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Meloni, Osvaldo

Instituto de Investigaciones Economicas, Universidad Nacional de Tucuman

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# **Is there an electoral-motivated crime rate cycle? Evidence from Argentina**

**Oswaldo Meloni**

Universidad Nacional de Tucumán, Argentina

[omeloni@herrera.unt.edu.ar](mailto:omeloni@herrera.unt.edu.ar)

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### **Abstract.**

In the last three decades Argentina tripled its crime rate boosting safety at the top of mayor concerns of Argentineans which leaves open the question about the behavior of incumbent governors of the 23 provinces about anti-crime measures in the proximity of elections. How do incumbent governors react to escalating crime as elections come closer? This paper investigates electorally-motivated crime rate fluctuations in Argentina for the period 1984-2007. District-level dynamic panel data reveals the existence of an electoral cycle in the total crime rate as well as in property crimes.

**Keywords:** Crime, Electoral cycles, Dynamic Panel Data, Argentina.

**Clasificación JEL:** K4, I3, D72, P16.

### **Resumen**

En las últimas tres décadas Argentina triplicó su tasa de delincuencia y el tema de la seguridad pasó al tope de las preocupaciones de sus ciudadanos, lo que es interesante preguntarse cómo se comportan los gobernadores oficialistas de las 23 provincias en las inmediaciones de las elecciones respecto de la medidas para reducir la inseguridad. Este trabajo investiga si las fluctuaciones en la tasa de delincuencia responden a motivaciones electorales. Mediante la estimación de un panel dinámico para 1984-2007, encuentro que existe un ciclo electoralmente motivado en la tasa de delincuencia general y en la de delitos contra la propiedad.

## **1. Motivation**

Despite turbulent political life during most of the second half of the 20th century, Argentina took pride in its relative safety compared with other emergent as well as developed countries, but in the 1980s crime rate started an unequivocal upward tendency that became steeper in the 1990s and definitively worrisome at the turn of the century when crime rates hit historical records. In less than two decades, from 1983 to 2002, Argentina tripled its crime rate. The increasing consensus on the media and opinion surveys throughout the country, that crime is foremost in voters' consideration, clearly relates the security policy to the electoral cycle.

How do incumbent governors react to escalating crime as elections come closer? Do they attempt to get rapid declines in key indicators by taking short-run but reversible steps or, by contrast, they take measures with long-run impact? They know (or envisage) that failing at reducing crime could jeopardize their desire to remain in office so it is plausible to conjecture that incumbents would likely behave opportunistically as predicted by the theoretical and empirical literature on political budget cycles in budgetary matters (Drazen and Eslava, 2005; Eslava, 2006; Jones et al., 2009; Meloni, 2010) Do incumbent governors also behave opportunistically in safety matters? Do they reinforce anti crime measures, particularly in the proximity of elections, to increase their chances to remain in office?

This paper investigates electorally-induced crime rate fluctuations in Argentine provinces. I estimate a dynamic panel data that spans 23 districts for the period 1984-2007. I cover 113 gubernatorial elections from 1983. By focusing on a single country this paper exploits within-country variation. This is a remarkable source of variation that goes beyond traditional cross-country empirical studies.

The rest of the paper is organized as follows. Next section discusses theoretical as well as empirical literature linking political budget cycle and crime. Section 3 looks briefly at the behavior of crime in Argentina. Section 4 describes the empirical investigation and Section 5 presents the results. Finally, Section 6 concludes.

## **2. Crime rate and elections**

The Political Budget Cycles (hereafter PBC) literature is conclusive about the behavior of incumbents in the neighborhood of elections. Theoretical models (Rogoff and Siebert, 1988; Persson and Tabellini, 2000) as well as the copious empirical discussion find that incumbents engage in opportunistic pre-election profligacy to influence voters and maximize chances to remain in office. Both, cross-country studies, like Brender and Drazen (2005) and subnational-level panel data, like Galli and Rossi (2002) Petry et al. (1999), Lema (2009), to

cite a few, support PBC. Still, the literature on PBC hardly explains how expenditure influences voters. That is, what are the operating channels through which expenditure twist voters' preferences? It is implicitly assumed that incumbents invest in goods and services highly valued by constituencies. Hence, if crime rate is at the top among voters' worries, incumbents should devote resources and efforts to reverse or minimize negative indicators. If anti-crime policies impact predominantly in the short-run, then a crime rate cycle should be observed. This opens a question about the instruments available to opportunistic incumbents. Is opportunism limited to changes in the expenditure and expenditure composition as reported by the PBC literature? Besides the emblematic increases in police numbers and means for patrolling, are there any other policies that can affect critical variables in the short-run? Some candidates are: displacement of police forces to critical areas (those showing higher criminal activity), targeting prolific offenders, electronic monitoring to reduce recidivism rates of ex-prisoners and working on managerial issues such as promotions at the top of the organization pyramid (typical, promoting a new Chief of Police)

