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THE EFFECT OF THE PERCEPTION OF VIOLENCE ON SOCIAL CAPITAL IN MEXICO

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Abstract

Increasing levels of violence in Mexico, which have the potential to damage the very fabric of society, as well as impact key economic variables, led us to analyze the effect that changes in the perception of violence had on social capital fluctuations (including associative capital) between 2006 and 2011. This was a period in which an anti-violence and anti-organized crime policy was launched in Mexico (2006-2012). A panel model was constructed and estimated using least-squares instrumental variables in two stages. This was due to the endogeneity problem inherent to using 2006 ENCASU and 2011 ENCAS data. Results showed that changes in the perception of violence are not related to information-source type. They do, however, correlate to changes in municipal homicide rates. The study also found that the perception of violence negatively affects the level of social association in Mexico. In the north of the country people perceive more violence. The policy recommendations are aimed at reducing the influence of violence or crime rates in municipalities if the objective is to strengthen the social fabric of Mexico.

Keywords: social capital, social interactivity, social connections, social fabric, violence, crime, panels, instrumental variables.

Introduction

From 2006 to 2012 a policy to reduce violence and organized crime was carried out in Mexico. The policy generated a gradual increase in violence as power centers within organized crime shifted. During this period, anti-violence measures began to abound and events aimed at counteracting the spread of violence were publicized. Some of the steps included mechanisms to reduce corruption within the security forces, as well as directly confronting organized crime, in addition to the aforementioned measures taken to protect the citizenry against violence.

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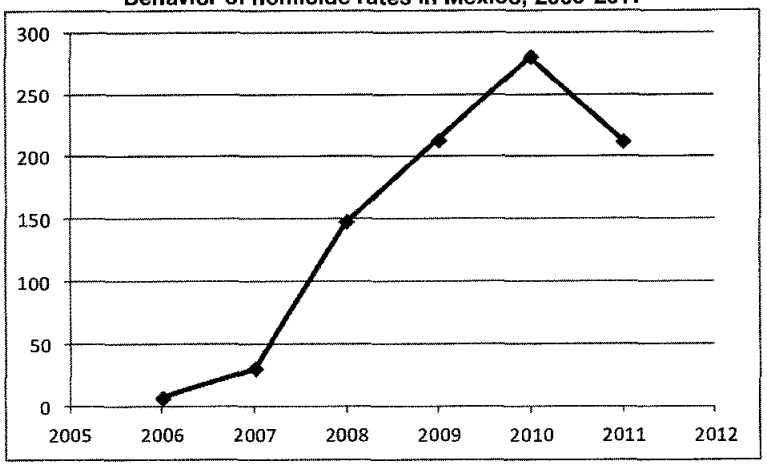
Figure 1 shows homicide-rate increases during 2006-2010, as well as 24.3% decrease which occurred during 2010-2011. The homicide rate represents the average monthly number of homicides occurring in a given municipality per 100,000 inhabitants. The most pronounced increase occurred during the period 2007-2010.

Figure 1
Behavior of homicide rates in Mexico, 2006-2011



Source: Authors' calculations based on data reported on Secretaría de Gobernación webpage in 2012[4].

This created an atmosphere of uncertainty and apparent lawlessness in citizenry, in some places it was used to promote sustained outbreaks of violence that were based on a variety of rationales. In general, these outbreaks of violence stemmed from problems related to property rights or human rights. However, the presence of the armed forces, in areas where this was traditionally not the case, may have created an atmosphere of uncertainty among the citizenry. Events resulting from the anti-violence policy, as well as those generated by citizens, were reported by the media.

The violent events themselves, combined with a high degree of dissemination of same, alarmed the citizenry. This probably changed their habits and may have affected the social fabric. For example, perhaps people stopped going out to public places and getting together with people other than their close relatives and co-workers. The central hypothesis here involves verifying whether the perception of increased violence changed the degree of association within the population. According to the literature, the economic consequences of the deterioration of the social fabric lie in the effects on aggregate demand; specifically consumption and investment (Ferreira, Prennusht and Ravallion, 1999; Haacker, 2004). Consumption, because a lower level of affluence among households leads to reductions in spending on goods and services. There is also less investment by entrepreneurs, who faced with the problems of uncertainty and low consumption.

Evidence shows that the effects of violence include increased societal tensions, combined with the breakdown of family and community ties (Fajnzylber, Lederman and Loayza, 1998). This

[4] http://www.encuentra.gob.mx/APF?q=tasa%20de%20homicidios%20en%20M%C3%A9xico&client=segob

paper seeks to examine whether changes in the perception of violence in Mexico during 2006-2011 impacted levels of social capital during the same period. In this study, social capital stock is estimated by the proxy of social interaction (associativity); i.e., the number of people who gather each month outside their home with individuals other than their close relatives or co-workers.

Data from the 2006 National Survey of Social Capital in an Urban Environment (ENCASU) and the 2011 National Survey of Social Capital (ENCAS) is used. These surveys are used because they contain information which can be used to construct various proxies of social capital. Additionally, the indicators for estimating the analysis variables also coincide with the period in which the anti-violence policy was launched in Mexico.

Social capital is seen as an asset that people produce through their interaction with others (Grootaert et al., 2004). Social interactivity (associativity) here refers to relationships with others and is considered as a proxy of social capital because resources are generated through relationships with others within a given social network. Such resources may include data transmission, lower costs or the production of positive externalities, among others (Burt, 2000).

In this study, we analyze the effect changes in violence or crime have on changes in social capital, specifically regarding the above mentioned social interactivity. Increasing levels of violence in Mexico, which have the potential to damage the very fabric of society, as well as impact key economic variables, led us to analyze the effect that changes in the perception of violence had on social capital fluctuations (including associative capital) between 2006 and 2011. This was a period in which an anti-violence and anti-organized crime policy was launched in Mexico (2006-2012).

1. Review of the literature

Social capital is an asset that individuals produce through interaction with others, as wellas through trust and reciprocity (Grootaert et al., 2004). As seen from the viewpoint of Burt (2000), social capital refers to resources such as information, ideas and support that individuals are able to procure through their relations with others. Lin (2001) mentions that social capital is investment in social relations with expected returns in the market.

Unlike physical capital, social capital is a social resource, in the sense that it is generated through interaction with others (Grootaert et al., 2004). In the case of human capital, it is essentially owned by individuals and not dependent on others. The literature shows that the creation of social capital is a process influenced by various social, political and cultural factors, and increases through networks and can be used in productive activities (Coleman, 1988).

Different types of social capital have been identified; for example, structural and cognitive social capital. Structural social capital relates to social networks, roles, rules and patterns of interaction that are relatively objective and visible, including institutionalized types such as membership in groups, as well as agreements and informal networks. The norms, trust, attitudes and beliefs based on subjective processes that are shared in a group or society constitute cognitive social capital (Uphoff and Wijayaratna, 2000).

Because it is present in many different features of the social fabric, social capital is not viewed as a single entity. Instead, it is perceived as possessing a multidimensional nature (Grootaert, et. Al., 2004), and, as such, it cannot be captured in a single way, but requires a multidimensional approach. The most commonly used are:

- Trust (Coleman, 1988; Collier, 1998; Cox, 1997; Kawachi et al., 1999; Kilpatrick, 2000; Leana and Van Buren III, 1999; Lemmel, 2001; Putnam, 1993; Snijders, 1999; Welsh and Pringle, 2001).
- Rules and norms governing social action (Coleman, 1988; Collier, 1998; Fukuyama, 2001; Portes and Sensenbrenner, 1993)
- Types of social interaction or associativity (Collier, 1998; Snijders, 1999)
- Types of networks (ABS, 2002; Kilpatrick, 2000; Snijders, 1999; Burt, 1997; Hawe and Shielle, 2000; Kilpatrick, 2000; Putnam, 1995).

Liu and Besser (2003) identified four dimensions of social capital: informal social ties, formal social ties, trust, and norms of collective action; while Narayan and Cassidy (2001) identify dimensions relating to: membership in groups, generalized standards, social distance, associative and social connections, volunteering and trust.

Grootaert and Bastelaer (2002) treat social capital using the following dimensions: *structural capital,* involving membership, social networks, associative behavior, social cohesion, collective action; and *cognitive capital,* involving trust, norms and values.

Associative social interactions and ties[5] are a commonly cited factor. Narayan and Pritchett (1999) relate belonging to groups with social capital, defining social capital as the quantity and quality of associational life and the related social norms. The effects of associative economic activity are diverse (Manski, 2000). For example, the interconnection between people creates channels that produce information between the parties and reduces transaction costs. Associativism can generate greater economic transactions; decrease the risk between members of a community; and act as an informal safety net. Additionally, it can create channels for further diffusion of innovations (Rogers, 1983; Morduch, 1995; Knack and Keefer, 1997).

According to Blau (1977) "associativism, seen as social interactions, depends on opportunities for social contact." Associativism also occurs in a context of opportunity that prevents or allows different types of social contacts (Blau, 1977). These may be adversely affected by violence. By violence we mean the kind of human interaction manifested in situations that cause harm to an individual or community and limit their potential or future[6][7].

The literature asserts that there is a relationship between social interaction levels and violence. Studies have analyzed the effect of social interactions on violence, while others have addressed the inverse thereof. Glaeser, Scheinkman and Sacerdote (1996), for example, mention

[5] In this paper, we identify social ties, social relationships, social interactions and interconnections between people as associativism. In some cases the literature makes clear distinctions between one and another meaning in other cases cited used different terms to refer to the same concept, however all of them have been considered as proxies of social capital.

[6] http://es.wikipedia.org/wiki/Violeocia.

