

## **Supplementary Appendix (for online publication)**

# Crime, Incentives and Political Effort: Evidence from India<sup>\*</sup>

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### **Abstract**

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Political representatives with criminal backgrounds are considered a great problem in many countries. In India, public disclosure of the large share of politicians currently facing criminal charges has sparked a heated public debate and emerging literature assessing the causes and effects. We develop two hypotheses based on our theoretical considerations. Based on the coding of published affidavits and a comprehensive set of three proxies to measure effort in the 14<sup>th</sup> Lok Sabha over the 2004-2009 legislative period, we put these hypotheses to an empirical test. Members of the parliament (MPs) facing criminal accusations exhibit on average about 5% lower attendance rates and lower utilization rates in a local area development fund, but only insignificantly lower parliamentary activity. In line with our hypotheses, these differences decline in the development level of the constituency - a proxy for higher rent-seeking possibilities and monitoring intensity. We argue and demonstrate why these negative relations should constitute an upper bound estimate of the causal effect, and show that even under conservative assumptions the effect is unlikely to be caused by unaccounted selection-bias.

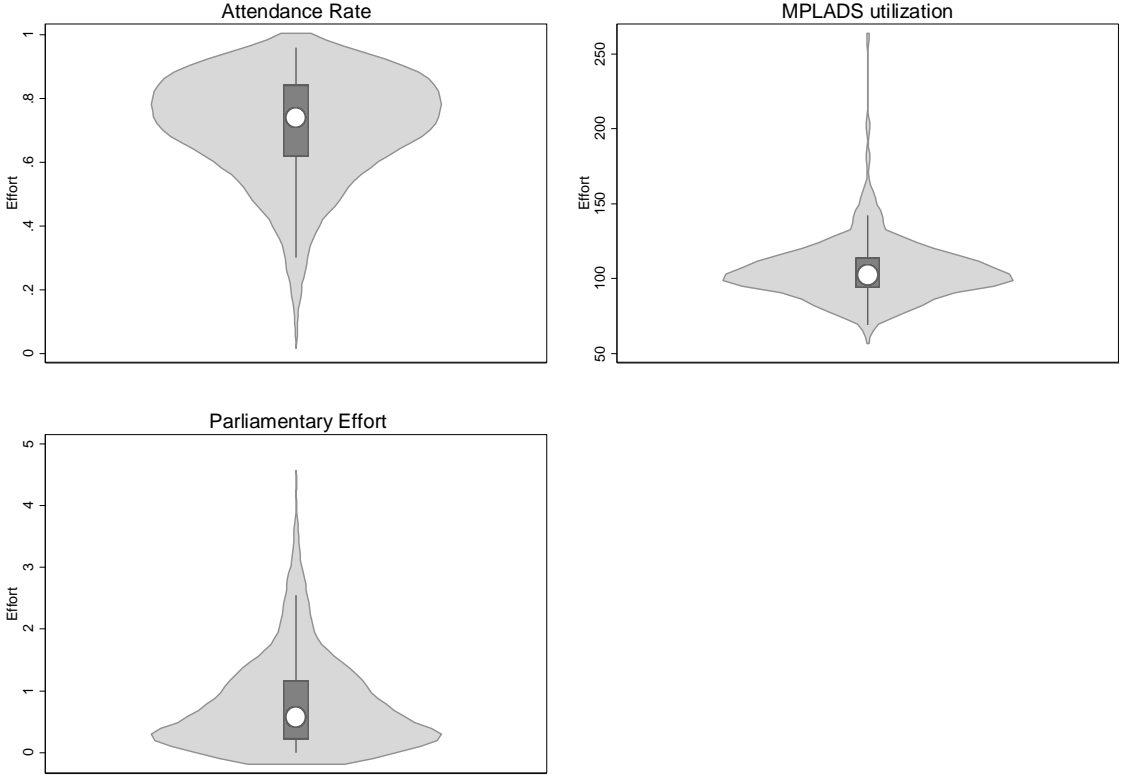
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**Appendix Figure 1:** Violinplots of dependent variables