Despite this reasonable presumption about opportunism in criminal policy, investigations linking elections and crime are still scanty. Some of the papers treat the topic as inputs to demonstrate the effect of deterrence, like Levitt (1997) or McCrary (2002) that rely on police hiring during elections to estimate the effect of police on crime. Other papers focus mainly on the behavior of elected judges facing polls. Dyke (2007) presents evidence on the effects of district attorney elections in North Carolina on criminal case outcomes. He finds that defendants face a higher probability of conviction and a lower probability of having all charges dismissed in an election year. The results suggest that in election years, District Attorneys are more likely to prosecute cases that might otherwise be dismissed. The estimated effects are more pronounced for defendants charged with property or drug crimes than for defendants charged with violent crimes, and more pronounced in districts with more electoral competition. Similarly, Berdejó and Yuchtman (2010) show that Washington State judges respond to political pressure by sentencing serious crimes more severely. They found that sentences are around 10% longer at the end of a judge's political cycle than the beginning; deviations above the sentencing guidelines increase by 50% across the electoral cycle.

Ghosh (2006) is the nearest reference of this study. He uses annual data on the major Indian states to investigate the effect of the timing of elections on the crime rate. He finds that scheduled elections are associated with a fall in both, property crimes and violent crimes.

### 3. Criminal behavior in Argentina

In 1983 Argentina could proudly show the return to democracy after several years of military regime and one of the lowest crime rates in America, just 1167 offenses per 100,000 inhabitants. But crime had been climbing steadily since the beginning of the decade so it did not surprise that, by the end of the 1980s, crime rate have grown 74%. A sharp descend in the early 1990s could not be sustained and crime initiated a new impetuous upward trend. In 2002, amid the greatest crisis in nation's life, crime rate have reached 3573 offenses per 100,000 inhabitants, history's highest. Victimization surveys conducted by Universidad Di Tella in the most populated cities of Argentina show that one third of the households suffered from crime in 2007<sup>1</sup>.

As offenses hiked and violent crime soared and seemed to be out of police control, population organized massive protests demanding for safety and claiming deeper investigation in many unresolved murders. The paradigmatic cases of Maria Soledad Morales in the province of Catamarca (1990), Walter Bulacio in the City of Buenos Aires (1991), Omar Carrasco in Neuquén (1994), Jose Luis Cabezas in Buenos Aires (1997) to cite a few, derived in huge popular demonstrations that took the issue of safety to media and alerted politicians about their importance for election results. In 2004, after the murder of Axel Blumberg, more than 100,000 people marched in the city of Buenos Aires demanding criminal-justice reform. Besides, numerous property crime (some violent) also have significant media coverage.

The solid augment in crime convinced Argentineans that their country become much more dangerous, but data present high variability across districts: those with the fastest crime rate expansion during the period under study were the City of Buenos Aires with an average annual growth rate of 8.2%, San Luis (7.5%) and Santa Cruz (6.6%). The provinces of Chubut and Buenos Aires also had significant increases in their annual average crime rates, exceeding 5%. In opposition, Chaco and Santiago del Estero had the lowest annual rate of growth, 0.6% in both provinces. In most of the districts property crimes (robbery, burglary and larceny) represented more than 50% of total felonies.

Soaring crimes rates hit politicians that reacted promising to be tough with criminals. The paradigmatic case was Carlos Ruckauf, former Vice President and governor of the province of Buenos Aires that campaigned in 1999 with the lemma "bullets to the criminals".

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<sup>1</sup> Victimization surveys ask people whether they have been the victims of crimes.

