When the state becomes complicit: mayors, criminal actors, and the deliberate weakening of the local state in Colombia

Supplementary Information

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A Data Description
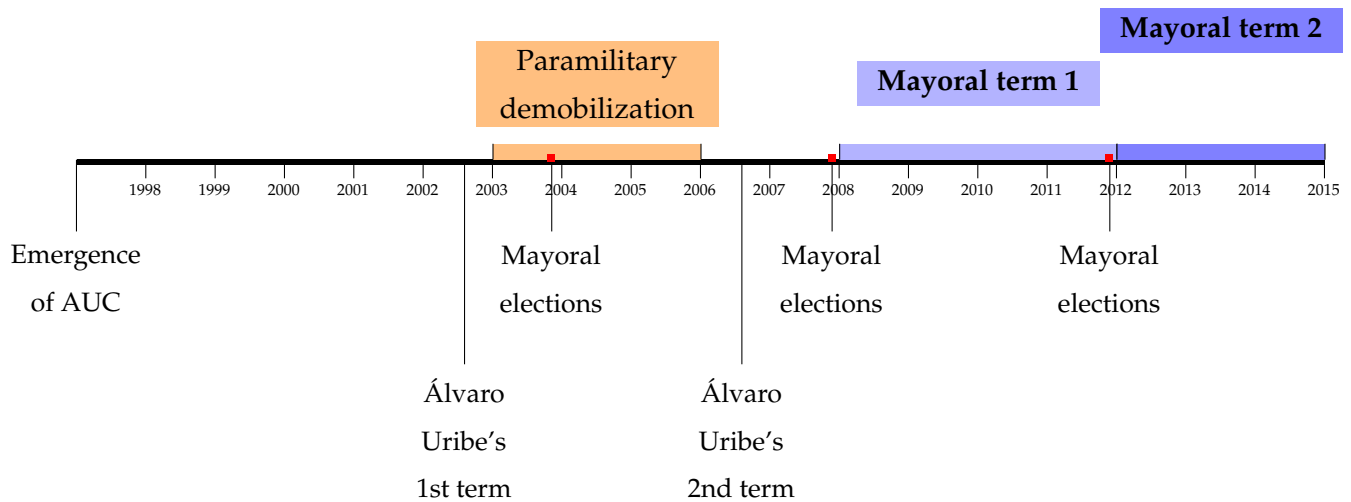
Sources

Variable	Description	Source
Property taxes	Log of per capita property taxes	CEDE (2016)
Homicide rates	Homicides per 100,000 population	National Police
Cadastral lag	Number of years since the municipal cadaster was updated	IGAC
Rural property value	Land value per capita in a given municipality	IGAC
Land informality	Share of land without formal titles	IGAC
Vote margin 2007	Difference between winner and runner-up vote share	Pachón and Sánchez (2014)
Vote margin 2011	Difference between winner and runner-up vote share	Pachón and Sánchez (2014)
No. of parties 2011	Laakso and Taagapera's effective number of parties	Pachón and Sánchez (2014)
No. of candidates 2011	Number of candidates running for mayoral elections	Pachón and Sánchez (2014)
Party reelected 2011	Incumbent party was reelected in 2011	Pachón and Sánchez (2014)
Population density	Number of people per municipality area	DANE
Coca hectares	Hectares of coca crops	SIMCI
Soil quality	Soil quality index	IGAC
National transfers	Transfers per capita by the National government	CEDE (2016)
Violence 1948-53	Dummy variable indicating the presence of partisan violence	
Land conflicts 1901-31	Dummy variable indicating the presence of land conflicts between landed elites and peasants	LeGrand (1986)
Guerrilla events	Per capita number of violent actions by guerrilla groups	ViPAA
Paramilitary events	Per capita number of violent actions by paramilitary groups	ViPAA
Bacrim events	Per capita number of violent actions by criminal bands groups	ViPAA
Distance to market	Distance to the closest market	CEDE (2016)
Distance to Bogotá	Distance to Bogotá	CEDE (2016)
Municipality area	Municipality area in squared kilometers	CEDE (2016)
Altitude	Elevation above sea level in meters	CEDE (2016)