[7] We use the term violence, crime and violent crime interchangeably. In English is primarily linked to intra-household situations, whereas violence in Mexico is a generic term that even includes organized crime violence.

that social interactions can explain the high variance of crime rates in different locales and over time. This high variance appears to be explained by changes in exogenous costs, as well as the benefits of crime. When a law enforcement agent's (LEA) decides to become a criminal positively affects the decision of the LEA's neighbor to enter a life of crime, crime rates in cities where this occurs will differ from those where the effect is not positive.

Returning to the study by Gary Becker (1968) in which he asserts crime is the result of individuals' decisions based on a cost-benefit analysis, we found evidence of a positive relationship between social capital and violence. In certain contexts, stronger social interactions allow individuals involved in criminal activities to increase their exchange of information and access to expertise that reduce the costs of crime. Furthermore, these social interactions may facilitate the influence of criminals in other members of the community and lead to a greater propensity for crime and violence. In this sense, social capital has the potential to induce more crime and violence when it is limited to certain groups (such as gangs, crime based on gated communities and ethnic groups), but not available to society at large (Lederman, Loayza, and Menéndez, 2002).

For example, Colombia has been characterized by high levels of violence. Colombian violence has taken on a variety of forms. It has also resulted from a wide array of situations. On the one hand, an intense armed conflict where outlaw groups, especially guerrillas and paramilitaries, have invaded territories and expanded their level of action through intimidation of farmers and landholders. While it is unclear the purpose driving these groups, there are theories link the cause to political ideals, drug trafficking or a livelihood option; which would explain the inclusion of kidnapping in their modus operandi. On the other hand, another type of conflict exists, which is generated by economic and social factors such as lack of opportunity for young people, unemployment and poverty. These circumstances make individuals more prone to commit crimes and to view collective actions as a "solution" to their problems (LaTorre, 2004).

Violence has been related to different dimensions of social capital, and Sampson and Raudenbusch (1999) found that trust in neighbors is associated with low rates of crime. Rosenfeld, Messner and Baumer (2001) argue that law enforcement agencies with broader citizen participation in civic activities are capable of exerting more influence in the control of crime than those with lower participation rates. Higher civic participation rates may allow them to influence local police, as well as boost access to other relevant crime-fighting resources. Similarly, a community's ability to mobilize resources, another factor related to high levels of trust, can play a role in reducing violence. In this sense, trust is associated with a high propensity for cooperation; and this type of cooperation is useful for mobilizing resources within the government, bureaucracy, police and civil society that have an impact on crime. Civic participation and trust are two dimensions of social capital that have had positive effects on crime and violence through informal and formal mechanisms.

On the other hand, a negative relationship exists between other indicators of social capital and violence. Kennedy et al. (1998) found a negative relationship between social capital and crime. The authors argue that rising income inequality is related to the weakening of social cohesion (which is a proxy of social capital). They also assert that the decline of social capital, in turn, is associated with increases in firearm homicides and violent crimes.

The relationship between social capital and violence is even more complex because the causal link between these two factors is capable of working in both directions. Violence can also affect social capital, and crime levels may reduce social capital by inculcating distrust among community members; community ties can also disintegrate (Lederman, Loayza, and Menéndez, 2002).

According to Moser and Shrader (1999) violence erodes social capital when it reduces a society's trust in, and cooperation with, its formal institutions and informal organizations. This effect occurs in two forms. Where formal institutions are concerned, violence is linked to drug trafficking, judicial system corruption and human rights violations. It can also cause high rates of impunity that undermine the relevance and governance of some institutions, which can, in turn, reduce trust, cooperation with and participation in these institutions. Where informal institutions are concerned, community organizations are affected because violence decreases an individual's capacity for action, weakens social cohesion and trust among members. It also reduces a household's ability to function effectively as a unit.

However, violence is not limited to a negative relationship with social capital. Evidence suggests violence increases levels of social capital. According to Wiig (2003), communities who have been victims of guerrilla fighting, and have not been protected by the state, tend to have higher levels of social capital because they have seen the need to organize for self-protection. According to Messner, Baumer and Rosenfeld (2004) homicide rates have a significant association with two dimensions of social capital: trust and social activism. In the case of social activism, the relationship is positive. In the case of trust, the relationship is negative. And in both cases, social capital is the consequence, and not the cause, of crime.

Evidence has been found for a relationship between various types of crimes and social interaction such as visiting friends or family outside their homes. Glaeser, Scheinkman and Sacerdote (1996) found the following: the frequency of social interaction increases when the offenses are minor; frequency of social interactions is moderate when crimes are serious; and the frequency of social interactions is very low in cases such as murder or rape.

Social capital is generally perceived in one of its three dimensions: *bonding, bridging* and *linking*. Bonding capital features relations between people in similar situations, such as immediate family, close friends and neighbors. Bridging capital involves more distant relationships between people, such as casual friends and coworkers. These groups generally share common characteristics and interests. , Lastly, linking capital is acquired in situations that are outside the community which allows individuals to leverage a far wider range of resources. Relationships formed via linking capital involve links to power structures (Woolcock, 2001).

This paper will focus on *bonding* social capital. This is because the data used to ascertain violence levels necessarily limits the ability to analyze its relationship with the other two types of social capital.

2. Methodology

This section describes the methodology utilized. The null hypothesis to be analyzed in this article is as follows: changes in the perception of violence affect changes in levels of social

interactivity (H_o: ΔPV affect ΔKS). Social interactivity (in groups, associations, inter alia) is the proxy variable selected to estimate social capital. In order to test this hypothesis the following structural model is proposed:

$$\Delta KS = f(\Delta PV)$$

Where ΔKS represents the change in social capital stock; or in this case, the change associative capital, which is a function of ΔPV. This means that, for the change in the perception of violence, the model to be estimated is:

$$\Delta KS_i = \beta_{0i} + \beta_{1i}\widehat{\Delta PV_i} + \gamma_{ik}\Delta X_{ik} + u_i \qquad (1)$$

Where i represents the average individual of each cohort, and k is the number of exogenous variable X. ΔKS represents the rate of change of capital from one year to another; in this case, from 2006 to 2011. ΔX represents the vector of variables that affect KS and acts as a control variable in this model. Each X variable signifies the difference between 2006 and 2011 and generates the vector of the coefficients of the *X* variables. ui is the random error term with $E[u|X]=0$ y $u \sim N(0,\sigma^2)$, represents ΔPV changing the perception of violence between 2006 and 2011. Each of these changes are defined as follows:

$$\Delta KS_i = KS_{it} - KS_{it-1} \qquad (2)$$

$$\Delta X_{ik} = X_{ikt} - X_{ikt-1} \quad \forall \; k \qquad (3)$$

$$\Delta PV_i = PV_{it} - PV_{it-1} \qquad (4)$$

Where t refers to the observation corresponding to 2011, and *t -1* to 2006. We decided to use the differences between periods (and no exchange rate) because some explanatory variables are dummies. Thus, the ratio of exchange rates would generate undefined values and produce very few observations in the estimates. The endogeneity problem is anticipated in the proposed model because the relationship ΔPV_i and ΔKS_i, the error term $_{ui}$ might correlate to ΔPVi variances due to omitted variables or unobserved characteristics of the average individual in the cohort that would make them experience changes in the perception of violence. Additionally, these features that generate changes in the perception of violence may be related to changes in social interactivity levels or social capital between 2006 and 2011. Given the problem of endogeneity, ordinary least square estimates would produce inconsistent estimates.

In the presence of endogeneity, the use of instrumental variables provides a generalized solution to the problem (Greene, 2003; Cameron and Trivedi, 2005; and Wooldridge, 2009). The tools chosen to test endogeneity are based on changes in the variables which are related to the perception of violence (defined as *homicide rate* and *access to media*). It is believed that perception of violence levels increase in relation to spikes in homicide rates, and in relation to the frequency with which the media exposes a population to such stories. For example, an individual's perception of violence may be linked to the number of people with whom they interact in (or near) their neighborhood. Similarly, a person who meets with groups containing larger numbers of people is more likely to receive information on violence in their surrounding vicinity than a socially "isolated" person.

$$\Delta PV_i = \alpha_{0i} + \alpha_{1i}\Delta H_i + \alpha_{2i} M_{it-1} + e_i \quad (5)$$

$$\Delta H_i = H_{it} - H_{it-1} \quad (6)$$

$$\Delta H_i M_i = H_{it} M_{it-1} - H_{it-1} M_{it-1} \quad (7)$$

The above equations define the model to be estimated using instrumental variables, where ΔHi refers to the difference in homicide rates between 2006 and 2011. ΔHiMi refers to the interaction of the *change in homicide rate* variable with the *access to media* variable. The *access to media* variable is for 2006. e_i is the random error term with $E[e|\ \Delta H,M]=0$ y $e \sim N(0,\sigma^2)$. To test for endogeneity, as well as the instruments in the model, Equation 5 is estimated through the use of instrumental variables (Heckman, 1997).

The instrumental variables (IV) method supposes the existence of a correlation[8] between the variable ΔPV and the instruments (ΔH y M_{t-1}) that are not determined by the ΔKS, and which do not directly determine the ΔKS in order to estimate the effect of the exogenous changes of the ΔPV variable in ΔKS. This would eliminate the difficulty created by the potentially simultaneous determination of ΔKS and ΔPV. Thus, ΔH and M_{t-1} may not be directly affected by ΔKS, nor would they not directly affect ΔKS; rather, an increase in the homicide rate (ΔH) and *access to media* (M_{t-1}) could lead to an increased perception of violence (ΔPV).

3. Data and variables

All data was obtained from the 2006 National Survey of Social Capital in an Urban Context (ENCASU) and the 2011 National Survey of Social Capital (ENCAS). Both surveys provide information on membership and participation in organizations (associativism), levels of trust, social networks, social cohesion, collective action, as well as citizen rights and values. Data is consistent with other surveys that estimate the proxies of social capital, such as the World Values survey and other surveys. Additionally, the ENCAS and ENCASU are unique in their focus on assets.