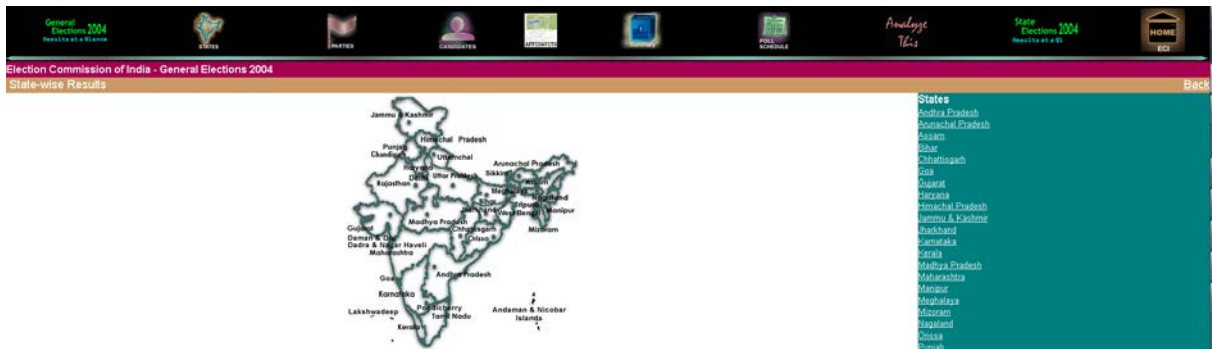


Notes: Violin plots are a modification of box plots that add plots of the estimated kernel density to the summary statistics displayed by box plots. The white dot indicates the median value, the box comprises the 25th to 75th percentiles. Points beyond the upper and lower adjacent values indicate potential outliers. (Define  $x\%$  as the value at the  $x$ -percentile of the distribution of the indicator. Vioplots then defines outliers as values being larger than  $75\% + 1.5 * |75\% - 25\%|$  or smaller than  $25\% - 1.5 * |75\% - 25\%|$ .)

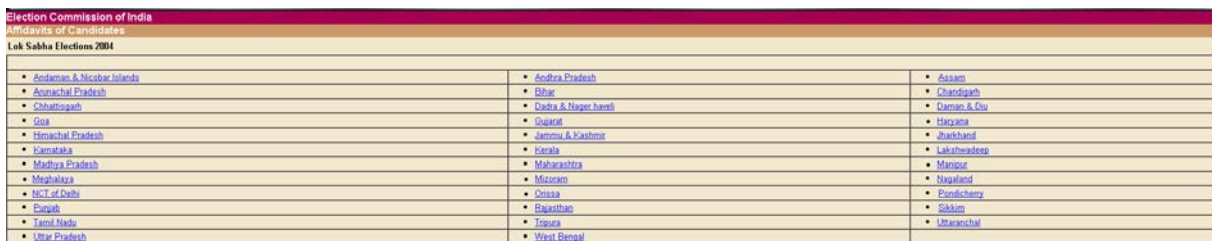


## Replication:

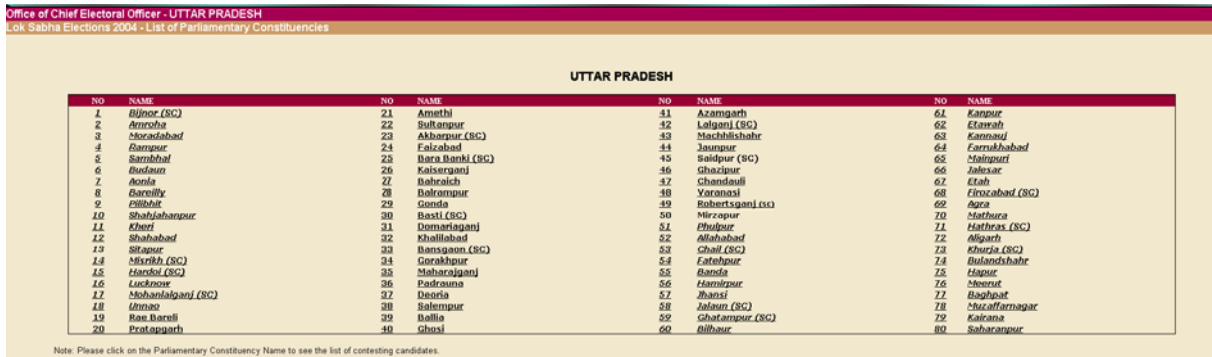
1. Select the "Affidavits" option on the page of the election commission.



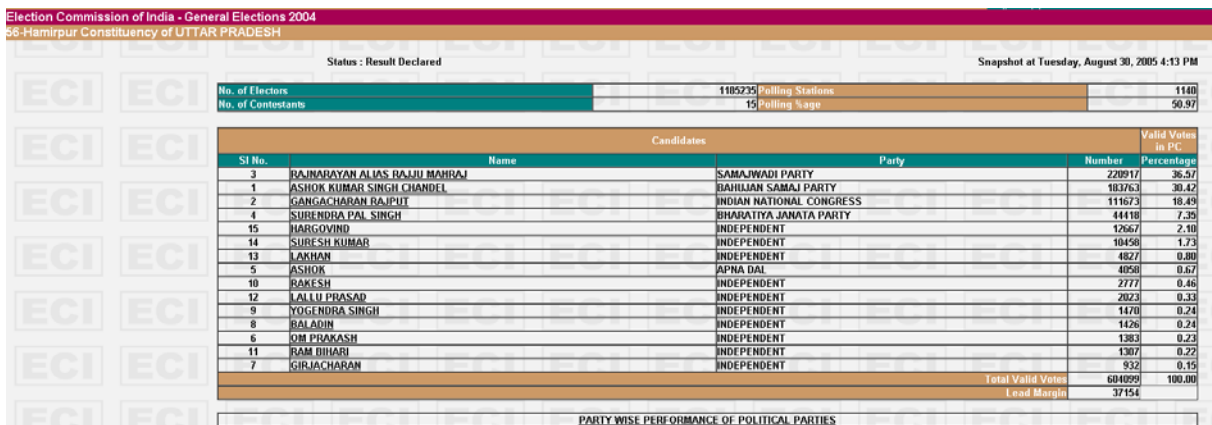
2. Select the state for the 2004 Lok Sabha election.