Summary Statistics

Variable	N	Mean	St. Dev.	Min	Max
Vote margin - paramilitary-friendly party	262	−0.01	0.2	−0.6	0.6
Property taxes 08-11	259	35.0	50.6	0.0	563.6
Property taxes 12-15	262	50.4	77.8	0.003	669.8
Cadaster age	238	6.3	5.1	0.5	18.5
Land informality	223	0.2	0.2	0.0	1.0
Land values	227	8.7	11.9	0.004	86.3
Judicial inefficiency	262	0.1	0.1	0.0	0.5
Vote margin 2011	260	0.2	0.1	0.001	0.7
Number of parties 2011	261	2.7	0.8	1.0	8.1
Number of candidates 2011	262	4.2	1.8	1	11
Incumbent party reelected	262	0.1	0.3	0	1
Homicide rates 04-07	262	50.1	45.2	0.0	255.8
Altitude	262	1,200.3	903.9	2	3,051
Area km2	262	1,354.4	5,294.1	25	65,674
Distance to Bogota	262	317.2	178.1	16.4	816.5
Distance to closest market	262	124.1	94.9	0.0	561.5
Per capita GDP	262	15.4	0.7	13.1	17.2
Fiscal performance	262	4.0	0.5	0.0	4.4
Transfers	262	5.8	1.5	0.0	7.2
Population density	262	153.0	515.4	0.4	6,906.6
Soil quality	255	2.8	1.3	0.0	7.0
Land conflicts 1901-31	262	0.1	0.2	0	1
Violence 1948-43	262	0.2	0.4	0	1
Paramilitary actions	262	5.9	39.7	0.0	614.1
Guerrilla actions	262	6.3	46.2	0.0	734.1
Coca	262	0.2	0.4	0	1

B Timeline

The following figure illustrates the timing of the elections within the broader context.

Mayoral term 2

Paramilitary
demobilization

Mayoral term 1

1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

Emergence
of AUC

Mayoral
elections

Mayoral
elections

Mayoral
elections

Álvaro
Uribe's
1st term

Álvaro
Uribe's
2nd term

C Political parties investigated for paramilitary links

I report the list of parties that were accused and/or sentenced for their involvement with paramilitary groups. Consistent with existing research, the table suggests that most of the parties that engaged in alliances with paramilitary groups were small, third, newly created parties with a pro-Uribe stance (Acemoglu et al., 2013; López, 2010). It is also worth noting that despite the tendency to see 'parapolítica' as a phenomenon solely restricted to third parties, the table suggests that Colombia's traditional parties—Liberal and Conservatives—also engaged in alliances with parapolítica. For instance, in the Bajo Cauca region, the Liberal Party became a key platform through which politicians established alliances with the AUC's Mineros Bloc. The list suggests that while third parties constituted key actors of the *parapolítica* scandal, it is also important to account for the role of traditional parties.

Lastly, it is important to note the variation in the trajectory of these parties. Out of all the parties involved in parapolítica, only 10 participated in the 2007 elections. Of course, there was some variation in the type of position that 'paramilitary-friendly' parties were able to hold. Some parties had candidates and politicians elected exclusively for local positions, such as councils and mayors, while other parties were able to place candidates in regional and national-level positions, including governorships and Congress. Out of the 10 parties that participated in the 2007 elections and had involvement with paramilitary groups, I only focus on those with a national reach, thus excluding Polo Democratico (PD) for not having a national reach in its paramilitary involvement. More substantively, however, this exclusion makes sense, as PD is a left-wing party, which stands in contrast with the right-wing orientation of paramilitary groups.

	Participated in '07 elections?	In sample
Partido Liberal	✓	✓
Partido Conservador	✓	✓
Cambio Radical	✓	✓
Partido de la U	✓	✓
Colombia Democrática	✓	✓
Alas Equipo Colombia	✓	✓
Apertura Liberal	✓	✓
Colombia Viva	✓	✓
Polo Democrático	✓	
Convergencia Ciudadana	✓	✓
Moral		
Mov. de Participación Popular		
Mov. Nacional Progresista		
Partido de Acción Social		
Mov. Unionista		
Nuevo Partido		
Mov. Ciudadano		
Mov. Cívico Independiente		
Mov. Huella Ciudadana		
Mov. de Integracion Popular		
Mov. Dejen Jugar al Moreno		
Mov. Nacional Conservador		
Mov. Político Actitud Renovadora		
Mov. Popular Unido		
Mov. Progresismo Democrático		
Mov. Somos Colombia		
Mov. Via Alterna		
Partido Colombia Siempre		
Partido Popular Colombiano		

Note: Data come from the Supreme Court, the Attorney General's Office, and Carreri and Dube (2017)

