

Social Capital, Economic Development, and Homicide: A Cross-National Investigation

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Abstract This article draws from an ongoing debate over explanations of homicide. Within this debate, we investigate the pro-social effects of civil society and social capital. Few cross-national studies explore whether elements of social capital either increase or decrease homicide. The cross-national work that does is often characterized by small, homogeneous samples and the use of inappropriate statistical techniques. Replicating elements of Lederman et al.'s (*Econ Dev Cult Change* 50:509–539, 2002) original study but with wave IV World Values Survey data and negative binomial regression, we find weak support for the beneficial consequences of social capital on homicide. One dimension of social capital, however, does exhibit a significant negative association with homicide rates, net of other influences: social activism. We also fail to support the Durkheimian hypothesis that the negative effect of social capital on homicide is conditional on modernization. We explore the implications of the findings along with avenues for future research.

Keywords Social capital · Economic development · Cross-national homicide

1 Introduction

The value of social capital as a possible mitigating force on homicide has made the concept an important one for criminologists. In particular, elements of social capital, such as civic engagement and generalized trust, are considered to be valuable tangible and intangible resources linked to social networks that facilitate action (Coleman 1990; Putnam 2000). This action constitutes not just social movement participation or simple acts of voting, but also private-order activities, like community policing within neighborhoods, which translates into neighbors willing to monitor and sanction each other because they can draw from their social capital. The criminological implication is that community-based social control should deter criminal activities and, as a result, reduce rates of homicide.

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Although the relationship between social capital and homicide has been empirically tested (e.g., Grasmick and Green 1981; Lee 2008; McVeigh 2006; Messner et al. 2004; Rosenfeld et al. 2001; Sampson et al. 1997), scholars rarely devote their attention to how this association operates in international contexts (see Buonanno et al. 2009; Crow 1980; Gatti et al. 2003; Lancaster 1992; Nieuwbeerta et al. 2008; Rivera 1978; Savolainen et al. 2008 for international case studies), especially with cross-national survey data. With few exceptions, the empirical focus of this literature has been mostly limited to crime in the US. In spite of these efforts, the generality and applicability of social capital remains an empirical question requiring more cross-national research.

The goal of this paper is to fill the cross-national void in the social capital and homicide literature. We do so by replicating and modifying elements of Lederman et al. (2002), the first study to do so (LLM hereafter). Our investigation differs, and improves upon, LLM's original study in three important respects. First, the sample size of LLM's study was noticeably small. Because of missing data issues for some of their social capital indicators, a number of their models had sample sizes less than 30. This results in issues of omitted variable bias, unobserved heterogeneity in the dependent variable, and inefficient and unreliable estimates. To overcome these problems, we use recent data from the WVS (wave IV), which has survey items on over 50 nations for all social capital indicators found in the original LLM study. Second, LLM used ordinary least squares (OLS) regression to explore the impact of social capital on a logged per capita homicide dependent variable. This is an inappropriate modeling technique. When the homicide rates observed are low relative to the population size of the nation, OLS regression places equal weight on small countries as on large countries, which biases the estimates. As a result, we use negative binomial regression to correct for this issue (see Osgood 2000; Osgood and Chambers 2001). Third, LLM investigated problems of joint endogeneity with instrumental regression, when doing so was unwarranted. We, like LLM, find that many forms of social capital are unrelated to homicide, but instead of using instrumental regressions, we draw on Durkheimian theories of deviance and explore complex interaction effects between dimensions of social capital and economic development.

In the following pages, we briefly define social capital and outline how it is distinct from other relational mechanisms, such as collective efficacy and civic culture. We continue by explaining how and why elements of social capital might stunt homicide, and underscore key differences between the current study and LLM's original article. We then describe our modeling technique—negative binomial regression—and discuss our data. Finally, we test our models and show that when considering the direct effects of economic development and other classic structural controls, only one dimension of social capital—social activism—is significantly and negatively related to homicide. This lack of overall effect for dimensions of social capital is also robust to conditions of economic development: indicators of social capital do not differentially reduce homicide depending on modernization. We conclude by discussing the implications in addition to specifying avenues for future research.

2 Defining Social Capital

The concept of social capital—often associated with civic culture (Almond and Verba 1963), civic virtues (Putnam 1993), pluralism (Dahl 1971), political culture (Inglehart 1988), and collective efficacy (Sampson et al. 1997)—has a long history in the social sciences. At the core of this concept is the notion that social relations and organizations, in addition to human and physical capital, are critical in the production of material and

nonmaterial goods, which, in their absence, would be difficult if not impossible to produce (Bourdieu 1983; Coleman 1990). For instance, individuals with high stocks of social capital are better able to monitor, sanction, and exchange information (i.e., secure and achieve their interests) than similar individuals with just human and physical capital. Following earlier research on the relationship between social capital and crime (see Messner et al. 2004; Rosenfeld et al. 2001) and building from prior work by Paxton (1999, 2002) and Putnam (1993, 2000), we use a multi-dimensional definition of social capital. We define social capital as *the objective associations of a particular type among individuals that foster collective action*.¹ These objective associations can range from family, friends, and neighbors, to nonpolitical associations such as city league soccer teams to local labor unions. Associations of a particular type reflect the content of social relations: are associations characterized by civic norms of reciprocity and generalized exchange? Do they promote positive emotions such as pride and a sense of belonging? And do those within the association generally trust others and expect cooperation? Finally, collective action entails whether group members achieve, or attempt to achieve, their common goals. That is, do individuals within an objective association of a particular type overcome their self-interested urge to free-ride or does the association collapse under the pressure of collective irrationality as Olson (1965) suggests might be the case?