3. Select the constituency from the list within the state.



4. Copy the relevant from the election results into an excel sheet for the respective constituency and select the winner.



5. Select the winner from the affidavit list.

Office of Chief Electoral Officer - UTTAR PRADESH  
Lok Sabha Elections 2004 - List of Parliamentary Constituencies

**56 - Hamirpur**

S.No	Name	Sex	Party Affiliation
1	<a href="#">Ashok Kumar Singh Chandel</a>	M	Bahujan Samaj Party
2	<a href="#">Gangacharan Rajput</a>	M	Indian National Congress
3	<a href="#">Rajnarayan Alias Rajju Mahraj</a>	M	Samajwadi Party
4	<a href="#">Surendra Pal Singh</a>	M	Bharatiya Janata Party
5	<a href="#">Ashok</a>	M	Apna Dal
6	<a href="#">Om Prakash</a>	M	Independent
7	<a href="#">Giracharan</a>	M	Independent
8	<a href="#">Baladin</a>	M	Independent
9	<a href="#">Yogendra Singh</a>	M	Independent
10	<a href="#">Rakesh</a>	M	Independent
11	<a href="#">Ram Bihari</a>	M	Independent
12	<a href="#">Lalu Prasad</a>	M	Independent
13	<a href="#">Lakhan</a>	M	Independent
14	<a href="#">Suresh Kumar</a>	M	Independent
15	<a href="#">Hargovind</a>	M	Independent

Note: Please click on the Candidate's Name to see the affidavits filed by him/her.

6. Download and code the PDF scans for the affidavit.

Office of Chief Electoral Officer - UTTAR PRADESH  
General Election 2004 - Affidavits filed by Candidate