D Testing Model Assumptions
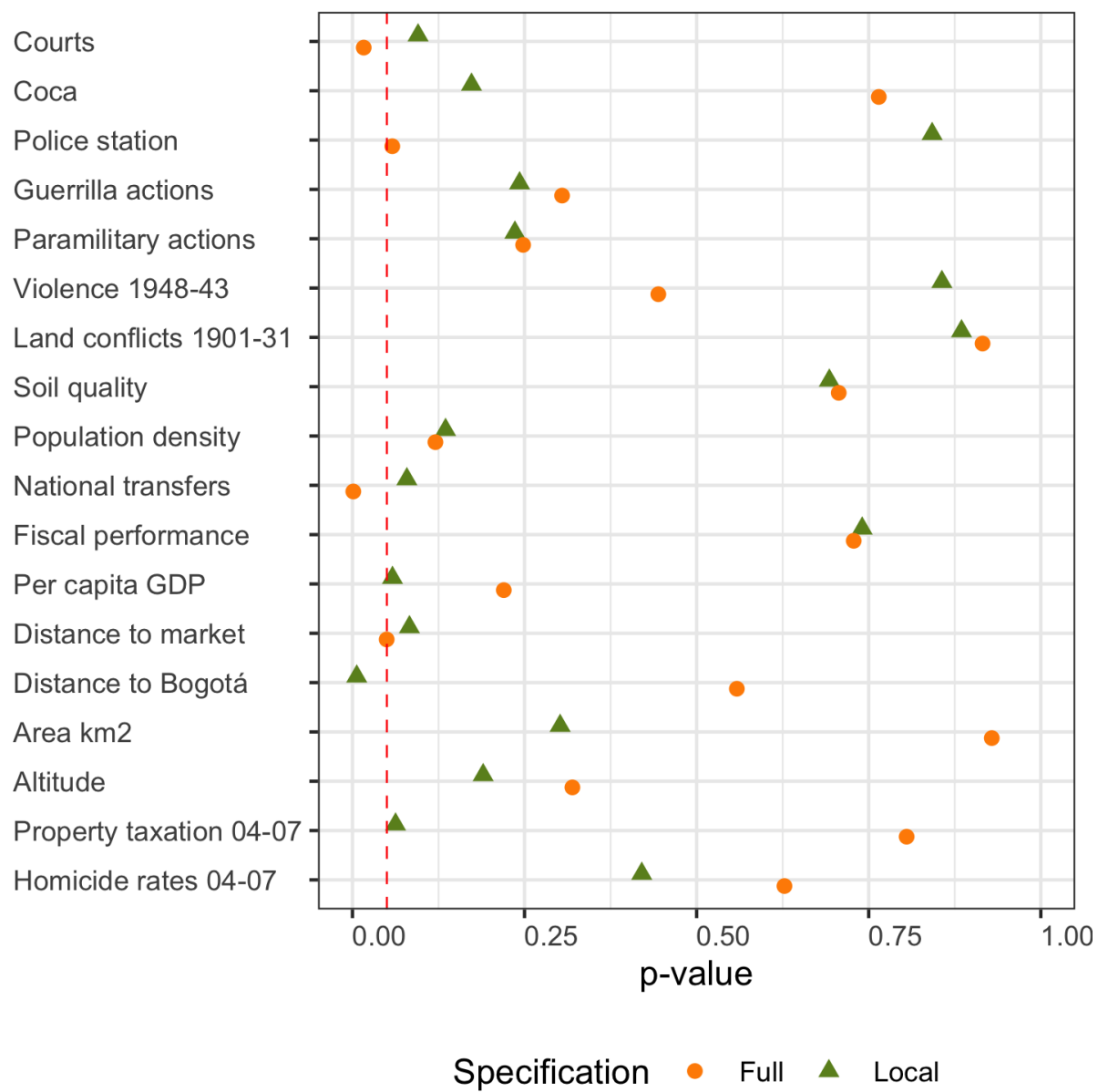
Covariate Balance

Obtaining credible estimates about the impact of paramilitary-linked political parties on taxation is not an easy task, as their electoral victories are not randomly assigned and are likely to be correlated with a number of confounders. While the regression discontinuity design used in this paper treats close elections as a natural experiment, the validity of the estimates depend on the assumption that close elections are indeed as good as random and not systematically affected by political actors. I conduct a number of validity checks that augment the credibility of my results.

A key assumption of the regression discontinuity design is that observations around the cutoff are identical on every characteristic except for the fact that those above the threshold received the treatment and those below received the control. For instance, it is important to determine that the victory of this type of party is not correlated with a higher presence of paramilitary actors, history of violence, and other socioeconomic conditions. Of course, while it is indisputable that the presence of paramilitary groups and the existence of certain conditions shaped the probability of victory of paramilitary-aligned parties, a valid regression discontinuity design requires that these factors be balanced and statistically identical inside the bandwidth around the cutoff.