Table 1. Evolution of the Total Crime Rate in Argentina.

| Districts            | Offenses per 100,000 inhabitants |        | Annual Growth rate 1983-2007 (%) | Average AVG | Standard Deviation STD | STD/AVG |
|----------------------|----------------------------------|--------|----------------------------------|-------------|------------------------|---------|
|                      | 1983                             | 2007   |                                  |             |                        |         |
| Buenos Aires         | 452.8                            | 1646.8 | 5.5                              | 1402        | 611.8                  | 0.44    |
| Catamarca            | 1654.8                           | 4920.6 | 4.6                              | 2714        | 1070.2                 | 0.39    |
| Chaco                | 2217.4                           | 2552.0 | 0.6                              | 5922        | 4770.1                 | 0.81    |
| Chubut               | 757.6                            | 3454.3 | 6.5                              | 3246        | 2330.6                 | 0.72    |
| Córdoba              | 1927.5                           | 4157.2 | 3.3                              | 2174        | 794.2                  | 0.37    |
| Corrientes           | 1137.0                           | 2405.9 | 3.2                              | 1562        | 295.2                  | 0.19    |
| Entre Ríos           | 925.0                            | 2186.0 | 3.6                              | 1633        | 428.1                  | 0.26    |
| Formosa              | 1062.7                           | 2106.3 | 2.9                              | 1645        | 672.3                  | 0.41    |
| Jujuy                | 2158.4                           | 3441.2 | 2.0                              | 3005        | 951.5                  | 0.32    |
| La Pampa             | 1218.7                           | 2890.0 | 3.7                              | 2948        | 922.8                  | 0.31    |
| La Rioja             | 1059.9                           | 1885.4 | 2.4                              | 1899        | 558.8                  | 0.29    |
| Mendoza              | 1988.8                           | 6075.0 | 4.8                              | 3709        | 1833.7                 | 0.49    |
| Misiones             | 735.3                            | 1921.9 | 4.1                              | 1551        | 558.3                  | 0.36    |
| Neuquén              | 2019.7                           | 5849.0 | 4.5                              | 4335        | 1636.0                 | 0.38    |
| Río Negro            | 1673.7                           | 2992.9 | 2.5                              | 2525        | 764.4                  | 0.30    |
| Salta                | 2860.2                           | 4648.7 | 2.0                              | 3585        | 993.2                  | 0.28    |
| San Juan             | 1802.7                           | 3771.7 | 3.1                              | 2877        | 1153.2                 | 0.40    |
| San Luis             | 442.8                            | 2509.1 | 7.5                              | 1588        | 650.1                  | 0.41    |
| Santa Cruz           | 1160.0                           | 5399.4 | 6.6                              | 3284        | 1708.8                 | 0.52    |
| Santa Fe             | 1929.1                           | 3833.0 | 2.9                              | 2699        | 642.1                  | 0.24    |
| Santiago del Estero  | 1902.5                           | 2177.1 | 0.6                              | 2111        | 350.2                  | 0.17    |
| Tierra del Fuego     | 1184.3                           | 3555.0 | 4.7                              | 2388        | 980.4                  | 0.41    |
| Tucumán              | 1649.3                           | 2551.2 | 1.8                              | 1966        | 424.7                  | 0.22    |
| City of Buenos Aires | 1220.5                           | 8145.2 | 8.2                              | 4417        | 2486.1                 | 0.56    |

Source: Dirección Nacional de Política Criminal and INDEC.

#### 4. Empirical specification

I estimate the effect of the electoral cycle by merging the standard political budget cycle equation (Brender and Drazen, 2005) with the typical supply of offenses (Cerro and Meloni, 1999):

$$\text{CRIME RATE}_{it} = \alpha_0 + \alpha_1 \text{CRIME RATE}_{it-1} + \alpha_2 \text{ELECTION}_{it} + \text{DETERRENCE}_{it} + \text{CONTROLS}_{it} + \varepsilon_{it} \quad (1)$$

The dependent variable CRIME RATE is measured as the number of offenses per 100,000 inhabitants in a given district  $i$  and year  $t$ . I work with three dependent variables corresponding to the following categories of felonies: property crime, homicides and total crime<sup>2</sup>.