The ENCASU was taken in urban areas during 2006. It comprises 2,167 homes and 8,554 people in three regions: North, Central-West and South-Southeast. The ENCAS surveyed 5,391 households with 20,876 people in urban and rural areas. 2,722 households were surveyed in urban areas and 2,669 households in rural areas. It is also representative of the same three geographic regions in the ENCASU. Household respondents in the two surveys are people over 18 who may be heads of households or maintain a relationship with same, and these individuals are the unit of analysis in this study. These two surveys provide indicators that can be compared over time because the questions asked in 2006 were also used in 2011. Only urban data from the ENCAS was used due to comparability issues, whereas the ENCASU only surveyed urban areas.

Because surveys are not panel studies, a synthetic panel was constructed utilizing cohorts that allowed us to follow the evolution of a group of people with certain characteristics over time. A cohort can be identified as a group of people with one or more fixed sociodemographic

[8] The highest correlation is between ΔPV and ΔH at 0.9070. The lowest is between ΔPV y M_{t-1} at 0.1647.

characteristics that can be identified in a series of cross-sections. The traditional example is to form cohorts of age, gender, native tongue, place of origin (assuming no physical mobility, etc.). The individuals making up a cohort on a regular basis are the same cohort in the years of the series. As such, the aim of this methodology is to follow the evolution of the average characteristics of a specific sociodemographic group in order to build a synthetic panel.

Synthetic panels help make statistical inferences and econometric analysis possible. The main problem faced when using this type of data is that the variance of the variables that are imputed to cohorts differs because, in principle, they are not the same size. This problem can be solved by increasing the size of the cohort; however, this is not always possible. A discussion of this topic from the econometric point of view is found in Deaton (1985).

In order to construct the synthetic panel, the following variables that form the cohort in each year were chosen: educational level, year of birth, sex and place of residence or district. Level of education is a useful criterion because after a certain age range this variable does not change over time. People in the sample are adults; therefore, the majority of the population has ended their studies. Four categories are considered in the level of education: no education, primary education, high school education and university education. These four categories were chosen because educational levels do not have a high degree of variance when people are adults. Schooling categories were restricted to four levels in order to expand the number of observations in each group, as well as maintain the asymptotic properties involved in the construction of the synthetic panel (see Antam and McKenzie, 2007). The number of educational level observations for the two years is shown in Table 1.

Table 1
Distribution of sample by educational level
(Percentage and number of observations)

Educational level	2006 ENCASU[1]	2011 ENCAS[1]
No education	240 (11.08%)	143 (5.25%)
Primary education	1300 (59.99%)	1528 (56.14%)
High Middle school education	348 (16.06%)	618 (22.70%)
University education	272 (12.55%)	413 (15.17%)
Sample size (individual interviewed in household)	2,167	2,7222

1 Observations reported may not match sample size of missing values.
2 Limited to 2011 ENCAS data from urban areas.

A subsample, based on birth year, was also created. This made it possible to follow a group of people through a given period of time and made up of a 14-year age bracket. This represents a fixed category, if we assume zero attrition. The people in the sample were grouped into six groups according to their year of birth. Individuals were grouped into 14-year cohorts. If the ranges had been smaller than this the number of observations would have been reduced. The analysis would have been less precise, too. This age range is able to capture observations in each group during

the two years (2006 and 2011). It was able to cover people over 18 and those aged 97 and older. Table 2 shows the number of persons belonging to each category for each survey sample.

It is important to note that an attempt was made to reduce the size of the age cohorts (e.g., groups consisting of 3 to 5 years) in order to expand the number of cohorts. Unfortunately the number of observations within such small age ranges included either minimal or no observations at all.

Table 2
Distribution of the sample by year of birth
(Percentage and number of observations)

Birth year	2006 ENCASU	2011 ENCAS
1904-1918	13 (0.60%)	10 (0.37%)
1919-1933	123 (5.68%)	54 (1.98%)
1934-1948	301 (13.89%)	253 (9.29%)
1949-1963	498 (22.98%)	487 (17.89%)
1964-1978	750 (34.61%)	893 (32.81%)
1979-1993	482 (22.24%)	1,025 (37.66%)
Sample size (individual interviewed in household)	2,167	2,7221

1 Limited to 2011 ENCAS data from urban areas.

People in the sample were also grouped according to gender. This category is the least fixed of all selected variables. The number of men and women for each year of the survey is presented in Table 3. A test was made to construct two cohorts considering only the gender and year of birth variables; unfortunately the number of cohorts was reduced to 24, which also decreased the number of observations when the 2006 and 2011 data was combined. The problem of working with a very small sample size is that statistical inference cannot necessarily be performed with the same level of confidence as with a larger sample.

Table 3
Distribution of sample by gender
(Percentage and number of observations)

Birth year	2006 ENCASU	2011 ENCAS1
Women	1,232 (56.85%)	1,581 (58.08%)
Men	935 (43.15%)	1,140 (41.88%)
Sample size (individual interviewed in household)	2,167	2,7222

1 Observations reported may not match sample size of missing values.
2 Limited to 2011 ENCAS data from urban areas.

Finally, the study reviewed municipalities which coincided in both surveys and in which people reported living in. There turned out to be a total of 19 such municipalities. The synthetic panel (Annex Table 1) was constructed using 48 cohorts, which were the result of combining the education, birth year and gender variables for each year of the survey. By joining the cohorts 2006 ENCASU cohorts with the 2011 ENCAS cohorts, 79 cohorts were included in the synthetic panel. Not all cohorts were included in the final version of the synthetic panel because some of the cohort observations did not match the municipalities considered in the two surveys. The average of the observations in each cohort was utilized to make estimates of the models and each cohort was treated as an observation. An example of the defining characteristics of Cohort 1 of Table 1 of the Annex is as follow: a female, born during 1904-1918, who lacks any formal education.

The social capital variable (KS) estimated in the model was constructed through the proxy variable which was termed associativism. It is a continuous variable and refers to the number of people an individual meets each month who are not members of their immediate family or coworkers. Table 3, in the Annex, shows the KS variable statistics for 2006 and 2011; i.e., the average values of the cohort are reported. The average value between 2006 and 2011 of the change in social capital or associativism is 0.1865 and has a standard deviation of 16.4376.

The perception of violence (PV) is a dummy variable which refers to whether or not an act of violence has occurred in the neighborhood or town where the person lives during the given survey year. The answer to this question is dichotomous and presented on both the ENCAS and the ENCASU surveys. Table 3 in the Annex shows the statistics for the PV variable between 2006 and 2011. The average values of the cohort are also reported. The average value between 2006 and 2011 of the change in the perception of violence was -0.9543 and had a standard deviation of 0.4297.

The selection of the variables that are associated with social capital (X_k) was performed based on what the literature considers determinants of social capital. This selection process also relied on the data available in the 2006 ENCASU and 2011 ENCAS, as well as the relationship said variables have with the associativism proxy for social capital.

Glaeser, Laibson and Sacerdote (2002) find that people accumulate social capital when they have incentives to do so. For example, people who belong to groups with more social capital tend to invest more in social capital. Some of the characteristics of individuals associated with social capital investment include:

- Effects of the life cycle: younger people invest more in social capital, whereas investment decreases as they age (*edad edad2*) (*Age age2*) [9].
- Mobility of individuals decreases the possibility of their capitalizing on their investment in social capital. I.e., homeowners reduce their mobility and therefore increase their investment in social capital (*tenencia*) (*home ownership*).
- Social capital increases in occupations where social skills are compensated. Individuals who work in occupations in which social skills are important accumulate more social capital (*whitecollar*) (*white-collar*).

[9] The names of the factors affecting the social capital or determinants of social capital from the literature appear in italics in this paper.

- The connections between people substantively decrease in relation to physical distance. Travel costs associated with large physical distances reduce the frequency of their relations, to include deterioration of same (*distancia*) (*distance*).

- People who invest in human capital also invest in social capital: More training, experience and education fosters greater opportunities for taking advantage of social relationships (*educación*) (*education*).

- People who receive higher wages accumulate less social capital. They value their time more for wage-earning than for accruing the benefits found in social networks (*ingreso*) (*income*).

Krishna and Uphoff (1999) also analyzed the factors associated with social capital (at the household and community). They identified the following relationships:

- Previous experience in collective action positively affects social capital.

- The existence of rules of behavior in the community increases social capital.

- The degree to which people participate in decision-making positively affects social capital.

- The greater the number of sources of information (*telephone, radio,* etc.), the greater the social capital.

- More years of education generates greater social capital (*education*).

- Economic status, estimated by land ownership, enjoys a positive relationship with social capital (*home ownership*).

- A positive relationship exists between social capital and the female gender (*woman*), while a negative relationship with family size (*household size*) was observed. The study observed a positive relationship between social capital and time in the home (*residence*).

In their analysis of three dimensions (trust, reciprocity, solidarity) of social capital, Pargal, Hug, and Gilligan (1999) observed the following relationships:

- Households with a business, as well as those who own their dwelling (*home ownership*) were positively and significantly associated with all three measures of social capital.

- The variable composed of the number of places to meet had mixed results; indicator demonstrated a negative correlation to trust, and a positive correlation to reciprocity.

- The number of private organizations was not statistically significant in relation to any of the three dimensions of social capital.

- The number of public organizations was also not statistically significant for any of the three dimensions of social capital.

Coleman (1988), as well as Furstenberg and Hughes (1995), related social capital to intra-family factors. They found the following relationships:

- The time and effort spent by parents with children in intellectual pursuits (*time*) has a positive relation to family social capital.

