Paving the Road to Re-election

Camille Boudot-Reddy Andre Butler

Birkbeck UNIVERSITY OF LONDON

UNIVERSITY OF CAMBRIDGE

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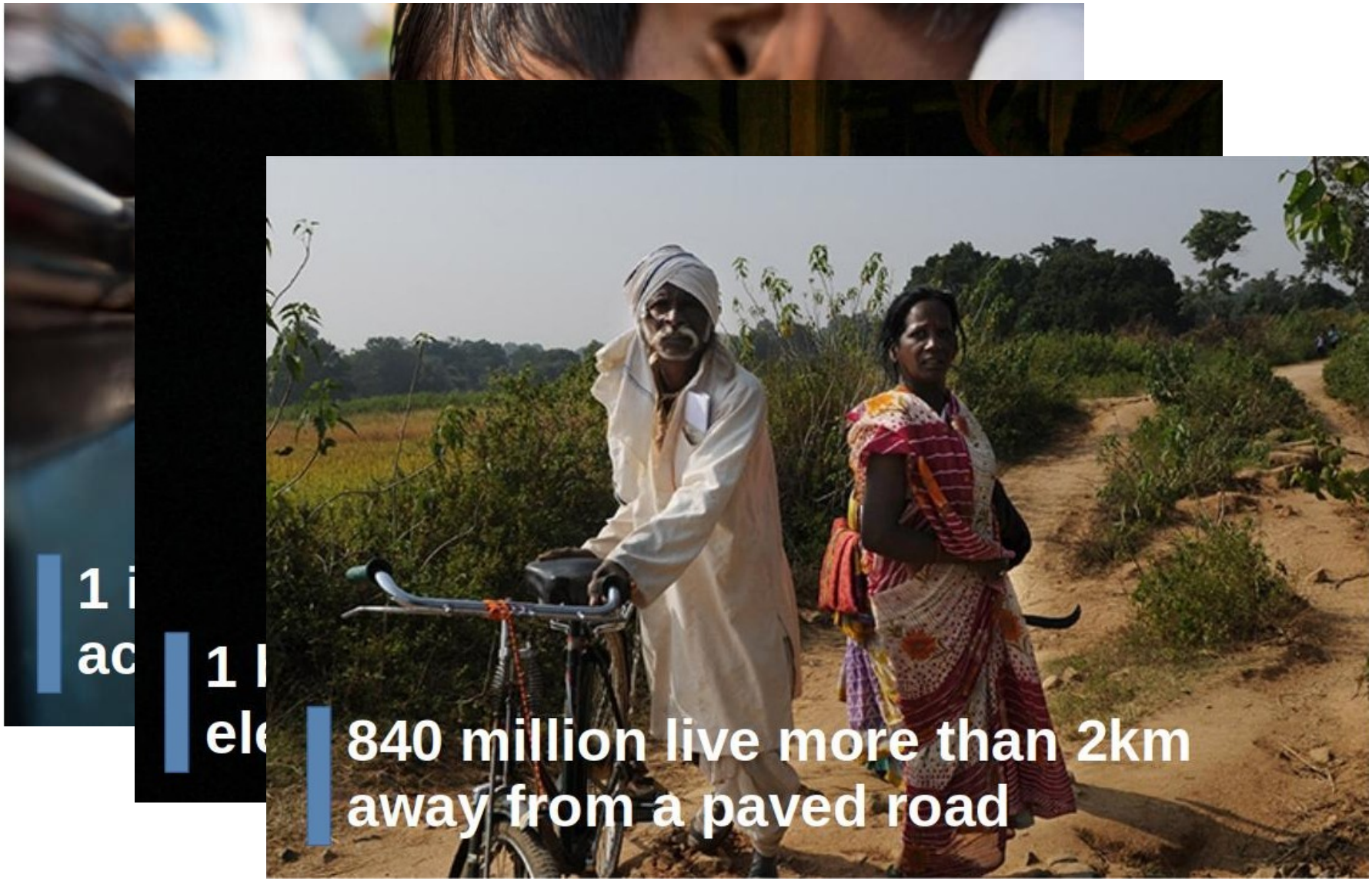
European Economic Association


1 in 3 people do not have
access to clean drinking water


1 billion people have no electricity connection
Reuters/Rupak De Chowdhuri


840 million live more than 2km
away from a paved road

Motivation

- Evidence from:
  - vote-buying (Finan and Schechter 2012)
  - budget surplus (Brender and Drazen 2008)
  - programme expenditures (Brollo and Nannicini 2012)

  in election years all suggest that these provide substantial rewards at the ballot box.

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  in election years all suggest that these provide substantial rewards at the ballot box.
- This phenomenon may lead governments to turn towards short-run policies with immediate electoral returns at the expense of programmes whose benefits may only accrue in the medium to long-run.
- Infrastructure development, may under such a democratic accountability mechanism receive sub-optimal investment.

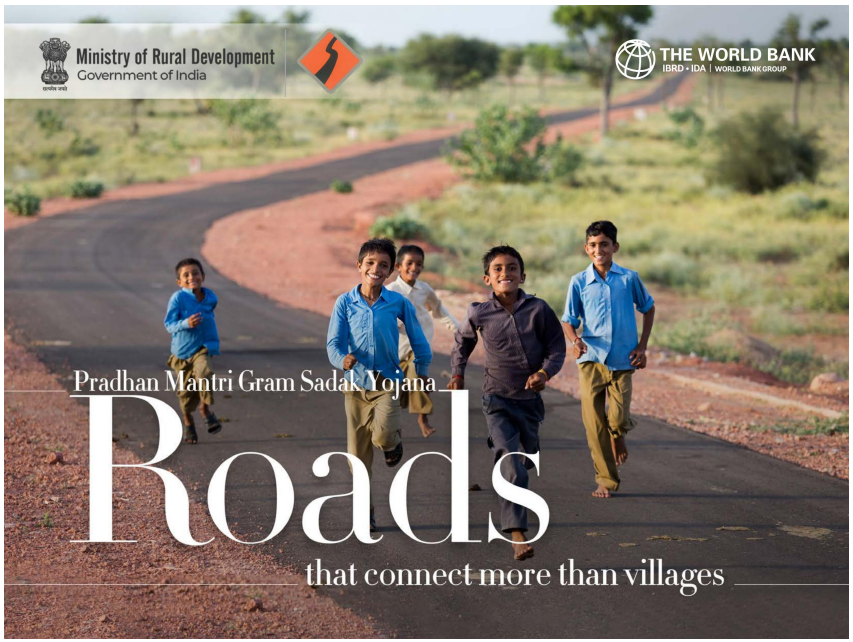
Motivation

- **Do beneficiaries of a rural road expansion programme reward the government at the ballot box?**
- We exploit quasi-random between-village variation based on policy guidelines from a nation wide rural road expansion programme implemented in India between 2000 to 2014.