For example, a neighborhood watch group (i.e., objective association) with high rates of generalized trust (i.e., type of association) and robust civic norms of reciprocity (i.e., type of association) will likely police criminal activity (i.e., collective action) within their own neighborhood. While Paxton (1999, 2002) and Portes (1998) clearly focus on the conceptual distinction between resource potential and collective action, we agree with Rosenfeld et al. (2001) and "...prefer a conception of social capital that incorporates components of social action" (p. 286). We thus employ a measurement model of social capital that includes such indicators as total secular memberships, generalized trust, civic norms, types of social activism, and church attendance. Note how our definition of social capital is broader than ideas of collective efficacy (Sampson et al. 1997), which underscores the shared expectations of community members to expend resources in controlling fellow neighbors, and broader than other conceptions of social capital such as civic culture (Almond and Verba 1963). This is because our definition includes (a) objective associations of particular types not just within neighborhoods but within society at large, and (b) norms and values that may accompany a vibrant civic culture. In conclusion, although we measure social capital with individual survey items, we must clearly demarcate for the reader that "...social capital is not an individual characteristic or a personality trait but a resource that resides in the networks and groups to which people belong" (Mouw 2006: 79).

3 The Theoretical Link Between Social Capital and Homicide

The idea that people learn pro-social values and attitudes through their social relationships and voluntary associations dates back to the writings of John Stuart Mill and Alexis de Tocqueville. De Tocqueville (2000 [1863]) argued that when specific initial conditions are satisfied, such as a weak and limited central government, individuals come to expect little

¹ While we acknowledge that individuals can increase their social capital through criminal organizations or deviant subgroups, which can facilitate criminal activity, we focus, instead, on objective associations that are exclusively civic and political in nature. Thus, when we invoke social capital we are excluding objective associations that promote a common interest in criminal and deviant behavior.

from their state, which leads people to concern themselves with regional affairs—sparking local collective action to achieve both private and public goods. This manifests itself as civic associations that promote common interests ranging from charitable societies and religious organizations to social clubs and sports leagues. Not only do these civic associations take the lead in addressing public needs, they also educate their members to pay more attention to public affairs and foster individual attitudes and values in the common good, making it easier to mobilize.

This thesis was later taken up in the 1950s and 1960s by scholars of democratic politics who argued that a particular orientation toward political life must exist for the success and stability of democratic political institutions (e.g., Almond and Verba 1963; Dahl 1971). That is, there should be some normative and value consensus within a nation concerning liberty and equality if democracies are to emerge and reproduce. People acquire these values of public spiritedness and shared responsibility through the repeated social interactions they develop by participating in voluntary associations (Putnam 1993; see also Fukuyama 1995). The implication is that social capital should not only mold political orientations, but also foster norms of reciprocity that shun criminal activities. So long as individuals are invested in social capital, they should develop civic norms that foster cooperation in obtaining public goods, including security.

Since social networks are the backbone of social capital, neighborhoods that exhibit sparse social connections are not likely to have enough social capital so as to inhibit violent crime (Putnam 2000). Or, as Uggen and Janikula (1999) suggest, those who are civically disengaged are more likely to break the social contract and commit criminal acts. As evidence, Putnam observed that U.S. states with low levels of civic engagement, volunteerism, and social trust generally exhibit higher murder rates (Putnam 2000). Putnam's explanation for this relationship was not only the monitoring and sanctioning of common standards that accompanies social capital (Hechter 1987), but access to mentors, role models, and job opportunities outside of their immediate network in addition to emotional support and the willingness of volunteers to form community organizations and institutions. Criminologists, specifically social disorganization theorists, were among the first to identify the relationship between social ties and homicide (see Bursik 1988; Park and Burgess 1925; Shaw and McKay 1969). Unlike Putnam, who argued that economic and institutional features of a nation were the product of social capital, social disorganization theorists argue that structural features of a community, such as economic deprivation, residential instability, and population heterogeneity, stunt the development of social ties within those neighborhoods and hinder a community's capacity to privately control fellow residents and lessen criminal behavior (Bursik and Grasmick 1993; Sampson and Groves 1989). These arguments are most evident in the recent criminological literature on collective efficacy (see Browning et al. 2004; Sampson et al. 1997), which is based on the notion that personal investments in social capital increase neighborhood social cohesion and the willingness of neighbors to promote the common good because they believe that others will do the same. Thus, regardless of the theoretical tradition or the causes of social capital, all of the aforementioned arguments suggest that some element of social capital, either objective or subjective, will reduce homicide.

4 Empirical Considerations

Not surprisingly, prior research provides strong support for these arguments. Using measures of trust and civic engagement from the General Social Survey (GSS), Kennedy et al. (1998)

found that indicators of social capital were significantly related to lower incidents of firearm violence. In a similar vein, with trust and civic engagement as observed indicators of a social capital latent dimension, Rosenfeld et al. (2001) explored the reciprocal relationship between social capital and homicide using structural equation models, and found that social capital in the U.S. has a strong negative effect on homicide but failed to find evidence for the reverse. In contrast, Galea et al. (2002) and Messner et al. (2004) found that there is a negative, reciprocal relationship between trust and homicide in the U.S., such that greater trust decreases homicide and greater homicide decreases trust. Finally, LLM (2002) examined the impact of various social capital measures on homicide at the international-level and found with instrumental variable regression that only trust had a significant negative effect on homicide.

Yet there has been very little cross-national comparative work investigating the relationship between social capital and homicide since LLM. The problem is that without more comparative cross-national research, it is difficult to determine social capital's generality, level of geographic exceptionalism, or conditionality. As a result, we replicate and modify certain elements of LLM's original study to fill this void. Our study differs, and improves upon, LLM in three important respects. First, the sample size of LLM's study was noticeably small. The largest sample for any model was 39 while the smallest was 25. Note that the latter was only applicable to their generalized method of moments (GMM) instrumental regression models. The issue is that analyses with small samples (a) will be inefficient and produce unreliable estimates, even with the OLS apparatus; (b) prohibit the inclusion of key control variables at the cost of omitted variable bias; and (c) produce unobserved heterogeneity in the dependent variable, which will bias the estimates and make generalizability of the findings difficult. To overcome this issue, we explore the effects of social capital on homicide with a larger sample of 50 or more countries (depending on the model) while including other control variables besides gross domestic product and income inequality, such as ethnic homogeneity.