PC No. & Name: 56 - Hamirpur

Sl. No.	Candidate Name	Party
3	Rajnarayan Alias Rajju Mahraj	Samajwadi Party

**Affidavit Regarding Assets/Liabilities**

Page 1      Page 2      Page 3      Page 4      Page 5

**Affidavit In Form 28(Rule 4A)**

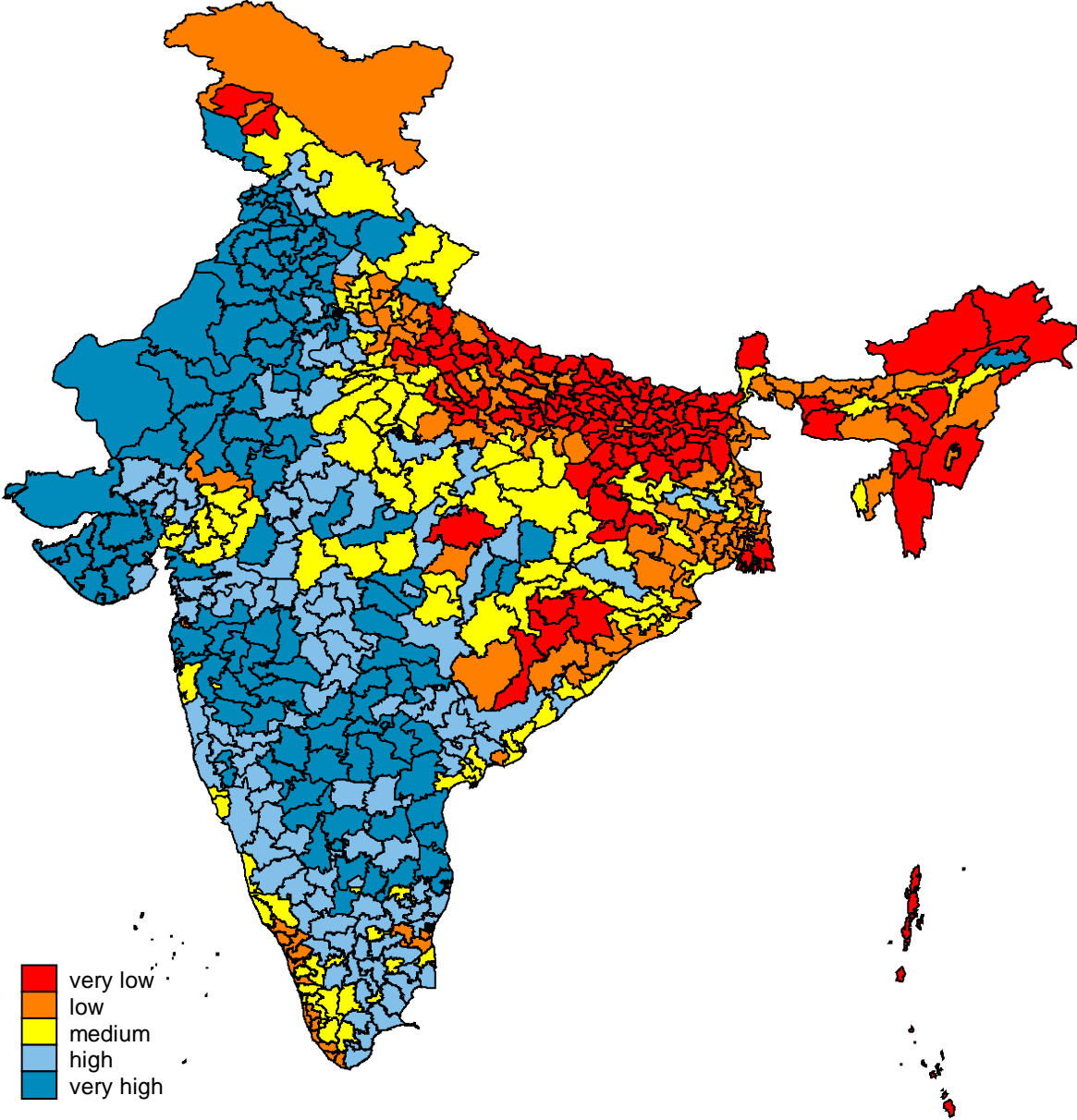
Page 1      Page 2

Note: Please Click on thumbnails to view the full page.

7. Continue and repeat for each constituency.

Each constituency was coded twice independently and the results were compared to detect any potential coding errors. In very few cases (<5), the affidavits were either not available or only in a local language that we could not translate. A list of these cases is available from the authors on request. In other cases, the names differed between either affidavits and election results, election summary results and statistics from other sources, or the homepage of the parliament and the election commission. We verified each of these cases with multiple sources to find the correct match.

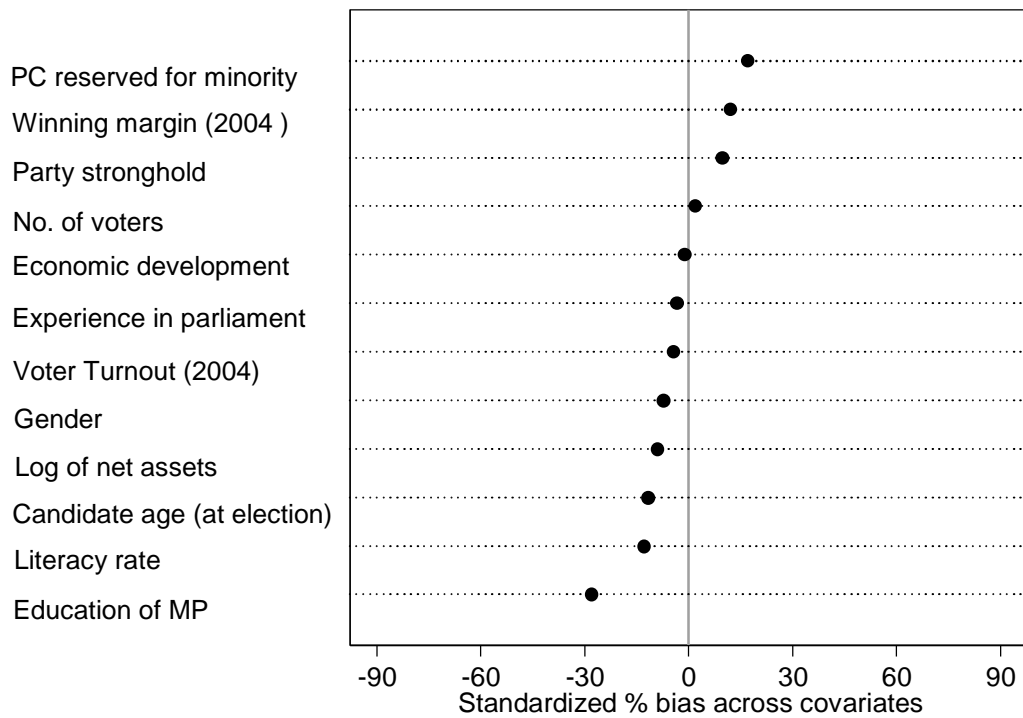
**Appendix Figure 3:** Constituency-level approximation of economic development based on nighttime light intensity using satellite data.



