the outcomes share a common pre-treatment trends across the two groups for identification of the treatment effect.

We find that exposure to high levels of criminal violence does affect outcomes but that this effect is not uniform across the outcomes studied. Rather, there are important differences with the previous literature on political violence. We first examine the effects of exposure to violence on risk aversion. Although behavioral parameters, such as risk aversion, have traditionally been considered as being largely fixed (Stigler and Becker 1977), recent research has found that these

can be changed by large shocks (Cameron and Shah 2013; Eckel et al. 2009; Malmendier and Nagel 2011). Consequently, exposure to violence, a potentially large and traumatic shock, might be expected to similarly affect risk aversion especially since the behavioral changes reported in the psychological literature are consistent with shifts in risk aversion (Macksoud et al. 1993).

Similar to prior micro-conflict studies (Callen et al. 2015; Jakiela and Ozier 2015; Moya 2015; Voors et al. 2012), we find that exposure to violence causally affects risk aversion[1]. In particular, living in a municipality that experiences an above median level of homicide rates leads to increased risk aversion (of about 50 percentage points in our benchmark specification). Our results using panel data contrast sharply with those from the previous literature that rely on cross-sectional data which find, depending on the study, both increased risk aversion (Brown et al. 2015; Jakiela and Ozier 2015; Moya 2015; Kim and Lee 2014) and risk loving (Voors et. al 2012). Among the studies which find increased risk aversion, our findings point to substantial increases in the magnitude of the treatment effect relative to these previous works.

Second, we consider the effect of the rise in homicide on mental health. In addition to being an important outcome in itself, mental health is frequently hypothesized to be a (or even *the*) channel from exposure to violence to changes in behavioral outcomes. This hypothesis has, to our knowledge, only been directly examined by Moya (2015) who finds that the rise in the incidence of anxiety disorders arising from exposure to violence explains the observed changes in risk aversion.[2] Using a 20 questions mental health module based on the Center for Epidemiologic Studies-Depression scale (CES-D; Radloff 1977) to measure depressive symptoms/anxiety among individuals, we examine whether the changes to risk aversion in Mexico are similarly explained by a deterioration of mental health. In contrast to Moya (2015), we find no effect of exposure to violence on mental health. This suggests that while mental health may be a channel through which violence affects risk aversion, it is not the only channel nor is it a necessary condition for these changes.

Finally, we investigate the effects of exposure to violence on the individual's preference for pro-social behavior at various social distances. Pro-social behavior, particularly trust (Cassar

[1] With respect to the Mexican drug war, we are one of three papers which were concurrently and independently developed. Manian (2015) does not examine risk aversion directly but rather examines how the local homicide rate influence risky behavior by sex workers (inconsistent condom use). She finds increased violence leads to more consistent condom use. More comparable to our work, Brown et al. (2015) examine the effect of increases in municipal homicide rates on the probability of being in the most risk averse group. Similar to our paper, they find an increase in risk aversion although the results are not directly comparable due to differences in the manner in which the dependent variable was defined.

[2] Whereas Moya (2015) examines whether exposure to violence affects risk aversion through changes in mental health, Brown et al. (2015) examine the related question of whether the level of emotional well-being determines the effects of violence on risk aversion and do not find a statistically significant relationship.

et al. 2013; De Luca and Verpooten 2015; Nunn and Wantchekon 2011; Rohner et al. 2013; Voors et al. 2012) and political participation (Bellows and Miguel 2009; Blattman 2009), has been studied by the literature. We focus on four different aspects of pro-social behavior which are crucial to growth: civic social capital, freedom of choice, sense of fairness, and private social capital. The effects of exposure to violence turns out to affect different aspects of pro-social behavior differently. While exposure to violence led to a deterioration of generalized trust (civic social capital), it resulted in a corresponding increase in the desire for (personal) freedom of choice and a weakening of constraints imposed by general social norms. Exposure to violence also resulted in an increase in the desire for strengthening kinship networks (private social capital). Overall, these findings are similar to Cassar et al. (2013), and Rohner et al. (2013): exposure to violence increases within-group (family) cohesion while simultaneously decreasing out-of-group trust and the sense of being constrained by societal norms/values. Our findings for risk aversion also potentially highlights the importance of the role that social insurance plays in kinship networks. The social insurance derived from the reciprocity inherent in kinship networks may be more valuable to individuals as their risk aversion rises.

Taken together, the findings suggest important costs arising from the increased criminal violence in Mexico and, more broadly, in Latin America and the Caribbean. Both risk aversion and social behavior are key inputs for economic growth. Risk aversion affects investment decisions and the willingness to seize new opportunities (Skriabikova et al. 2014). Similarly, social behavior, such as trust, cooperation, and inter-group exchanges, underpin market development and all manners of economic interaction (see, for instance, Knack and Keefer 1997; Zak and Knack 2001; Henrich et al. 2010; Fafchamps 2006; Algan and Cahuc 2010). Consequently, violence engenders a negative externality on growth via these behavioral changes. Since the health literature finds that traumatic experiences can lead to behavioral changes that last decades (Hubbard et al. 1995; Kulka et al. 1990; McSharry and Kinny 1992; Schnurr et al. 2004), even as the current violence levels decline, this friction on growth is likely to persist.

The remainder of the paper is organized as follows: section 2 briefly describes the evolution of homicide rates in Mexico, section 3 describes the data and explains the nonlinear difference-in-differences methodology employed, section 4 discusses our main findings as well as robustness checks and results on heterogeneity, and section 5 concludes.

2. VIOLENCE IN MEXICO

Prior to the election of Felipe Calderón to the presidency and his subsequent crackdown on organized crime groups (OCGs), violence levels were relatively stable in Mexico. For example, homicide statistics from the Mexican National Institute for Statistics and Geography (INEGI in

Spanish) show stable levels before 2007 (Figure 1: yearly variation). Upon becoming President, Calderón launched a military-led crackdown on organized crime groups (OCGs) which is believed to have led to the subsequent spike in violence (Molzahn et al. 2012; Guerrero 2011). In the subsequent four years, the number of homicides roughly tripled, from roughly 8,500 to nearly 25,000 between 2007 and 2010.

Prior to the military crackdown, the drug cartels operated in an oligopolistic equilibrium in the drug market which resulted in the relatively stable levels of violence (Velásquez 2015). The crackdown increased the violence through three channels: direct confrontations between the military and OCGs, internal power struggles following the arrest/death of major leaders, and attempts by rival organizations to take market share from weakened organizations (Guerrero 2012b). This cycle of violence was self-reinforcing: crackdowns led to violence which incited both further government actions and confrontations among remaining OCGs. The power struggles also led to a splintering of drug trafficking organizations (DTOs) as the number increased from 6 to 16 within four years (2007-2010). In turn, this further reinforced the cycle of violence (Guerrero 2011).

This violence spilled over onto the civilian population in several ways. First, the increased number of OGCs reduced profit margins and pushed them into other criminal activities including extortions, kidnapping and thefts to increase profits (Molzahn et al. 2012; Guerrero 2011). Second, OGC's also targeted the civilian population to maintain a climate of fear and hinder cooperation with the government (Brown 2015). Lastly, civilians were also caught in the cross-fire between heavily armed gangs. The violence was not limited to men as women were also directly targeted through kidnapping, murders and rapes, and indirectly affected through family exposure (United Nations 2011; Velásquez 2015).

The violence not only escalated over time but also spread throughout the country. For example, only 48 municipalities reported 12 or more homicides in 2007. By 2010, this level of homicides occurred in 148 municipalities (Velásquez 2015). Maps 1-3 show the spatial spread of violence for 2002, 2005 (the year before President Calderon's term), and 2009 respectively. By 2009, the crackdown had reached full strength as had the reinforcing feedback. This led to violence spikes in many previously unaffected municipalities. The increase in violence was not uniform across municipalities nor time.

While it is not possible to verify, a large portion of the increased homicides are believed to directly result from the crackdown and the violence it engendered. This violence was driven by the OGC's and events (such as major arrests) which were beyond the influence of ordinary citizens.

3. DATA AND METHODOLOGY

3.1 Data

We primarily rely on the Mexican Family Life Survey (MxFLS), a longitudinal panel with surveys in 2002 (MxFLS1), 2005-06 (MxFLS2), and 2009-12 (MxFLS3) respectively.[3] The survey is representative of the Mexican population. We focus on the MxFLS2 and MxFLS3 since data on risk aversion and pro-social behavior (discussed further in later sections) are only available for these rounds. However, we also include data from MxFLS1 in some of our analyses since data for mental health (also discussed later) is available for all three rounds. These data provide information for the pre-violence (MxFLS2) and peak violence periods (2009-2012) thereby allowing us to exploit a non-linear difference-in-differences strategy (which we detail in the next section) in order to identify average treatment effects.

The 2002 baseline survey collected data from 8,440 households consisting of 35,600 individuals in 150 communities of 16 states across Mexico (Rubalcava and Teruel 2013). The individuals in baseline households were followed in the second and third waves. The attrition rates in the following waves were very low with 89% respondents re-interviewed in the second wave (2005-06) and 87% of panel respondents re-interviewed in the third waves (2009-12). We restrict the sample to adults (15 and older) since children did not answer the risk preference and mental health modules. After cleaning the data and dropping some observations due to missing information, our final sample size consists of 11,455 individuals.[4]

We supplement the MxFLS with data on the monthly municipal level homicide rate from the Mexican National Institute for Statistics and Geography (INEGI) which records on all intentional homicides. This data, however, reports information only on registered homicides. This could be an important concern if the cartel related homicides are significantly underreported. Velásquez (2015) addressed this concern by comparing the INEGI data with the data on homicides related to organized crime (which is reported by the President's Office) and finds similar trends. We use the former data instead of the latter since it is available for a longer span of time (1990-2012) thus allowing us to examine both the pre-escalation and escalation periods.

3.1.1 Violence and Treatment Assignment

As noted earlier, the increase in violence was not homogenous. It occurred in different areas at different points in time. Consequently, we identify "treatment" at the lowest geographical level for which the homicide rate is available: the municipality.[5] We divide the municipalities

[3] 94% of the data for the third wave was collected in the years 2009 and 2010 (Brown 2015).
[4] However, this varies based on outcome variables.
[5] We do not focus on individual level exposure since selection into violence is unlikely to be random.

based on the median homicide rate in 2009 among MxFLS sample communities. Municipalities with homicide rates (per 100,000) above the median were assigned to the treated group. The remaining municipalities were assigned to the control group. The choice of the year 2009 seems appropriate since violence started to escalate by the end of 2007 and our assumption that some period of time is needed before any change in behavioral parameters takes place. For the purpose of robustness, we also change the treatment assignment by using the third quartile (75^{th} percentile) homicide rate across the sample municipalities.

3.1.2 Risk Preferences

Risk preferences are constructed using the risk modules from the second and third waves of the MxFLS data. These are designed as a simple gamble-choice task (Eckel and Grossman 2008). The survey played hypothetical games by asking respondents to choose sequentially between two different lotteries. The risk module from the second wave is shown in Figure A1 in the Appendix. In a series of games, the respondents are offered two choices: a safe option of a bag with two chips of equal values of 1,000 pesos while the other bag varies both in terms of risk and expected payoffs. This in line with the seminal work of Binswanger (1980) which suggests that higher expected payoff can be earned only at the cost of higher variance. At each stage, respondents are offered a choice between the two choices. The most risk averse person chooses the safe option throughout and ends up at the terminal point in the lower left corner (category 1). The least risk averse person ends up at the terminal point in the lower right corner (category 5). Consequently, the terminal points characterize an ordinal ranking of risk preferences among the respondents.