I test and visually illustrate this assumption by plotting RD estimates of the effect of pro-paramilitary political parties on a set of important social, economic, and political characteristics before 2007. Figure D.1 plots their p-values using two different specifications: one uses an OLS specification with the full sample and the other uses a local polynomial regression with a common MSE-optimal bandwidth. As shown by the plot, when using the full sample, there are significant differences on three relevant economic and political variables—national transfers, actions by criminal groups and distance to the market. The use of a local linear specification minimizes the differences between con-

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trol and treatement municipalities. *Distance to Bogotá* is the only variable that reaches a marginal statistical significance (p-value=0.044), but the overall results give credibility to the research design.

**Figure D.1:** Balance test of pre-treatment covariates

McCrary's Density Test

An additional problem may arise if politicians and paramilitaries are able to manipulate the electoral results and change their status from losers to winners. Compared to guerrilla groups, paramilitaries became closer allies to politicians and bureaucrats and extensively used fraudulent tactics to alter electoral results (López, 2010; Acemoglu and Robinson, 2008). More often than not, paramilitaries used violence to favor third parties or displace political identities adverse to their interests (Gallego, 2018; Steele, 2011). In any case, paramilitaries significantly changed Colombia's political map and were able to get an important proportion of Congress members elected[1] and provided electoral support to a number of local politicians.

If there exists systematic manipulation of electoral results around the cutoff, the results could be invalidated. One way to test whether there is manipulation of electoral results around the threshold is to check the distribution of the running variable around the cutoff: a discontinuous jump around this neighborhood would provide evidence that pro-paramilitary parties are more likely to manipulate close elections. Based on McCrary (2008), I test the null hypothesis of no jump around the cutoff. With a p-value of 0.722, I fail to reject the null hypotheses, thus finding evidence of no sorting behavior around the threshold. The smoothness of the distribution, shown in plot (a) of Figure D.2 of the Appendix visually confirms this result.

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[1]In the midst of the demobilization process in 2005, paramilitary leader Salvatore Mancuso was invited to speak before the Congress and stated: "When we say we are very fond of the 35% of the National Congress, we are saying that these Congress members were elected in areas under influence of the Autodefensas"(Caracol Radio, 2005).
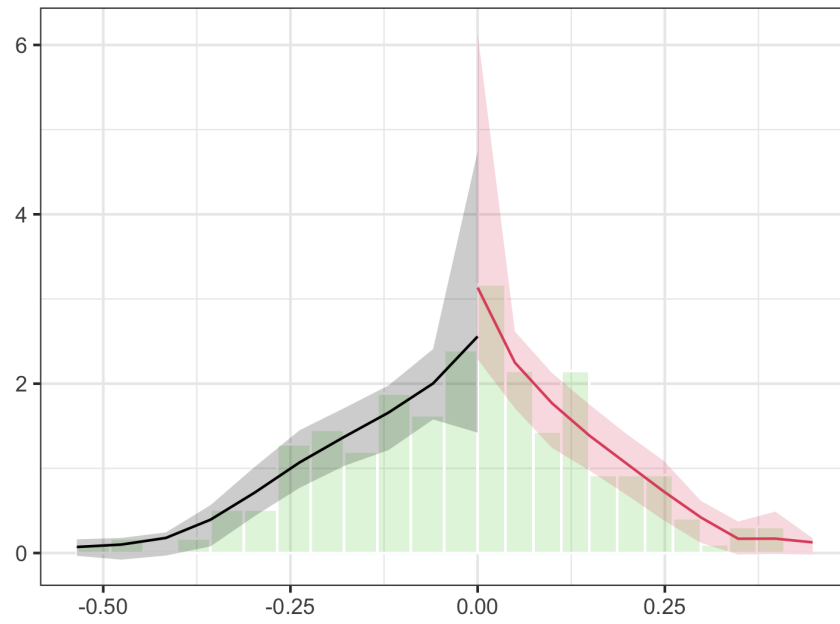
(a) McCrary's density test
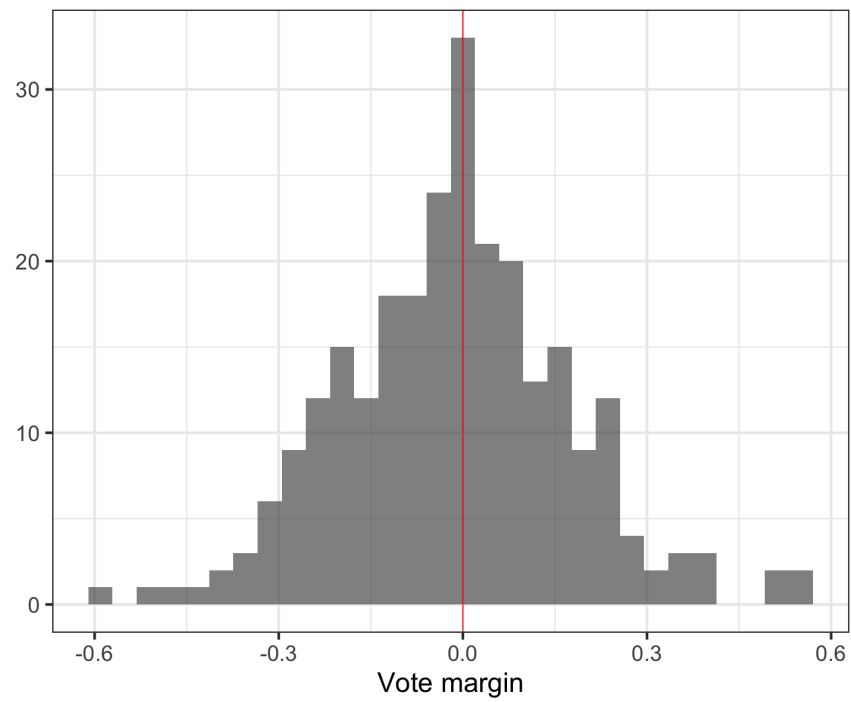
(b) Histogram of the forcing variable