The Pradhan Mantri Gram Sadak Yojana

In 2000, the Indian government launched the PMGSY: Prime Minister's Village Roads Scheme.

- Aimed at providing all-weather new paved roads to unconnected villages across India.



The Pradhan Mantri Gram Sadak Yojana

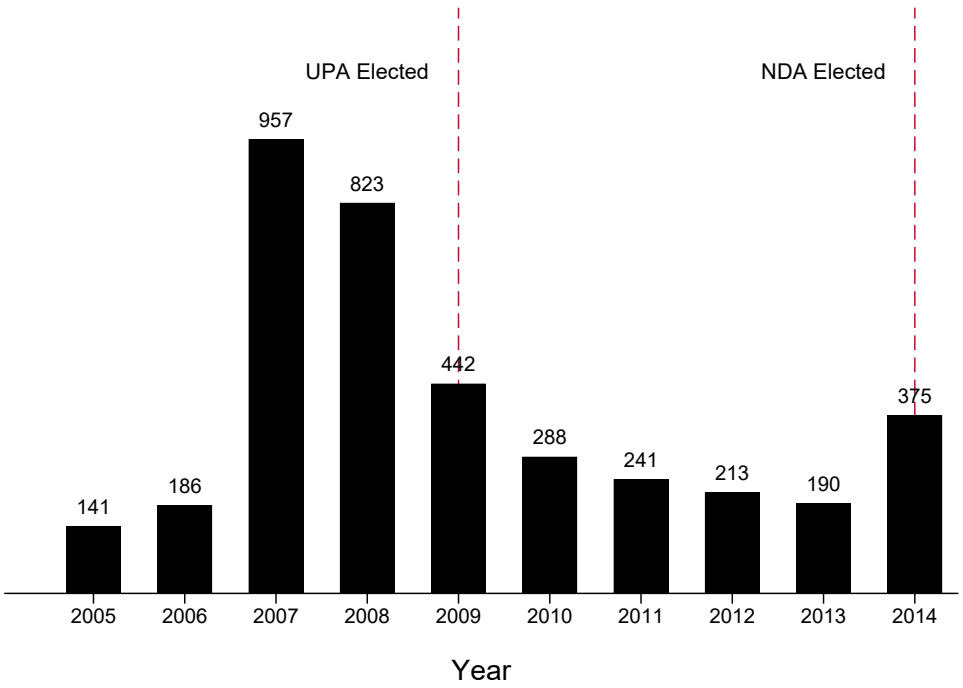
- Guidelines were issued by the National Rural Roads Development Authority.
- Leveraged arbitrary population thresholds using the 2001 Population Census of India for selection of villages into the programme
  - First target: population > 1000
  - Second target: population > 500
- Implementation of the PMGSY was delegated to State governments.

The Pradhan Mantri Gram Sadak Yojana

Between 2000 and 2014:

- 400,000 kilometres of roads constructed
- 185,000 villages of which 107,000 previously unconnected

at the cost of almost $40 billion.



▸ All roads

Data

Digitise data on voting outcomes come from the Form-20 documents available from the Election Commission of India. Assign polling stations (over 800,000) to villages using their GPS coordinates (Susewind, 2014).

निर्वाचन का संचालन नियम, 1961

[प्ररूप–20]

अन्तिम परिणाम–पत्र

[नियम 56ग (2) (ग) देखिये]

(अधिसूचित मतदान केन्द्रों से भिन्न मतदान केन्द्रों पर मतदान का परिणाम अभिखित करने के लिये उपयोग में लाया जाए)

02– भिण्ड (अ.जा.) संसदीय क्षेत्र के लिए निर्वाचन

भाग–I

(संसदीय और विधानसभा दोनों निर्वाचनों के लिए उपयोग में लाया जाए)

20–सेंवढ़ा विधानसभा खण्ड में निर्वाचकों की कुल संख्या – 166102

राउण्ड–1	निम्नलिखित के पक्ष में दिये गये विधिमान्य मतों की संख्या									कुल विधिमान्य मत	प्रतिक्षेपित मतों की संख्या	"उपरोक्त में से कोई नहीं" विकल्प के मतों की संख्या	योग	निविदत्त मतों की सख्या
मतदान केन्द्र की कम संख्या	इमरतीदेवी	डॉ. भागीरथप्रसाद	मनीष कतरौलिया	अनिता हितेन्द्र चौधरी	कृष्णादेवी	बी.एस. थानेस्वरिया	फूलसिंह बरैया	विजयसिंह कोरी	हाकिम सिंह					
1	85	64	5	0	0	0	2	0	0	156	0	2	158	0
2	103	116	62	0	0	0	4	1	1	287	0	2	289	0
3	259	70	38	1	0	0	4	0	2	374	0	6	380	0
4	91	69	4	2	0	2	3	2	0	173	0	4	177	0
5	133	204	4	1	0	0	3	2	4	351	0	2	353	0
6	79	248	3	0	2	0	8	0	6	346	0	4	350	0
7	248	118	58	2	0	3	8	3	2	442	0	1	443	0
8	63	76	3	8	1	0	1	0	1	153	0	2	155	0
9	60	106	15	3	2	0	4	0	0	190	0	0	190	0
10	113	270	28	7	13	4	9	3	3	450	0	4	454	0
11	183	122	1	10	0	0	1	0	0	317	0	0	317	0
11 क	169	182	2	5	1	0	1	1	3	364	0	5	369	0
12	185	113	11	2	6	2	3	3	4	329	0	0	329	0
13	106	90	12	16	2	0	7	1	3	237	0	0	237	0
मतदान केन्द्रों में अभिलिखित किये गये मतों की संख्या	1877	1848	246	57	27	11	58	16	29	4169	0	32	4201	0
डाक मतपत्रों पर अभिलिखित किये गये मतों की संख्या	0	0	0	0	0	0	0	0	0	0	0	0	0	0
डाले गये कुल मत	1877	1848	246	57	27	11	58	16	29	4169	0	32	4201	0