Since no actual payoff is received, stated preferences may not accurately map actual preferences as the absence of real financial reward could affect their motivation to provide accurate and unbiased answers (Holt and Laury 2002). To deal with this concern and to establish the validity of survey answers regarding risk preferences, Hamoudi and Thomas (2006) carried out an economic experiment using a subset of the households from the MxFLS data. The study found that preferences measured using the survey and the experiment are highly correlated.

Similar categories are also defined for the risk module from the third wave. Although the payoffs in the third wave were different than those in the second wave, it is measured in an identical fashion across both the treated and non-treated groups. Consequently, there is a common shift for everyone in the third wave. With our difference-in-difference methodology, this common shift is "differenced" away so that, as in the second wave, we recover the relevant average treatment effect.

The distribution across different categories of risk preferences for both pre-escalation and escalation period are shown in the Figures A2 and A3 in the Appendix. There is a very obvious overall shift from risk-loving behavior in the pre-escalation (2005-06: MxFLS2) to risk aversion

in the escalation period (2009-12: MxFLS3). The final step in the construction of the risk aversion dependent variable is to transform the ordered variable for risk aversion into a binary variable. Specifically, respondents who fall in categories 1 and 2 in the ordered variable are assigned the value 1 and are considered risk averse; 0 otherwise. Hence, a positive average treatment effect would imply an increase in risk aversion due to exposure to violence. Since the threshold for binary conversion is arbitrarily defined, we also examine an alternate specification where the first three categories are assigned the value of 1 in the binary conversion; 0 otherwise.

3.1.3 Mental Health

We construct a mental health variable based on the twenty questions where the respondent reports his/her own perception about emotional status in the past four weeks. This module is based on the Center for Epidemiologic Studies-Depression scale (CES-D). The CES-D was first developed by Radloff (1977) and was designed for inclusion in surveys. It has been described as "the workhorse of depression [psychiatric] epidemiology"[6]. Over the decades since its introduction, hundreds of studies have employed the CES-D in both clinical and non-clinical settings, and the CES-D has been extensively validated to be a good instrument for "identifying individuals at risk for clinical depression, with good sensitivity and specificity and high internal consistency (Lewinsohn et al. 1997)" according to the American Psychological Association.[7] The mental health module used in the MxFLS was also authenticated by the Mexican Institute of Psychiatry (Calderon 1997) to identify anxiety and moderate and severe depression.

Each question is given a score from 1 to 4 (with 1 being normal and 4 being severe). These are added to construct the depression index ranging between 20 and 80. According to the guidelines of the National Institute of Psychiatrics, these can be partitioned as follows: 1=normal (20-35); 2=anxious (36-45); 3=moderately depressed (46-65); and 4=severely depressed (66-80). Consistent with the way the CES-D is typically employed in the clinical setting where scores above a particular cutoff indicate elevated risk for clinical depression, we convert the above index into a binary dependent variable. In our context, we combine, the moderately and severely depressed categories into one and assigned the single category a value of 1; 0 otherwise. A positive average treatment effect on this outcome would therefore imply a deterioration in mental health due to exposure to violence. For robustness, a binary variable where only severely depressed was assigned 1 is also analyzed.

[6] http://cesd-r.com/about-cesdr/
[7] See also Steffick (2000) for an extensive discussion of the CES-D.

3.1.4 Pro-Social Behavior

The MxFLS also provides information regarding the preferences of respondent for various types of pro-social behavior. In four survey questions, respondents are asked to show their support or opposition to a statement on a scale of 1 to 4 with 1 being "completely agree" and 4 being "completely disagree". Specifically, respondents are asked whether they think that (i) "laws are made to be broken", (ii) "It is alright to do whatever we want as long as we do not hurt others", (iii) "The one who does not cheat, does not get ahead", and (iv) "No one should get involved in family or friends' problems". In our baseline exercises, we convert these survey responses into binary dependent variables.[8] Specifically, respondents who choose "completely agree" or "agree" are assigned the value 1 and considered supporters of the statement; 0 otherwise.

The four statements can be interpreted as eliciting individual behavioral preferences that map into various forms of social capital (see, Dasgupta 2005; Durlauf and Fafchamps 2004); in particular, the deeply related concepts of social norms and trust. Statement (i) gets at the individual's view of her relationship with civic (legal) institutions. In the discussion of results in Section 4.3, we will refer to this statement as "civic social capital". As we noted in the Introduction, there is now a large literature that argues that social capital is an important determinant of economic outcomes; e.g., growth. To the extent that exposure to violence results in the breakdown of conformity to social norms embedded in formal legal institutions, we would expect to see a reduction in the stock of generalized trust in society (Knack and Keefer 1997). Statements (ii) and (iii), on the other hand, characterize the individual's respect for social constraints on her freedom to act in the pursuit of her own self-interest in her personal interactions with others. These statements target the informal rules and norms that govern interactions within social networks. Compliance with these informal norms would raise the level of trust within social networks. In Section 4.3 below, we will refer to statement (ii) as "freedom of choice" and statement (iii) as "sense of fairness". Finally, statement (iv) addresses a special type of social network. It gets at the question of whether exposure to violence leads to a strengthening or weakening of kinship networks. We will refer to statement (iv) as "private social capital" in Section 4.3 below. Collectively, therefore, the four statements allow us to investigate how exposure to violence changes individual pro-social behavioral preferences at different social distances from her interaction with society at large down to her relationship with family and friends.

[8] There is also an option of responding "don't know". We drop individuals who responded with "don't know" to preserve the interpretability of the binary variable. The number of respondents responding "don't know" constitute less than 1% of the sample.

3.2 Methodology

Because our dependent variables for both risk aversion and mental health are binary, we employ a non-linear difference-in-differences (DID) model to identify the average treatment effect on the treated (ATET). There are two common approaches to implementing nonlinear DID based on different common trend assumptions.[9] We report results for both approaches in the next section. The first approach employs the standard common trend assumption in the linear framework. This approach parsimoniously estimates the conditional expectation functions of the four DID subpopulations using standard nonlinear parametric approximations. It then averages across the support of the confounders to obtain estimates for the ATET. In our context, this first approach is given by

$$ATET_1 = \frac{1}{N}\sum_{i=1}^{N} d_i t_i \{[y_{it} - \emptyset(x_i\varphi_1^0)] - [\emptyset(x_i\varphi_0^1) - \emptyset(x_i\varphi_0^0)]\}, \quad N = \sum d_i t_i$$

where d_i denotes whether individual i was born in a municipality which experience "severe violence" or not; if $d_i = 1$, individual i is in the treatment group, if $d_i = 0$, individual i is in the control group. Note that the treatment variable d_i is binary. As we noted in the previous section, we define "severe violence" as exposure to a level of violence above the median level of violence across municipalities. For robustness, we also consider the case where exposure to violence above the top quartile is defined as "severe". t_i denotes the pre- or post-treatment periods; $t_i = 1$ is the post-treatment period, and $t_i = 0$ is the pre-treatment period.

We next describe the set of coefficients, $\varphi_{t_i}^{d_i}$. For example, φ_1^0 denotes a vector of coefficients (including a constant) estimated using a probit model with dependent variable, y_1^0, in the subsample defined by group $t_i = 1$ and $d_i = 0$. $\emptyset(.)$ is the normal cdf and hence $\emptyset(x_i\varphi_1^0)$ denotes the estimated probit model results using φ_1^0 and x_i. Similarly, we can define φ_0^1 and φ_0^0 and estimate them using the other subsamples. For estimating $\varphi_{t_i}^{d_i}$, we control for some basic exogenous variables, like age, square of age, gender, and region (e.g., municipality) fixed effects as well as other pre-treatment characteristics such as marital status, education, employment, household expenditure, household size and wealth. The bootstraped standard errors are obtained through simulation for 1000 replications.

However, as pointed out by Lechner (2011), the standard common trend assumption invoked in the above approach could lead to cases where adjusting for the common trend results

[9] We refer the reader to Lechner (2011) for a detailed discussion of these approaches.

in expected outcome values that are outside of the support of the limited dependent variable. Lechner (2011) provides an example for the binary dependent variable case and argues that the standard common trend assumption is therefore unlikely to be persuasive for this case. Instead, a second nonlinear DID approach to identifying the ATET, following Blundell and Costa Dias (2009), relies on a modified common trend assumption that may be more persuasive for dependent variables with bounded support.

This second approach employs the concept of a latent dependent variable and assumes that the (observed) dependent variable is connected to the latent dependent variable via a link function. For example, in the probit case, the link function is the cdf of the standard normal distribution. Lecher (2011) shows that if we assume that the standard common trend assumption holds at the level of the expectations of the *latent* dependent variables, then, the ATET is identified and given, using the same notation from above, as

$$ATET_2 = \frac{1}{N}\sum_{i=1}^{N} d_i t_i \left[y_{it} - \emptyset(x_i\varphi_1^0 - x_i\varphi_0^0 + x_i\varphi_0^1)\right], \quad N = \sum d_i t_i$$

The modified common trend assumption described here may be particularly persuasive in our case since both the survey measured risk aversion and mental health variables potentially express an underlying latent spectrum of preference and depression realizations in the population that are then mapped into the categories allowed by the survey questionnaire. As in applications in health studies where the dependent variables are fully observed, it appears reasonable that, in our context, the standard common trend assumption should be imposed on these more relevant, though latent, expressions of risk aversion and mental health.

Finally, we note that identification in both cases above assumes an exogenous surge in violence. It is possible that the surge in violence was related to unobserved changes in characteristics at the level of the municipality. Brown (2015) formally examines this issue using data on pre-escalation trends for 135 baseline municipalities of MxFLS to predict each municipality's homicide rate in 2009 along with the change in the homicide rate between 2005 and 2009. He does not find any evidence that the pre-escalation trends in the *observed* characteristics of municipalities were related to future homicide rates.[10] This evidence provides some assurance that the surge in violence may be exogenous to municipalities' characteristics. [11]

[10] For details on how these trends were created, see Brown (2015).
[11] Velásquez (2015) followed the same strategy and found similar results.

4. RESULTS

4.1 Violence and Risk Preference

In our baseline specification, the classification of municipalities into treatment and control groups is based on the median homicide rate. Municipalities with higher than median (10.619) homicide rates in year 2009 were placed in the treated group. Table 1 presents the descriptive statistics from the pre-treatment period. With the exception of the binary variable for being adjacent to the US and the agriculture production area at the municipality level, the characteristics for the two groups are very similar. The differences due to bordering the US are understandable since this area often forms part of the drug corridor to the US. Consequently, these are very profitable areas and vigorously contested.

Table 2 presents the time and cross-sectional differences in the unconditional means of the two groups. We note that the difference in the pre-treatment means between the treated and comparison groups is negative implying that the treated group started out exhibiting less risk aversion on average than the comparison group. The treated group subsequently observed a net increase of 10.76 percentage point in risk aversion in the post-treatment period. More systematically, the estimation results for the nonlinear DID using the standard common trend assumption are shown in Table 3 (Panel A). Column (1) includes only individual levels characteristics while column (2) adds time varying municipal-level characteristics. Columns (3) and (4) add municipal and state fixed effects respectively to the individual characteristics. Irrespective of the model, the coefficient (the average treatment effect on the treated (ATET)) for exposure to violence at the municipal level is highly significant. The estimated coefficient for column (1), the 11 percentage point increase in likelihood of being in the risk averse group, is consistent with Moya's (2015) finding that forced displacement in Columbia increases the probability of risk aversion by 15%. While the coefficients for columns (1) and (2) are qualitatively similar, there is a sharp increase with the inclusion of municipal or state fixed effects. When these fixed effects are included, the coefficient for the homicide rates reflects deviations from the municipal (state) average. This implies that changes in the levels of homicide rates (columns (1) and (2) are less important than departures from geographical averages (columns (3) and (4)).

