

Corruption and Theft of Electricity in an Indian State

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Why is Energy Theft so Prevalent in India (and Other LDC's)?

- ▶ “Technical” reasons: not all use is metered;
 - ▶ Policing reasons: illegally tapping into an existing electricity line is often ignored;
 - ▶ Bureaucratic reasons: not all use is billed and not all bills are paid.
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- ▶ These characteristics of energy use are *political*;
 - ▶ The power corporations that build, maintain, and operate the energy infrastructure are publicly-owned bodies whose CEO's are political appointees.

What Determines Line Loss?

- ▶ Line loss is power generated and sent out but not billed;
- ▶ A small proportion ($\approx 5 - 15\%$) is unavoidable;
- ▶ We call the rest “theft,” which consists of:
 1. Meter tampering (fraud);
 2. Illegal connections;
 3. Excess use (by flat rate customers) and other billing irregularities, including bribing the meter reader to report a lower number.



Questions Regarding Variations in Line Loss Across UP over 10 Years

1. Does line loss increase in electoral periods?
2. Is line loss larger for electorally important socio-economic interests, especially agriculture?
3. Is line loss larger in geographic areas whose legislators are self-reported criminals?
4. Is line loss electorally beneficial?

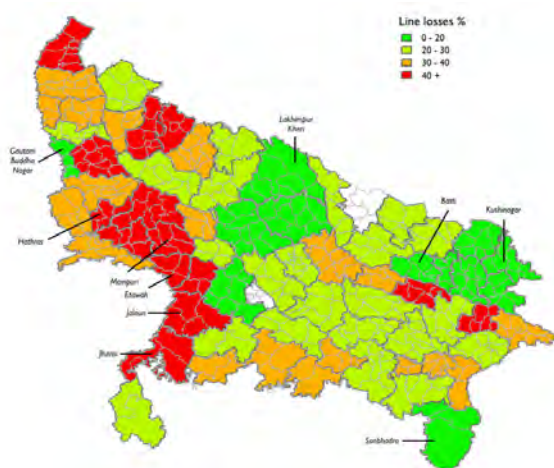
Data, Uttar Pradesh

- ▶ Power output, bills, and revenues: monthly for 179 service divisions, 2000–2009;
- ▶ Electoral data: 403 single-member state assembly constituencies, 2002 and 2007 state elections;
- ▶ Demographic: 70 administrative districts, 2001 census.

Some Descriptive Information

- ▶ Only two-thirds of power sent out in UP is billed for;
- ▶ One-third of power is therefore lost to theft, meter tampering, and excess usage by flat rate customers;
- ▶ Large variation exists across the state, ranging from 13 percent (Sonbhadra) to 66 percent line loss (Mainpuri);
- ▶ Bills to agriculture are based on the unit horsepower of the motor for the irrigation unit, not actual usage, potentially permitting considerable excess use.

Line Losses Across Uttar Pradesh Districts, 2005



Results: Electoral Cycle Effects

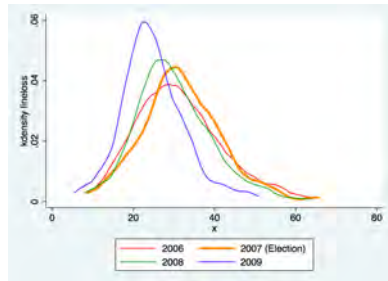
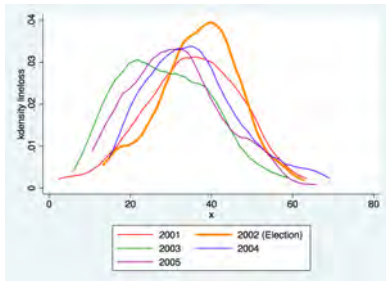


Figure: Kernel Density Plots of Line Losses by Year

Results: Incumbent MLA's Benefit From Line Loss

Table 6: Logit Regression Predicting Incumbency Re-Election
February 2007 UP State Election

Variable	Coefficient	(Std. Err.)
Line losses, FY 2007	0.031 [†]	(0.016)
Criminal Charges	0.038	(0.288)
Reserved Status	-0.120	(0.314)
Income Index	0.646	(2.559)
Education Index	1.117	(1.805)
Health Index	5.700 [†]	(3.119)
Number of voters	-7.280*	(3.346)
Voter Turnout	-4.396*	(2.145)
Win margin last election	8.178**	(1.837)
Seat previously held by SP	1.865**	(0.550)
Seat previously held by BSP	3.561**	(0.577)
Seat previously held by BJP	1.432*	(0.573)
Seat previously held by INC	1.198	(0.781)
Intercept	-4.830*	(2.464)
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N	392	
Log-likelihood	-201.29	
$\chi^2_{(13)}$	106.001	
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Significance levels : † : 10% * : 5% ** : 1%		

Results: Line Loss is Increasing in Agricultural Intensity of the Power Zone

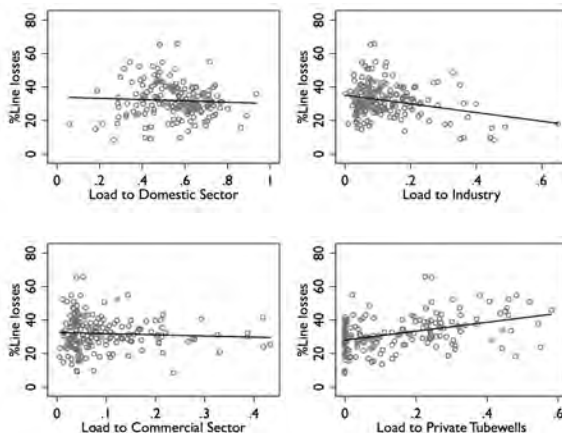
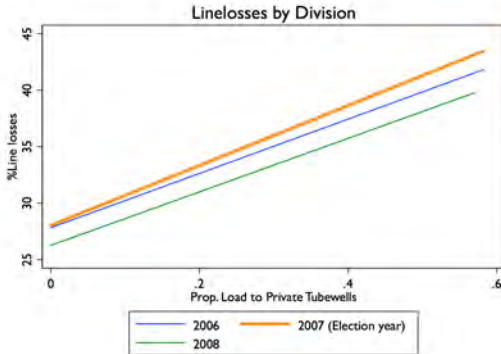


Figure: Line Losses by Sector

Results: Electoral Cycle is Noticeable for Private Tubewells



Results: Political Criminality and Line Loss

- ▶ We observe no significant differences in line loss in constituencies represented by self-reported criminal MLA's;
- ▶ Realized revenue is 5 percentage points higher higher in constituencies with no self-reported criminals on the ballot;
- ▶ Constituencies that attract self-reported criminal candidates are characterized by less effective bill collection.

Interpretations

- ▶ Power “theft” is politically correlated;
- ▶ It is greater around election years;
- ▶ It is electorally advantageous to the incumbent member of the legislative assembly;
- ▶ It is greater in zones with more agricultural users, suggesting it may reflect tubewell owners who exceed their allotted usage;
- ▶ Tubewell owners are generally relatively high caste and well off economically;
- ▶ Preliminary results of auxiliary analyses find that closer races for state assembly seats result in more electricity going to all sectors, suggesting that the release of scarce power is also electorally sensitive;
- ▶ Tentative conclusion: power “theft” is a metaphor for deliberate electorally-generated strategies by incumbent politicians involving hidden subsidies to well off agricultural interests.