- The physical presence of adults in the family and adult attention to children (*together*) positively correlates to domestic social capital.
- When both parents work outside the home (*woman works*), this indicator has a negative correlation to domestic social capital.
- The type of relationship that develops between parents and children, as well as between parents and other adults, influences the commitment children have with other young members of their community. If this is positive, then the effect on social capital will be positive.
- A greater number of siblings can negatively affect family social capital because parents' focus on each is necessarily diluted (*TDE*).
- The frequency with which parents talk with children about children's personal lives positively correlates to domestic social capital.
- Other variables that have a positive correlation with domestic social capital: home ownership involves less physical mobility (*home ownership*), which results in fewer school changes due to changes in residence; if the mother worked before the child began school; expectations of the mother on the educational attainment of children.

According to Coleman (1990), investment in social capital is also related to:

- The frequency with which parents participate in the lives of their children has a positive correlation to domestic social capital.
- When women are more involved in their children's activities (*woman*) domestic social capital increases.
- When both parents work outside the home, their attention to their children decreases (*woman works*). As a result, the family's social capital decreases.
- When there is a greater number of members within the home, the intensity of childcare for each child (*household size*) is diluted and the family's social capital decreases.
- The higher the number of dependents, the less the level of social capital investment (*TDE*).

Narayan and Pritchett (1999), Putnam (1995), as well as Knowles and Anker (1981), all note that:

- There is a greater investment in social capital bonding among lower-income populations (*poor*).
- Individuals who place a high value on time accumulate less social capital (*income*).
- Having a television (which is viewed for hours) decreases social capital (*television*).
- Social capital is higher in smaller, less-populated communities (*rural*).
- The greater the length of residence in a community, the greater the level of social capital accrued (*residence*).

The social capital variables used in the studies mentioned above (see Table 2, Annex for descriptions of X-variables) are listed below:

- *Age and age²* (X_1 and X_2): effects of the life cycle. Social capital first increases with age, then tapers off (Glaeser, Laibson and Sacerdote, 2002).
- *Education* (X_3): people who invest in human capital also invest in social capital (Glaeser, Laibson and Sacerdote, 2002; Krishna and Uphoff, 1999).
- *TDE* (X_4): the higher the number of dependents, the lower the level of investment in social capital (Coleman, 1990).
- *Telephone* (X_5): mechanisms of information increase social connections (Krishna and Uphoff, 1999).
- *Womanworks* (X_6): the condition of being female negatively affects social capital; i.e., if a woman works, there is less social capital within family (Krishna and Uphoff, 1999, Coleman 1990).
- *White-collar* (X_7): investment in social capital is high in occupations with high rewards for social skills (Glaeser, Laibson and Sacerdote, 2002).
- Household_size (X_8): the greater the number of household members, the lower the social capital within home (Krishna and Uphoff, 1999; Coleman, 1988 and 1990; Furstenberg and Hughes, 1995).
- *Log_income* (X_9): the higher income, the lower the social capital (Glaeser, Laibson and Sacerdote, 2002).
- *Residence* (X_{10}): the longer the period of time in the community, the stronger the ties to community and, the larger the social networks (Krishna and Uphoff, 1999; Narayan and Pritchett, 1999; Putnam, 1995; Knowles and Anker, 1981).
- *Together* (X_{11}): the attention of adults to children is greater when both parents reside in household (Coleman, 1988; Furstenberg and Hughes, 1995).
- *Job_permanen* (X_{12}): permanent job position correlates to more work-related networks.
- *Household_furn* (X_{13}): increased household assets correlate to more bonding and less linking social capital (Narayan and Pritchett, 1999).
- *Poor* (X_{14}) lower-income or impoverished (poor) individuals invest more bonding social capital (Narayan and Pritchett, 1999; Putnam, 1995; Knowles and Anker, 1981).

Variables are taken at the individual level (Glaeser, Laibson and Sacerdote, 2002) because the results of individual perception of violence are analyzed as a function of social interaction; some variables were added at the household level. Table 3 in Annex includes statistics for X_k variables between 2006 and 2011; the average values of the cohort are shown.

The *Region* variable is included in order to analyze its impact on the model given the differences in reports of violence in Mexico. The *Region* 1 variable includes northern area; Region 2, central and Gulf; and Region 3, south central or Pacific[10].

[10] Region 1: Baja California, Baja California Sur, Coahuila, Chihuahua, Durango, Nayarit, Nuevo León, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Zacatecas. Region 2: Aguascalientes, Colima, Distrito Federal, Guanajuato, Hidalgo, Jalisco, Estado de México, Michoacán,

Instrumental variables were selected due to the endogeneity problem described above. One of the instruments used was built using the homicide rate variable (H), which refers to the monthly average number of homicides, per 100,000 inhabitants, that occurred in a locale. The municipal homicide rates were obtained from a different set of data: the 2012 database managed by the *Secretaría de Gobernación.* The number of inhabitants per municipality (population aged over 18 years) was obtained from 2005 *Conteo de Población y Vivienda* for the construction of the 2006 variable; and from the 2010 *Censo de Población y Vivienda* for the construction of the 2011 variable. In Table 3 of the Annex, the H-variable statistics between 2006 and 2011 are reported. The average value between 2006 and 2011 for H is 2.6002 and its standard deviation is 5.6808.

Another instrument used in the model is access to media (M). This variable (expressed in number of days) was constructed using the frequency with which people are informed via media such as television, family, radio, neighbors, newspapers, people at church, internet, friends or colleagues. This indicator could only be obtained through the use of 2006 ENCASU data, so it is assumed that access to media from 2006 to 2011 did not change. This 2011 indicator was unfortunately not comparable with that of the 2006 ENCASU; the question was worded differently and did not include the same response alternatives. In the second panel of Table 3 in the Annex, the average values of the cohort for the M_{t-1} variable are shown. As can be seen, the average value for the 2006 M_{t-1} is 28.0376, with a standard deviation of 3.8957.

In the estimates, several instrumental variables were analyzed in order to verify the consistency of the results and reject the possible presence of heterogeneous results: three instruments were considered as alternatives to homicide rate. Ward's method for clusters (Ward, 1963) was used, where the dummy variable (D_H) takes a value of 1 if the change in the municipal homicide rate is higher than average rate of change between 2006 to 2011 (average is 2.600241 per Table 3 in Annex). The advantage of this indicator is that it provides simple and direct interpretation: the correlation between a certain threshold of violence and an individual's level of social interaction in groups. Additionally, the average municipal homicide-rate change indicator was squared (H^2).

4. Results

In this section, the results of the econometric estimates of equations reported in the previous section are described. The Durbin-Wu-Hausman endogeneity test (Davidson and MacKinnon, 1993; Hausman, 1978) was applied. Results indicated that the variable change in the perception of security (ΔPV_i) is endogenous[11]. The following were included as potential instrumental variables: change in the average homicide rate, by municipality, from 2006 to 2011 (H); Ward indicator (D_H); indicator of change in the homicide rate squared (H^2); access to media (M_2006); *homicide rate* in 2006 (H_2006); and the interaction between the access to media variable and the homicide rate variable (MH). Table 4 illustrates the model using a variety of proposed instruments.

Morelos, Puebla, Querétaro, Tlaxcala. Region 3: Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, Yucatán.

11 The coefficient of residual perception of violence was 13.9957 with a value of "p" 0.081, the statistical significance of the variable indicates that it is an endogenous variable. The value F (1,64) = 3.14 with Prob> F = 0.0812, indicating that an OLS model is not consistent, so it is necessary to use another method. Given these results, the model is estimated with OLS and instrumental variables in two stages.

Table 4
Test models using different instruments

	Underidentification test (Kleibergen-Paap rk LM statistic)	Weak identification test (Kleibergen-Paap rk Wald F statistic)	Hansen J statistic (overidentification test of all instruments)	Endogeneity test of endogenous regressors
Model with 6 instruments H, D_H, H^2, MH, M_2006, H_2006	6.316 (0.3885)[1]	1.623 (19.28)[2]	3.509 (0.6220)[1]	3.243 (0.0717)[1]
Model with 5 instruments H, D_H, H^2, MH, M_2006	6.214 (0.2859)[1]	1.940 (18.37)[2]	0.921 (0.9215)[1]	3.464 (0.0627)[1]
Model with 4 instruments H, D_H, H^2, MH, M_2006	4.212 (0.3781)[1]	1.530 (16.85)[2]	0.796 (0.8504)[1]	3.447 (0.0634)[1]
Model with 3 instruments H, H2, M_2006	4.175 (0.2432)1	2.034 (13.91)2	0.616 (0.7348)1	3.384 (0.0658)1
Model with 2 instruments H, M_2006	4.092 (0.1293)1	3.099 (19.93)2	0.156 (0.6929)1	2.825 (0.0928)1

1 P-value 2 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias

Table 4 shows the results of the various tests for endogeneity using different combinations of instruments in the estimation model. The overidentification test was performed to assess the validity of the instruments; i.e., if the excluded instruments are independent of error (ui). The p -values of the J statistic (third column in Table 4) are 0.6220, 0.9215, 0.8504, 0.7348 and 0.6929, indicating that the overidentifying restrictions are not rejected. This seems to point towards rejecting MCO in favor of instrumental variables, which was borne out by the endogeneity test (last column in Table 4). The p-values permit the rejection of the null hypothesis of exogeneity, in favor of endogeneity.

The first column of Table 4 shows the underidentification test results. It is a test for the range of a matrix. The second column of Table 4 shows the test for weak instrument. The null hypothesis is that the estimator is weakly identified (in the sense that it is subject to bias), where weak instruments are those that lead to bias in the models. In this case, models are rejected if they have more than two instruments, given that a tolerable rejection rate is 5%; consequently, two instruments deliver better identified models. Table 5 shows the results of the estimated model by comparing the results of the ordinary least squares method with those of the instrumental variable method.