Second, LLM express homicide as a logged value in OLS regression. They use logged values since the countries under investigation include a high frequency of low non-zero homicide values. This creates a positively skewed distribution where a small number of cases have very high values relative to the other cases. The problem with this type of distribution is that it violates the normality assumption of OLS regression and requires transforming the dependent variable. Although transformations help approximate normality of the residuals, information is lost in favor of conforming to the OLS apparatus. An alternative technique is to use negative binomial regression (NBR). NBR is able to accommodate positively skewed distributions and overdispersion, which exists when the variance of the dependent variable is significantly greater than what is expected with Poisson distributions. When this is the case, a parameter must be estimated that adjusts the variance independent of the mean. OLS is unable to do this. NBR is also more appropriate than OLS when the observed rates are low relative to the population size. OLS regression places equal weight on small countries as on large countries, whereas NBR is less influenced by small countries because it can take into account the greater error variance found in smaller countries with a population exposure variable. Thus, when the count and respective population is small, OLS is inefficient at generating unbiased standard errors (see Osgood 2000; Osgood and Chambers 2001).

Third, note that we do not explore the problem of joint endogeneity. In LLM's original study, they found with OLS regression that their measures of social capital were unrelated to homicide. They then assumed that this lack of effect was due to joint endogeneity, and proceeded to use instrumental variable techniques, specifically GMM, to disentangle the causal relationship between social capital and homicide. There are a number of problems

with this endeavor and their instrumental variable regressions. First, it is only reasonable to explore instrumental variables if the explanatory variable(s) of interest—indicators of social capital—are significantly related to the outcome variable—homicide. If not, it is unjustifiable to investigate whether social capital reduces homicide or whether homicide reduces social capital, because there is no evidence of a relationship, conditional on the control variables. If and only if the relationship between the questionable explanatory variable and the outcome variable is statistically significant should the problem of joint endogeneity be investigated; otherwise, the relationship is likely spurious or null. Since LLM did not find a statistically significant effect between social capital and homicide with OLS regression, their instrumental variable analysis is unwarranted. Second, LLM use the instrumental variable regression estimation technique of GMM. The problem with this technique is that it is inefficient and tends to produce unreasonable estimates with small samples (Baum et al. 2003). Since LLM's sample for their instrumental variable models was 25, their parameter estimates and standard errors are likely biased. Third, although the instrument validity test LLM provide (i.e., *J*-statistic) is important, they did not include other key tests, such as the Stock-Yogo weak instrument test or an LM test of under-identification, which questions the strength and validity of their instruments (see Murray 2006). Fourth, and finally, it is customary to discuss, at length, the theoretical and historical reasons for choosing particular instruments; neither of which LLM do. Instead, LLM rely on a limited number of instrument validity tests to convince the reader that their instruments (i.e., region and phones and radios per capita) are indeed valid. This is interesting to note since there are a number of other well-known and valid instruments available for generalized trust, such as a country's current monarchical status and the average coldest month in a year for a country, to name a few (see Bjørnskov 2009).

Thus, instead of investigating the joint endogeneity problem, we pursue models that explore the conditional effects of social capital on cross-national homicide. Our reason for doing so is driven by classic Durkheimian theories of deviance (Dicristina 2004; Durkheim 1951 [1897], 1957 [1900]). According to this tradition, economic development brought about through a complex division of labor will produce an increasingly differentiated social structure. The result of this process is that the non-contractual basis of contract will replace normative order in controlling the behavior of societal members. In other words, social systems make a transition from mechanical to organic forms of solidarity. The issue is that a progressive differentiation in the social structure continuously dampens the control capacity of normative orders, resulting in greater social deregulation and isolation in which individuals are increasingly less constrained by the collective conscience and traditional authority. Under such conditions, individualism and the pursuit of self-interest will be common, but so will crime and deviance (Krohn 1978; Messner 1982; Quinney 1965). Thus, forms of informal social control, such as social capital, will have differential effects on homicide conditional on levels of modernity and economic development. More specifically, we expect measures of social capital to have less of a negative effect on homicide in modernized societies.

In sum, using negative binomial regression on aggregated data from more than 50 nations that took part in the World Values Survey, we set out to replicate and improve upon LLM's original study. Data from the World Values Survey is particularly well suited for this purpose since it was originally used by LLM, contains all of our social capital measures of interest, and is derived from representative samples within each nation. Besides LLM, the current investigation is one of the first cross-national studies to provide a full empirical test of the complex relationship between economic development, social capital, and cross-national homicide. In line with prior literature, our main prediction is that social

capital will be negatively related to homicide, but that this effect is conditional on economic development.

5 Data

The analysis in this paper employs both country and individual-level data. Individual-level data were compiled from the fourth wave (1999–2004) of the World Values Survey (WVS). Country-level data were obtained from various sources. They include the World Bank, the United Nations Statistics Division, the United Nations Office on Drugs and Crime, and the CIA World Factbook. Countries included in the sample were required to have both national and individual-level data available. As a result, the sample includes 56 nations.² This filtering process reduced the representation of under- and undeveloped countries, yielding 5 African, 8 Asian-Pacific, 18 Central and Eastern European, 19 Western European, and 6 American countries. It is clear that our country sample is not representative of all nations. As a result, we caution the generalizations of our findings to nations outside of our sample and at different points in time.

5.1 Variables

Our empirical strategy consists of testing whether dimensions of social capital affect homicide rates. To do so, we need to adequately measure social capital and embed these indicators within an appropriate model of homicide with relevant controls. Among the variables in our data set are measures of homicide, social capital, gross domestic product, income inequality, ethnic homogeneity, and former Soviet economies.