स्थान– शा0उ0मा0वि0 क.–1 दतिया

तारीख : 16 मई 2014

सहायक रिटर्निंग ऑफीसर

▸ Election 2014

Data

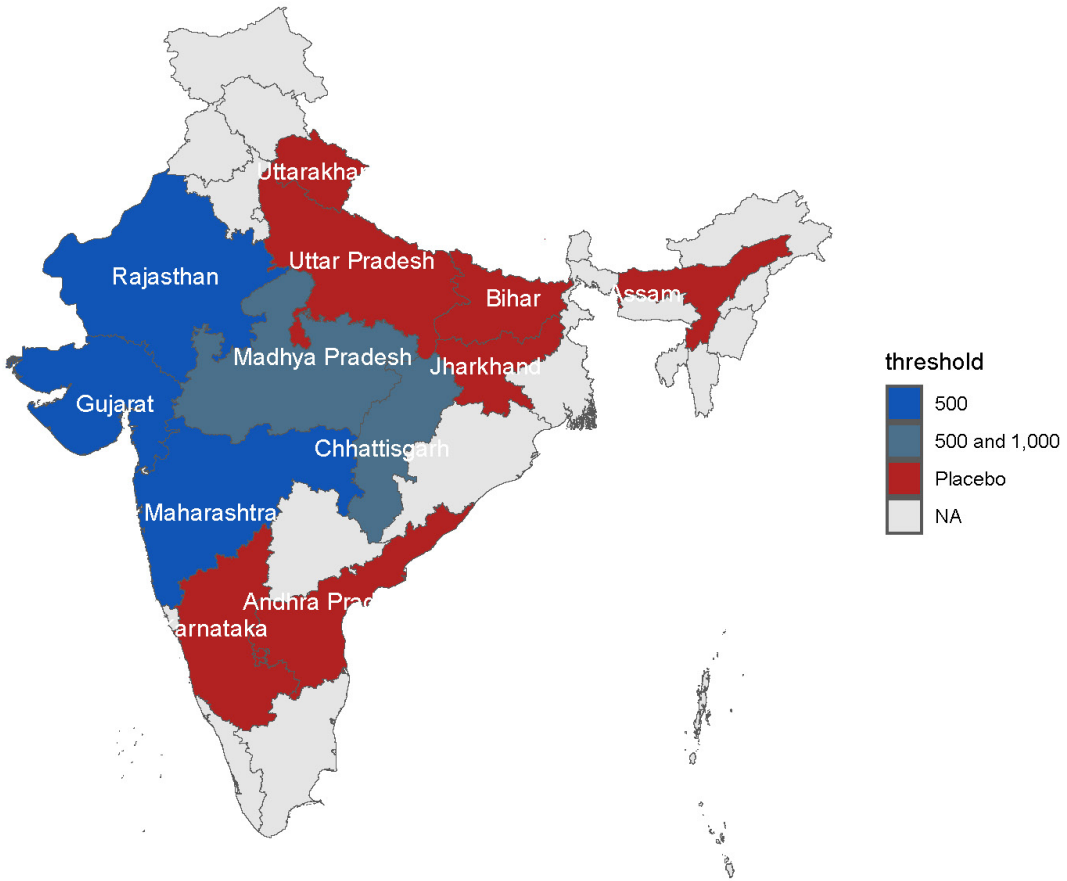
We leverage the SHRUG dataset on India which combines information from:

- 2001 Population Census – population
- PMGSY Portal – rural road construction
- 2011 Village Directory – transport services
- India Human Development Survey 2012 and remote sensing – consumption, poverty, and night light

Sample

Our main sample includes states that (i) adhered to the policy guidelines, (ii) had no paved road at baseline, (iii) within an optimal bandwidth.

States that did not adhere to the policy guidelines, but actively build roads, form the placebo sample.