In Table 3 (Panel B), we present the estimation results for nonlinear DID using the modified common trend assumption. The covariates in each column replicate those from Table 3. The estimated coefficients are very similar, albeit somewhat larger than in Table 3. Taken together, these results confirm the positive causal relationship between exposure to municipality level violence and risk aversion. Moreover, the estimation results that include fixed effects imply a strong response. Again, these results are similar to those in Brown et al. (2015), Jakiela and Ozier

(2015), Moya (2015) and Kim and Lee (2014), who find an increase in risk aversion due to exposure to violence, and stand in contrast to those of Voors et al. (2012) who finds the opposite.

4.1.1 Robustness checks

We conduct two types of robustness analyses. The first addresses the way in which we converted the ordered risk preferences responses in the survey questionnaire into a binary variable. As we detailed in section 3.1, in the baseline analysis discussed above, we used the second category as the threshold for risk aversion. To verify the robustness of the baseline findings to alternative thresholds (at least qualitatively), we recode the binary variable such that the first three categories are now assigned the value of 1 in the binary conversion. Table A1 in the Appendix presents the simple differences in the unconditional means for the two groups. As in the baseline case, we observe that the treated group started out as being less risk averse than the comparison group in the pre-treatment period. Subsequently, the treated group observed a net increase of 12.38 percentage point in risk aversion in the post-treatment period. In comparison to our earlier coding, this represents a roughly 2 percentage point increase in the unconditional treatment effect.

Tables A2 in the Appendix show the nonlinear DID results for the cases of the standard and modified common trend assumptions respectively. The estimated coefficients for the standard common trend case (Panel A, Table A2) remain highly significant and the estimates are qualitatively similar to the corresponding baseline findings although the estimated coefficients for the first three specifications are larger. When the model includes a state fixed effect (column 4), the newly estimated coefficient is smaller although generally similar. In contrast, the estimated coefficients for the modified common trend (Panel B, Table A2), while significant and qualitatively similar, are smaller than the earlier estimated coefficients. That said, the results from both panels of Table A2 suggest that our results are not due to the particular transformation of the categorical variable into a binary variable.

We next re-examine our definition of the treatment variable, and, in particular, what it means to be exposed to "severe" violence. In the earlier baseline analysis, treatment was defined relative to the median homicide rate across the MxFLS municipalities. However, this threshold is arbitrary. It is possible that the effects of violence vary based on the threshold chosen. Moreover, earlier analyses have focused on civil wars which have much higher levels of violence. Consequently, we employ a higher threshold - the third quartile (75^{th} percentile) homicide rates as a threshold for treatment assignment. We present the corresponding estimation results in Tables A3 and A4 in the Appendix. Although the magnitudes of the coefficients vary somewhat, they are qualitatively robust. Using this more stringent treatment assignment, we also ran the corresponding analysis for when the risk aversion outcome variable was defined using the first three categories

(instead of just the two categories in the baseline case) in the binary conversion. The results are also provided in the Appendix (Tables A5-A6). These results show that varying the definition of the treatment variable does not affect the results. More broadly, the similarity between the estimated coefficients despite the change in the treatment threshold suggests that the effects are broadly constant across a large range of homicide values.

4.1.2 Heterogeneous effects

We now consider whether the effects may vary based on individual characteristics. We specifically consider three dimensions: gender, education and age. Not only does the potential for exposure vary within the population but risk perceptions may be more or less malleable based on age and education. Generally speaking, women have been found to exhibit higher levels of risk aversion (see Croson and Gneezy 2009 for a detailed review). We present the results by gender in Table A7 in the Appendix. For each model, we present our earlier results (Tables 3) in the first column and the results for just men and just women. Similar to other studies on the effects of exposure to violence on risk aversion, we find no significant differences between the genders. Consequently, even though men and women may have differences in their likelihood of being exposed to violence, there is no difference in its effect on risk aversion.

We next examine the effects of education levels. In particular, education might be correlated with exposure via types of employment and might be correlated with access to information regarding homicides. In Mexico, 9 years of schooling has been made compulsory. We therefore use this level of education as the threshold to see if those with 9 or more years of education behave differently from those who have not attained this basic level of education. The results are reported in Panels A and B of Table A8 for the cases of the standard and modified common trend. The results suggest that there are no significant differences based on these education groups. This result is similar to the broader literature on risk aversion (Dohmen et al. 2005; Hryshko et al. 2011) although it contrasts with some studies (Jung 2015).

The third dimension for which we check heterogeneity in the effect of violence on risk aversion is age. The general belief is that risk aversion increases with age. However, the empirical literature provides mixed evidence on this issue (see Mather et al. 2012 for a discussion). The median age of the respondents in our sample is 36 years. We therefore use the median age as a threshold to check for age heterogeneity in the effect of exposure to violence on risk preferences. The results are presented in Table A9. The results show that there is no age heterogeneity both

qualitatively (in terms of sign) and quantitatively (magnitude). These results for heterogeneity are confirmed using Wald tests.[12]

In the light of the above discussion, we can conclude that exposure to violence at the municipality level in Mexico results in people becoming more risk averse and that this result is robust to different specifications, change of the thresholds for the binary conversion of the risk aversion outcome variable, and different treatment assignments. Moreover, there appears to be no heterogeneity in the effect of violence exposure on risk aversion across gender, age or education levels.

4.2 Violence and Mental Health

The literature on how risk attitudes vary as a consequence of exposure to violence frequently cites the importance of the effects of violence exposure on mental health. In fact, the impact of violence on mental health is used to motivate the observed changes in risk attitudes, and, in the case of Moya (2015), it is explicitly found to be an important channel for the latter. We therefore explore the effects of violence exposure on mental health with two questions in mind. First, does violence affect mental health in the Mexican context? Second, if there is an effect, is this an (important) channel for explaining the increased risk aversion?

We investigate these questions in Tables 4 and 5. The simple difference in unconditional means (Table 4) shows that the difference between the treatment and comparison groups is very small and negative in the pre-treatment period (indicating relatively better mental health in the treated group). In contrast to the case of risk aversion above where the signs were subsequently reversed, this difference for mental health is maintained in the post-treatment period. The suggestion that exposure to violence might have negligible impact on mental health is further confirmed in the more systematic nonlinear DID results in Table 5 (Panels A and B). In general, none of the estimated coefficients are significant. However, there is an important exception. In both the standard and modified common trend cases, the estimated ATET's are positive when state level fixed effects are included; i.e., implying that exposure to violence leads to worse mental health. We therefore certainly cannot definitively conclude that violence exposure has no impact on mental health outcomes, but raise the possibility that any such findings may be very sensitive to model specification.

The lack of significance for the effect of violence exposure on mental health in the majority of our findings is initially surprising since this pathway implicitly (and explicitly) underlies much of the existing literature. One possibility is that this is caused by our combining moderate and

[12] The results are qualitatively similar using the alternate threshold for treatment assignment (75th percentile).

severe depression into one category (to create a binary variable). We therefore re-estimated the models recoding severe depression as 1 and everything else as 0. Although not shown here, the results are qualitatively similar to our earlier results. Another possibility is that mental health only responds to higher levels of violence. We therefore employ the higher third quartile threshold treatment variable as described in section 4.1 and report the results in Table A10 in the Appendix. Again, the estimated coefficients are not significant. Hence, these insignificant results for mental health are robust to different cutoffs for the binary conversion that produces the depression/mental health outcome variable as well as to different treatment assignments.[13]

The difference between our results and Moya (2015) might be explained by the level of aggregation for the violence. Moya (2015) has individual-level data on exposure to violence while we use a more aggregate level. Consequently, we are capturing a data-weighted average of directly and indirectly exposed respondents. In the case of Mexico, we presume that there are relatively more of the latter. It is possible that direct exposure is required for substantial changes to mental health. That said, our results do suggest that while mental health may play an important role for changes in risk aversion, it is not a necessary condition. We find clear and robust changes to risk aversion without any corresponding changes to mental health.[14] This suggests that the focus on mental health in the literature, while important, may be missing out on other relevant channels.

4.3 Violence and Pro-Social Behavior

We begin by describing our findings for statement (i) of pro-social behavior; i.e., civic social capital. The positive difference in unconditional means (see, Table 6) between the treatment and control groups suggests that civic social capital deteriorated by 4.3 percentage point in the post-treatment period. These results are upheld by the formal nonlinear DID estimations; see, Table 7. Under both nonlinear DID approaches, the ATET is positive and highly significant across all but one specification confirming a deterioration in civic social capital of between 4-10 percent points as a result of exposure to violence. However, when we control for municipality fixed effects, we find an insignificant effect of violence on civic social capital.

[13] We also check for heterogeneous effects across gender, education and age. Due to space limitation, however, only the results for gender heterogeneity are reported in Table A11 in the Appendix. It is apparent that there is no heterogeneity in terms of sign, significance and magnitude. Similar results are found for heterogeneity with respect to education and age.

[14] As noted earlier, Brown et al. (2015) investigate the related question of whether emotional well-being mediates the effects of exposure to violence on risk aversion and do not find any statistically significant effects. To proxy for emotional well-being they construct a measure using the Short Form 36 Health Survey which is a general measure of physical and mental health. Our results for the relationship between mental health status and risk aversion is consistent with Brown et al. (2015)'s. However, our measure of mental health (based on CES-D scale) is one that has been validated to indicate clinical depression symptoms and thus is a more direct and specific measure of that particular dimension of mental health. In any case, we view the results in both papers as fundamentally complementary.

Overall, therefore, while our results do indicate evidence for detrimental effects of violence on this aspect of pro-social behavior, it does appear that the results are sensitive to changes in the model specification. A possible explanation for a positive ATET could be that people who experience an increase in violence perceive their exposure as a failure of the system/institutions by the public to protect them. This loss of trust in civic institutions and, in particular, in the rule of law leads to a reduction in the desire to comply with these laws leading to lower levels of social capital (Paras 2007). Our results are generally supportive of the findings of Blanco (2012) and Blanco and Ruiz (2013) for Mexico and Columbia, respectively, who employ different data[15] and find that increased perceptions of insecurity and crime victimization have negative effects on trust in institutions related to the criminal justice system.

The results for statement (ii); i.e., freedom of choice, are provided in Tables 8 and 9. The simple difference in unconditional means (Table 8) between the treated and control groups shows a weakening of social constraints on individual freedom of choice by 5 percentage point in the post-treatment period. The results for nonlinear DID under both types of common trend assumptions (Panels A and B: Table 9) support the simple DID both quantitatively and qualitatively, for the cases where no fixed effects are included and only when time-varying municipality characteristics are included in the model specification. However, when we include either municipality or state fixed effects, the ATET is not significant at the 5% level. Yet again, therefore, while there is certainly evidence that exposure to violence causes individuals to become less restraint in their behavior by social norms, the findings do depend on model specification.

The findings for statement (iii) of pro-social behavior; i.e., sense of fairness, are reported in Tables 10-11. It is evident from Table 10 that although the net difference between the treated and control groups is positive, the magnitude of the effect is very small (only 1.5 percentage point). The estimation results from nonlinear DID for both standard and modified common trend assumptions (Panels A and B in Table 11, respectively) provide scant evidence that exposure to violence affects an individual's sense of fairness. The ATET is insignificant for all the specifications in both cases except for the specification in which municipality fixed effects are controlled for. For that specification, the results suggest counter-intuitively perhaps a strengthening of the sense of fairness on the part of exposed individuals. Overall, the results do not suggest a strong relationship between exposure to violence and an individual's sense of fairness.

[15] Specifically, survey data from the Latin American Public Opinion Project (LAPOP) and Encuesta Nacional Sobre la Inseguridad (ENSI).