5.1.1 Homicide

This is the total number of homicides for each sampled country (*Homicide*). The data was gathered from the United Nations Surveys on Crime Trends and the Operations of Criminal Justice Systems for the year 2000. Although we did examine alternative measures of violent crime, in particular burglaries and theft, we use total homicides since the measure tends to be more reliable than the others, which reduces bias and facilitates cross-national comparison (Beirne and Messerschmidt 2000; Tonry 1997).³

5.1.2 Social capital

Drawing on prior studies of social capital and crime (see Lederman et al. 2002; McVeigh 2006; Messner et al. 2004; Rosenfeld et al. 2001; Sampson et al. 1997) we measure social capital using a number of different survey items from the fourth wave of the World Values Survey. First, we include a measure of the total number of secular organizations of which

² The WVS has a total of 56 countries that match on the individual-level social capital and cross-national homicide measures. We only explore 52 because of influential case and outlier analyses discussed below.

³ We examined alternative measures of crime, such as burglary, fraud, robbery, car theft, and total crime rates, as either discrete non-latent variables or as latent dimensions. Regardless of the measure and method, the results were congruent with those presented here. We chose homicide as our measure of violent crime for the reasons that it produces the largest sample and is the most reliable cross-national measure of crime.

each individual within a country is a member, sum and divide this value by the sample size of the country (*Secular memberships*) ($\alpha = 0.93$, eigenvalue = 8.66).⁴ Second, we also include a measure of the sum total of respondents in each country agreeing with the statement “most people can be trusted” rather than with the alternative “you need to be very careful in dealing with people” that we then divide by the sample size of the country (*Generalized trust*). Third, we include a measure of the total number of collective activities in which each respondent has participated, which we then sum and divide by the sample size of the country (*Social activism*) ($\alpha = 0.66$, eigenvalue = 2.22).⁵ Fourth, drawing from Knack and Keefer (1997), we measure civic norms with three survey items derived from the same question: “Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between... (a) claiming government benefits to which you are not entitled; (b) cheating on taxes if you have a chance; and, (c) someone accepting a bribe in the course of their duties.” All of the questions were then summed and divided by their respective country sample size (*Civic norms*) ($\alpha = 0.78$, eigenvalue = 1.54). Thus, as the value for each respective measure increases, a country’s civic norms are more tolerant of the specific activity.⁶ Fifth, and finally, we include a measure of the sum total of respondents in each country who are members of a church organization that we then divide by the sample size of the country (*Church attendance*).

5.1.3 Controls

We use three variables to capture the effects of economic growth, social distance, and institutional and economic transitions on homicide. First, specifically from the World Bank, we include a measure of the gross domestic product per capita (in constant 2000 U.S. dollars) divided by 10,000 (*GDP*). This was done since GDP is a common control used either as a regional or national predictor of crime (Antonaccio and Tittle 2007; LaFree and Kick 1986; Neumayer 2003; Rosenfeld and Messner 1991). Second, we include a variable from the CIA World Factbook that measures the percentage of the total population that is a member of the largest ethnic group (*Ethnic homogeneity*). We do so as the homogeneity of a population is often associated with decreased homicide rates (Hansmann and Quigley 1982; LaFree and Kick 1986) and increased rates of social capital (Delhey and Newton 2005; Putnam 2007). As Hansmann and Quigley (1982) state, “The most straightforward theory is simply that people are inclined to feel antagonistic to, and to act abusively toward, others who are physiologically or culturally different from themselves” (p. 208).

⁴ The question is as follows: “Please look carefully at the following list of voluntary organizations and activities and say...which, if any, do you belong to?” The list contains 14 different organizations and activities ranging from social welfare service for elderly, labor unions, human rights group, to sports and recreation groups. We do not include religious organizations.

⁵ The question is as follows: “I’m going to read out some different forms of political action that people can take, and I’d like you to tell me, for each one, whether you have actually done any of these things, whether you might do it or would never, under any circumstances, do it?” The actions include signing a petition, joining in boycotts, attending lawful demonstrations, joining unofficial strikes, and occupying buildings or factories.

⁶ It is often difficult to find exact measures of concepts when dealing with cross-national data. This is especially the case when researchers favor a wide range of countries to ensure variability. Unfortunately, the WVS does not contain questions measuring norms against violence, and as a result we cannot include such a measure. This is a common limitation not only of the current study but of all cross-national investigations as well. Therefore, we assume that norms tolerating such behavior as tax evasion and corruption will parallel norms for other crimes like theft and homicide.

Third, suspecting that inequality produces social cleavages that lead to increased homicide rates (e.g., Avison and Loring 1986; Blau and Blau 1982; Chamlin and Cochran 2005, 2006; Krahn et al. 1986; Pratt and Godsey 2003; Pridemore 2008), in addition to lower rates of social capital (see Uslaner 2000, 2002), we include the Gini coefficient circa the year 2000 from the World Bank (*Income inequality*). Fourth, since prior work has shown that institutional and economic transitions might decrease social capital (see Mondak and Gearing 1998; Paxton 2007; Rosenberg 1995) and increase rates of interpersonal violence (Stamatel 2009), we follow Cole and Gramajo (2009) and include a dummy variable for former Soviet economies (*FSE*).⁷

6 Analysis

Like others who examine the predictors of regional and national homicide rates (see Osgood 2000; Chamlin and Cochran 2006), we use negative binomial regression. This is done because our total homicides variable is positively skewed and overdispersed, and negative binomial regression takes into account the larger error variances found with smaller countries (see discussion above). All of which are present in the current data. To interpret the results of the models as rates, an exposure variable is needed, which is often the population at risk of being murdered (see Osgood 2000). Based on the available data, a country's total population was used as the exposure. We use robust standard errors throughout to alleviate small departures from the negative binomial model assumptions. We also assume that the count mean varies randomly and, as a result, model the dispersion parameter as a function of the mean (not as a constant). Although diagnostics reveal that multicollinearity⁸ and the partialling fallacy⁹ likely do not bias the results, we exclude