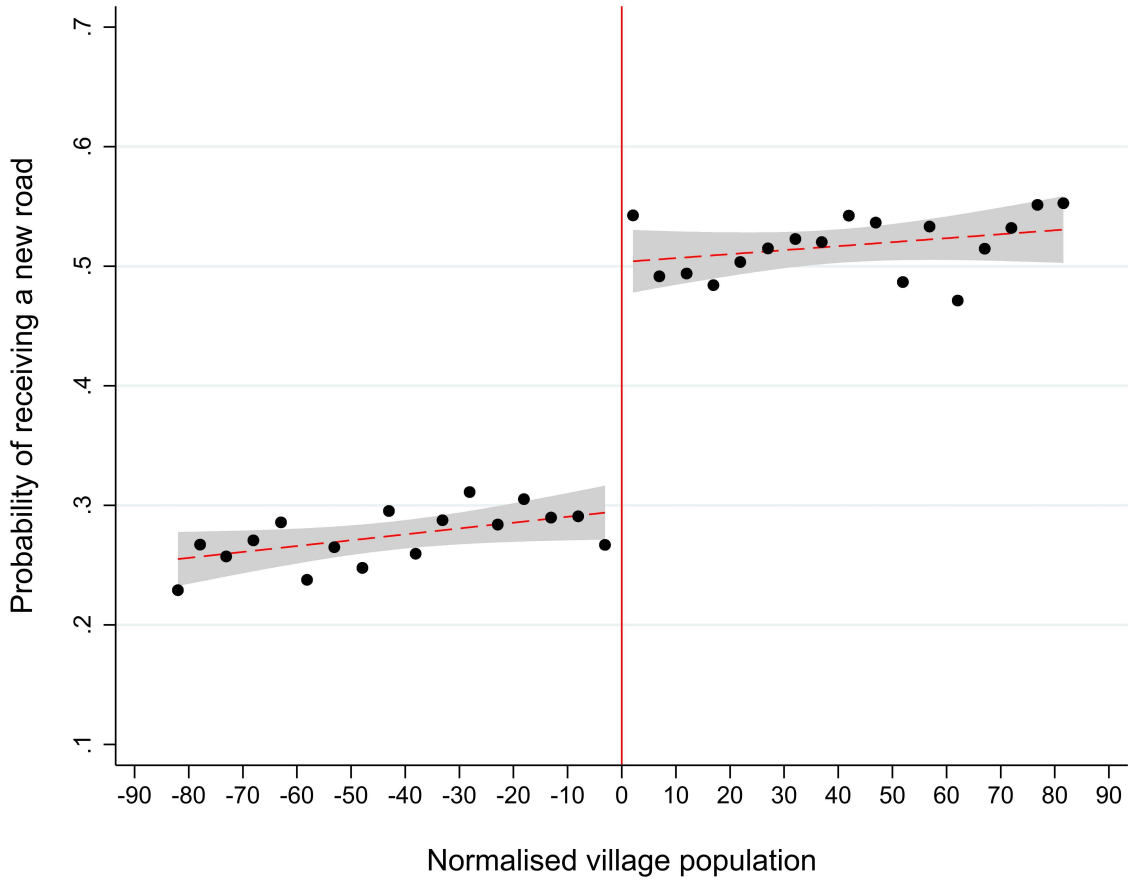


Exogenous Variation

- Given the large budgets required for public infrastructure programmes, the decision of where to allocate the investment is unlikely to be random.
- We exploit the PMGSY arbitrary population thresholds used to guide road construction as a source of exogenous variation.
  - Eligibility rules were not definitive
  - Estimate the causal effect using a Fuzzy Regression Discontinuity

▸ Regression Equation

First-stage: Treatment Effect on the Assignment Variable



▸ First Stage Table ▸ Baseline Balance Check Table ▸ Mccrary Test

Transport and the Village Economy

- As in the work by Asher & Novosad (2020), we find that a new road:

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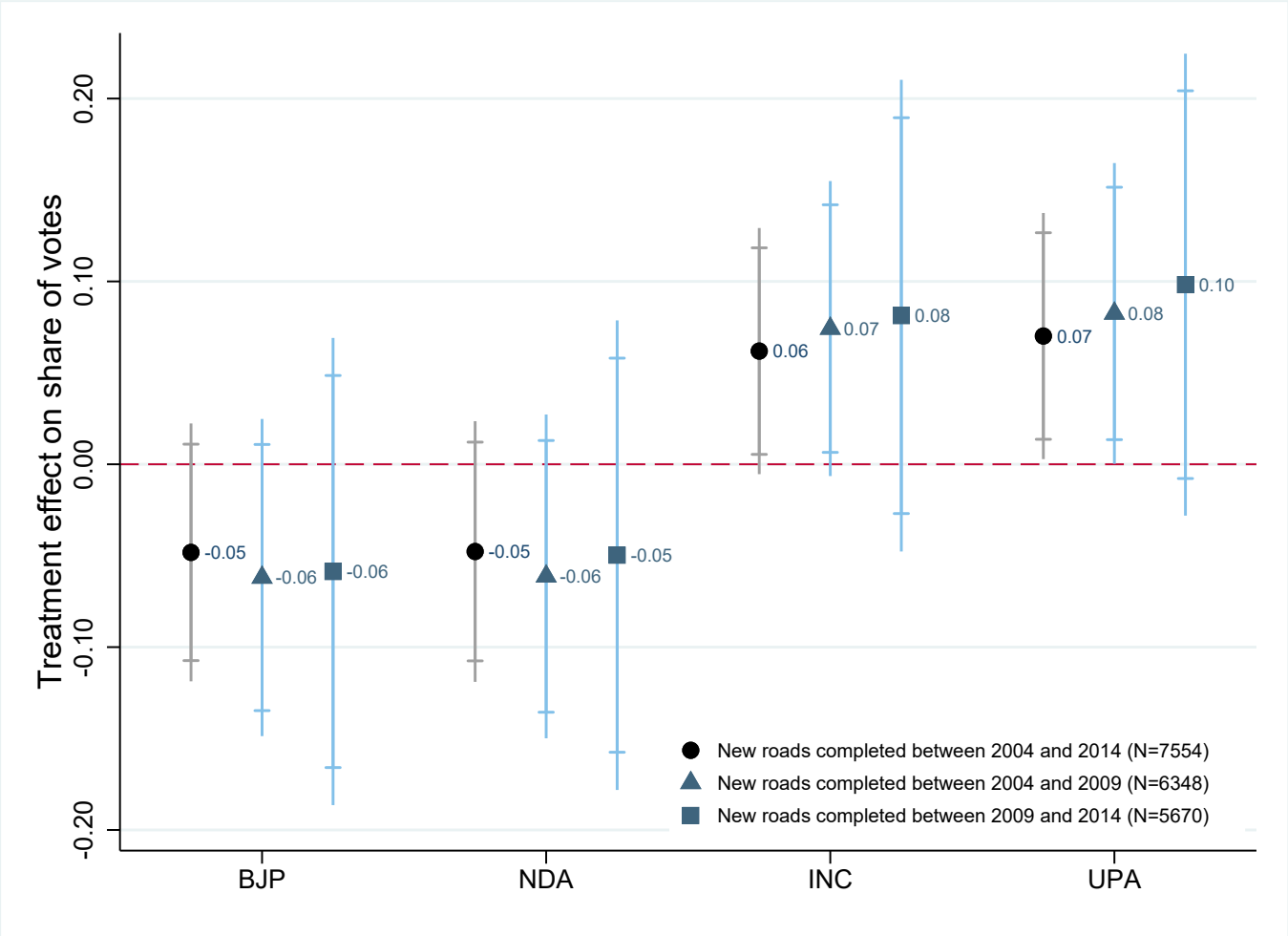
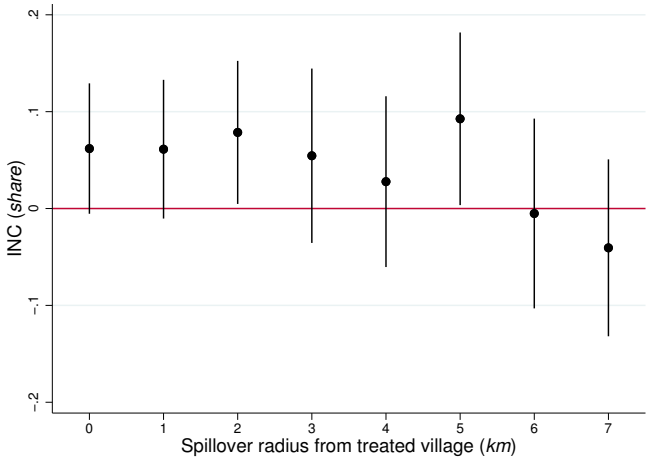
  - No significant effects on consumption at the village level. ▸ Figure
- Scheme may have affected other dimensions of welfare: education (Adukia et al. 2020), finance (Agarwal et al. 2023).