Figure D.2: McCrary's density test of the running variable

Placebo Cutoffs

Lastly, I conduct a series of robustness checks and alternative model specifications to determine whether the findings are sensitive to these changes. First, I estimate the main models for the dependent variable using cutoff values of the forcing variable different from zero and plot the coefficients and confident intervals. If the research design is valid, this form of placebo should yield statistically insignificant estimates when using cutoff values other than zero. As Figure D.3 in the Appendix shows, the RD coefficients are only statistically significant and in the expected direction when the cutoff is at zero. Second, I run all models using quadratic polynomial regression and find no statistical differences between them. Results are reported in **??** in the Appendix. The absence of systematic differences between linear and quadratic specifications should add confidence to the results.
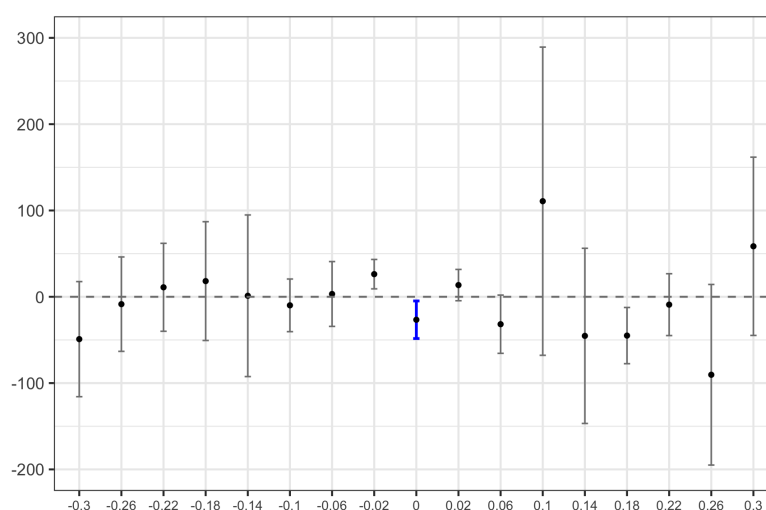
(a) Property taxes

Figure D.3: Placebo test: RD estimates using different cutoffs

E RD estimates with covariate adjustment

In this section, I re-run the analyses with covariates. Although the standard practice in the literature is to omit the inclusion of covariates, doing so is intended to increase the precision of the point estimate, "in the same spirit as (preintervention) covariates are often included in the analysis of randomized experiments" (Calonico et al., 2019, p. 443). This requires that covariates be continuous at the cutoff, that is, there should not be any systematic difference between treatment and control units.

I control for a set of historical and contemporary covariates, including the presence of land-related conflicts between 1901 and 1930; population density, land quality, and the prevalence of coca crops as the proportion of municipality size. I report the main results in **??** with property taxes as the outcome variable and using both linear and quadratic polynomials. As expected, using covariate adjustment leads to similar and consistent results compared to those in the main analysis. Concretely, as shown in column 1, the size of the coefficient shrinks by a relatively small margin, from -26 to -23, but its precision only slightly increases, as the standard error also decreases by a very small margin.