⁷ We code the following countries as *FSE*: Albania, Bosnia and Herzegovina, Bulgaria, Belarus, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Republic of Moldova, Poland, Romania, Russian Federation, Slovakia, Slovenia, Ukraine, Republic of Macedonia, and Serbia and Montenegro. In alternative analyses, we explored other geopolitical regions outlined by Cole and Gramajo (2009) including dummies for Sub-Saharan African countries and Middle Eastern Crescent countries (also see Ortega et al. 1992). None of these alternative geopolitical dummy variables were statistically significant when paired with *FSE* or the other controls. As a result, we only include *FSE* in the present analysis. As a further robustness check, we ran the models presented herein using hierarchical generalized linear models with the Cole and Gramajo (2009) geopolitical regions as random intercepts (i.e., level-1 countries embedded within level-2 geopolitical regions). The results were similar to using negative binomial regression except for only minor deviations in the control variables. We also investigated the impact of sex ratios on homicide since low sex ratios (more women than men) may expand the incidence of lethal violence against women or capture a country's prior history of war (see Avakame 1999; Messner and Rosenfeld 1997; O'Brien 1991; Pratt and Godsey 2003; Savolainen 2000). Yet we exclude sex ratios from the final analysis since it (a) is highly correlated with *FSE* ($r > 0.60$), and (b) *FSE* renders sex ratios insignificant regardless of model specification. As a result, we exclude the sex ratios measure in favor of *FSE* in order to avoid issues of multicollinearity.

⁸ With respect to multicollinearity, only GDP and social activism are highly correlated with each other ($r = 0.79$), which we address in the results. And although the secular membership and church attendance variables are highly correlated ($r = 0.65$), we do not include these and other social capital measures in the same model. Note that all other correlations between independent variables are well below a conservative cutoff value of 0.60; slightly different parameter specifications did not produce noticeable shifts in the results (i.e., no changes in the signs of effects); and drawing 5 randomly chosen 30 country samples did not produce dramatic differences in the coefficients across models. All of this suggests that multicollinearity is not an issue in the present investigation.

⁹ With respect to the partialling fallacy—which is when one of two moderately collinear regressors is slightly more correlated with an outcome variable than the other and, as a result, is assigned all of the explained variance (see Gordon 1968; Land et al. 1990)—we explored model sensitivity to the following

China, South Africa, United States, and Venezuela in all analyses as they are strong outliers regardless of model specification.¹⁰ The exclusion of these cases is common among both cross-national studies of homicide (e.g., Butchart and Engström 2002; Walter 2009) and social capital (e.g., Bjørnskov 2007, 2008; Uslaner 2002).¹¹

Some further clarifications, descriptive statistics, and variable sources are given in Table 1, while correlation matrices are presented in Table 2. Note that for both Tables 1 and 2 we exclude the four influential cases. See Table 5 in the Appendix for a list of countries (including the influential cases).

6.1 Results: Direct Effects Models

Table 3 contains the results from the negative binomial regression analyses of the count of cross-national homicides. For each predictor, row 1 reports the metric coefficient, row 2 reports the incidence rate ratios with each of the parameter estimates, and row 3 reports the robust standard error.

In order to determine the extent to which indicators of social capital influence total homicides within a country we begin with a baseline model for comparison (Model 1). In this model we regress the total homicide count on the full set of country-level controls: GDP, income inequality, FSE and ethnic homogeneity. For models 2 through 6, we explicitly examine if any of the social capital indicators (i.e., secular memberships, generalized trust, social activism, civic norms, and church attendance) affect homicide by sequentially adding the dimensions of social capital to the baseline model. We compare models by using an information criteria—the BIC—to determine which model accounts for the most variation with the least amount of parameters. Note that we only compare model BIC when the number of observations in each model are equivalent.

Model 1 reveals strong support for past research. All of the control variables are statistically significant and in the expected direction. The metric coefficient (row 1) helps illustrate the direction of effect. It shows that both increases in GDP and ethnic homogeneity will reduce homicide within a country, while, conversely, increases in FSE and

Footnote 9 continued

moderately correlated independent variables (see Table 2): (1) secular memberships and FSE, (2) generalized trust and all other control variables, and (3) church attendance and FSE. That is, we investigated models without the fallacious control variable (e.g., FSE) while including all other controls and the social capital indicator of interest (e.g., secular memberships). Only one such model re-specification yielded statistical significance for a social capital variable—secular memberships without FSE. Following Baron and Kenny (1986), we then explored whether the relationship between FSE, secular memberships, and total homicides was either spurious or one of mediation. We did so following prior theoretical and empirical work showing that the transition from communism to capitalism likely undermined civic engagement in former Soviet economies (e.g., Mondak and Gearing 1998; Rosenberg 1995). Although FSE is significantly associated with secular memberships (results available upon request), model 2, Table 3 suggests that the relationship between secular memberships and total homicides in a country is spurious. All of this suggests that the partialling fallacy is likely not an issue with respect to the present investigation.

¹⁰ With respect to influential cases, China, South Africa, USA, and Venezuela consistently produced either (a) CooksD values above the cutoff value of $4/N$ regardless of the model, (b) skewed deviance residuals, and/or (c) both large diagonal “hat” matrix and studentized residuals. Without these four influential cases, all CooksD values regardless of the model are below the cutoff value of $4/N$, the distribution of the deviance residuals is approximately normal (McCullah and Nelder 1989), and none of the remaining cases produce large diagonal “hat” matrix and studentized residuals. This suggests that all of the models are fit correctly when excluding these four cases.

¹¹ China was further excluded since translation errors were made with respect to some of the social capital dimensions (e.g., secular memberships) (see codebook for World Values Study Group 1999).