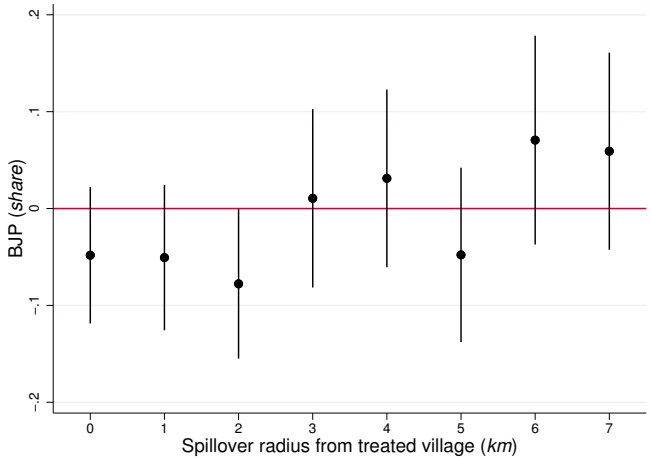
Share of Votes to Political Parties

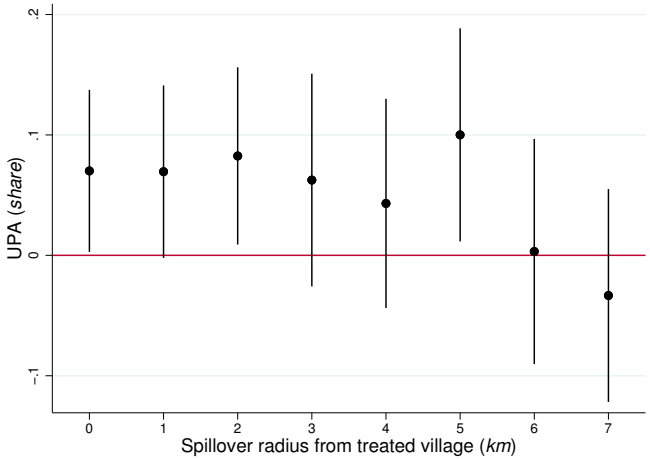


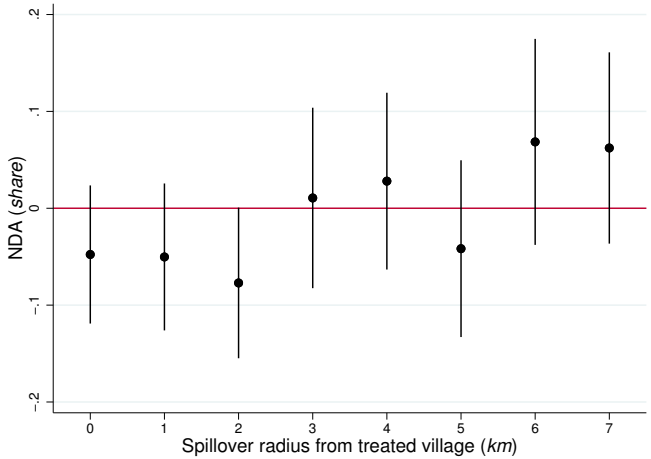
▸ Robustness

Spillover Effects

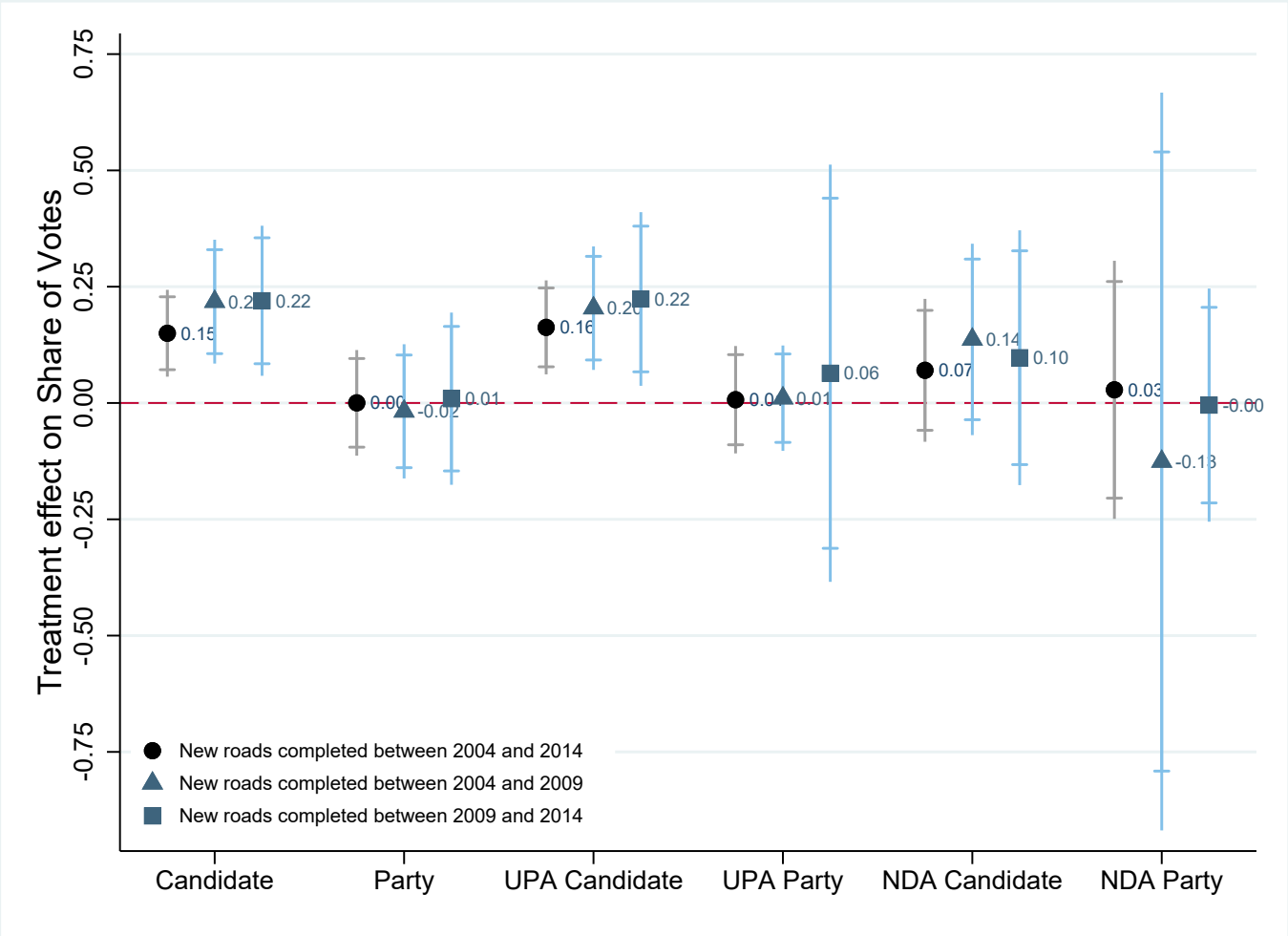








Share of Votes to the Incumbent



Contribution

- This paper is related to literature on economic voting.
- Evidence on political budget cycles suggests that voters use economic conditions immediately preceding elections as a signal of the government's ability (Healy and Lenz, 2014).
- Recently, a number of studies have evaluated the electoral outcomes from large government led poverty-alleviation programmes:
  - Voters value conditional cash transfer schemes and reward the incumbent (Manacorda et al. 2011; De La O 2013).
  - For India's public-works programme, Zimmerman (2021) finds that voter support declines with length of programme exposure.