Table E.1: RD Estimates

	Dependent variable:	
	Property Taxes	
Paramilitary party	-22.507^{**}	-21.176^{*}
	(10.53)	(12.05)
Observations	252	241
Effective Obs	101	148
Bandwidth	0.088	0.146
Polynomial	Linear	Quadratic
Covariates	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Note: The outcomes are an average over the 2008-2011 period. All estimates are based on local polynomial regression with robust biased-corrected confidence intervals, and triangular kernel, as described in Calonico et al. (2014).

Table E.2: Mechanisms - with covariate adjustment

	Dependent variable:			
	Cadaster lag	*Rural land value*	*Land informality*	*Judicial inefficiency*
Paramilitary party	0.840	-11.42^{**}	0.118^{*}	0.082^{**}
	(2.37)	(5.49)	(0.062)	(0.035)
Observations	203	221	219	255
Effective Obs	98	102	85	150
Bandwidth	0.111	0.102	0.085	0.145
Covariates	✓	✓	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Note: The outcomes are averaged over the 2008-2009 period, as data for the remaining years are not available. All estimates are based on local polynomial regression with robust biased-corrected confidence intervals, and triangular kernel, as described in Calonico et al. (2014).

In Table E.3, I also analyze how the rise of paramilitary-friendly parties shaped property taxation. Like the analysis shown in Table E.1, the analyses include covariate adjustment, but in this case I add three additional variables: land informality, cadaster lag, land informality, and judicial inefficiency averaged between 2003 and 2006.

Table E.3: RD Estimates

	Dependent variable:	
	Property Taxes	
Paramilitary party	-19.688^{**}	-17.642^{*}
	(9.80)	(15.32)
Observations	221	221
Effective Obs	111	117
Bandwidth	0.118	0.160
Polynomial	Linear	Quadratic
Covariates	✓	✓

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.
Note: The outcomes are an average over the 2008-2011 period. All estimates are based on local polynomial regression with robust biased-corrected confidence intervals, and triangular kernel, as described in Calonico et al. (2014).

F   Placebo Test: Preexisting Trends

A crucial test to validate the results is whether there are any systematic differences, between treatment and control, in the pre-election levels of the dependent variable. Because changes in property taxes should emerge once a paramilitary-friendly party has taken office—January 2008—there should not exist systematic differences prior to that. This is especially true for the case of property taxes, as mayors play a crucial role in its collection.

Using average levels of property taxes between 2004-2007—the previous mayoral term—, Plot (a) of Figure F.1 shows RD estimates using different bandwidths. While point estimates for both outcomes are in the expected direction, the vast majority of them are not statistically significant, suggesting that control and treatment municipalities were similar and changed only as a result of the electoral victory of a paramilitary-friendly party. With covariate adjustment, as plot (b) suggests, none of the coefficients, using a wide variety of bandwidths, are statistically significant.

Figure F.1: Different bandwidths 2004-2007
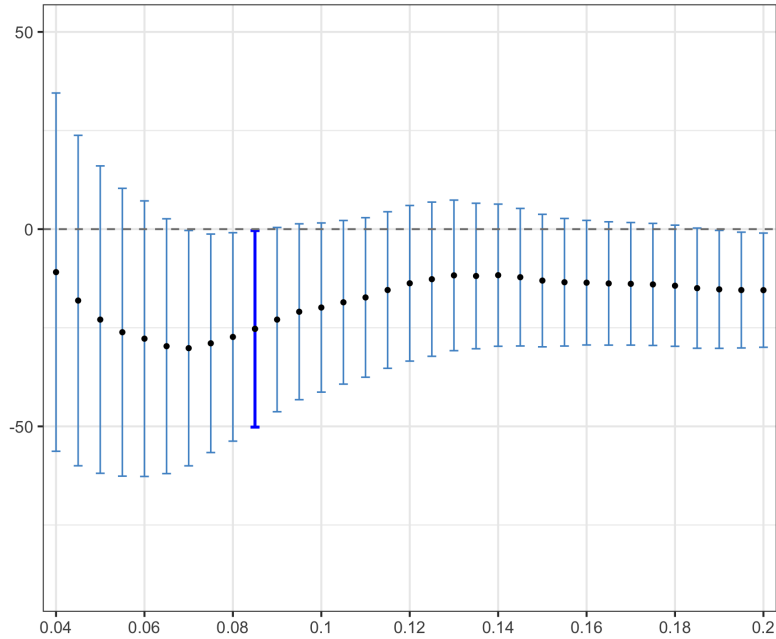
(a) Property taxes, 2004-2007
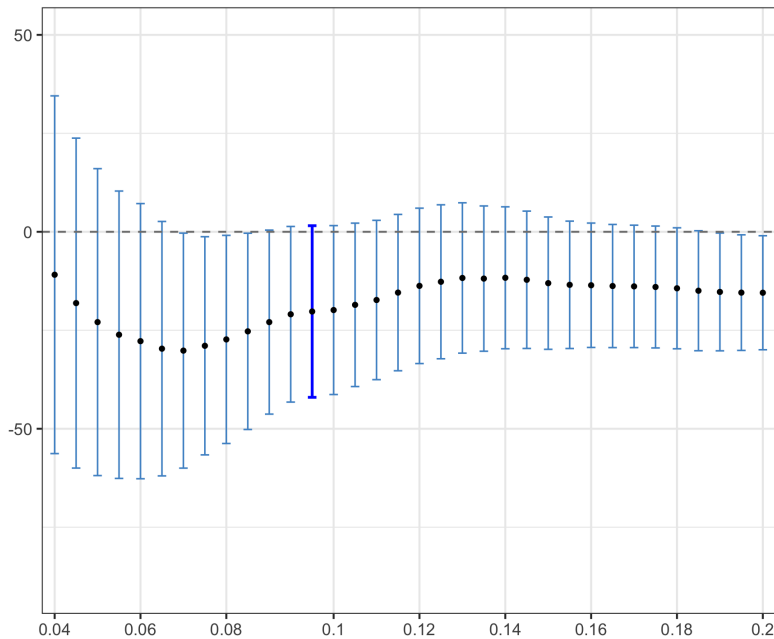
(b) Property taxes, 2004-2007 - covariate adjustment