Table 5
Estimation of model using OLS or instrumental variables

	MCO				IV			
	Variable dependiente KS				variable dependiente KS			
	Nacional	Region 1	Region 2	Region 3	Nacional	Región 1	Región 2	Región 3
PV	-4.2884	-4.4085	-4.3371	-4.0181	-17.2885 **	-15.2058**	-15.3876**	-19.6749*
	(2.9764)	(3.3501)	(3.0375)	(2.9298)	(8.4065)	(6.7534)	(7.2063)	(10.9280)
x1	-1.6938*	-1.7109*	-1.7364*	-1.6860*	-2.4463**	-2.4170**	-2.3903**	-2.5585**
	(0.9472)	(0.9836)	(0.9608)	(0.9548)	(1.0830)	(0.9894)	(1.0161)	(1.1985)
x2	0.0173*	0.0176	0.0180*	0.0171	0.0281**	0.0282**	0.0274**	0.0300**
	(0.0103)	(0.0111)	(0.0105)	(0.0105)	(0.0124)	(0.0116)	(0.0117)	(0.0143)
x5	-14.6062***	-14.6963***	-14.7414***	-14.4882***	-17.1607***	-17.3503***	-16.9578***	-17.846***
	(4.4375)	(4.4463)	(4.3948)	(4.5429)	(4.6652)	(4.3487)	(4.5233)	(5.1702)
x6	8.3646*	8.4565	8.1204	7.9163	13.7990**	13.3040**	12.6450**	15.9145*
	(5.0910)	(5.3494)	(5.1302)	(5.2128)	(6.5930)	(6.3464)	(6.0098)	(8.1737)
x7	-12.6247**	-12.6884**	-12.4056**	-12.2714**	-12.4673**	-13.0790**	-12.1935**	-13.6273**
	(4.9617)	(5.1095)	(4.9820)	(4.9974)	(5.3007)	(5.1431)	(5.0793)	(5.3395)
x8	-0.3127	-0.2914	-0.2811	-0.3408	-0.2519	-0.0752	-0.2183	-0.1511
	(1.0689)	(1.1307)	(1.0985)	(1.0978)	(1.3093)	(1.2644)	(1.2606)	(1.3856)
x9	1.8997	1.8265	1.8132	2.0158	3.5363	2.4780	3.1712	3.3363
	(3.1323)	(3.1726)	(3.1242)	(3.1993)	(3.4436)	(3.1449)	(3.2250)	(3.5304)
x10	-0.2330*	-0.2340*	-0.2335*	-0.2310*	-0.2129	-0.2264*	-0.2166*	-0.2175
	(0.1372)	(0.1373)	(0.1395)	(0.1380)	(0.1361)	(0.1344)	(0.1338)	(0.1394)
x11	-1.1301	-1.1676	-1.2682	-1.1511	1.9712	0.8779	1.3142	2.3955
	(4.3142)	(4.3106)	(4.2504)	(4.3318)	(4.9315)	(4.5423)	(4.5072)	(5.0722)
x12	-6.7741*	-6.8753*	-6.7897*	-6.5248*	-10.2444**	-10.3106**	-9.7405**	-11.4723**
	(3.7490)	(3.5971)	(3.7804)	(3.6898)	(4.6891)	(4.3942)	(4.4105)	(5.3797)
x13	14.1106*	14.5387*	14.5426**	13.3686*	17.6823**	20.6705**	17.7286**	20.5639*
	(7.0756)	(7.3661)	(6.9966)	(7.6216)	(8.7841)	(8.4684)	(8.2524)	(10.7006)
Región		0.3697	1.1200	0.9608		3.3317	1.5212	3.2033
		(3.2903)	(3.2550)	(2.6855)		(3.5887)	(2.9828)	(4.4644)
Constante	6.0604*	6.1547*	5.6362	6.4122	8.5091**	8.7629**	7.5624*	7.6159**
	(3.6282)	(3.7848)	(3.6553)	(4.0100)	(4.2960)	(4.2546)	(3.9667)	(4.4674)
RMSE	11.849	11.94	11.929	11.934	12.002	11.575	11.674	12.376

Significance levels are: *90%, **95% and ***99%.
RMSE: Root-mean-square error (RMSE).

In Table 5, the OLS models have lower RMSEs than the IV models, except for the case of estimates for Region 1 and Region 2 models. Note that RMSE is a measure of the differences between the values predicted by the model and the observed values. As one might expect, the models that include Region 1 and Region 2 are better predicted by IV than when estimated by OLS. The PV estimator is greater in the case of IV. Table 6 shows the results of the IV-estimated model in two stages for panel models (Heckman, 1997).

Table 6
Estimation of model via instrumental variables in two stages

Variable dependiente PV								
	Total Nacional		Región 1		Región 2		Region 3	
	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar
x1	-0.0770*	0.0455	-0.0871**	0.0419	-0.0828*	0.0450	-0.0722	0.0454
x2	0.0010**	0.0005	0.0011***	0.0004	0.0010**	0.0005	0.0009**	0.0005
x5	-0.2473	0.1695	-0.3046*	0.1595	-0.2638	0.1670	-0.2549	0.1698
x6	0.4190*	0.2114	0.4316**	0.1978	0.3847*	0.2114	0.5025**	0.2084
x7	-0.0400	0.2332	-0.1024	0.2309	-0.0273	0.2312	-0.1146	0.2324
x8	0.0104	0.0409	0.0233	0.0364	0.0119	0.0403	0.0168	0.0395
x9	0.1610	0.1045	0.0949	0.1050	0.1570	0.1046	0.1197	0.1056
x10	0.0017	0.0037	0.0012	0.0039	0.0018	0.0037	0.0010	0.0039
x11	0.2734*	0.1634	0.2358	0.1540	0.2689*	0.1647	0.2548	0.1571
x12	-0.2657*	0.1594	-0.3034**	0.1517	-0.2576*	0.1559	-0.3116*	0.1596
x13	0.3312	0.3449	0.6615*	0.3486	0.3786	0.3526	0.4783	0.3525
Region			0.2993***	0.0949	0.1046	0.1034	0.2260**	0.1124
H	0.0206**	0.0083	0.0224***	0.0075	0.0227**	0.0086	0.0174**	0.0078
M	-0.0056	0.0128	-0.0001	0.0129	-0.0035	0.0133	-0.0061	0.0124
Constante	0.3508	0.3333	0.2539	0.3247	0.2501	0.3610	0.2691	0.3311
No. obs.	78		78		782.14		78	
F(13,65)	1.77		3.42		0.0209		2.06	
Prob>F	0.0678		0.0004		0.2075		0.0265	
R2	0.1973		0.2866		0.0314		0.2425	
R2 adj.	0.0342		0.1280		0.4255		0.0742	

Variable dependiente KS								
	Total Nacional		Región 1		Región 2		Region 3	
	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar
PV	-17.2885 **	8.4066	-15.2058**	6.7535	-15.3876**	7.2064	-19.6749*	10.9281
x1	-2.4463**	1.0831	-2.4170**	0.9894	-2.3903**	1.0162	-2.5585**	1.1986
x2	0.0281**	0.0125	0.0282**	0.0117	0.0274**	0.0118	0.0300**	0.0144
x5	-17.1607***	4.6652	-17.3503***	4.3487	-16.9578***	4.5234	-17.846***	5.1703
x6	13.7990**	6.5931	13.3040**	6.3465	12.6450**	6.0099	15.9145*	8.1738
x7	-12.4673**	5.3008	-13.079**	5.1432	-12.1935**	5.0793	-13.6273**	5.3396
x8	-0.2519	1.3094	-0.0752	1.2644	-0.2183	1.2607	-0.1511	1.3857
x9	3.5363	3.4437	2.4780	3.1450	3.1712	3.2251	3.3363	3.5305
x10	-0.2129	0.1361	-0.2264*	0.1344	-0.2166*	0.1338	-0.2175	0.1394
x11	1.9712	4.9315	0.8779	4.5424	1.3142	4.5073	2.3955	5.0722
x12	-10.2444**	4.6891	-10.3106**	4.3942	-9.7405**	4.4105	-11.4723**	5.3798
x13	17.6823**	8.7841	20.6705**	8.4685	17.7286**	8.2524	20.5639*	10.7006
Region			3.3317	3.5888	1.5212	2.9828	3.2033	4.4644
Constante	8.509123**	4.2961	8.7629**	4.2546	7.5624*	3.9668	7.6159**	4.4675
No. obs.	78		78.00		78.00		78.00	
Wald X2(12)	29.01		33.98		31.40		29.02	
Prob>X2	0.0039		0.0012		0.0029		0.0065	
R2	0.0594		0.1252		0.1102			

Significance levels are: *90%, **95% and ***99%.

Table 7 shows the results obtained through the use of standardized variables. Estimates of the difference of the variables for the two years analyzed (2006 and 2011) in the average value of the cohort are reported.