What is the Cost of a Vote?

- Among only direct beneficiary villages, we estimate the price of a single vote to be $1799, which corresponds to 115% of GDP per capita in India in 2014.
- If we incorporate the spillover villages (2km), the average cost of a vote is only $59, or 3.8% of GDP.

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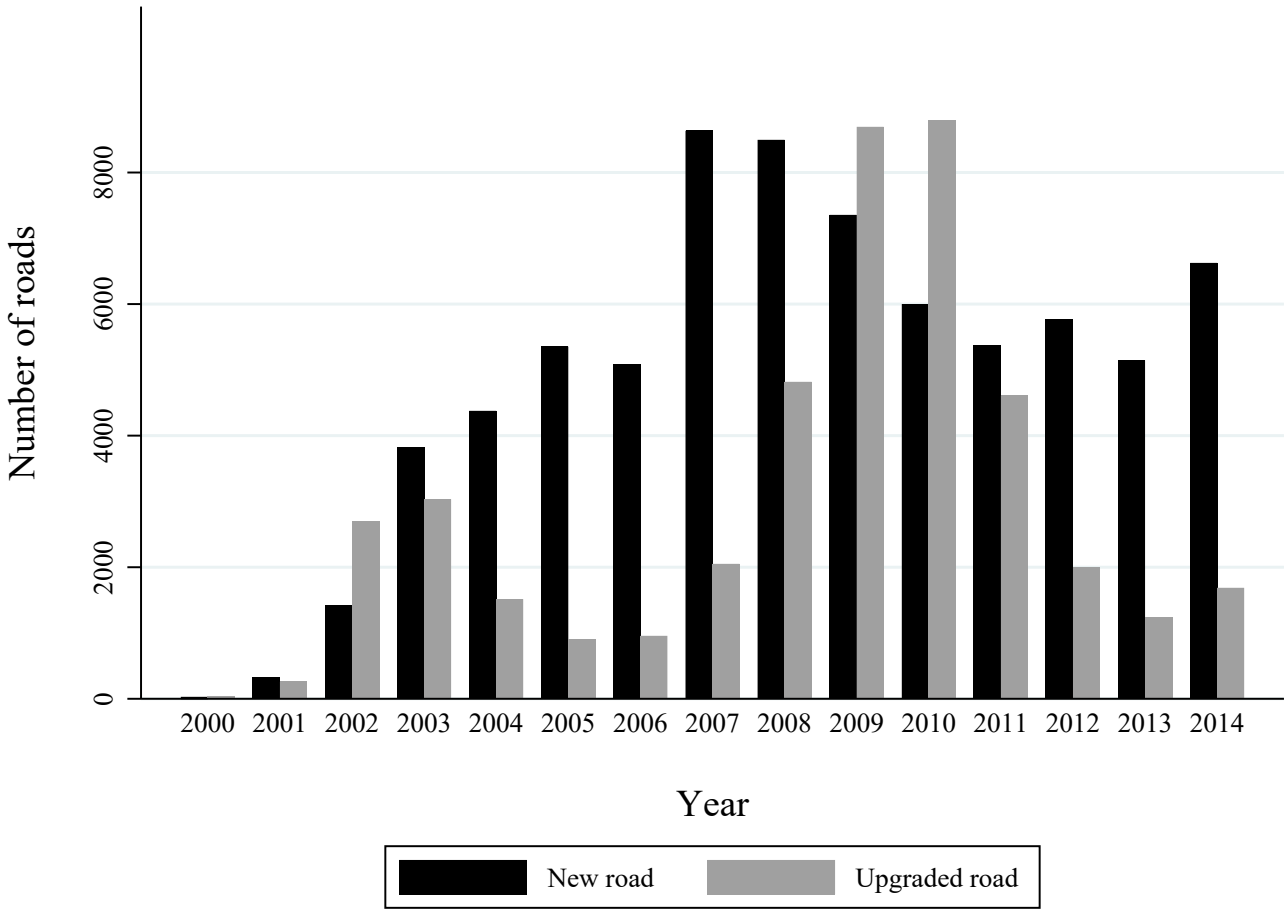
  - **How substantial is this cost?**
  - Evidence from vote buying through a food subsidy programme in Turkey suggests the cost of a vote to be $22, or 5.3% of GDP per capita in 2019 (Kaba 2022).
- While voters incorporate large-scale public infrastructure investment in their accountability mechanism, the cost effectiveness in comparison to short-term vote buying is largely dependent on the benefit spillover into surrounding areas.