A distinctive feature of the empirical literature of political budget cycle is the inclusion of a dummy variable (ELECTION) that takes the value **1** if the gubernatorial election is held during year  $t$ ; **-1** in the year following the election, and **0** otherwise. I consider that  $t$  is an election year if the voting ballot was carried out from May to December. Governors have agenda power to set elections dates which might raise endogeneity problems, a frequent issue in political budget cycles studies. Nonetheless, elections dates are barely moved more than six months and usually restricted to the year the election was originally scheduled by laws or constitutional arrangements what eliminates the potential estimation problem since I work with annual data. This study covers five of the seven gubernatorial elections carried out in Argentina since democracy was recovered, in 1983. Gubernatorial elections took place regularly in most of the 23 districts analyzed every four years, in 1983, 1987, 1991, 1995, 1999, 2003 and 2007. I excluded the 1983 election because there was no party allied with the military regime, so I could not treat any party as incumbent in that election. I also excluded from the data set the federal District (City of Buenos Aires - CABA) because security forces do not depend on the Chief of Government but on the President.

The vector DETERRANCE includes the variable *Condemnatory Sentences* to capture the deterrence effect of the probability of conviction, calculated as the ratio of total condemnatory sentences to total reported offenses. This variable is only available for Total Crime.

The vector CONTROLS contain political and economic variables such as the *Rate of Unemployment*, *GDP per Capita* and the *Rate of Growth of GDP per Capita* to control for an environment prone to crime. Earning opportunities influence the allocation of time and effort in legal and illegal labor markets therefore, at the margin, higher rates of unemployment are expected to increase illicit undertakings because they diminish the rate of return of legal activities (Cerro and Meloni, 2000). On the other hand, richer provinces, those with a higher GDP per capita, are expected to be more attractive for criminals since they involve larger and better opportunities for illegal activities. The rate of growth of GDP per capita is included to capture the pure income effect. If criminal activity were an inferior good, the pure income effect would be negative. The set of explanatory variables also include *Urbanization Rate* and *First Term*. The former, defined as the percentage of urban population in each province is included to control for the effects of large agglomerations on crime: in a closely knit

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<sup>2</sup> Notice that total crime rate does not include felonies subject to federal jurisdiction such as drug trafficking, smuggling, counterfeiting, etc.

neighborhood the presence of strangers is easily noticed so the cost of crime is higher. The latter is a dummy variable that takes the value 1 if the governor is serving his/her first gubernatorial term and 0 in cases of reelection and federal intervention. This variable attempts to capture the usual deterioration in governance affecting second and third terms.

Except for CONDEMNATORY SENTENCE and FIRST TERM control variables were lagged one period to avoid estimation biases due to endogeneity and to lessen the omitted variable bias related to contemporaneous shocks that affect each explanatory variable and the crime rate. Table 2 provides summary statistics for each of the variables analyzed.

Table 2. **Descriptive Statistics.**

| Variable                      | Obs. | Mean    | Std. Dev. | Min    | Max    |
|-------------------------------|------|---------|-----------|--------|--------|
| Total Crime Rate              | 552  | 2601.78 | 1230.07   | 485.4  | 7899   |
| Property Crime Rate           | 552  | 1723.98 | 849.49    | 217.9  | 4860   |
| Homicide                      | 552  | 7.96    | 7.81      | 0      | 61.98  |
| Condemnatory Sentences        | 552  | 2.58    | 2.17      | 0      | 14.54  |
| Election                      | 552  | 0.04    | 0.67      | -1     | 1      |
| Rate of Unemployment          | 552  | 9.59    | 4.73      | 1      | 25.5   |
| GDP per capita                | 552  | 360.88  | 248.06    | 93.9   | 1811.2 |
| Rate of growth GDP per capita | 552  | 1.72    | 9.77      | -36.88 | 46.3   |
| Urbanization rate             | 552  | 79.48   | 9.01      | 55.0   | 97.5   |
| First Term                    | 552  | 0.73    | 0.44      | 0      | 1      |

My empirical specifications include the lagged dependent variable to handle the inertia of the crime rate and the asymmetric response of crime to economic opportunities and deterrence reported by Mocan and Bali (2005). They found that increases in the crime rate are sharper but decreases are gradual.