Table 7
Estimation of model via instrumental variables in two stages, standardized variables

Variable dependiente PV								
	Total Nacional		Región 1		Región 2		Region 3	
	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar
x1	-0.5930*	0.3512	-0.6748**	0.3242	-0.6395*	0.3469	-0.5564	0.3510
x2	0.6849**	0.3178	0.8134***	0.2893	0.7397**	0.3135	0.6662**	0.3131
x5	-0.2120	0.1439	-0.2589*	0.1349	-0.2260	0.1416	-0.2179	0.1441
x6	0.3180**	0.1617	0.3324**	0.1511	0.2919*	0.1609	0.3843**	0.1592
x7	-0.0294	0.1506	-0.0660	0.1484	-0.0202	0.1492	-0.0769	0.1499
x8	0.0325	0.1394	0.0809	0.1247	0.0387	0.1376	0.0561	0.1349
x9	0.2089	0.1371	0.1261	0.1366	0.2043	0.1368	0.1554	0.1386
x10	0.0473	0.1117	0.0395	0.1203	0.0538	0.1132	0.0275	0.1180
x11	0.2282*	0.1356	0.1961	0.1278	0.2241*	0.1367	0.2122*	0.1302
x12	-0.2287*	0.1361	-0.2586**	0.1289	-0.2212*	0.1329	-0.2674*	0.1360
x13	0.1324	0.1400	0.2698*	0.1419	0.1528	0.1434	0.1938	0.1436
Region			0.6950***	0.2145	0.2492	0.2366	0.5299**	0.2612
H	0.2745**	0.1093	0.2959***	0.0988	0.3026***	0.1125	0.2312**	0.1021
M	-0.0545	0.1150	-0.0009	0.1161	-0.0337	0.1201	-0.0578	0.1121
Constante	-5.2E-09	0.1105	0.2903**	0.1365	-0.0757	0.1469	-0.1475	0.1198
No. obs.	79		79		79		79	
F(13,65)	1.77		3.45		2.14		2.07	
Prob>F	0.0682		0.0003		0.0206		0.0258	
R2	0.1962		0.2869		0.2070		0.2423	
R2 adj.	0.0354		0.1309		0.0336		0.0766	

Variable dependiente KS								
	Total Nacional		Región 1		Región 2		Region 3	
	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar	Coeficiente	Error Estándar
PV	-0.5739**	0.2684	-0.5140**	0.2290	-0.5549**	0.2605	-0.6318*	0.3374
x1	-0.6251**	0.2922	-0.6043**	0.2707	-0.6156**	0.2856	-0.6471**	0.3121
x2	0.6929**	0.3164	0.6696**	0.2953	0.6808**	0.3096	0.7255**	0.3453
x5	-0.3821***	0.1191	-0.3757***	0.1119	-0.3785***	0.1184	-0.3955***	0.1307
x6	0.4025**	0.1839	0.3863**	0.1774	0.3972**	0.1874	0.4391**	0.2095
x7	-0.1540	0.1108	-0.1567	0.1100	-0.1546	0.1060	-0.1693	0.1136
x8	0.0516	0.1491	0.0562	0.1427	0.0510	0.1453	0.0591	0.1559
x9	0.2130	0.1575	0.1959	0.1576	0.2103	0.1571	0.2092	0.1612
x10	-0.0665	0.1612	-0.0707	0.1605	-0.0672	0.1603	-0.0688	0.1641
x11	0.0473	0.1154	0.0315	0.1092	0.0439	0.1098	0.0562	0.1182
x12	-0.2347**	0.1124	-0.2247**	0.1070	-0.2303**	0.1085	-0.2582**	0.1273
x13	0.2478**	0.1205	0.2524**	0.1092	0.2452**	0.1159	0.2732**	0.1376
Region			-0.0577	0.2727	-0.0090	0.2128	0.1538	0.3042
Constante	4.1E-10	0.1134	0.0241	0.1418	0.0027	0.1387	-0.0428	0.1450
No. obs.	79.00		79.00		79.00		79.00	
Wald X2 (12)	25.35		30.14		26.37		26.71	
Prob>X2	0.0133		0.0045		0.0152		0.0136	
R2	1.0080		0.0126		1.0013		1.0281	

Significance levels are: *90%, **95% and ***99%.

The first three columns in Tables 6 and 7 present the estimates of the first and second stage of the model (1) described in the Methodology section of this paper. The next three columns show

the estimate of the first and second stages of the model (1) with standardized variables[12]. The X-variables reported in Table 4 refer to *Age and age*^{2} (X_1 *and* X_2), *Telephone* (X_5), *Womanworks* (X_6), *White-collar* (X_7), *Household_size* (X_8), *Log_income* (X_9), *Residence* (X_{10}), *Together* (X_{11}), *Job_permanen* (X_{12}), *Household_furn* (X_{13}). The *Education* (X_3), *TDE* (X_4) and *Poor* (X_{14}) variables were omitted due to collineality issues[13]. The education variable correlated to *Log_ income, Womanworks, White-collar and Job_permanen.* The *TDE* variable correlated to *Age* and *age*^{2}, *Womanworks, White-collar and Job_permanen.* The *Poor* variable correlated to *Log_ income, Household_furn and Education.* Given that a synthetic panel is involved, the population size is 79 observations, in the standardized estimate, and 78 observations in the nonstandardized estimation, omitting the outlier that distorts the model.

In general terms, changes in the homicide rate increased the perception of violence between 2006 and 2011; however, access to media was observed to have no effect on perceptions of violence. The interaction of this variable (ΔHM) was included in the estimation model as can be seen directly below in Equation 7. Tthe change was also included in the estimate of the average municipal homicide rate (DH) and *access to media* (M_{t-1}). This interaction changed the sign of the variable homicide rate, which could be related to the orthogonality of the variables; however, access to media (M_{t-1}) was not statistically significant in the estimation of this model, so this was clearly not the result of orthogonality. By including only the *access to media* (M_{t-1}) variable in the model, we noted that this variable did not contribute to explaining the change in the perception of violence (ΔPV). For this reason, the interaction of the ΔHM variables was also not significant. To verify this model, we again used *access to media* (M_{t-1}) and the average municipal homicide rate (DH); the variable M_{t-1} was, once again, not statistically significant. Additionally, the average effect of DH on ΔPV was obtained via the following estimations:

$$\Delta PV_i = \alpha_{0i} + \alpha_{1i}\Delta H_i + \alpha_{2i}\Delta H_i M_i + \gamma_{ik}\Delta X_{ik} + \varphi_i \qquad (8)$$

$$\frac{\partial \Delta PV_i}{\partial \Delta H_i} = \alpha_{1i} + \alpha_{2i}\overline{M_i} \qquad (9)$$

In estimating Equations 8 and 9, we found that the sign of the average effect of the change in the homicide rate on the change in the perception of violence is positive and has a value of 0.00785; this confirms that changes in homicide rates positively affect changes in the perception of violence. Table 4 shows the estimated values of the DH and M_{t-1} coefficients. The results maintained at about the standardized level, with respect to non-standardized. The coefficient of the DH variable is 0.2746. Therefore, we can infer that the change in the perception of violence of the cohort's average respondent 2006 and 2011 is 0.2746 standard deviations higher in people living in municipalities that had major changes in their homicide rate between 2006 and 2011.

In region 1 the average individual in the cohort perceived more violence than those living in the other two regions. The change in the perception of violence of the average respondent in

[12] Variables are standardized because it is intended that all variables contribute uniformly to a scale when elements are aggregated jointly and the units of measure are different; and, to make it easier to interpret the results of the regressions. The process of standardization consists of rescaling the variable (subtracting the mean and dividing by its standard deviation) in order to have a mean of zero and a standard deviation of one.

[13] If the collinearity of any independent variable is a linear combination of another, the model is unsolvable because the X'X matrix is singular; i.e., its determinant is zero and cannot be inverted.

the cohort between 2006 and 2011 is 0.6950 standard deviations higher for individuals living in Region 1. However, changes in the homicide rate had greater impact in Region 2 changes in the perception of violence. The change in the perception of violence in the cohort's average respondent between 2006 and 2011 is 0.3026 standard deviations greater in people who live in municipalities that had major changes in the homicide rate between 2006 and 2011.

During the estimation of the first stage of the model, the variables ΔX_1 and ΔX_2 were significant for explaining ΔPV. They demonstrated both negative and positive signs; that is, the behavior of *changes in age* relative to *changes in perceived violence* is an inverted parabola. One interpretation of this behavior is that after 38 years of age (which is where the parabola reaches its minimum value), the perception of violence begins to increase with age. The corresponding coefficients of the standardized variables ΔX_1 and ΔX_2 were -0.5930 and 0.6849, respectively. The interpretation is as follows: the change in the perception of violence of the cohort's average respondent between 2006 and 2011 is 0.5930 less standard deviations at an early age among the cohort's average respondents between 2006 and 2011, while it is 0.6849 standard deviations greater during the later life of the cohort's average respondent between 2006 and 2011; that is, after 38 years of age.

Another variable that was statistically significant in explaining the first stage of the model was ΔX_6 which refers to the working women variable. Provided the sign was positive, it can be inferred that if the average respondent in the cohort during the two periods is a working woman, than her perception of violence will increase. The model with the working male variable was also estimated. It was also significant but the coefficient was lower. This makes us think that the fact that a person works contributes to their perception of violence, although it is more pronounced in the case of women. The coefficient of the standardized variable ΔX_6 had a value of 0.3180; i.e., the change in the perception of violence for the average respondent in the cohort between 2006 and 2011 is 0.3180 standard deviations higher when the cohort's average respondent between 2006 and 2011 is a working woman.

This behavior also confirms the significance of the ΔX_{12} variable, which involves whether an average person in the cohort for the two periods has permanent work. However, the coefficient was negative which may indicate that if a person works on a permanent (full-or part-time) basis, their perception of violence decreases. Perhaps this behavior can be associated with the opportunity costs of time; i.e., if a person channels most of their time into work, in order to remain employed, then this leaves little time to learn about the violent events occurring around them. The coefficient of the standardized ΔX_{12} variable presented a value of -0.2287; i.e., the change in the perception of violence in cohort's average respondent between 2006 and 2011 is 0.2287 standard deviations lower when said respondent works part or full time.

The *Together* (ΔX_{11}) variable that refers to whether the average person interviewed in the cohort of the two periods lives with a partner. It was also statistically significant and the coefficient was positive, which may be related to the fact that the person is near information sources (their spouse) that may increase the possibility of finding out about violent events. The coefficient of the standardized variable ΔX_{11} had a value of 0.2282; i.e., the change in the perception of violence the average cohort respondent between 2006 and 2011 is 0.2282 standard deviations higher when said respondent lives with their partner in a common-law or married state.