Thank you!

Road construction



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The 2014 General Election

- The 2014 general election had two main political alliances that were declared before the vote:
  1. The incumbent United Progressive Alliance (UPA) led by the Indian National Congress (INC)
  2. The main opposition National Democratic Alliance (NDA), led by the Bharatiya Janata Party (BJP)
- 834 million registered voters, with 66% turnout.
- The BJP received 31% of the vote, winning 282 seats, while the INC received 19% of the vote, winning 44 seats.

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Fuzzy Regression Discontinuity

$$Road_{vcs} = \gamma_0 + \gamma_1(pop_{vcs} \geq T_s) + \gamma_2(pop_{vcs} - T_s) + \gamma_3(pop_{vcs} - T_s).(pop_{vcs} \geq T_s) + \nu X_{vcs} + \mu_c + \upsilon_{vcs} \quad (1)$$

$$Y_{vcs} = \beta_0 + \beta_1 Road_{vcs} + \beta_2(pop_{vcs} - T_s) + \beta_3(pop_{vcs} - T_s).(pop_{vcs} \geq T_s) + \sigma X_{vcs} + \eta_c + \varepsilon_{vcs} \quad (2)$$

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First Stage

	Bandwidth of the population threshold					
	± 60	± 70	± 80	± 90	± 100	± 110
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: New roads completed between 2004 and 2014						
New road	0.233***	0.229***	0.226***	0.222***	0.221***	0.221***
	(0.022)	(0.020)	(0.019)	(0.018)	(0.017)	(0.016)
F-Statistic	115.80	130.18	143.56	154.92	170.15	187.82
N	7736	9023	10299	11567	12895	14170
R^2	0.19	0.19	0.18	0.18	0.18	0.18
Panel B: New roads completed between 2009 and 2014						
New road	0.162***	0.159***	0.155***	0.151***	0.150***	0.150***
	(0.022)	(0.020)	(0.019)	(0.018)	(0.017)	(0.016)
F-Statistic	53.87	60.57	65.52	69.67	76.22	82.98
N	6039	7075	8087	9090	10097	11100
R^2	0.16	0.16	0.16	0.15	0.15	0.15
Panel C: New roads completed between 2004 and 2009						
New road	0.194***	0.192***	0.190***	0.188***	0.187***	0.188***
	(0.022)	(0.020)	(0.019)	(0.018)	(0.017)	(0.016)
F-Statistic	79.10	90.10	101.12	110.49	121.81	135.17
N	6370	7429	8472	9543	10658	11724
R^2	0.22	0.21	0.21	0.21	0.21	0.21

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Balance check

Variable	Full	Below	Over	Diff.	p-value on diff.	RD	p-value on RD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Amenities							
Primary school (*binary*)	0.954	0.949	0.960	0.011	0.01	-0.003	0.93
Medical centre (*binary*)	0.159	0.147	0.172	0.025	0.00	-0.055	0.40
Electricity (*binary*)	0.423	0.406	0.441	0.034	0.00	0.129	0.15
Distance to town (*km*)	26.983	26.943	27.028	0.085	0.85	-4.582	0.25
Panel B: Agricultural sector							
Agricultural area (*ln*)	5.149	5.096	5.208	0.112	0.00	0.018	0.89
Irrigated area (*share*)	0.280	0.275	0.286	0.011	0.05	0.054	0.29
Panel C: Demographics							
Literacy (*share*)	0.456	0.453	0.460	0.008	0.01	0.005	0.85
Scheduled caste (*share*)	0.142	0.141	0.143	0.002	0.54	-0.009	0.77
Landownership (*share*)	0.737	0.738	0.735	-0.003	0.55	0.020	0.64
Subsistence agriculture (*share*)	0.434	0.438	0.430	-0.007	0.15	0.037	0.43
Income > Rs.250/mth (*share*)	0.759	0.758	0.759	0.001	0.82	-0.052	0.29
N	10425	5513	4912				