Notes: Created using average visible, stable light and cloud free from the F16 satellite for 2004. The original description states that “The cleaned up (file) contains the lights from cities, towns, and other sites with persistent lighting, including gas flares. Ephemeral events, such as fires have been discarded. Then the background noise was identified and replaced with values of zero. Data values range from 1-63. Areas with zero cloud-free observations are represented by the value 255.” More information can be found at [http://ngdc.noaa.gov/eog/gcv4\\_readme.txt](http://ngdc.noaa.gov/eog/gcv4_readme.txt). We use the tif-image-file from the National Geophysical Data Center and merged it in ArcGIS with constituency boundaries that were shared by Aidt et al. (2015). We then calculated the sum of lights using zonal statistics within the constituencies to proxy for economic development.

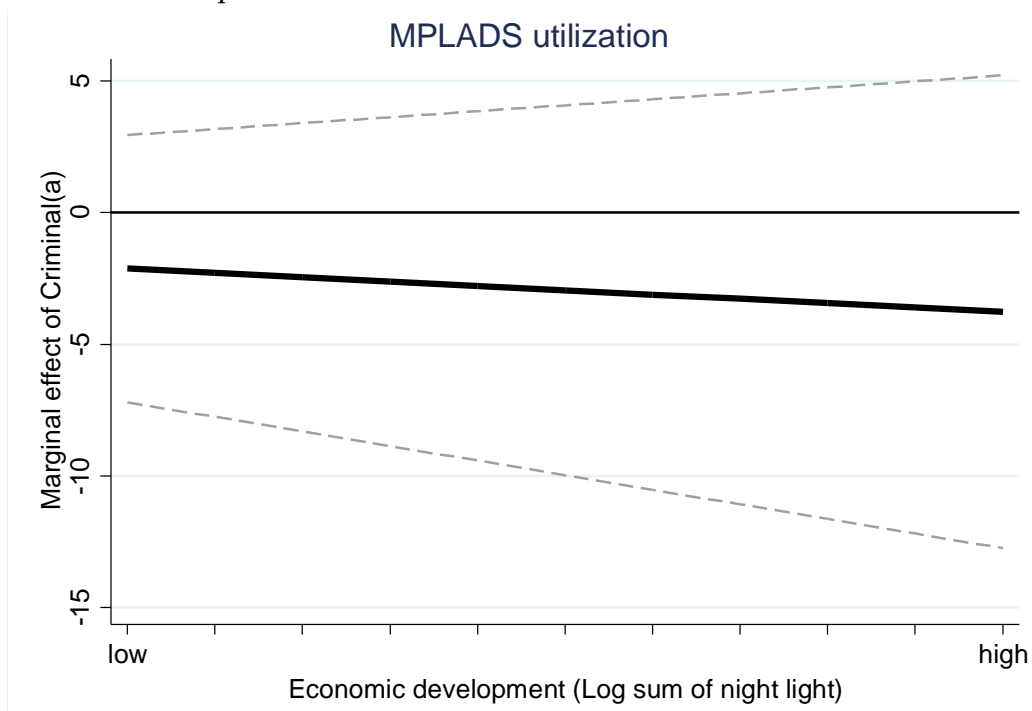


**Appendix Figure 4:** Covariate matching balance



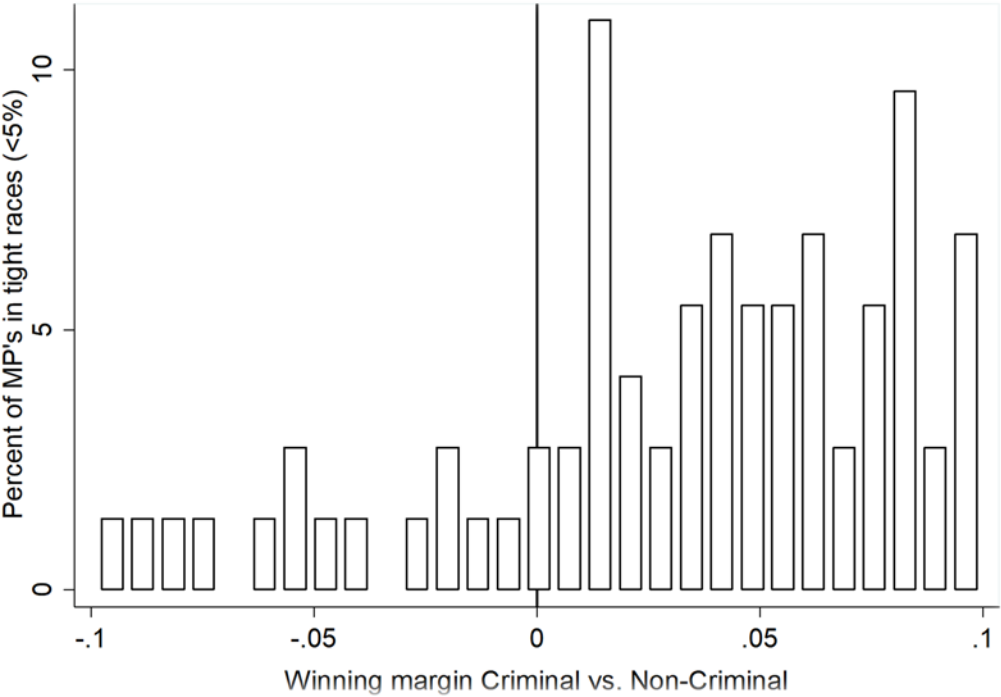
Notes: Relates to Table 6. Graphical depiction of matching balance. Results remain qualitatively unchanged when matching exactly on education.