In the estimation of the second stage of the model, we found that the *change in the perception of violence* variable negatively affects changes in social or associative capital. This means that increasing perceptions of violence causes a decrease in associative social capital; i.e. the number of people one meets on a monthly basis decreases. The results are also maintained at standardized level, as compared to non-standardized, in the second stage of the estimation model. The coefficient of the ΔPV variable is -0.5739. Therefore, it may be inferred that the change in associative social capital on the part of the cohort's average respondent between 2006 and 2011 is 0.5739 smaller standard deviations if said respondent's perception of violence increased between 2006 and 2011.

The ΔX_1 and ΔX_2 variables relating to *age* and *age*^{2} were significant in the model. Their behavior was illustrated by an inverted parabola; i.e., during early life associative capital decreases, but increases during later years. It should be noted that this behavior is contrary to that in the literature, but consistent with other findings for Mexico (Lopez-Rodriguez and de la Torre, 2010 and 2012). These estimates found that, beginning at 43 years of age, associativism begins to increase. A possible explanation for this behavior is that at early ages people concentrate more on developing educational and productive activities, while in later life they tend to make use of social resources. The values of the coefficients of the ΔX_1 and ΔX_2 standardized variables were -0.6251 and 0.6930, respectively. This can be interpreted as follows: the change in associative social capital for the cohort's average respondent between 2006 and 2011 is 0.6251 standard deviations lower in the early years of said respondent, as compared to 0.6930 standard deviations greater in later life; i.e., after 43 years of age.

We found that the ΔX_5 variable was statistically significant and the estimated coefficient showed a negative sign. This is contrary to what the literature says (Krishna and Uphoff, 1999), which indicates that information mechanisms increase social connections. In this case, information mechanisms such as telephones reduce associativism between people. This behavior could be related to the fact that the phone lowers the cost of travel aimed at relating to others, so people prefer to speak by phone rather than incurring transport costs to physically meet with others. The coefficient of the standardized variable ΔX_5 presented a value of -0.3821; i.e., the change in social capital of the average respondent in the cohort between 2006 and 2011 is 0.3821 standard deviations lower when the average respondent in the cohort between 2006 and 2011 has a cell phone.

In the estimation of the second stage of the model the ΔX_6 variable was also statistically significant. The sign of the coefficient was positive; i.e., if the average respondent in the cohort in the difference of the two periods is a working woman, the number of people with which individuals meet monthly increase. In the studies involving Mexico (Lopez-Rodriguez and de la Torre, 2010 and 2012), women in poverty were found to tend to invest more in their social networks as mechanisms of social security. The results of these estimates may be denoting a behavior where working women increase their social connections in order to be covered in case of need. One might expect the coefficient to be greater in the case of working women with children. The coefficient of the standardized ΔX_6 variable had a value of 0.4026; i.e., the change in social capital of the average cohort respondent between 2006 and 2011 is 0.4026 standard deviations higher when the average respondent cohort between 2006 and 2011 is a working woman.

The ΔX_7 variable was statistically significant and the sign of the coefficient was negative in the estimation of the second stage of the model. This indicates that if the average cohort respondent in the difference in the two periods was working in white-collar office activities, then

associativism, or the number of people they meet with each month, decreases. This behavior may be once again related to an opportunity cost of time, because people who engage in this type of activity could be channeling more time working and less time in interacting with family and friends outside the home. The coefficient of the standardized ΔX_7 variable was -0.1540; i.e., the change in social capital of the average cohort respondent between 2006 and 2011 is 0.1540 standard deviations lower when said respondent was working in office activities.

The ΔX_{12} variable was statistically significant and the sign of the coefficient was negative in the estimation of the second stage of the model. If the average cohort respondent in the difference during the two periods has a full-time or part-time job, then they relate less with others. Here again, this behavior may be related to the opportunity cost of time, where people who have a job have less time to interact with others. The coefficient of the standardized ΔX_{12} variable was -0.2347; i.e., the change in social capital of the average cohort respondent between 2006 and 2011 is 0.2347 standard deviations lower when said respondent is working full time or part time.

The ΔX_{13} variable was statistically significant and the sign of the coefficient was positive in the estimation of the second stage of the model; i.e., the more major assets in the average home in the interviewed cohort during the difference in the two periods, the more people they meet with each month. The types of household assets analyzed include the following: stoves, washing machines, refrigerators, televisions, VCRs, telephones and owning a vehicle. The coefficient of the standardized ΔX_{13} variable was 0.2479; i.e., the change in social capital of the average cohort respondent between 2006 and 2011 is 0.2479 standard deviations higher when said interviewee owned more household-related assets.

The intercept was statistically significant in the second stage of the model and in the first step of the model was not statistically significant. However, it was decided to continue working both models with the intercept so as to not bias the results.

The Granger test[14] was used to determine causality in the ΔKS and ΔPV relation shown in Model 1. However no evidence of reverse causality was found. This could be an issue that merits analysis in future studies on whether changes in social capital affect the changes in the perception of violence in Mexico.

5. Conclusions

It was noted that changes in the perception of violence are not affected by the sources of information that people use. They are, however, affected by changes in the homicide rates reported in their city. It might be expected that a lower homicide rate indirectly affects the level of social interaction in Mexico. However, one could not expect there to be a positive relationship between the level of social interaction and the use of media, which does not strengthen the assumptions of those (Manski, 2000) who find that interaction between people creates channels that produce information between individuals.

Another result obtained from the previous estimates is that the perception of violence negatively affects the level of social interaction in Mexico; that is, whether people perceive

[14] La hipótesis nula de que ΔPV no causa a ΔKS en el sentido de Granger fue rechazada contra la hipótesis alternativa donde ΔPV causa a ΔKS en el sentido de Granger, F(1, 72)=12.62, Prob>F=0.0015.

greater acts of violence in their neighborhoods or localities decreases the number of family or friends with whom they meet on a monthly basis. This result is consistent with the findings of Glaeser, Scheinkman and Sacerdote (1996), who found an inverse relationship between crime and social interactions, arguing that the frequency of social interactions is greater when the offenses are less serious.

The results are also consistent with other studies using other dimensions of capital, such as the Moser and Shrader study (1999), which argues that violence erodes social capital when it reduces trust and cooperation in formal and informal organizations. Meanwhile, the study of Lederman, Loayza, and Menéndez (2002), which employed other indicators of social capital, also found a negative effect of violence on capital. They argue that the incidence of crime can reduce social capital, through the generation of mistrust between community members and the disintegration of community ties.

The explanatory variables of social capital yielded mixed results. Some results were consistent with other literature, showing them to be different from the issues raised by the empirical studies in the literature. The age variable is one such example. The literature indicates a parabolic relationship between age and investment in social capital. In this study and in the case of Mexico, however, the parabolic relationship is reversed. This behavior may be related to the type of indicator used in this study to estimate social capital and the social protection system which exists in Mexico. Initially social relations decline with age, and then they increase. People at an early age may focus more on educational and productive activities. In later life, they use their networks to get resources not obtained in a formal social protection system (Lopez-Rodriguez and de la Torre, 2010 and 2012). For example in Mexico, elderly people are usually cared for by relatives.

Another of the results that differed to those found in the literature is that the mechanisms of information, such as phones, result in social interaction decreases among people. However, Krishna and Uphoff (1999) note that mechanisms of information increase social connections. This behavior could be related to the fact that the phone reduces the transfer costs of relating to others, so people prefer to speak by phone rather than incur travel costs to meet with others.

Apparently job characteristics affect social capital, which in this study was measured by associative or social interaction. The behavior of these variables in regards to social capital may be related to an opportunity cost of time. Thus we find that women increase their social capital or social connections. This could be related to women in poverty tending to invest more in their social networks as mechanisms of social security. In Mexico on average 50.3 percent of women were in poverty from 2006 to 2010. Moreover, we found that people working in white-collar office activities diminished their social interaction. This behavior may be related to the fact that people who engage in such activities could be channeling more time working and less to interacting with family and friends outside the home. We also found that people with full-time employment or part-time are related les with others. Here again, this behavior may be related to the opportunity cost of time.

Another result of this study shows that households with more assets tend to interact more with others. This result was consistent with that of Narayan and Pritchett (1999), who argue that the more assets homes have, the more linking social capital is present.

It was also noted that in Region 1 people perceive more violence than in the other two regions. However, changes in the homicide rate affected changes in the perception of violence to a greater degree in Region 2.

The models presented for Mexico were performed considering that the perception of violence in Mexico is analyzed through its effect on social capital (measured as associativism; i.e., level of social interaction in groups) between 2006 and 2011. However further studies would be useful to examine whether the social interaction may also explain the social capital, and in order to analyze whether this relationship maintains or reverses.

The results of this research show how the perception of violence affects the social capital of people, measured as social interaction or social connections. It is known that social interaction can generate greater economic transactions, reduce the risk between members of a community, act as a safety net and provide channels for the diffusion of innovations (Rogers, 1983; Morduch, 1995; Knack and Keefer, 1997). Additionally it is known that when the social fabric is damaged, negative effects on consumption and investment (Ferreira, Prennusht, and Ravallion, 1999; Haacker, 2004) are generated. As such, this study's policy recommendations are in line with influencing the perception of violence to reduce the harmful effects that violence has on social interaction Mexico.

The provision of assets by the State must not lean entirely towards strengthening aggregate demand; rather, it should also address decreasing crime rates in Mexico if its aim is to influence key elements of social capital, such as the social fabric and social cohesion demand.