## 5. Results

Econometric estimations of equation (1) are displayed in Table 2. I use the Arellano-Bond technique with robust standard errors. As a robustness check I also estimated it with OLS

with fixed effects<sup>3</sup>. Results of this alternative technique, which differ slightly with the ones on Table 2, are presented in the Appendix. I find strong evidence of an electoral cycle in property crimes and total crime rate. In fact, total crime rate diminishes, on average, 75 offenses per 100,000 inhabitants in election years but resumes the year after elections. Similarly, Property Crime rates fall 56 offenses in election years. Both results indicate that incumbent governors manipulate instruments at hand namely expenditures on security, police force hiring and management changes and adjustments, etc., to affect crime rate<sup>4</sup>. Conversely, Homicide shows no statistical significant changes in election years.

Table 2. **Dynamic Panel data Estimations.**

Period: 1984 -2007

Provinces: 23

Observations: 552

| Explanatory Variables   | Dependent variables       |                          |                           |                        |
|---|---------------------------|--------------------------|---------------------------|------------------------|
|   | Total Crime               |                          | Property Crime            | Homicide               |
|   | I                         | II                       | III                       | IV                     |
| Total Crime Rate (t-1)  | 0.6448***<br>(0.0893)     | 0.6572***<br>(0.0865)    |                           |                        |
| Property Crime Rate (t-1)   |                           |                          | 0.6512***<br>(0.0758)     |                        |
| Homicide (t-1)  |                           |                          |                           | 0.5806***<br>(0.0984)  |
| ELECTION  | -74.9832***<br>(23.8614)  | -90.6755***<br>(22.7227) | -56.3055***<br>(15.70844) | -0.4223<br>(0.3277)    |
| Condemnatory Sentences  | -105.6203***<br>(30.7962) |                          |                           |                        |
| Rate of Unemployment (t-1)  | 17.8349**<br>(8.5392)     | 17.2171**<br>(8.7737)    | 13.1542**<br>(5.9063)     | -0.0006<br>(0.0548)    |
| GDP per capita (t-1)  | -0.2984<br>(0.4826)       | 0.0625<br>(0.5565)       | 0.0593<br>(0.3283)        | -0.0055<br>(0.0066)    |
| Rate of growth GDP per capita (t-1)   | -2.9474<br>(2.3655)       | -4.2539<br>(2.8773)      | -3.6648*<br>(1.9456)      | -0.0479***<br>(0.0161) |
| Urbanization rate (t-1)   | 31.4515*<br>(18.0327)     | 42.8948**<br>(19.2159)   | 19.8568**<br>(9.5387)     | -0.2411**<br>(0.1250)  |
| First Term  | -74.1672<br>(56.5091)     | -113.8675**<br>(54.4957) | -76.9139*<br>(43.3603)    | 0.1203<br>(0.8267)     |
| Constant  | -1242.450**<br>(1371.603) | -2529.777*<br>(1493.70)  | -1020.314<br>(720.527)    | 24.3885***<br>(7.9844) |
| Arellano-Bond test that average autocovariance in residuals of order 1 is 0. H0: no autocorrelation Pr>z= | 0.0591                    | 0.0591                   | 0.0403                    | 0.0091                 |
| Arellano-Bond test that average autocovariance in residuals of order 2 is 0. H0: no autocorrelation Pr>z= | 0.9635                    | 0.9502                   | 0.8748                    | 0.6727                 |

Note: standard errors in parenthesis below coefficient. \*\*\* Significant at .01. \*\* Significant at .05. \* Significant at .10.

<sup>3</sup> The Arellano-Bond estimation method is generally used when N is large (here the number of provinces) and T (time periods) is small. My data set has N=T= 23.

<sup>4</sup> Table 2A in the Appendix shows estimation of a LOG-LINEAR version of equation (1)

As expected, the estimated coefficient for deterrence effect is negative and significant at usual levels. Also, high levels of unemployment and urbanization spur crime. Conversely, governor's first term is associated with lower crime rates, both total and property. In all four regressions, the lag dependent variable is statistical significant and the estimated coefficients imply important inertial effects.

## **6. Concluding remarks**

This paper contributes to the political budget cycle literature as well as to the research on crime by presenting further evidence on the opportunistic behavior of incumbent governors in Argentina. Governors not only manipulate fiscal variables such as public expenditure and its compositions, as reported by previous studies, but also influence the crime rate generating electoral cycles in this variable. The argument explaining such manipulation is simple: since public safety ranks at the top of Argentineans concerns, incumbent governors dedicate additional efforts to get short-run improvements in crime indicators in election years. Presumably, incumbents not only dedicate more resources to safety matters but also displace police forces to critical areas and work on managerial issues (i.e. changing the Police Chief, etc.) to get concrete results on the crime rate.