The result for the impact of violence on private social capital (statement (iv)) are provided in Tables 12-13. The difference in unconditional means in Table 12 shows that exposure to violence increases private social capital by 3.8 percentage point. We note that the negative sign for the ATET means that the respondents disagree with the statement "*No one should get involved in family or friends' problems*". The estimation results for nonlinear DID under both standard and modified trends assumptions (Panels A and B in Table 13, respectively) deliver similar findings. While the results for the specification with time-varying municipality characteristics are not significant at the 5% level, the results for the other specifications are all strongly significant and negative at the 1% level. In particular, the exercises that control for municipality and state fixed effects find that exposure to violence strengthens kinship networks (as measured by statement (ii)) by 20-26 percentage points. Our findings for the strengthening of kinship networks with a corresponding reduction in civic social capital (the findings for statement (i) discussed above) are consistent with the literature on the effects of civil conflict on social capital. For example, Cassar et al. (2013) found, in the context of the Tajik civil war, that exposure to conflict resulted in a reduction in the willingness to engage in impersonal interactions while reinforcing kinship-based morality norms. Similarly, Rohner (2013) found in the ethnic conflicts in Uganda that the fighting decreased generalized trust while increasing ethnic identity.

4.3.1 Robustness checks

We conduct the robustness check by changing the definition of treatment variable. In the previous analysis, the median homicide rates are used for treatment assignment. We now run the analysis by exposing the treated group to "severe" violence (i.e. 75^{th} percentile homicide rates). The results for nonlinear DID for both the trends assumptions are presented in Tables A12-A15 in the Appendix for all the four characteristics of social behavior. It is evident from these tables that almost all the results are robust to this "severe" treatment assignment. They are similar in terms of sign, significance and magnitudes to the ones obtained for median homicide rates. Like with the benchmark findings above, we do see some sensitivity to model specification. For example, the findings for sense of fairness in Table A14 now deliver significant findings for the specification with no municipality characteristics and fixed effects and no state fixed effects (Model 1). Also, the results for the nonlinear DID exercises with the modified common trend assumption (Panel B: Table A14) are now significant in the presence of state fixed effects though they become insignificant when we include municipality fixed effects instead. Hence, while we believe that the overall findings support the conclusions we derived in the above section, we nevertheless concede that they should be interpreted with caution.

4.3.2 Heterogeneous effects

Similar to what we did for risk aversion (see, Section 4.1.2), we check for heterogeneity in the causal effects of violence exposure on pro-social behavior across gender, education and age. All results are validated using Wald tests and the tables discussed are found in the Appendix. In order to economize on space, we only report results for those cases where significant heterogeneity was found.[16] We find no evidence for gender heterogeneity for all the four aspects of pro-social behavior. We do find that exposure to violence reduces the civic social capital of older respondents (37 years and above) while the corresponding impact on younger respondents is insignificant (Table A16).

However, our most interesting results are for the heterogeneity across years of education (a proxy for socioeconomic class; Tables A17-A20). Interestingly, the detrimental effects on civic social capital from exposure to violence are observed only for less educated (less than 9 years of schooling) respondents. The findings in Table A17 show that the ATET coefficients for more educated people are insignificant. Hence, exposure to violence results in a loss in trust in civic institutions that are felt primarily by those of lower socioeconomic class. This same class of respondents also experience an increase in self-interested behavior and a reduction in sense of fairness as a result of the violence (Table A18-19). This general withdrawal of trust in society towards a more acute sense of individualism as a result of exposure to violence did not accompany a desire to strengthen kinship networks (Table A20). In combination with the results we found for risk aversion in Section 4.1.2 (i.e., no heterogeneity in the effects on risk aversion across respondents with different levels of educational attainment), the suggestion is that the impact of violence on this group amounts to a levels effect – that is, an aggregate reduction in pro-social behavior at both the social and individual level – and not a substitution effect where a reduction in pro-social behavior in one dimension was traded-off for an increase in pro-social behavior along another dimension for the purposes of, perhaps, optimizing the possibilities for insurance against the effects of future shocks. We should also note that there is some evidence that respondents with more years of education (9 or more school years; i.e., individuals of higher socioeconomic class) appear to want to strengthen kinship networks in response to violence (Table A20). However, this finding is sensitive to model specification.

4.4. Falsification Tests

We conduct standard falsification (i.e., placebo) tests using pre-treatment data in order to support the common trend assumptions that underlie identification in our DID approach.

[16] However, all unreported results for heterogeneity are available upon request.

Specifically, we check that the trends in the outcomes variables before the surge in violence are similar for both treatment and comparison groups. We can directly carry out the falsification test for the mental health outcome because we have data for two pre-treatment periods (MxFLS1and MxFLS2). If the trends were similar in both groups in the pre-violence period, then the ATET for the false treatment (placebo) should be insignificant. The nonlinear DID falsification test results for both common trend assumptions (Panels A and B in Table A21 in the Appendix) verify that this is indeed the case.

We are not, however, able to conduct direct falsification tests for the risk aversion and pro-social behavior outcome variables because the data for these variables do not exist in the first pre-treatment wave (MxFLS1) leaving us with data for only one pre-treatment wave. Since, we do not have sufficient pre-treatment data to carry out falsification tests on these outcomes variables directly, we instead conduct falsification tests on other pre-treatment variables that are correlated with risk aversion and pro-social behavior. Specifically, using the 3rd wave of the data (MxFLS3), we regress these two outcome variables on a set of covariates and note those that are significant. We then conduct falsification tests (i.e., run nonlinear DID with a false treatment) on these significant covariates using data from the two pre-treatment waves (MxFLS1and MxFLS2). If the pre-treatment trends for these significant covariates plausibly indicate the nature of pre-treatment trends for risk aversion and pro-social behavior, then we would hope that the ATET for the false treatment for these covariates would be insignificant. The falsification test results for the covariates for risk aversion and pro-social behavior are presented in Table A22 and Table A23 in the Appendix, respectively. In both cases, we find that the common trend assumptions are largely upheld.

The fact that the DID common trend assumptions hold for the outcome variables considered in this paper is consistent with similar findings in other studies (investigating other outcome variables) using MxFLS data. For example, Brown and Velásquez (2015) undertake falsification (placebo) tests for the impact of violent crimes on a range of outcomes related to human capital including years of educational attainment, school attendance, cognitive scores, cognitive alertness, and employment behavior. Similarly, Velásquez (2015) and Brown (2015) employ falsification tests when examining the impact of violence on, respectively, labor market outcomes and birth outcomes in Mexico.

4.5. Migration and Attrition

We finally address two other potential threats to identification; i.e., migration and sample attrition. In order to address these concerns, we follow the approaches in Brown (2015) and Velásquez (2015).

4.5.1 Migration

Migration (e.g., out of high violence municipalities) potentially poses a threat to identification if it is driven by unobserved factors. It turns out that those respondents who migrated between the pre- and post-treatment waves represent only 3% percent of the sample. Nevertheless, we attempt to directly verify that this migration was not in response to violence. We first constructed a measure of migration by using a dummy variable to indicate whether the respondent's municipality changed between the second and third waves of the data. Using a probit model, this indicator is then regressed on the change in homicide rates between 2005 and 2009 controlling for a set of individual and household characteristics and state fixed effects. The results (marginal effects) are shown in Table 14. Columns 1 and 2 of Table 14 confirm that migration is not associated with the surge in violence. The coefficients of the change in violence are not significantly different from zero indicating that the surge in violence does not predict migration. This result is consistent with Brown (2015) for this particular measure of migration. Moreover, migration behavior does not appear to be specific to any group; the coefficients to the interaction terms between change in violence and individual and household characteristics are insignificant except for the case of married people. However, even in this latter case, the coefficient is significant at only the 10% level and the small value of the coefficient suggests a small impact on migration decision. In unreported results (available upon request), we also check that our baseline results are robust to dropping migrants from the sample and find that this is, in fact, the case.

4.5.2 Attrition

The attrition rate between the pre- and post-treatment samples (i.e., MxFLS2 and MxFLS3) is 23%. This is certainly a substantial number. We attempt to check whether the decision to attrite from the sample was affected by the surge in violence. We define an attrition variable that takes the value 1 if the respondent was not present in the MxFLS3 wave conditional on being present in the MxFLS2 wave; 0 otherwise (Velásquez 2015). We then run a probit regression of the attrition variable on the change in homicide rates between 2005 and 2009, a set of individual and household characteristics and state fixed effects. The results (marginal effects) from the probit regression are shown in columns 3 and 4 in Table 14. The evidence suggests that attrition from the MxFLS3 is potentially not being caused by anticipation of future violence. Similar results are found in Brown (2015) and (Velásquez 2015). Moreover, except for years of education, the interaction terms for change in violence and individual and household characteristics are also insignificant, suggesting that violence does not predict attrition within specific groups. The coefficient of the interaction term for education, although statistically significant, is also small suggesting a negligible effect on the decision to attrite from the panel.

Overall, our findings for migration and attrition suggests that the surge in violence was plausibly exogenous, and, at least across the span of the pre- and post-treatment waves of the data, individuals did not spatially sort across treatment and control municipalities nor systematically attrite from the panel because of it.

5. CONCLUSION

With the rise of criminal violence in many areas of the world, it is important to understand its consequences for economic behavior. Using the exogenous surge in violence caused by the crackdown on the drug trade in Mexico, we present one of the first systematic examinations of its effects in the context of Mexico. In particular, we present evidence of a negative impact of exposure to high levels of criminal violence on risk aversion. Similar to the earlier micro-conflict literature, we find strong evidence for a resultant increase in risk aversion. We differ, however, with respect to the effects of violence exposure on mental health. Prior research has focused on mental health as the primary channel through which changes in risk aversion occur. Although we find strong effects of exposure to violence on risk aversion, we do not find a similar effect on mental health. At the very least, this result suggests that while mental health changes may be one channel for determining risk aversion, it is unlikely to be the only channel. Further research is required to identify alternate channels.

Finally, we also investigate the effects of violence exposure on pro-social behavior. We find that exposure to violence resulted in a reduced willingness to support generalized social institutions (e.g., legal and generalized social norms) and an increased desire to strengthen personal/kinship bonds. The former outcome potentially arises from the direct loss of trust due to the perceived failure of state institutions to stem violence and to protect the public from its consequences. The reinforcement of kinship networks is potentially related to our findings for risk aversion. As the individual's risk aversion rises, the social insurance inherent in kinship networks becomes more valuable. The value of kinship networks may also be further strengthened as the level of security provided by state institutions weakens as a result of the reduced compliance by individuals in society with the law. In this sense, personal networks become a substitute for impersonal institutions.

More broadly, because previous research has concluded that changes in behavioral parameters due to exposure to violence may be highly persistent, our work suggests that criminal violence in Mexico (and elsewhere in Latin America and the Caribbean) could have potentially lasting effects on social welfare. The costs of crime to the individual and to society will continue to be felt for many years.