Note: Each estimate is a separate model with 95% confidence intervals and a different bandwidth. The darker bar is the point estimate and confidence interval resulting from Calonico et al.'s (2014) data-driven bandwidth procedure.

G Effects over time 2012-2015

Table G.1: RD Estimates

	Dependent variable:	
	Property Taxes	
Paramilitary party	-51.8^{***}	-54.93^{*}
	(19.64)	(25.94)
Observations	262	241
Effective Obs	94	133
Bandwidth	0.077	0.121
Polynomial	Linear	Quadratic

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Note: The outcomes are an average over the 2008-2011 period. All estimates are based on local polynomial regression with robust biased-corrected confidence intervals, and triangular kernel, as described in Calonico et al. (2014).

Figure G.1: Property taxes, 2012-2015
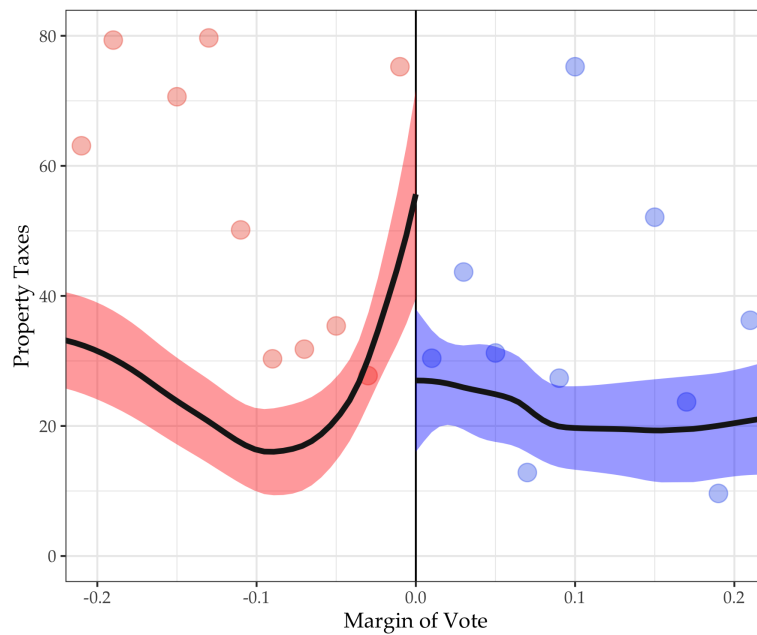
Note: The forcing variable is the margin of vote, calculated as the difference between the winner and the runner-up. The graph plots a quadratic polynomial on both sides of the cutoff. Points are averages in equal-sample-sized bins of the running variable.

H   OLS: alternative empirical strategy

To mitigate potential concerns with the regression discontinuity design and its underlying party-based approach, I supplement this empirical strategy using an OLS estimation. As I have argued, one of the problems of relying on the name of politicians is that it is likely to be biased towards the more visible cases and against smaller instances of collusion not captured by the media or judiciary. However, if we manage to find similar results with this approach, we can increase our confidence in the results from the regression discontinuity design.