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## Appendix

Table 1A. **Definition and Source of Variables Employed in the Statistical Analysis.**

| Abbreviation                                       | Description   | Source  |
|--|---|---|
| <b>CRIME RATE</b> <sub>t,i</sub>                   | Total number of offenses per 100,000 inhabitants in year t at district i.   | Dirección Nacional de Política Criminal, Ministerio del Interior.   |
| <b>PROPERTY CRIME</b> <sub>t,i</sub>               | Number of offenses against property per 100,000 inhabitants in year t at district i.  | Dirección Nacional de Política Criminal, Ministerio del Interior  |
| <b>HOMICIDE</b> <sub>it</sub>                      | Murders per 100,000 inhabitants in year t at district i.  | Dirección Nacional de Política Criminal, Ministerio del Interior  |
| <b>ELECTION</b> <sub>it</sub>                      | Dummy variable that takes the value 1 in gubernatorial election years (t), -1 the year t+1, and 0 otherwise.                          | Dirección Nacional Electoral<br>Electoral map of Andy Tow<br>(www.towsa.com/andy)   |
| <b>CONDEMNATORY SENTENCE</b> <sub>t-1,i</sub>      | Ratio of condemnatory sentences to crime in district i at year t.   | Dirección Nacional de Política Criminal, Ministerio del Interior.<br>Registro Nacional de Reincidencia.   |
| <b>UNEMPLOYMENT</b> <sub>i,t-1</sub> :             | Rate of unemployment in province i at year t-1. <b>(level)</b>  | Instituto Nacional de Estadísticas y Censos (INDEC)   |
| <b>GDP Per Capita</b> <sub>i,t-1</sub>             | Real provincial GDP per capita for province i (average of the gubernatorial term t).  | <i>GDP</i> : Dirección de Estadísticas Provincial (each district); Universidad Nacional de La Plata estimations, based on official figures<br><i>Population</i> : Instituto Nacional de Estadísticas y Censos (INDEC) |
| <b>RATE OF GROWTH GDP per Capita</b> <sub>it</sub> | Rate of Growth of GDP per capita in province i and year t (in percentages)  | <i>GDP</i> : Dirección de Estadísticas Provincial (each district); Universidad Nacional de La Plata estimations, based on official figures<br><i>Population</i> : Instituto Nacional de Estadísticas y Censos (INDEC) |
| <b>URBANIZATION RATE</b> <sub>it</sub>             | Percentage of urban population for province i and year t.   | Instituto Nacional de Estadísticas y Censos (INDEC)   |
| <b>FIRST TERM</b> <sub>it</sub>                    | Dummy variable that takes the value 1 if the governor of district i is serving in his/her first gubernatorial period and 0 otherwise. | Dirección Nacional Electoral<br>Electoral map of Andy Tow<br>(www.towsa.com/andy)   |