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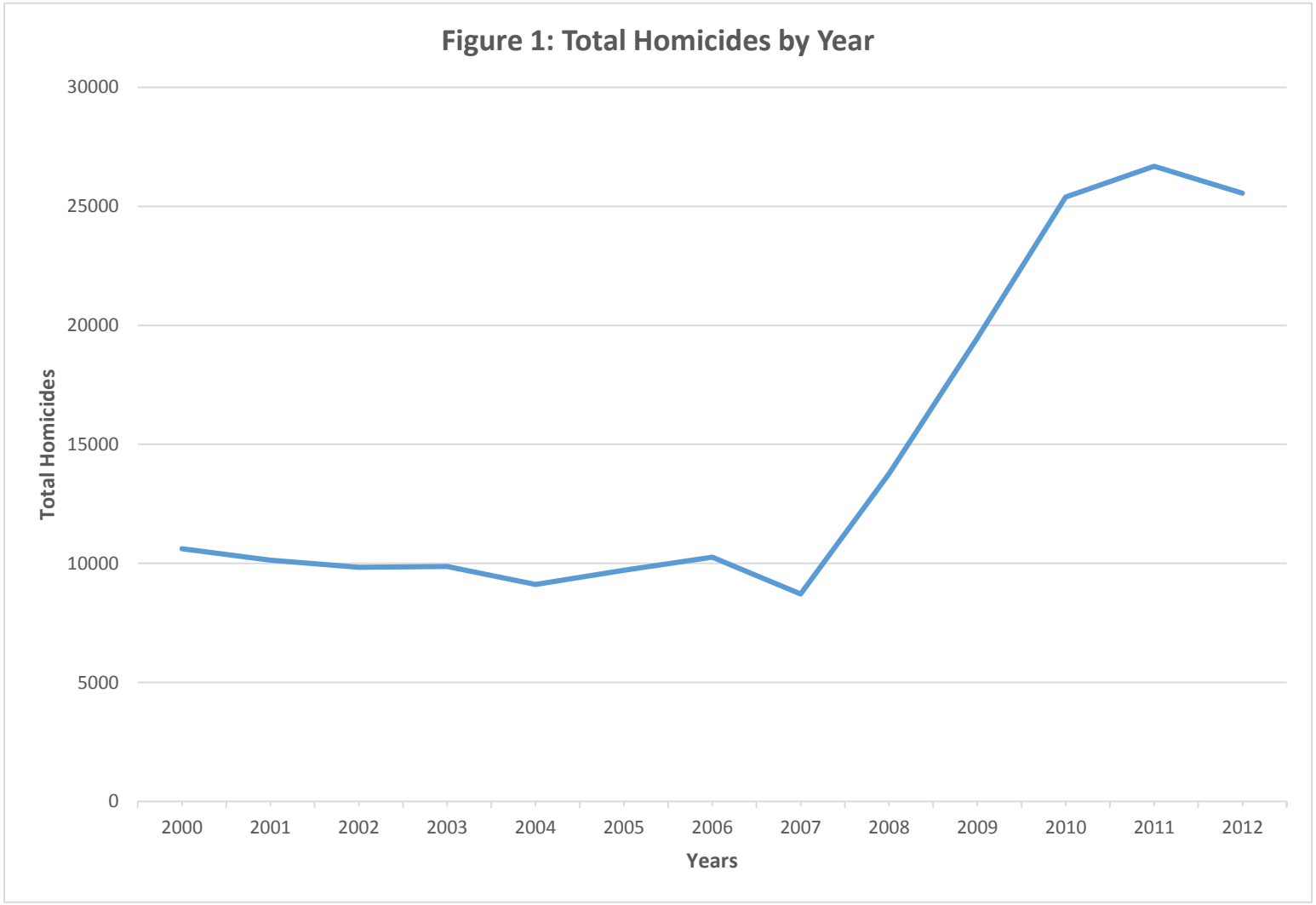
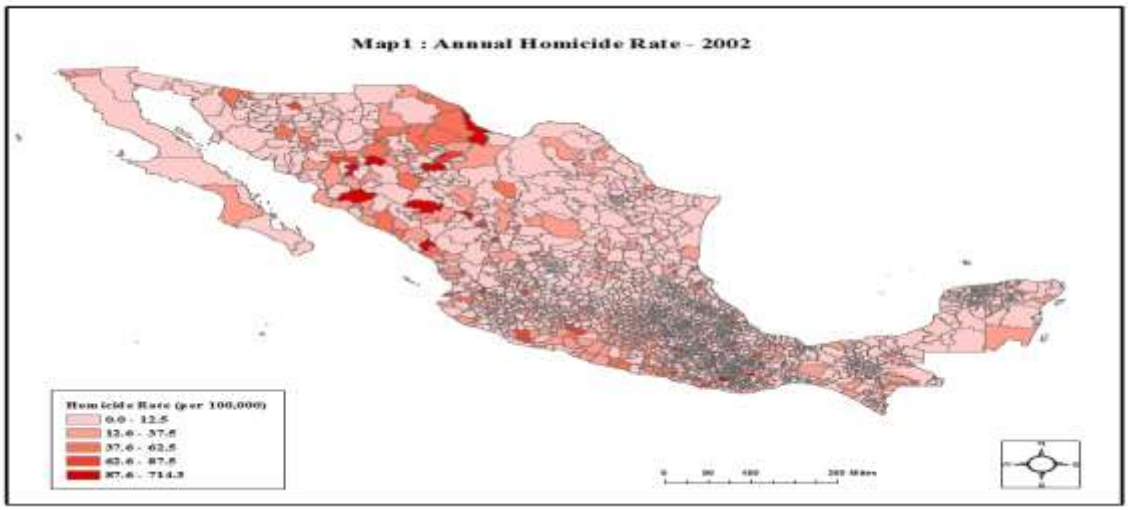
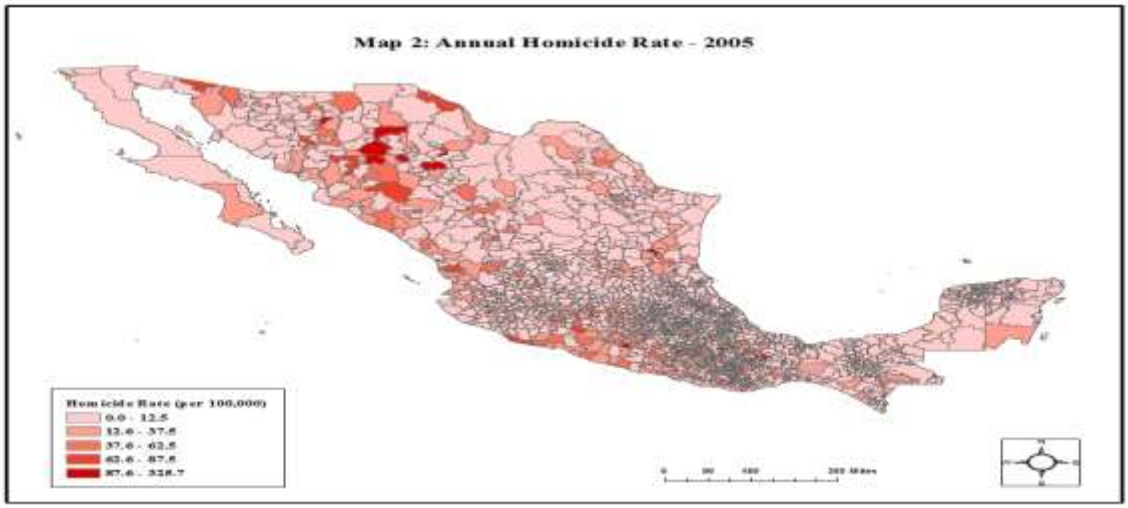


Figure 1: Total Homicides by Year
30000
25000
20000
15000
10000
5000
0
Total Homicides
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Years


Map1 : Annual Homicide Rate - 2002
Homicide Rate (per 100,000)
0.0 - 12.5
12.6 - 37.5
37.6 - 62.5
62.6 - 87.5
87.6 - 714.3


Map 2: Annual Homicide Rate - 2005
Homicide Rate (per 100,000)
0.0 - 12.5
12.6 - 37.5
37.6 - 62.5
62.6 - 87.5
87.6 - 328.7

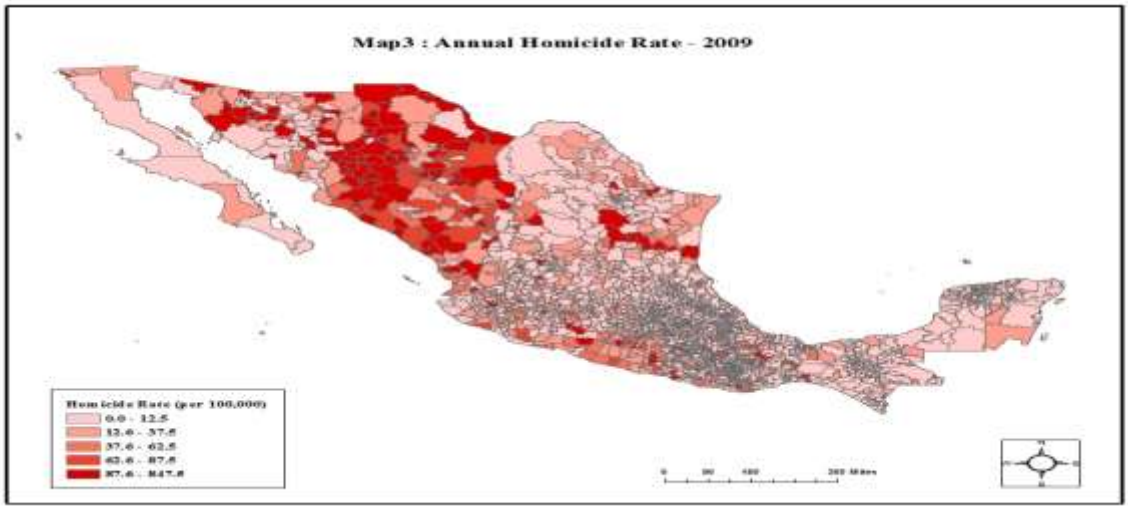

Map3 : Annual Homicide Rate - 2009
Homicide Rate (per 100,000)
0.0 - 12.5
12.6 - 37.5
37.6 - 62.5
62.6 - 87.5
87.6 - 847.8

Table 1: Descriptive Statistics

	Treated Group		Control Group	
Outcome Variables	Mean	SD	Mean	SD
Risk Aversion 2005	0.0955	0.2953	0.1363	0.3432
Risk Aversion 2009	0.5915	0.4915	0.5237	0.4994
Mental Health 2005	0.0170	0.1293	0.0199	0.1397
Mental Health 2009	0.0173	0.1306	0.0257	0.1582
Civic Social Capital 2005	0.1859	0.3890	0.1752	0.3801
Civic Social Capital 2009	0.2622	0.4398	0.2081	0.4060
Freedom of Choice 2005	0.7997	0.4002	0.8081	0.3938
Freedom of Choice 2009	0.8310	0.3747	0.7875	0.4090
Sense of Fairness 2005	0.2065	0.4048	0.1979	0.3985
Sense of Fairness 2009	0.2208	0.4148	0.1968	0.3976
Private Social Capital 2005	0.6828	0.4654	0.6538	0.4757
Private Social Capital 2009	0.6184	0.4858	0.6273	0.4835
Individual Characteristics				
Age	38.46	16.86	37.46	16.37
Age Squared	1764.34	1476.43	1671.731	1415.29
Gender	0.4066	0.4912	0.4112	0.4920
Education	7.350	4.505	7.192	4.445
Marriage	0.5259	0.4993	0.5443	0.4980
Employment	0.4819	0.4997	0.4912	0.4999
Household Characteristics				
Household Size	5.137	2.376	5.460	2.603
Household Expenditure	67352.34	77968.63	69146.86	83622.64
Household Wealth[1]	0.8432	0.3636	0.8430	0.3638
Municipality Characteristics				
Border with US	0.2088	0.4065	0.1431	0.3503
Agriculture Production Area	40641.46	61421.96	15332.12	19029.45
Housing (total private dwelling)	65698.37	80804.58	70143.32	96254.72
Average Household Size	4.113	0.2637	4.206	0.4138
Conviction Rate	86.150	15.915	85.657	19.157
Literacy Rate	86.163	1.487	86.117	2.098
Health Care Access	46.040	19.875	51.340	17.752
Observations	5582		5873	

Note 1: Household wealth is measure by whether or not the respondent owns a house.
Note 2: All the characteristics are from pre-escalation period (2005-06 survey).