Table 1 Variable specifications and descriptive statistics

Variable	Definition	μ	SD	Min	Max	Source
Total homicides	Total murders in the year 2000	2257	6364	4.97	34707	UN
Secular memberships	Total organizational membership divided by the sample size	0.99	0.7	0.21	3.09	WVS
Generalized trust	Total 'yes' who trust most people divided by the sample size	0.27	0.14	0.08	0.67	WVS
Social activism	Total political activities divided by sample size	0.68	0.38	0.08	1.65	WVS
Civic norms	Total justifications divided by sample size	3.58	1.59	0.44	7.81	WVS
Church attendance	Total church memberships divided by sample size	0.18	0.18	0.02	0.76	WVS
GDP	Gross domestic product per capita divided by 10,000	1.17	0.93	0.06	3.42	WB
FSE	Former Soviet economy	0.37	-	0	1	AU
Ethnic homogeneity	Percent largest ethnic group of the total population	0.81	0.17	0.4	0.99	WF
Inequality	Gini index of income distribution	34.12	7.87	24.7	57.1	WB

N = 52, *AU* Authors' Coding, *UN* United Nations Crime Trends Data <http://www.uncjin.org/Statistics/statistics.html>, *WVS* World Values Survey, *WB* World Bank <http://www.worldbank.org>, *WF* CIA World Factbook (Kurian 2001) <https://www.cia.gov/library/publications/the-world-factbook>

Table 2 Correlation matrix for variables predicting total homicide

	1	2	3	4	5	6	7	8	9	10
(1) Total homicides	1.00									
(2) Secular memberships	-0.07	1.00								
(3) Generalized trust	0.02	0.39	1.00							
(4) Social activism	-0.15	0.33	0.56	1.00						
(5) Civic norms	0.06	-0.29	-0.21	-0.05	1.00					
(6) Church attendance	-0.04	0.65	0.17	0.11	-0.27	1.00				
(7) GDP	-0.27	0.14	0.56	0.79	-0.12	0.03	1.00			
(8) FSE	-0.02	-0.45	-0.29	-0.40	0.22	-0.45	-0.47	1.00		
(9) Ethnic homogeneity	-0.10	-0.02	0.31	0.17	-0.16	-0.04	0.33	-0.09	1.00	
(10) Income inequality	0.18	-0.18	-0.43	-0.34	0.18	0.13	-0.24	-0.29	-0.19	1.00

income inequality will increase homicide. Interpretation is made by looking at the incidence rate ratios (row 2). The incident rate ratio for GDP in model 1 is 0.72. This means that a one-unit increase in GDP results in a 28% decrease in the homicide rate. The incident rate ratios for income inequality, FSE, and ethnic homogeneity are 1.06, 2.22, and 0.15, respectively. Suggesting that a one-unit increase in ethnic homogeneity will result in a 85% decrease in the homicide rate, while former Soviet economies will have a 122% increase in their homicide rates compared to non-FSE countries. The reason the percentage for ethnic homogeneity is so high is that the measure varies from 0.4 to 0.99. Finally, the BIC for model 1 is approximately 731, the lowest of any model with 52 observations. This suggests that model 1 explains the most variation in homicide with the least amount of parameters (in comparison with models 3, 5, and 6).¹²

Interestingly, we find weak evidence for the proposition that social capital reduces homicide within a country. This is evident from models 2 through 6, which show that none of the social capital measures significantly impact homicide. Also of note is how the magnitude of the coefficients for the structural controls fails to dramatically change across models. Yet we find with model 4 that when our social activism variable is paired with the country-level controls, GDP becomes insignificant. To determine if this is the result of high collinearity between GDP and social activism ($r = 0.79$) we (a) explore a similar model without GDP (see model 7), and (b) revert to the model specifications found in LLM and only control for GDP and income inequality, since there may be too many parameters in the model to detect an effect (see model 8). The results are compelling. Model 7 shows that without controlling for GDP the negative effect of social activism on homicide becomes statistically significant. The model 7 BIC is also noticeably smaller than any other model with 51 observations, but not smaller than the model 1 BIC with the missing observation found in model 7—Singapore—removed (BIC = 708). As further evidence of the social activism dimension's negative association with homicide, model 8 reveals that without controlling for FSE and ethnic homogeneity, GDP and social activism become statistically significant at the 0.05 level. Models 5, 7, and 8 suggest, then, that social activism likely accounts for variation in homicide rates (see Fig. 1 for an illustration of this result). In short, besides social activism, the direct effects of social capital on homicide are either spurious or conditional.

¹² The AIC (not shown) reveals similar results: model 1 explains more variation than the others.

Table 3 Negative binomial regressions of total homicide: Direct effects models

	1	2	3	4	5	6	7	8	
GDP	-.33** .72 (.11)	-.33** .72 (.12)	-.39** .67 (.13)	-.12 .88 (.14)	-.33** .72 (.11)	-.30** .74 (.11)			-.39* .68 (.23)
Income inequality	.04** 1.04 (.01)	.04** 1.04 (.02)	.05*** 1.05 (.02)	.03** 1.03 (.01)	.04** 1.04 (.01)	.04** 1.04 (.01)	.03** 1.03 (.01)		.01 1.01 (.02)
FSE	.80*** 2.22 (.20)	.82*** 2.26 (.24)	.84*** 2.32 (.19)	.74*** 2.09 (.19)	.77*** 2.16 (.21)	.94*** 2.56 (.23)	.76*** 2.13 (.19)		
Ethnic homogeneity	-1.89*** .15 (.52)	-1.85*** .16 (.55)	-1.99*** .14 (.52)	-2.06*** .13 (.50)	-1.87*** .15 (.53)	-1.88*** .15 (.53)	-2.20*** .11 (.48)		
Secular memberships		.03 1.03 (.09)							
Generalized trust			1.07 2.91 (.66)						
Social activism				-55 .58 (.38)			-75*** .47 (.27)		-85* .43 (.47)
Civic norms					.04 1.04 (.04)				