**Appendix Figure 5:** Marginal Effect of Criminal(a) on parliamentary activity conditional on economic development



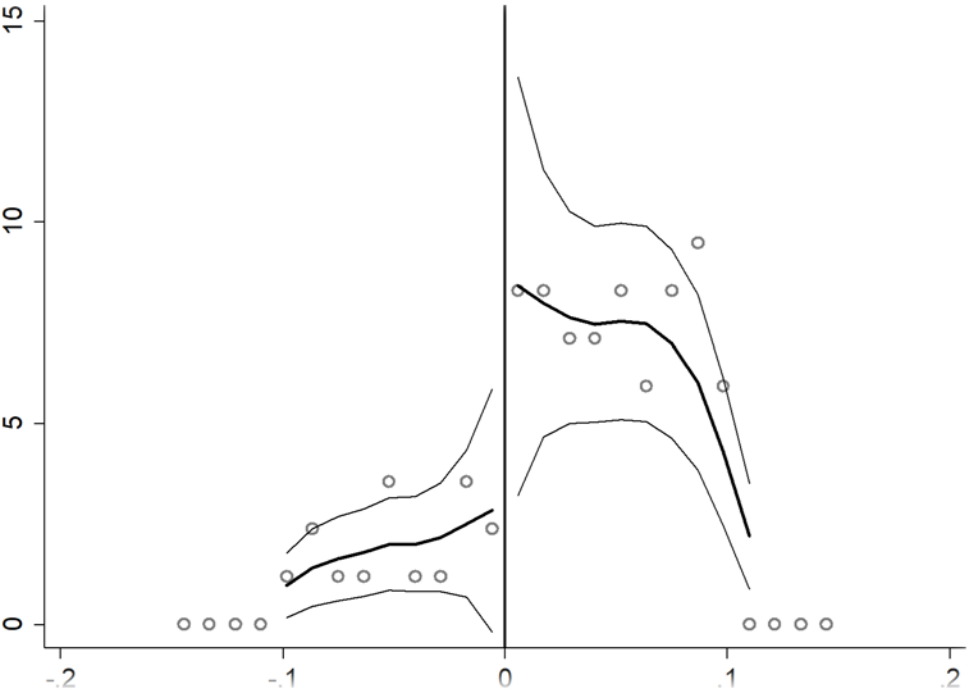
Notes: Marginal effect of a *Criminal(a)* MP Dummy on MPLADS utilization for different levels of economic development. Dotted lines represent the 95% confidence intervals.

**Appendix Figure 6:** Validity of Regression discontinuity assumptions – Density around the threshold



Notes: This suggests that criminals are able to manipulate elections. This seems to hold for close elections with a winning margin +/- 10%.

**Appendix Figure 7:** McCrary test



Notes: Density graph based on the DCdensity program code from <http://eml.berkeley.edu/~jmccrary/DCdensity/>. The x-axis display the margin between a criminal winner and a non-criminal runner-up in close elections with a winning margin +/-10%.



**Appendix Table 1: Frequency of Crimes**

Number of Crimes	Frequency	Percentage	Specification 1	Specification 2	Specification 3
0	336	[76.54%]	Non-Criminals	Non-Criminals	Non-Criminals
1	54	[12.30%]			Excluded
2	20	[4.56%]	Criminal(a)	Criminal(b)	Criminal(b)
3	8	[1.82%]			
4	7	[1.59%]			
5	3	[0.68%]			
8	1	[0.23%]			
9	1	[0.23%]			
13	3	[0.68%]			
18	1	[0.23%]			

Notes: Specification 1 is the main specification, used for example in Table 3, column 1-3. Specification 2 is used in all specifications using *Criminal(b)*, for example Table 3, column 4-6. The one exception is the last row in Table 5.2, where Specification 3 is used as a robustness check.