Table 2: Risk Aversion- DID for Unconditional Means

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.0965	0.5915	0.4950
Control Group	0.1363	0.5237	0.3874
Difference	-0.0398	0.0678	0.1076

Table 3: Risk Aversion- Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.1105***	0.0583***	0.4190***	0.3778***
	(0.0108)	(0.0166)	(0.0629)	(0.0309)
Panel B: Modified Common Trend				
ATET	0.1505***	0.0945***	0.5022**	0.4829***
	(0.0149)	(0.0226)	(0.0617)	(0.0307)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	22910	22910	22910	22910

Note: *** and ** show significance at 1% and 5% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual level control variables include age, age square, gender, education, marital status, employment status, household size, household expenditure and wealth. The municipality characteristics include municipality level per capita income, literacy rate, access to health services, total number of private dwellings, number of persons per dwelling, agriculture production, conviction rate and an indicator for whether the municipality is along the US border or touches the route to the US. All these control variables are used from pre-treatment period.

Table 4: Mental Health - DID for Unconditional Means

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.0170	0.0173	0.0003
Control Group	0.0199	0.0257	0.0058
Difference	-0.0029	-0.0084	-0.0055

Table 5: Mental Health- Nonlinear DID

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Panel A: Standard Common Trend				
	-0.0055	0.0059	-0.0448	0.0409***
ATET	(0.0034)	(0.0073)	(0.0379)	(0.0140)
Panel B: Modified Common Trend				
	-0.0049	0.0012	-0.0438	0.0168***
ATET	(0.0039)	(0.0044)	(0.0515)	(0.0039)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	22910	22910	22910	22910

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual level control variables include age, age square, gender, education, marital status, employment status, household size, household expenditure and wealth. The municipality characteristics include municipality level per capita income, literacy rate, access to health services, total number of private dwellings, number of persons per dwelling, agriculture production, conviction rate and an indicator for whether the municipality is along the US border or touches the route to the US. All these control variables are used from pre-treatment period.

Table 6: Pro-Social Behavior (Civic Social Capital) - DID for Unconditional Means

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.1859	0.2622	0.0763
Control Group	0.1752	0.2081	0.0329
Difference	0.0107	0.0541	0.0434

Table 7: Pro-Social Behavior (Civic Social Capital) - Nonlinear DID

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Panel A: Standard Common Trend				
	0.0439***	0.0731***	-0.0947	0.1018***
ATET	(0.0105)	(0.0171)	(0.0775)	(0.0371)
Panel B: Modified Common Trend				
	0.0418***	0.0665***	-0.0679	0.1027***
ATET	(0.0112)	(0.0140)	(0.0825)	(0.0306)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual level control variables include age, age square, gender, education, marital status, employment status, household size, household expenditure and wealth. The municipality characteristics include municipality level per capita income, literacy rate, access to health services, total number of private dwellings, number of persons per dwelling, agriculture production, conviction rate and an indicator for whether the municipality is along the US border or touches the route to the US. All these control variables are used from pre-treatment period.

Table 8: Pro-Social Behavior (Freedom of Choice) - DID for Unconditional Means

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.7997	0.8310	0.0313
Control Group	0.8081	0.7875	-0.0206
Difference	-0.0084	0.0435	0.0519

Table 9: Pro-Social Behavior (Freedom of Choice) - Nonlinear DID

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Panel A: Standard Common Trend				
	0.0509***	0.0584***	0.1054*	0.0043
ATET	(0.0103)	(0.0190)	(0.0612)	(0.0335)
Panel B: Modified Common Trend				
	0.0509***	0.0584***	-0.0028	-0.0072
ATET	(0.0108)	(0.0178)	(0.0784)	(0.0303)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** and * show significance at 1% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual level control variables include age, age square, gender, education, marital status, employment status, household size, household expenditure and wealth. The municipality characteristics include municipality level per capita income, literacy rate, access to health services, total number of private dwellings, number of persons per dwelling, agriculture production, conviction rate and an indicator for whether the municipality is along the US border or touches the route to the US. All these control variables are used from pre-treatment period.

Table 10: Pro-Social Behavior (Sense of Fairness) - DID for Unconditional Means

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.2065	0.2208	0.0143
Control Group	0.1979	0.1968	-0.0011
Difference	0.0086	0.024	0.0154

Table 11: Pro-Social Behavior (Sense of Fairness) - Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.0158	-0.0061	-0.2008***	0.0370
	(0.0102)	(0.0177)	(0.0748)	(0.0363)
Panel B: Modified Common Trend				
ATET	0.0145	-0.0092	-0.1531*	0.0571
	(0.0103)	(0.0188)	(0.0891)	(0.0320)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** and * shows significance at 1% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual level control variables include age, age square, gender, education, marital status, employment status, household size, household expenditure and wealth. The municipality characteristics include municipality level per capita income, literacy rate, access to health services, total number of private dwellings, number of persons per dwelling, agriculture production, conviction rate and an indicator for whether the municipality is along the US border or touches the route to the US. All these control variables are used from pre-treatment period.

Table 12: Pro-Social Behavior (Private Social Capital) - DID for Unconditional Means

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.6828	0.6184	-0.0644
Control Group	0.6538	0.6273	-0.0265
Difference	0.029	-0.0089	-0.0379

Table 13: Pro-Social Behavior (Private Social Capital) - Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
	-0.0351***	0.0349*	-0.2080***	-0.2679***
ATET	(0.0130)	(0.0198)	(0.0753)	(0.0414)
Panel B: Modified Common Trend				
	-0.0355***	0.0342*	-0.2075***	-0.2352***
ATET	(0.0130)	(0.0202)	(0.0612)	(0.0286)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** and * show significance at 1% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual level control variables include age, age square, gender, education, marital status, employment status, household size, household expenditure and wealth. The municipality characteristics include municipality level per capita income, literacy rate, access to health services, total number of private dwellings, number of persons per dwelling, agriculture production, conviction rate and an indicator for whether the municipality is along the US border or touches the route to the US. All these control variables are used from pre-treatment period.

Table 14: Migration and Attrition between MxFLS2 and MxFLS3

	Migration		Attrition	
	(1)	(2)	(3)	(4)
Δ Homicide Rate (2009-05)	0.0002	-0.0013	0.0001	0.0004
	(0.0002)	(0.0010)	(0.0002)	(0.0008)
Δ Homicide Rate (2009-05) interacted with MxFLS 2:				
Age		-0.0001		-0.0001
		(0.0000)		(0.0000)
Age Square		-0.0000		-0.0000
		(0.0000)		(0.0000)
Gender		0.0001		0.0002
		(0.0002)		(0.0003)
Education		-0.0000		0.00008**
		(0.0000)		(0.00004)
Married		0.0006*		-0.0004
		(0.0003)		(0.0003)
Employment		0.0002		0.0002
		(0.0002)		(0.0003)
Household Size		0.0001		-0.0000
		(0.0001)		(0.0000)
Household Expenditure		0.0000		0.0000
		(0.0000)		(0.0000)
Household Wealth		-0.0002		-0.0001
		(0.0004)		(0.0003)
Observations	10,410	9,997	19,769	19,769
Mean of Dependent Variable	3.10%	3.23%	22.99%	22.99%
State FE	No	Yes	No	Yes

Note: Standard errors are clustered at municipality level. ** and * show significance at 5% and 10% levels respectively. The homicide rates are per 100,000. Probit model is used for regressions. The coefficients reported in the table are marginal effects.

Appendix

Figure A1: Choice over Hypothetical Games (MxFLS2)

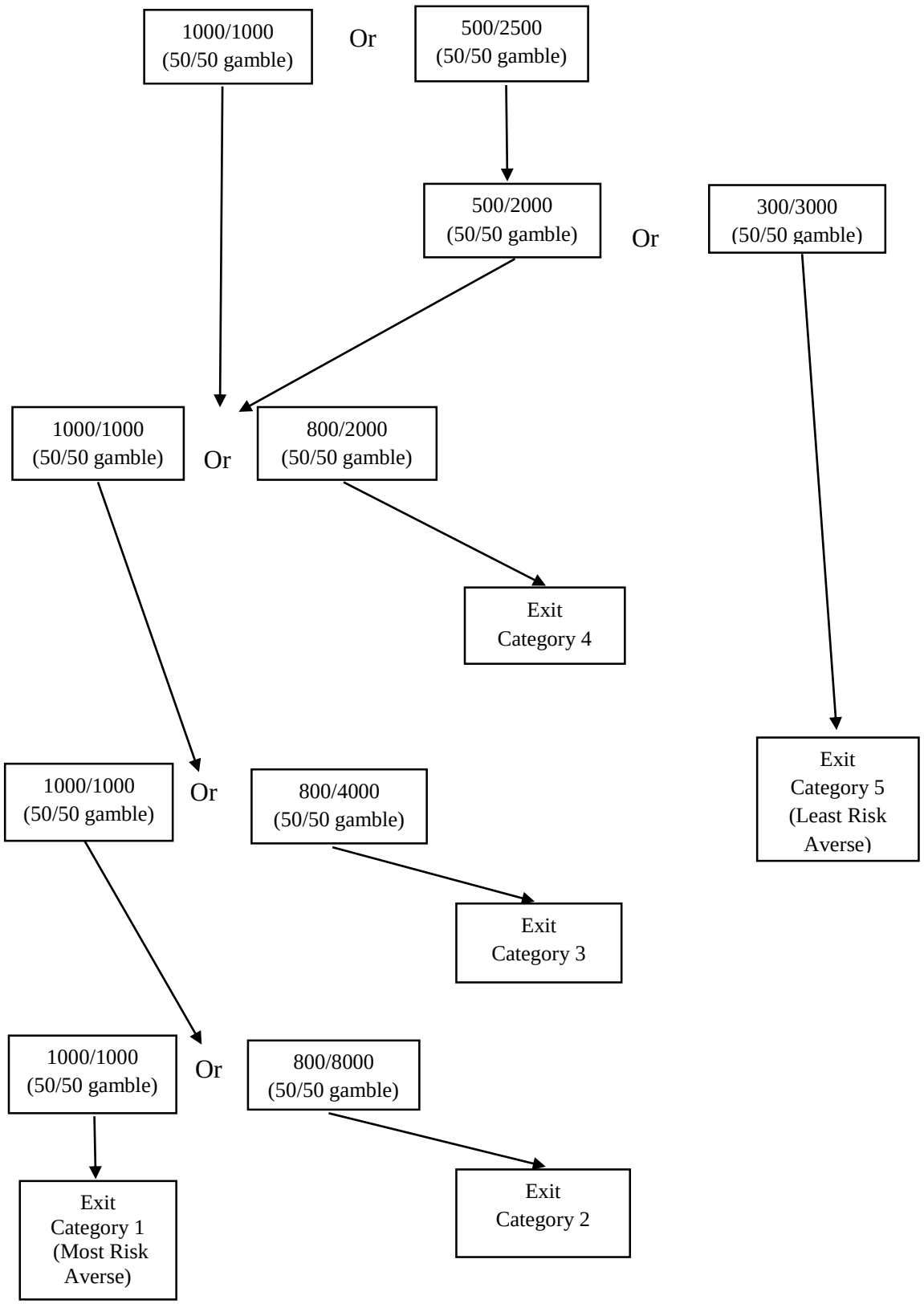


Figure A2: Risk Aversion (MxFLS2)