Table 3 continued

	1	2	3	4	5	6	7	8
Church attendance						.60		
						1.83		
						(.38)		
Constant	-9.97*** (.63)	-10.06*** (.76)	-10.44*** (.74)	-9.5*** (.72)	-10.04*** (.65)	-10.24*** (.71)	-9.38*** (.68)	-9.59*** (.68)
Overdispersion	.27*** (.04)	.28*** (.04)	.26*** (.04)	.26*** (.04)	.27*** (.04)	.27*** (.04)	.26*** (.04)	.43*** (.08)
Wald χ^2	121.99	123	140.6	132.75	133.84	163.75	124.71	74.57
BIC	731	721	732	722	734	733	718	742
N	52	51	52	51	52	52	51	51

Metric coefficient, incident rate ratios (robust standard errors), Exposure = total population of country, Dispersion parameter = Mean

* $p < .05$, ** $p < .01$, *** $p < .001$ (one-tailed test)

Bold numbers represent incident rate ratios

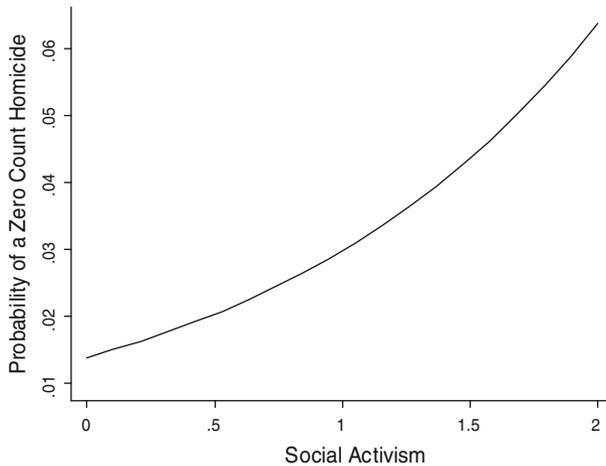


Fig. 1 Probability of a zero count homicide as the level of social activism increases. *Note:* Graph based on Model 7, Table 3

6.2 Results: Conditional Effects Models

Table 4 contains the results from a negative binomial regression analysis exploring the joint effect of forms of social capital and GDP on homicide. Models 1 through 5 sequentially examine if any of the social capital dimensions interact with GDP, our measure of economic development. For each predictor, row 1 reports the metric coefficient, row 2 reports the incidence rate ratios with each of the parameter estimates, and row 3 reports the robust standard error. Note that we do not present the results for the other control variables—income inequality, FSE, and ethnic homogeneity—to conserve space, since the results do not dramatically deviate from those presented in Table 3. Finally, centering the independent variables did not alter the statistical significance of the results nor did reducing the number of control variables, and, as a result, we include uncentered variables with all controls found in Table 3.

The negative binomial regression solutions found in Table 4 clearly show that the impact of social capital on homicide does not depend on levels of modernization. Although the sign for some of the social capital coefficients are negative as anticipated by the Durkheimian tradition, none of the interaction terms are statistically significant at the 0.05 level, indicating that the decreasing effects of social capital on homicide are not limited to either economically developed or undeveloped societies. This suggests, as seen in model 3, that social activism, regardless of modernization, is negatively related to homicide. Overall, the pattern of findings from both Tables 3 and 4 indicate that certain forms of social capital—specifically social activism—do indeed reduce homicide, while other measures, such as generalized trust and secular memberships, appear to be unrelated to homicide regardless of the economic conditions. We will interpret these findings below.

7 Discussion and Conclusion

Given the current preoccupation among sociologists, political scientists and economists with the concept of social capital, understanding its various consequences is becoming ever

Table 4 Negative binomial regressions of total homicide: Conditional effects models

	1	2	3	4	5
GDP	−.48* .62 (.21)	−.57** .56 (.19)	−.42 .66 (.34)	−.22 .81 (.22)	−.38** .68 (.16)
Secular memberships	−.09 .91 (.16)				
Secular X GDP	.11 1.12 (.09)				
Generalized trust		−.13 .88 (1.37)			
Trust X GDP		.76 2.13 (.69)			
Social activism			−1.21* .30 (.71)		
Activism X GDP			.43 1.54 (.39)		
Civic norms				.06 1.06 (.05)	
Norms X GDP				−.03 .97 (.05)	
Church attendance					.09 1.09 (.60)
Church X GDP					.40 1.49 (.38)
Constant	−9.97*** (.80)	−10.34*** (.75)	−9.35*** (.74)	−10.09 (.66)	−10.21*** (.69)
Overdispersion	.27*** (.04)	.26*** (.04)	.25*** (.04)	.28*** (.04)	.26*** (.04)
Wald χ^2	129	135.14	145.12	129.83	182.39
BIC	723	735	724	738	736
N	51	52	51	52	52

Metric coefficient, incident rate ratios (robust standard errors). Exposure = total population of country. Dispersion parameter = Mean. We do not provide control variable parameter estimates to conserve space

* $p < .05$, ** $p < .01$, *** $p < .001$ (one-tailed test)

Bold numbers represent incident rate ratios

more important for both theory and policy. In an effort to further explore the relationship between social capital and crime, the authors set out to replicate, and improve upon, Lederman et al.'s (2002) original study. Our main prediction, like LLM, was that countries with higher rates of social capital would exhibit less homicide. As the prior literature suggests, communities with lively secular and religious memberships, high rates of generalized trust, and strong civic norms of reciprocity are better able to monitor and sanction members of their own community and thereby reduce criminal activity. Using data from 56 nations and controlling for country-level effects of gross domestic product, income inequality, former Soviet economies, and ethnic homogeneity, the results provide weak support for this prediction. Yet, if social capital is narrowed down to those areas most directly related to social activism and political participation, empirical support is found for the beneficial consequences of social capital on homicide. The reasons for this relationship are quite clear. The social activism measure taps behavior directly related to political and social change, such as attending political demonstrations and signing petitions in the hopes of bringing about social reform. Although Putnam (2000) emphasized how social participation in the form of civic engagement and informal social ties would contribute to lower levels of crime, he underscored the role of political participation as well. Putnam noted that societies with higher rates of voting, more involvement in political campaigns, greater attendance of political rallies, or more participation in political protests would also benefit from less crime. This is because politically oriented individuals are also more likely to serve the needs of their community and assist in collective endeavors aimed at reducing crime. All of which follows the classic Tocquevillian premise: a willingness to take part in political affairs generates a willingness to contribute to the common good, including the production and maintenance of a safe and secure society.