**Appendix Table 2: Criminals by state**

State \ Status	Normal		Criminal(a)		Normal		Criminal(a)		
Andaman Nicobar	1	[100.0%]	0	[0.0%]	Maharashtra	21	[53.8%]	18	[46.2%]
Andhra Pradesh	29	[90.6%]	3	[9.4%]	Manipur	2	[100.0%]	0	[0.0%]
Arunachal Pradesh	2	[100.0%]	0	[0.0%]	Meghalaya	1	[100.0%]	0	[0.0%]
Assam	14	[100.0%]	0	[0.0%]	Mizoram	1	[100.0%]	0	[0.0%]
Bihar	19	[61.3%]	12	[38.7%]	NCT of Delhi	3	[60.0%]	2	[40.0%]
Chhattisgarh	6	[75.0%]	2	[25.0%]	Nagaland	1	[100.0%]	0	[0.0%]
Dadra & Nagar Haveli	1	[100.0%]	0	[0.0%]	Orrisa	16	[84.2%]	3	[15.8%]
Daman & Diu	0	[0.0%]	1	[100.0%]	Pondicherry	1	[100.0%]	0	[0.0%]
Goa	1	[100.0%]	0	[0.0%]	Punjab	7	[63.6%]	4	[36.4%]
Gujarat	17	[73.9%]	6	[26.1%]	Rajasthan	20	[87.0%]	3	[13.0%]
Haryana	7	[87.5%]	1	[12.5%]	Sikkim	1	[100.0%]	0	[0.0%]
Himachal Pradesh	3	[100.0%]	0	[0.0%]	Tamil Nadu	28	[75.7%]	9	[24.3%]
Jammu & Kashmir	4	[100.0%]	0	[0.0%]	Tripura	2	[100.0%]	0	[0.0%]
Jharkhand	4	[44.4%]	5	[55.6%]	Uttar Pradesh	46	[74.2%]	16	[25.8%]
Karnataka	15	[75.0%]	5	[25.0%]	Uttaranchal	3	[100.0%]	0	[0.0%]
Kerela	12	[63.2%]	7	[36.8%]	West Bengal	34	[94.4%]	2	[5.6%]
Madhya Pradesh	13	[72.2%]	5	[27.8%]	Total	335	[76.3%]	104	[23.7%]

**Appendix Table 3:** Relation between dropping out of sample, dependent variable and variable of interest

Dependent variable	Criminal Winner(a)		MPLADS	
<b>MP change from MP data</b>	<b>1.983</b>	<b>[2.518]</b>	<b>1.993</b>	<b>[2.516]</b>
Bharatiya Janata Party	-0.087	[0.064]	1.038	[3.309]
Communist Party of India (Marxist)	-0.031	[0.099]	8.452*	[5.108]
Indian National Congress	-0.077	[0.056]	-2.829	[2.912]
Rashtriya Janata Dal	0.139	[0.127]	-2.954	[6.584]
Samajwadi Party	0.006	[0.095]	-3.291	[4.907]
Party stronghold (3time winner)	-0.026	[0.060]	4.214	[3.125]
Winning margin (2004)	0.002	[0.202]	-11.984	[10.446]
PC is reserved for minority SC or ST	-0.027	[0.074]	2.615	[3.810]
No of voters	-0.041	[0.046]	-1.600	[2.389]
Economic development	0.000	[0.032]	-1.318	[1.633]
Literacy rate	-0.004	[0.002]	0.289**	[0.126]
Voter turnout (2004)	-0.195	[0.253]	-20.825	[13.083]
Candidate Age (at election)	-0.003*	[0.002]	0.036	[0.089]
Education of MP	-0.042*	[0.025]	1.185	[1.277]
Experience in parliament	-0.010	[0.021]	-2.166*	[1.112]
Gender	0.090	[0.069]	-1.696	[3.576]
Log of net assets	0.008	[0.018]	0.240	[0.910]
Number of constituencies	540		540	
SE's clustered at	State level		State level	

Notes: Analyzes whether there is a relation between *Criminal(a)* and MP's dropping out of parliament, and between the dependent variable MPLADS utilization and MP's dropping out of parliament. Standard errors are clustered at the state level. If *Criminal(a)* would be significantly related to the change, this could bias our results. If it would be significantly related to our dependent variables, it would be an omitted variable bias problem. We are only able to capture the value of the dependent variable for those constituencies with a change during the term. *Attendance rates* and *Parliamentary activity* are not provided for those constituencies with a change in MP. We can see in both regressions that there is no significant relationship; hence this does not affect our results.

**Appendix Table 4: Baseline results**

	Attendance rate		Parliamentary activity		MPLADS utilization	
	(1)		(2)		(3)	
Bharatiya Janata Party	-0.003	[0.012]	-0.098	[0.116]	-1.824	[1.994]
Communist Party of India	0.064	[0.039]	-0.371**	[0.156]	5.376	[4.198]
Indian National Congress	0.055***	[0.014]	-0.125	[0.104]	-4.098*	[2.131]
Rashtriya Janata Dal	0.028	[0.017]	0.291**	[0.120]	-4.626	[3.665]
Samajwadi Party	0.075***	[0.027]	0.162*	[0.087]	-4.360	[2.752]
Party stronghold (3time winner)	0.032	[0.031]	0.027	[0.153]	0.426	[2.977]
Winning margin (2004)	-0.178*	[0.092]	-0.545	[0.331]	-4.529	[6.570]
PC is reserved for minority SC or ST	-0.022	[0.022]	-0.044	[0.109]	6.975	[6.946]
No of voters	0.057***	[0.014]	-0.106	[0.103]	-1.757	[2.219]
Economic development	-0.008	[0.013]	0.108*	[0.060]	-0.658	[1.051]
Literacy rate	0.002***	[0.001]	0.003	[0.003]	0.143	[0.110]
Voter turnout (2004)	-0.214***	[0.066]	-0.345	[0.651]	-21.143	[13.250]
Candidate age (at election)	0.003***	[0.001]	0.000	[0.003]	0.000	[0.108]
Education of MP	0.024***	[0.007]	0.048	[0.069]	0.112	[1.517]
Experience in parliament	-0.013	[0.011]	0.017	[0.040]	-1.092	[1.248]
Gender	-0.015	[0.032]	0.206*	[0.105]	-0.197	[4.002]
Net assets (log)	-0.019**	[0.008]	-0.002	[0.031]	-0.205	[0.448]
R-Squared	0.30		0.11		0.08	
Number of MPs	394		394		439	
State Dummies	Yes		Yes		Yes	