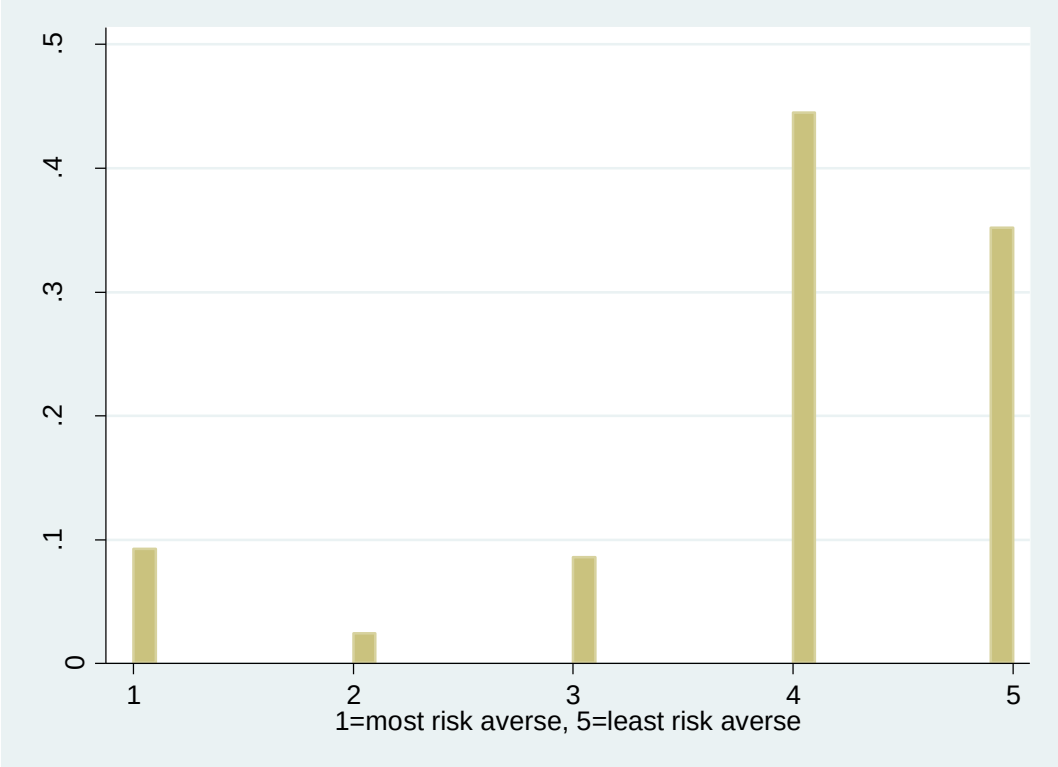


Figure A3: Risk Aversion (MxFLS3)

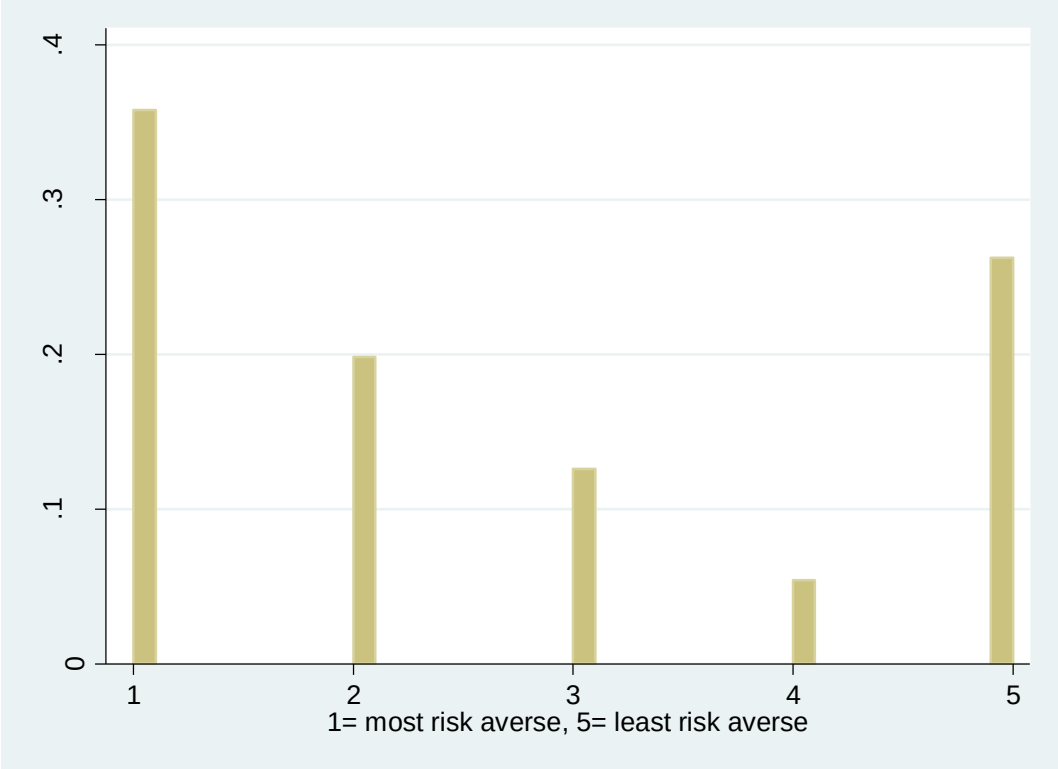


Table A1: Robustness Analysis for Risk Aversion (Binary Conversion)

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.1752	0.7187	0.5435
Control Group	0.2290	0.6487	0.4197
Difference	-0.0538	0.0700	0.1238

Table A2: Robustness Analysis for Risk Aversion (Binary Conversion) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.1274***	0.0680***	0.5138***	0.3092***
	(0.0114)	(0.0170)	(0.0750)	(0.0386)
Panel B: Modified Common Trend				
ATET	0.1473***	0.0888***	0.6314***	0.3992***
	(0.0136)	(0.0201)	(0.0719)	(0.0477)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	22910	22910	22910	22910

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A3: Robustness Analysis for Risk Aversion (Treatment Assignment)

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.0748	0.5846	0.5098
Control Group	0.1339	0.5455	0.4116
Difference	-0.0591	0.0391	0.0982

Table A4: Robustness Analysis for Risk Aversion (Treatment Assignment) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.09721***	0.0377**	0.4071***	0.3650***
	(0.0119)	(0.0190)	(0.0945)	(0.0318)
Panel B: Modified Common Trend				
ATET	0.1698***	0.1082***	0.4907***	0.4721***
	(0.0175)	(0.0283)	(0.1083)	(0.0319)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	22910	22910	22910	22910

Note: *** and ** show significance at 1% and 5% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A5: Robustness Analysis for Risk Aversion (Binary Conversion vs. Treatment Assignment)

	Pre-Treatment Period	Post-Treatment Period	Difference
Treated Group	0.1381	0.7194	0.5813
Control Group	0.2287	0.6681	0.4394
Difference	-0.0906	0.0513	0.1419

Table A6: Robustness Analysis for Risk Aversion (Binary Conversion vs. Treatment Assignment) - Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.1419***	0.0947***	0.5105***	0.3049***
	(0.0124)	(0.0198)	(0.0705)	(0.0391)
Panel B: Modified Common Trend				
ATET	0.1849	0.1302***	0.6320***	0.3960***
	(0.0159)	(0.0249)	(0.0618)	(0.0485)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	22910	22910	22910	22910

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A7: Heterogeneous Effects for Risk Aversion (Gender) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Panel A: Standard Common Trend												
	0.1105***	0.1141***	0.1076***	0.0583***	0.0457*	0.0667***	0.4190***	0.4110***	0.4003***	0.3778***	0.3553***	0.3945***
ATET	(0.0108)	(0.0175)	(0.0149)	(0.0166)	(0.0262)	(0.0221)	(0.0629)	(0.1347)	(0.0913)	(0.0309)	(0.0471)	(0.0427)
Panel B: Modified Common Trend												
	0.1505***	0.1595***	0.1446***	0.0945***	0.0853***	0.1006***	0.5022**	0.4352***	0.5396***	0.4829***	0.4286***	0.5200***
ATET	(0.0149)	(0.0239)	(0.0204)	(0.0226)	(0.0342)	(0.0299)	(0.0617)	(0.1480)	(0.1068)	(0.0307)	(0.0582)	(0.0429)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	22910	9370	13540	22910	9370	13540	22910	9370	13540	22910	9370	13540

Note: ***, ** and * show significance at 1%, 5% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All the control variables are used from pre-treatment period.

Table A8: Heterogeneous Effects for Risk Aversion (Education) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**
Panel A: Standard Common Trend												
	0.1105***	0.0941***	0.1306***	0.0583***	0.0603***	0.0489**	0.4190***	0.3014**	0.4355***	0.3778***	0.3645***	0.3930***
ATET	(0.0108)	(0.0151)	(0.0166)	(0.0166)	(0.0225)	(0.0241)	(0.0629)	(0.1316)	(0.1135)	(0.0309)	(0.0464)	(0.0438)
Panel B: Modified Common Trend												
	0.1505***	0.1303***	0.1761***	0.0945***	0.0993***	0.0811**	0.5022**	0.3221*	0.4659***	0.4829***	0.4746***	0.4879***
ATET	(0.0149)	(0.0206)	(0.0223)	(0.0226)	(0.0283)	(0.0335)	(0.0617)	(0.1778)	(0.1091)	(0.0307)	(0.0560)	(0.0405)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	22910	12456	10454	22910	12456	10454	22910	12456	10454	22910	12456	10454

Note: ***, ** and * show significance at 1%, 5% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A9: Heterogeneous Effects for Risk Aversion (Age) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**≤ 36 Years**	**> 36 Years**	**Total**	**≤ 36 Years**	**> 36 Years**	**Total**	**≤ 36 Years**	**> 36 Years**	**Total**	**≤ 36 Years**	**> 36 Years**
Panel A: Standard Common Trend												
ATET	0.1105*** (0.0108)	0.1006*** (0.0154)	0.1196*** (0.0160)	0.0583*** (0.0166)	0.0488** (0.0232)	0.0704*** (0.0233)	0.4190*** (0.0629)	0.4196*** (0.1242)	0.4205*** (0.1193)	0.3778*** (0.0309)	0.4009*** (0.0440)	0.3510*** (0.0565)
Panel B: Modified Common Trend												
ATET	0.1505*** (0.0149)	0.1424*** (0.0212)	0.1586*** (0.0218)	0.0945*** (0.0226)	0.0792** (0.0320)	0.1139*** (0.0303)	0.5022** (0.0617)	0.4779*** (0.1394)	0.5292*** (0.1419)	0.4829*** (0.0307)	0.4763*** (0.0416)	0.5007*** (0.0848)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	22910	11788	11122	22910	11788	11122	22910	11788	11122	22910	11788	11122

Note: *** and ** show significance at 1 % and 5% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A10: Robustness Analysis for Mental Health (Treatment Assignment) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
	-0.0004	0.0035	-0.0392	0.0406***
ATET	(0.0033)	(0.0078)	(0.0392)	(0.0139)
Panel B: Modified Common Trend				
	0.0008	0.0024	-0.0331	0.0177***
ATET	(0.0035)	(0.0086)	(0.0510)	(0.0040)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	22910	22910	22910	22910