The finding that social activism and not generalized trust or secular memberships directly reduce homicide rates is generally at odds with other empirical work in this area. Neighborhood studies, for instance, show that certain community characteristics, such as social cohesion and trust, decreases crime within those geographic regions (Sampson et al. 1997). Likewise, Rosenfeld et al. (2001) and Messner et al. (2004) find that as organizational involvement and generalized trust increase, respectively, homicide will subsequently decrease. Cross-national studies yield similar results. As LLM illustrate, certain dimensions of social capital are associated with lower rates of homicide within countries. The present investigation, however, fails to support these findings. In fact, all forms of social capital related to homicide in prior research, such as generalized trust, appear to be unrelated to homicide in the present investigation. The only social capital dimension that significantly and directly impacts homicide in our study is social activism. And unlike prior research, we find that social activism is not positively related to homicide rates (e.g., Messner et al. 2004), but, instead, negatively related. It seems quite clear to suggest that if measures of social capital directly impact homicide at the individual and neighborhood levels but not at the national level, then the social scientific community should seriously reconsider if and how social capital reduces violent crime.

We take up this challenge and attempt to reconcile the differences between our cross-national findings and previous neighborhood and regional studies of social capital and crime. We do so by suggesting that the effects of social capital on homicide are conditional. For social capital, we suspect that modernity and economic development is that moderating variable. Drawing on Durkheimian theories of crime and deviance (Durkheim 1951 [1897], 1957 [1900]), we propose that an increasing division of labor and structural differentiation fosters individualism and the breakdown of normative order. This results in the weakening of social capital as a social control mechanism and, as a consequence,

homicide rates increase. The implication is that in economically poor countries social capital will have a greater negative effect on homicide, while in economically rich countries the effect will lessen or disappear altogether. We found that none of the social capital dimensions significantly vary across levels of economic development. This suggests that economic development does not have a greater negative effect on homicide in countries with lower rates of social capital, or, conversely, that economic development dampens the effect of social capital on homicide. Interestingly, these findings counter much of the previous work supporting Durkheimian theories of crime and deviance (e.g., Krohn 1978; Messner 1982; Quinney 1965; Ortega et al. 1992).

In the case of the social capital variables denoting secular memberships, generalized trust, and social activism, their effects on homicide, especially when considering the current findings coupled with prior research, seem to depend on the level of analysis: social activism consistently predicts homicide at the national, neighborhood, and individual levels, while secular memberships and generalized trust do not. Yet note how the direction of effect between social activism and homicide is irregular across measurement levels—we find a negative relationship while neighborhood studies report a positive relationship. As a consequence, the reader should keep in mind that many of the null effects reported in the current study might not suggest refutation of particular social capital dimensions. Instead, it is possible that certain social capital mechanisms operate in different ways at different levels of analysis. Generalized trust, for instance, largely works at the individual-level: my optimistic expectations about you impacts my willingness to cooperate with you. The issue is that this effect, which has been shown to produce cooperation at the individual-level (e.g., Ashraf et al. 2004; Sapienza et al. 2007; Thöni et al. 2009), might be lost when the generalized trust survey item is aggregated to represent the structural or social environment of a country. To put it differently, slightly different units of analysis and correlation matrices of variables result in different inferences for cross-national and neighborhood studies. Thus, findings from a cross-national study with aggregated individual-level data like our own might not and probably should not exactly parallel those from another study at a different level of analysis. A major challenge for future research in this area, then, is to resolve the specificity problem by quantitatively disentangling the effects of group-specific and society-wide social capital on homicide. Doing so would be a great contribution to the literature and help determine whether or not social capital—measured as secular memberships, generalized trust, church attendance, and civic norms—is, in fact, associated with homicide or merely spurious as the current study suggests.

All of that aside, the present article did reveal a substantively interesting association between social activism and homicide. This is a potentially important finding that warrants further research. First, since the present analysis employs cross-sectional data to model the relationship between social activism and homicide, the association suffers from problems of causal order. That is, is it high levels of social activism that reduce homicide rates or is it high rates of homicide that reduce levels of social activism? Future research using instrumental variable regression should determine whether the relationship between social activism and homicide is unidirectional or bidirectional. As of yet, however, there are no theoretically, historically, and empirically valid cross-national instruments for both of these endogenous variables. Second, our results corroborate the notion that it may not necessarily be objective associations or resource potentials found in one's social network that directly reduce homicide rates, but actual collective action. Only by analyzing social activism as a mechanism between resource potentials, such as voluntary associations, and homicide can we learn more about how and when social capital matters for criminological outcomes.

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Appendix

See Table 5.

Table 5 List of countries

Country	
Albania	Lithuania
Algeria	Luxembourg
Argentina	Macedonia
Austria	Malta
Bangladesh	Mexico
Belarus	Netherlands
Belgium	Peru
Bosnia	Philippines
Bulgaria	Poland
Canada	Portugal
Chile	Republic of Moldova
China	Romania
Croatia	Russia
Czech	Republic Serbia
Denmark	Singapore
Estonia	Slovakia
Finland	Slovenia
France	South Africa
Germany	Spain
Greece	Sweden
Hungary	Tanzania
Iceland	Uganda
India	UK
Ireland	Ukraine
Italy	United States
Japan	Venezuela
Kyrgyzstan	Vietnam
Latvia	Zimbabwe

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