Notes: Dependent variable as specified above over the full legislative period 2004-2009, MPLADS 2005-2008. Standard errors are clustered at the party level. \*\*\*

(\*\*, \*) indicates significance at the 1 (5, 10) percent level respectively.

Descriptive statistics for the matching specifications:

**Appendix Table 5:** Matching balance - descriptive statistics for treated and control group

Variable	Mean		%bias	t-test	
	Treated	Control		t	p>t
Party stronghold (3time winner)	0.23	0.16	16.60	1.28	0.202
Winning margin (2004)	0.57	0.57	-1.80	-0.14	0.887
PC is reserved for minority SC or ST	6.53	6.53	1.00	0.08	0.937
No of voters	0.15	0.11	10.70	0.88	0.379
Economic development	0.11	0.10	11.70	0.97	0.331
Literacy rate	9.71	9.75	-4.20	-0.30	0.766
Voter turnout (2004)	54.55	56.49	-15.50	-1.04	0.300
Candidate Age (at election)	50.38	51.45	-10.50	-0.81	0.420
Education of MP	1.50	1.76	-34.20	-2.69	0.008
No of times the MP has won before, experience in parliament	0.55	0.59	-4.30	-0.34	0.733
Gender	0.94	0.98	-13.70	-1.30	0.197
Log of Net Assets	16.09	16.14	-4.00	-0.39	0.700

Notes: Relates to Table 6. T-test is a simple t-test of differences in the mean. Outcome variable is attendance rate.

**Appendix Table 6:** Selection equations for treatment effect regressions

Dependent variable in second stage	Attendance rate		Parliamentary activity		MPLADS	
Dependent variable in selection equation	Criminal(a)		Criminal(a)		Criminal(a)	
Bharatiya Janata Party	-0.585***	[0.226]	-0.570**	[0.234]	-0.536	[0.336]
Communist Party of India	0.087	[0.386]	0.038	[0.405]	0.099	[0.445]
Indian National Congress	-0.343**	[0.156]	-0.379**	[0.167]	-0.471	[0.311]
Rashtriya Janata Dal	0.374	[0.430]	0.37	[0.418]	0.579***	[0.214]
Samajwadi Party	0.154	[0.187]	-0.015	[0.141]	0.018	[0.153]
Party stronghold (3time winner)	0.016	[0.302]	0.017	[0.269]	-0.074	[0.249]
Winning margin (2004)	-0.089	[0.908]	0.103	[0.792]	0.396	[0.721]
PC is reserved for minority SC or ST	-0.230*	[0.140]	-0.204	[0.153]	-0.233	[0.334]
No of voters	0.056	[0.221]	0.075	[0.238]	0.014	[0.165]
Economic development	-0.023	[0.125]	0.025	[0.107]	0.041	[0.116]
Literacy rate	-0.018*	[0.010]	-0.018*	[0.009]	-0.023	[0.014]
Voter turnout (2004)	-1.401	[1.504]	-1.622	[1.653]	-1.425	[1.103]
Candidate age (at election)	-0.014***	[0.005]	-0.012**	[0.005]	-0.011	[0.009]
Education of MP	-0.134***	[0.050]	-0.147***	[0.055]	-0.178*	[0.093]
Experience in parliament	-0.111*	[0.060]	-0.096*	[0.055]	-0.102	[0.066]
Number of other contesting candidates with charges	0.572	[0.355]	0.52	[0.339]	0.282	[0.299]
State Dummies	Yes		Yes		Yes	
SE's clustered at	Party level		Party level		State level	
Number of MPs	394		394		439	
Lamda	0.09		0.12		4.28	
Rho	0.57		0.16		0.22	
Prob>Chi2	0.0744		0.1183		0.004	

Notes: Dependent variable as specified above over the full legislative period 2004-2009, MPLADS 2005-2008. Second stage results for Criminal(a) see Table 6. Standard errors are clustered at the party level. \*\*\* (\*\*, \*) indicates significance at the 1 (5, 10) percent level respectively.