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Annexes

Table 1
Number of cohorts per survey

ENCASU 2006			ENCAS 2011		
Grupo	Frecuencia	Porcentaje	Grupo	Frecuencia	Porcentaje
0	7	0.32	0	21	0.77
1	3	0.14	1	2	0.07
2	3	0.14	2	1	0.04
3	3	0.14	3	2	0.07
4	1	0.05	4	2	0.07
5	20	0.92	5	8	0.29
6	25	1.15	6	12	0.44
7	1	0.05	7	1	0.04
8	2	0.09	8	3	0.11
9	34	1.57	9	19	0.70
10	75	3.46	10	80	2.94
11	5	0.23	11	2	0.07
12	9	0.42	12	13	0.48
13	17	0.78	13	13	0.48
14	134	6.18	14	139	5.11
15	25	1.15	15	32	1.18
16	35	1.62	16	31	1.14
17	10	0.46	17	5	0.18
18	205	9.46	18	203	7.46
19	71	3.28	19	104	3.82
20	55	2.54	20	56	2.06
21	2	0.09	21	8	0.29
22	97	4.48	22	166	6.10
23	58	2.68	23	143	5.25
24	42	1.94	24	53	1.95
25	3	0.14	25	6	0.22
26	3	0.14	26	5	0.18
27	8	0.37	27	7	0.26
28	5	0.23	28	12	0.44
29	25	1.15	29	8	0.29
30	30	1.38	30	22	0.81
31	3	0.14	31	1	0.04
32	1	0.05	32	1	0.04
33	42	1.94	33	30	1.10
34	114	5.26	34	94	3.45
35	12	0.55	35	10	0.37
36	6	0.28	36	13	0.48
37	39	1.80	37	32	1.18
38	189	8.72	38	174	6.39
39	33	1.52	39	25	0.92
40	25	1.15	40	37	1.36
41	24	1.11	41	11	0.40
42	270	12.46	42	319	11.72
43	64	2.95	43	111	4.08
44	50	2.31	44	76	2.79
45	5	0.23	45	9	0.33
46	155	7.15	46	318	11.68
47	76	3.51	47	189	6.94
48	46	2.12	48	93	3.42
Total	**2,167**	**100**	**Total**	**2,722**	**100**

Table 2
Variables associated with social capital

Variable	Description	Question by Survey
X1: Edad (Age)	Continuous variable, representing age of the respondent.	ENCASU 2006 P7 ENCAS 2011 P7
X2: Edad 2 (Age 2)	Continuous variable, refers to age squared of respondent.	ENCASU 2006 P7 ENCAS 2011 P7
X3: Educación (Education)	Continuous variable, refers to years in schooling of respondent.	ENCASU 2006 P ENCAS 2011 P11
X4: TDE (TDE)	Continuous variable in the range [0-1], refers to the rate of economic dependency of household, including dependent population and the PEA. TDE=PD/PEA PD=[0-11] and [65 or older) PEA=inhabitants and [12-64]	ENCAS 2011 P7 P13 P17 ENCASU 2006 P7 P12 P16
X5: Teléfono (Telephone)	Dichotomous variable, refers to whether respondent owns a cellular phone=1, e.o.c=0	ENCAS 2011 P219 ENCASU 2006 P96
X6: Mujertrab (Workingwoman)	Dichotomous variable, refers to whether respondent is a working woman=1, e.o.c=0	ENCAS 2011 P6 P13, P17 ENCASU 2006 P8 P12 P16
X7: Whitecollar	Dichotomous variable, refers to whether respondent is white-collar worker=1, e.o.c=0	ENCAS 2011 P21==1, 2 ENCASU 2006 P20==3, 5
X8: Exten_hogar (Household_size)	Continuous variable, refers to number of inhabitants.	ENCAS 2011 P1, P4, P5 ENCASU 2006 P1, P5, P6
X9: Log_Ingreso (Log_income)	Continuous variable, refers to the per capita income of household, in logarithmic terms.	ENCAS 2011 P26-27.1 ENCASU 2006 P22-25
X10: Anclaje (Residence)	Continuous variable, refers to years in residence.	ENCAS 2011 P14 ENCASU 2006 P36
X11: Juntos (Together)	Dichotomous variable, refers to whether respondent is married or in common law marriage=1, e.o.c=0	ENCAS 2011 P12 ENCASU 2006 P14
X12: Trab_permanen (Job_Permanen)	Dichotomous variable, refers to whether respondent works full or part time=1, e.o.c=0.	ENCAS 2011 P13 (opciones 1, 2), P17.1 ENCASU 2006 P12 (opción 1), P16 (opción1), P18
X13: Activo_vivien (Household_furn)	Continuous variable in a range of [0-1], refers to number of appliances and goods Reported in reply to survey questions (stove, washer, refrigerator, TV, VCR, own vehicle, telephone).	ENCAS 2011 P219 ENCASU 2006 P96
X14: Pobre (Poor)	Continuous variable in a range of [0-1], refers to the poverty indicator. If monthly household income is less than or equal to the poverty line. The line is set to ½ the median per capita monthly income of the household. No CONEVAL income lines were used because the rural/urban cut is 15,000, whereas the 2011 ENCAS cur is 2,500. Involves a near validation of CONEVAL values for food poverty, without imputing income.	ENCAS 2011 P26-27.1 ENCASU 2006 P22-25

Table 3
Changes between 2006 and 2011
Levels of analyzed variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Cambios del 2006 al 2011					
edad (ΔX1)	79	2.7033	3.3254	-5.0000	10.2500
edad2 (ΔX2)	79	287.0105	293.9318	-530.0000	1186.4170
educacion (ΔX3)	79	-0.5457	1.7463	-6.5000	3.5000
TDE (ΔX4)	79	-1.2666	0.5681	-3.0000	0.2500
telefono (ΔX5)	79	-0.8329	0.3656	-1.6000	0.0000
mujertrab (ΔX6)	79	-0.9626	0.3305	-2.0000	0.0000
whitecollar (ΔX7)	79	-1.0020	0.2793	-1.6667	0.0000
exten_hogar (ΔX8)	79	-1.1551	1.4826	-6.0000	3.5000
Initpc (ΔX9)	79	-1.8463	0.5680	-3.4303	-0.8405
anclaje (ΔX10)	79	-0.3367	13.5294	-41.8333	20.0000
juntos (ΔX11)	79	-1.0063	0.3573	-2.0000	0.0000
trab_permanen (ΔX12)	79	-0.8285	0.3667	-2.0000	0.0000
activo_vivien (ΔX13)	79	-0.9794	0.1752	-1.5375	-0.5625
pobre (ΔX14)	79	-1.0496	0.2698	-1.6667	0.0000
Asociativismo (ΔKS)	79	0.1865	16.4376	-24.8750	95.1250
Perc. Violen. (ΔPV)	79	-0.9543	0.4297	-2.0000	0.0000
Homicidios (ΔH)	79	2.6002	5.6808	-0.2855	21.0112
Homic y Medios (ΔHMt-1)	79	75.5040	170.2621	-9.5645	629.3353
Datos del 2006 (t-1)					
edad (X1t-1)	79	37.6887	13.0531	19.3333	67.6667
edad2 (X2t-1)	79	1600.0080	1086.5190	375.3333	4588.3330
educacion (X3t-1)	79	7.5730	2.9020	0.0000	16.3333
TDE (X4t-1)	79	0.8169	0.5482	0.0000	2.0000
telefono (X5t-1)	79	0.4818	0.3158	0.0000	1.0000
mujertrab (X6t-1)	79	0.2408	0.3133	0.0000	1.0000
whitecollar (X7t-1)	79	0.0823	0.1737	0.0000	0.6667
exten_hogar (X8t-1)	79	4.0609	1.3463	1.0000	9.0000
Initpc (X9t-1)	79	8.1030	0.5180	6.8726	10.0858
anclaje (X10t-1)	79	21.2099	12.1388	2.5417	56.3333
juntos (X11t-1)	79	0.6787	0.3017	0.0000	1.0000
trab_permanen (X12t-1)	79	0.3446	0.3307	0.0000	1.0000
activo_vivien (X13t-1)	79	0.6939	0.1536	0.2500	1.0000
pobre (X14t-1)	79	0.1331	0.1973	0.0000	0.6667
Asociativismo (KSt-1)	79	8.1985	8.5270	0.0000	27.7500
Medios (Mt-1)	79	28.0376	3.8957	17.0000	30.0000
Perc. Violen. (PVt-1)	79	0.3121	0.3094	0.0000	1.0000
Homicidios (Ht-1)	79	0.0908	0.1833	0.0000	0.7103
Datos del 2011 (t)					
edad (X1t)	79	41.3920	12.8754	19.5000	71.2500
edad2 (X2t)	79	1888.0190	1119.9440	382.5000	5090.2500
educacion (X3t)	79	8.0273	2.8294	0.0000	16.6667
TDE (X4t)	79	0.5502	0.4446	0.0000	1.8333
telefono (X5t)	79	0.6488	0.3088	0.0000	1.0000
mujertrab (X6t)	79	0.2782	0.3053	0.0000	1.0000
whitecollar (X7t)	79	0.0803	0.2068	0.0000	1.0000
exten_hogar (X8t)	79	3.9058	1.0715	1.5000	7.0000
Initpc (X9t)	79	7.2567	0.5649	5.9269	8.8537
anclaje (X10t)	79	21.8731	11.0104	1.9679	54.0000
juntos (X11t)	79	0.6724	0.2841	0.0000	1.0000
trab_permanen (X12t)	79	0.5160	0.3484	0.0000	1.0000
activo_vivien (X13t)	79	0.7145	0.1493	0.3750	1.0000
pobre (X14t)	79	0.0835	0.1922	0.0000	1.0000
Asociativismo (KSt)	79	9.3850	15.0889	0.0000	97.0000
Perc. Violen. (PVt)	79	0.3578	0.3346	0.0000	1.0000
Homicidios (Ht)	79	2.6910	5.6926	0.0000	21.1414