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A11: Heterogeneous Effects for Mental Health (Gender) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Panel A: Standard Common Trend												
	-0.0055	-0.0067	-0.0046	0.0059	0.0007	0.0091	-0.0448	-0.0390	-0.0773	0.0409***	0.0069	0.0610**
ATET	(0.0034)	(0.0044)	(0.0052)	(0.0073)	(0.0098)	(0.0121)	(0.0379)	(0.0412)	(0.0627)	(0.0140)	(0.0107)	(0.0247)
Panel B: Modified Common Trend												
	-0.0049	-0.0078	-0.0049	0.0012	-0.0026	0.0020	-0.0438	-0.0514	-0.0734	0.0168***	0.0042	0.0236***
ATET	(0.0039)	(0.0037)	(0.0065)	(0.0044)	(0.0126)	(0.0083)	(0.0515)	(0.0584)	(0.0861)	(0.0039)	(0.0125)	(0.0084)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	22910	9370	13540	22910	9370	13540	22910	9370	13540	22910	9370	13540

Note: *** and ** show significance at 1 % and 5% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A12: Robustness Analysis for Civic Social Capital (Treatment Assignment) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.0505***	0.0601***	-0.0624	0.1041***
	(0.0115)	(0.0215)	(0.0765)	(0.0371)
Panel B: Modified Common Trend				
ATET	0.0487***	0.0610***	-0.0388	0.1051***
	(0.0121)	(0.0194)	(0.0795)	(0.0313)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A13: Robustness Analysis for Freedom of Choice (Treatment Assignment) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
ATET	0.0646***	0.0385	0.1137*	0.0122
	(0.0118)	(0.0236)	(0.0598)	(0.0339)
Panel B: Modified Common Trend				
ATET	0.0647***	0.0496***	0.0063	0.0009
	(0.0123)	(0.0171)	(0.0753)	(0.0305)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** and * show significance at 1% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A14: Robustness Analysis for Sense of Fairness (Treatment Assignment) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
	0.0293**	-0.0009	-0.1719**	0.0537
ATET	(0.0121)	(0.0232)	(0.0757)	(0.0369)
Panel B: Modified Common Trend				
	0.0294**	-0.0025	-0.1283	0.0736**
ATET	(0.0123)	(0.0244)	(0.0895)	(0.0337)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: ** shows significance at 5% level. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A15: Robustness Analysis for Private Social Capital (Treatment Assignment) – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
	-0.0394***	0.0218	-0.1962***	-0.2555***
ATET	(0.0139)	(0.0245)	(0.0755)	(0.0416)
Panel B: Modified Common Trend				
	-0.0416***	0.0166	-0.1962***	-0.2231***
ATET	(0.0139)	(0.0255)	(0.0613)	(0.0289)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	21286	21286	21286	21286

Note: *** shows significance at 1% level. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A16: Heterogeneous Effects for Civic Social Capital (Age) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**≤ 36 Years**	**> 36 Years**	**Total**	**≤ 36 Years**	**> 36 Years**	**Total**	**≤ 36 Years**	**> 36 Years**	**Total**	**≤ 36 Years**	**> 36 Years**
Panel A: Standard Common Trend												
ATET	0.0439***	0.0233	0.0649***	0.0731***	0.0378	0.1058***	-0.0947	-0.1221	-0.0488	0.1018***	0.0421	0.1716***
	(0.0105)	(0.0144)	(0.0165)	(0.0171)	(0.0255)	(0.0256)	(0.0775)	(0.1055)	(0.1008)	(0.0371)	(0.0467)	(0.0524)
Panel B: Modified Common Trend												
ATET	0.0418***	0.0215	0.0621***	0.0665***	0.0352	0.0938***	-0.0679	-0.1229	0.0203	0.1027***	0.0448	0.1661***
	(0.0112)	(0.0156)	(0.0174)	(0.0140)	(0.0219)	(0.0210)	(0.0825)	(0.1130)	(0.1036)	(0.0306)	(0.0423)	(0.0375)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	21286	11086	10200	21286	11086	10200	21286	11086	10200	21286	11086	10200

Note: *** shows significance at 1% levels. Bootstrap standard errors are shown in parenthesis. The z statistics is shown in brackets. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A17: Heterogeneous Effects for Civic Social Capital (Education) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**
Panel A: Standard Common Trend												
ATET	0.0439***	0.0644***	0.0200	0.0731***	0.1060***	0.0458*	-0.0947	-0.0417	-0.1318	0.1018***	0.2130***	0.0071
	(0.0105)	(0.0153)	(0.0149)	(0.0171)	(0.0249)	(0.0270)	(0.0775)	(0.1016)	(0.1053)	(0.0371)	(0.0562)	(0.0464)
Panel B: Modified Common Trend												
ATET	0.0418***	0.0651***	0.0141	0.0665***	0.0928***	0.0392	-0.0679	0.0192	-0.1403	0.1027***	0.1815***	0.0093
	(0.0112)	(0.0155)	(0.0168)	(0.0140)	(0.0185)	(0.0239)	(0.0825)	(0.0988)	(0.1179)	(0.0306)	(0.0313)	(0.0487)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	21286	11324	9962	21286	11324	9962	21286	11324	9962	21286	11324	9962

Note: *** and * show significance at 1% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A18: Heterogeneous Effects for Freedom of Choice (Education) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**
Panel A: Standard Common Trend												
	0.0509***	0.0530***	0.0491***	0.0584***	0.0513**	0.0697**	0.1054*	0.1455	0.0740	0.0043	0.0072	0.0069
ATET	(0.0103)	(0.0143)	(0.0157)	(0.0190)	(0.0240)	(0.0288)	(0.0612)	(0.0955)	(0.0970)	(0.0335)	(0.0493)	(0.0439)
Panel B: Modified Common Trend												
	0.0509***	0.0546***	0.0499***	0.0584***	0.0563**	0.0695**	-0.0028	0.0073	0.0001	-0.0072	-0.0151	0.0019
ATET	(0.0108)	(0.0148)	(0.0166)	(0.0178)	(0.0220)	(0.0291)	(0.0784)	(0.1261)	(0.1220)	(0.0303)	(0.0441)	(0.0427)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	21286	11324	9962	21286	11324	9962	21286	11324	9962	21286	11324	9962

Note: ***, ** and * show significance at 1%, 5% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A19: Heterogeneous Effects for Sense of Fairness (Education) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**
Panel A: Standard Common Trend												
	0.0158	0.0565***	-0.0307**	-0.0061	0.0445*	-0.0564**	-0.2008***	-0.1203	-0.2625**	0.0370	0.1423***	-0.0530
ATET	(0.0102)	(0.0161)	(0.0151)	(0.0177)	(0.0257)	(0.0259)	(0.0748)	(0.1010)	(0.1059)	(0.0363)	(0.0551)	(0.0453)
Panel B: Modified Common Trend												
	0.0145	0.0549***	-0.0328**	-0.0092	0.0432*	-0.0650**	-0.1531*	-0.0530	-0.2522*	0.0571	0.1522***	-0.0447
ATET	(0.0103)	(0.0158)	(0.0164)	(0.0188)	(0.0250)	(0.0281)	(0.0891)	(0.1069)	(0.1322)	(0.0320)	(0.0352)	(0.0521)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	21286	11324	9962	21286	11324	9962	21286	11324	9962	21286	11324	9962

Note: ***, ** and * show significance at 1%, 5% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A20: Heterogeneous Effects for Private Social Capital (Education) – Nonlinear DID

Variable	Model 1			Model 2			Model 3			Model 4		
	Total	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**	**Total**	**< 9 years**	**≥9 years**
Panel A: Standard Common Trend												
	-0.0351***	-0.0245	-0.0496***	0.0349*	0.0228	0.0477*	-0.2080***	-0.0534	-0.3599***	-0.2679***	-0.2542***	-0.2775***
ATET	(0.0130)	(0.0180)	(0.0188)	(0.0198)	(0.0277)	(0.0256)	(0.0753)	(0.1106)	(0.0967)	(0.0414)	(0.0619)	(0.0550)
Panel B: Modified Common Trend												
	-0.0355***	-0.0245	-0.0491***	0.0342*	0.0203	0.0480**	-0.2075***	-0.0728	-0.3067***	-0.2352***	-0.2280***	-0.2421***
ATET	(0.0130)	(0.0179)	(0.0187)	(0.0202)	(0.0279)	(0.0241)	(0.0612)	(0.1133)	(0.0561)	(0.0286)	(0.0441)	(0.0379)
Municipality Ch.	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No
Municipality FE	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**	No	No	No
State FE	No	No	No	No	No	No	No	No	No	**Yes**	**Yes**	**Yes**
Observations	21286	11324	9962	21286	11324	9962	21286	11324	9962	21286	11324	9962

Note: ***, ** and * show significance at 1%, 5% and 10% levels respectively. Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A21: Falsification Test for Mental Health – Nonlinear DID

Variable	Model 1	Model 2	Model 3	Model 4
Panel A: Standard Common Trend				
	0.0009	0.0031	-0.0245	-0.0187
ATET	(0.0041)	(0.0044)	(0.0309)	(0.0164)
Panel B: Modified Common Trend				
	-0.0010	0.0005	-0.0238	-0.0204
ATET	(0.0067)	(0.0063)	(0.0534)	(0.0250)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	17300	17300	17300	17300

Note: Bootstrap standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions. All these control variables are used from pre-treatment period.

Table A22: Falsification Tests for Risk Aversion-DID Estimates for the Correlates

Dependent Variable	Model 1	Model 2	Model 3	Model 4
	-0.0628	-0.0462	-0.0640	-0.0625
Age	(0.0882)	(0.0892)	(0.0884)	(0.0882)
	5.9314	5.2425	6.0958	5.9133
Age Squared	(7.7054)	(7.7838)	(7.7021)	(7.7170)
	-0.0023	-0.0033	-0.0026	-0.0022
Gender	(0.0119)	(0.0120)	(0.0118)	(0.0119)
	0.0684	0.1631	0.0711	0.0678
Education	(0.1053)	(0.1049)	(0.0972)	(0.1040)
	0.0025	0.0040	0.0032	0.0026
Marriage	(0.0114)	(0.0115)	(0.0112)	(0.0112)
	-0.0064	-0.0241	-0.0096	-0.0072
Household Size	(0.0625)	(0.0632)	(0.0598)	(0.0618)
	13122.72*	18775.23**	13288.79*	13137.34*
Household Expenditures	(7936.05)	(9105.46)	(7871.07)	(7907.87)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	20820	20820	20820	20820

Note: ** and * show significance at 5% and 10% levels respectively. The coefficients show the **ATET** for each dependent variable. Standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions.

Table A23: Falsification Tests for Pro-Social Behavior - DID Estimates for the Correlates

Dependent Variable	Model 1	Model 2	Model 3	Model 4
	-0.0371	-0.0190	-0.0363	-0.0366
Age	(0.0835)	(0.0845)	(0.0829)	(0.0833)
	3.6049	2.8509	3.5908	3.5559
Age Squared	(7.2636)	(7.3625)	(7.1922)	(7.2487)
	-0.0020	-0.0034	-0.0025	-0.0019
Gender	(0.0118)	(0.0120)	(0.0117)	(0.0119)
	0.0513	0.1568	0.0601	0.0510
Education	(0.1080)	(0.1068)	(0.1004)	(0.1066)
	-0.0175	-0.0350	-0.0211	-0.0180
Household Size	(0.0610)	(0.0615)	(0.0583)	(0.0602)
	13046.86*	18857.54**	13475.05	13128.94*
Household Expenditures	(7375.60)	(8488.73)	(7349.36)	(7387.39)
	0.0044	0.0096	0.0037	0.0044
Wealth	(0.0099)	(0.0100)	(0.0097)	(0.0097)
Municipality Characteristics	No	**Yes**	No	No
Municipality Fixed Effects	No	No	**Yes**	No
State Fixed Effects	No	No	No	**Yes**
Observations	20486	20486	20486	20486

Note: ** and * show significance at 5% and 10% levels respectively. The coefficients show the **ATET** for each dependent variable. Standard errors are shown in parenthesis. The individual and municipality level controls are the same used in main regressions.