Estimation

I estimate a simple ordinary least squares (OLS) of the following form:

$$Y_{i,t>2007} = \alpha + \beta_1 ParamilitaryPolitician_i + \beta_2 \mathbf{X}_i + \epsilon_i \tag{1}$$

where $Y_{i,t>2007}$ represents the outcome variable for municipality i after 2007—in this case, the log of property taxes per capita. Like in the main analyses, the outcome variables are the average levels of taxation during the mayoral term between 2008 and 2011. I also report results for individual years. α is the intercept term, $ParamilitaryPolitician$ is a binary variable indicating whether the mayor elected in 2007 was allied with paramilitary groups. $\mathbf{X}_i$ is a vector of pre-treatment (e.g. pre-2007) covariates intended to control for potential confounders, and ϵ is the idiosyncratic error term. The control variables include population density; the average number of events per capita perpetrated by guerrillas, criminals, and paramilitaries between 1997 and 2006; presence of colonial state institutions; soil quality; altitude; the presence of coca crops; partisan violence in the 1940s and 1950s; and per capita GDP. Data for politicians involved with paramilitary groups comes from Carreri and Dube's (2017) work on natural resources and rise of *parapolíticos* in Colombia. Their information comes from Fergusson et al. (2013), who manually code

all news events, from Colombia's leading newspaper, *El Tiempo*, of alliances between paramilitaries and politicians until 2011.

Results

I report the results in Table H.1, which are largely consistent with the main analysis. As shown in column 1, mayors involved with paramilitary groups have a negative and statistically significant effect on property taxation throughout the mayoral term.

In Table H.2, I test the effect of mayors with paramilitary affiliation on the key mechanisms tested in the main text. The findings from the analysis are largely consistent with the RD estimates, although they are not all significant. However, they partially lend greater credibility to the claim that paramilitary-friendly politicians undermine property taxation through changes in property rights institutions. Column 1 shows that mayors with a paramilitary affiliation have a positive and statistically significant effect on the age of cadastral records, meaning they are older and less updated. While RD estimates in the main text were consistent in the direction of the coefficients, they were insignificant. Column 2, consistent with the main analysis, shows that mayors with a paramilitary affiliation have a positive effect on land informality. Lastly, column 3 shows that such mayors have a negative effect on the value of rural property.

Relying exclusively on this empirical strategy can be insufficient, as it is hard to determine whether any confounder is biasing the results. However, the similar findings provide an additional source of confidence about the effect of state-crime collusion on local state capacity, in particular, property taxation.

Table H.1: Effect of paramilitary mayor on property taxation (OLS)

	Property taxes
(Intercept)	17.71**
	(7.52)
Paramilitary-friendly mayor	−6.10**
	(2.56)
Colonial State	3.85**
	(1.65)
Violence 48-53	−3.63
	(2.72)
Land conflict	−1.62
	(4.01)
Coca	−15.50***
	(2.41)
Altitude	0.00*
	(0.00)
Guerrilla events	−0.34**
	(0.14)
Paramilitary events	0.43***
	(0.13)
Soil quality	10.03*
	(5.55)
R^2	0.06
Adj. R^2	0.05
Num. obs.	948
RMSE	37.64

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Note: The outcomes are an average over the 2008-2011 period.

Table H.2: Mechanisms - effect of paramilitary mayor on property rights (OLS)

	Cadaster lag	Land informality	Rural property value
(Intercept)	7.00***	1.31***	−1.22
	(0.78)	(0.04)	(2.96)
Paramilitary-friendly mayor	0.59	0.01	−1.94***
	(0.40)	(0.01)	(0.69)
Colonial State	0.05	−0.01	0.14
	(0.17)	(0.01)	(0.57)
Violence 48-53	−1.45***	0.01	1.22
	(0.43)	(0.02)	(1.13)
Land conflict	−0.26	0.01	−0.10
	(0.69)	(0.03)	(1.74)
Coca	1.56***	0.21***	−3.08*
	(0.56)	(0.03)	(1.83)
Altitude	0.00***	−0.00***	−0.00
	(0.00)	(0.00)	(0.00)
Guerrilla events	0.03	0.00	−0.07
	(0.02)	(0.00)	(0.05)
Paramilitary events	−0.03	−0.00*	0.06
	(0.03)	(0.00)	(0.05)
Soil quality	−0.57	−0.10***	8.69***
	(0.50)	(0.03)	(2.08)
R^2	0.05	0.19	0.08
Adj. R^2	0.04	0.18	0.07
Num. obs.	898	827	827
RMSE	4.87	0.18	11.04

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Note: The outcomes are an average over the 2008-2009 period.

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