Table 2A. Dynamic Panel data Estimations. Arellano-Bond GMM. Log – Linear Model

Period: 1984 -2007

Provinces: 23

Observations: 552

| Explanatory Variables   | Dependent variables    |                        |                        |                        |
|---|------------------------|------------------------|------------------------|------------------------|
|   | Log Total Crime        |                        | Log Property Crime     | Log Homicides          |
|   | I                      | II                     | III                    | IV                     |
| Log Total Crime Rate (t-1)  | 0.6527***<br>(0.0494)  | 0.7161***<br>(0.0491)  |                        |                        |
| Log Property Crime Rate (t-1)   |                        |                        | 0.6901***<br>(0.0448)  |                        |
| Log Homicide (t-1)  |                        |                        |                        | 0.3109***<br>(0.1018)  |
| ELECTION  | -0.0382***<br>(0.0087) | -0.0476***<br>(0.0091) | -0.0362***<br>(0.0077) | -0.0509<br>(0.0364)    |
| Condemnatory Sentences  | -0.0585***<br>(0.0100) |                        |                        |                        |
| Rate of Unemployment (t-1)  | 0.0028<br>(0.0023)     | 0.0030<br>(0.0023)     | 0.0068**<br>(0.0027)   | 0.0063<br>(0.0077)     |
| GDP per capita (t-1)  | -0.0003<br>(0.0002)    | -0.00003<br>(0.0023)   | 0.00003<br>(0.0002)    | -0.0060<br>(0.0034)    |
| Rate of growth GDP per capita (t-1)   | -0.0001<br>(0.0008)    | -0.0008<br>(0.0010)    | -0.0010<br>(-0.0010)   | -0.0060*<br>(0.0034)   |
| Urbanization rate (t-1)   | 0.0114***<br>(0.0040)  | 0.0148***<br>(0.0044)  | 0.0102**<br>(0.0040)   | -0.0335***<br>(0.0102) |
| First Term  | -0.0233<br>(0.0201)    | -0.0433**<br>(0.0194)  | -0.0420*<br>(0.0220)   | 0.1079<br>(0.0796)     |
| Constant  | 2.0543***<br>(0.3025)  | 1.0803***<br>(0.3294)  | 1.4496***<br>(0.3123)  | 4.1311***<br>(0.8197)  |
| Arellano-Bond test that average autocovariance in residuals of order 1 is 0. H0: no autocorrelation Pr>z= | 0.0006                 | 0.0006                 | 0.0051                 | 0.0017                 |
| Arellano-Bond test that average autocovariance in residuals of order 2 is 0. H0: no autocorrelation Pr>z= | 0.6038                 | 0.2613                 | 0.2147                 | 0.2740                 |

Notes: standard errors in parenthesis below coefficient. \*\*\* Significant at .01. \*\* Significant at .05. \* Significant at .10.

There are 12 missing observations in Regression IV

## Robustness Check

Table 3A. Dynamic Panel data Estimations. OLS with fixed-effects

Period: 1984 -2007

Provinces: 23

Observations: 552

| Explanatory Variables               | Dependent variables      |                          |                          |                        |
|-------------------------------------|--------------------------|--------------------------|--------------------------|------------------------|
|                                     | Total Crime              |                          | Property Crime           | Homicides              |
|                                     | I                        | II                       | II                       | V                      |
| Total Crime Rate (t-1)              | 0.7673***<br>(0.06763)   | 0.7859***<br>(0.0681)    |                          |                        |
| Property Crime Rate (t-1)           |                          |                          | 0.7575***<br>(0.0703)    |                        |
| Homicide (t-1)                      |                          |                          |                          | 0.5740***<br>(0.1022)  |
| ELECTION                            | -86.0215***<br>(22.5017) | -97.0616***<br>(23.1952) | -60.0256***<br>(16.8571) | -0.4065<br>(0.3240)    |
| Condemnatory Sentences              | -69.0507***<br>(22.2915) |                          |                          |                        |
| Rate of Unemployment (t-1)          | 11.1367<br>(6.6777)      | 9.5715<br>(6.2626)       | 7.3147***<br>(4.7094)    | 0.0841<br>(0.0593)     |
| GDP per capita (t-1)                | 0.1912<br>(0.3313)       | 0.00118<br>(0.3136)      | 0.0235<br>(0.1849)       | -0.0007<br>(0.0027)    |
| Rate of growth GDP per capita (t-1) | -2.7742<br>(2.0014)      | -3.3027<br>(2.2702)      | -3.2386*<br>(1.6489)     | -0.0474**<br>(0.0184)  |
| Urbanization rate (t-1)             | 16.4698<br>(11.5012)     | 22.8403*<br>(11.9416)    | 13.2954*<br>(7.2859)     | -0.2176**<br>(0.0981)  |
| First Term                          | -64.6172<br>(38.0904)    | -89.7155*<br>(52.0399)   | -57.4335<br>(42.2822)    | 0.3286<br>(0.6334)     |
| Constant                            | -439.0053<br>(821.1073)  | -1193.996<br>(848.3804)  | -627.2528<br>(516.1257)  | 19.9036***<br>(6.6476) |
| R squared (within)                  | 0.7645                   | 0.7557                   | 0.6996                   | 0.4000                 |
| R squared (between)                 | 0.9409                   | 0.9147                   | 0.9362                   | 0.6934                 |
| R squared (overall)                 | 0.8268                   | 0.8173                   | 0.8084                   | 0.5173                 |

Note: standard errors in parenthesis below coefficient. \*\*\* Significant at .01. \*\* Significant at .05. \* Significant at .10.