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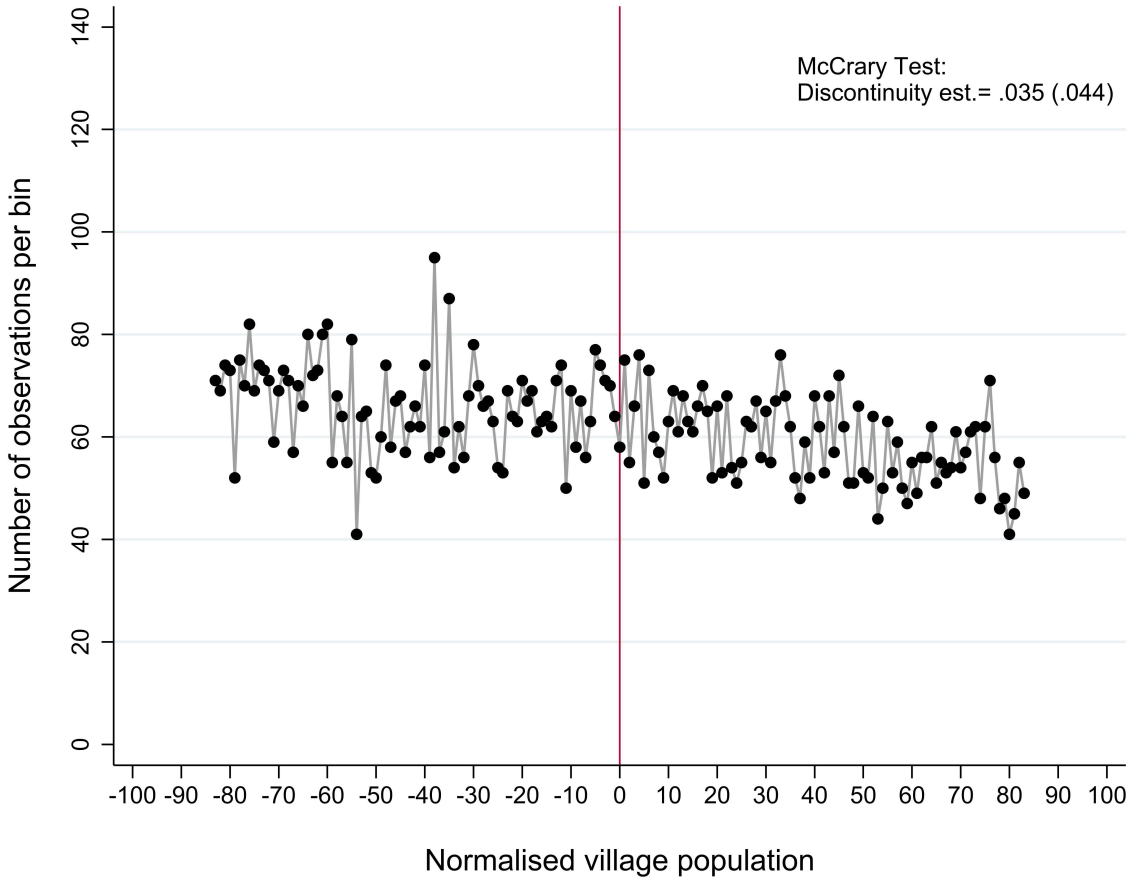
Distribution of the village population



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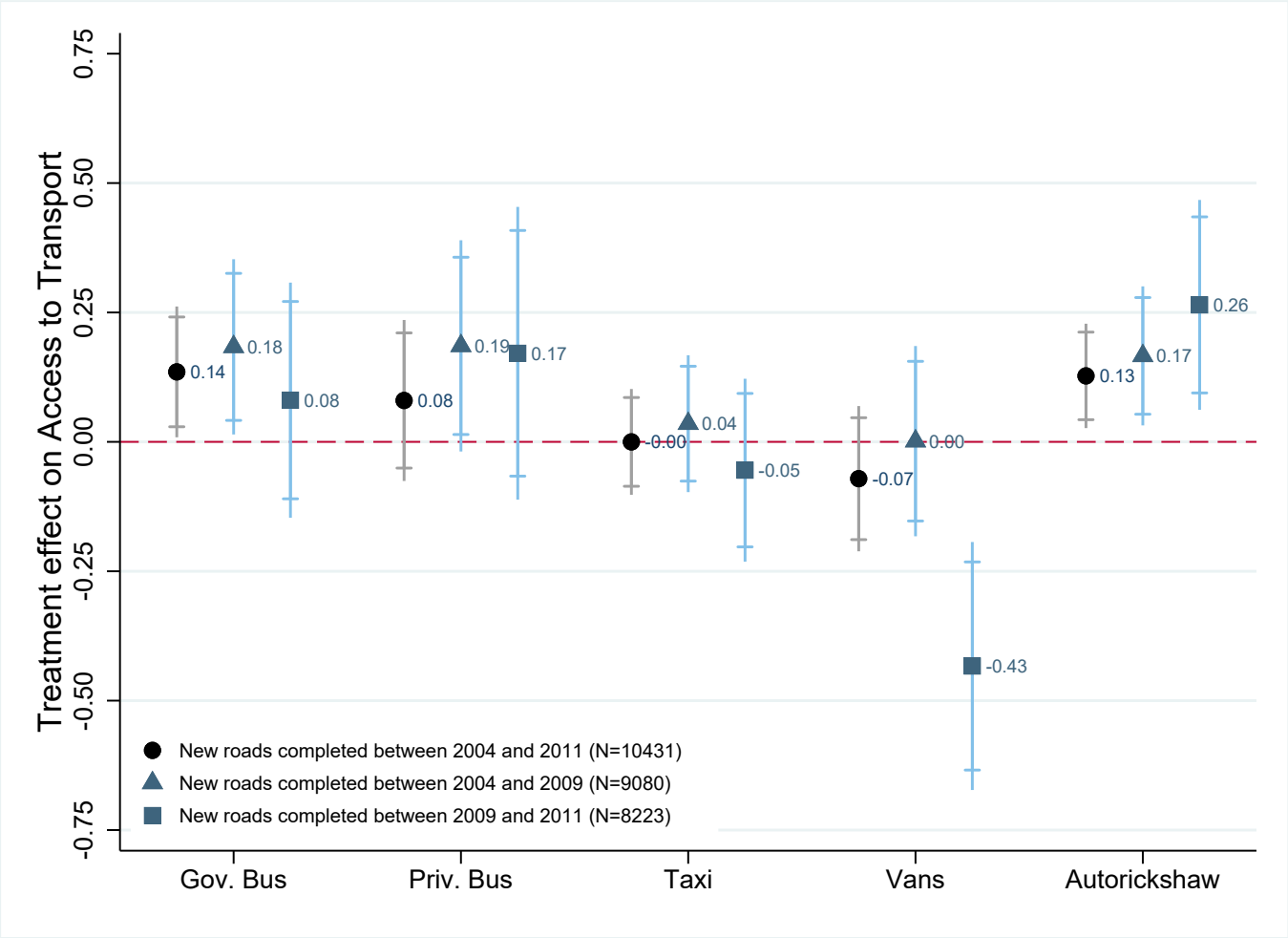
Access to Transport



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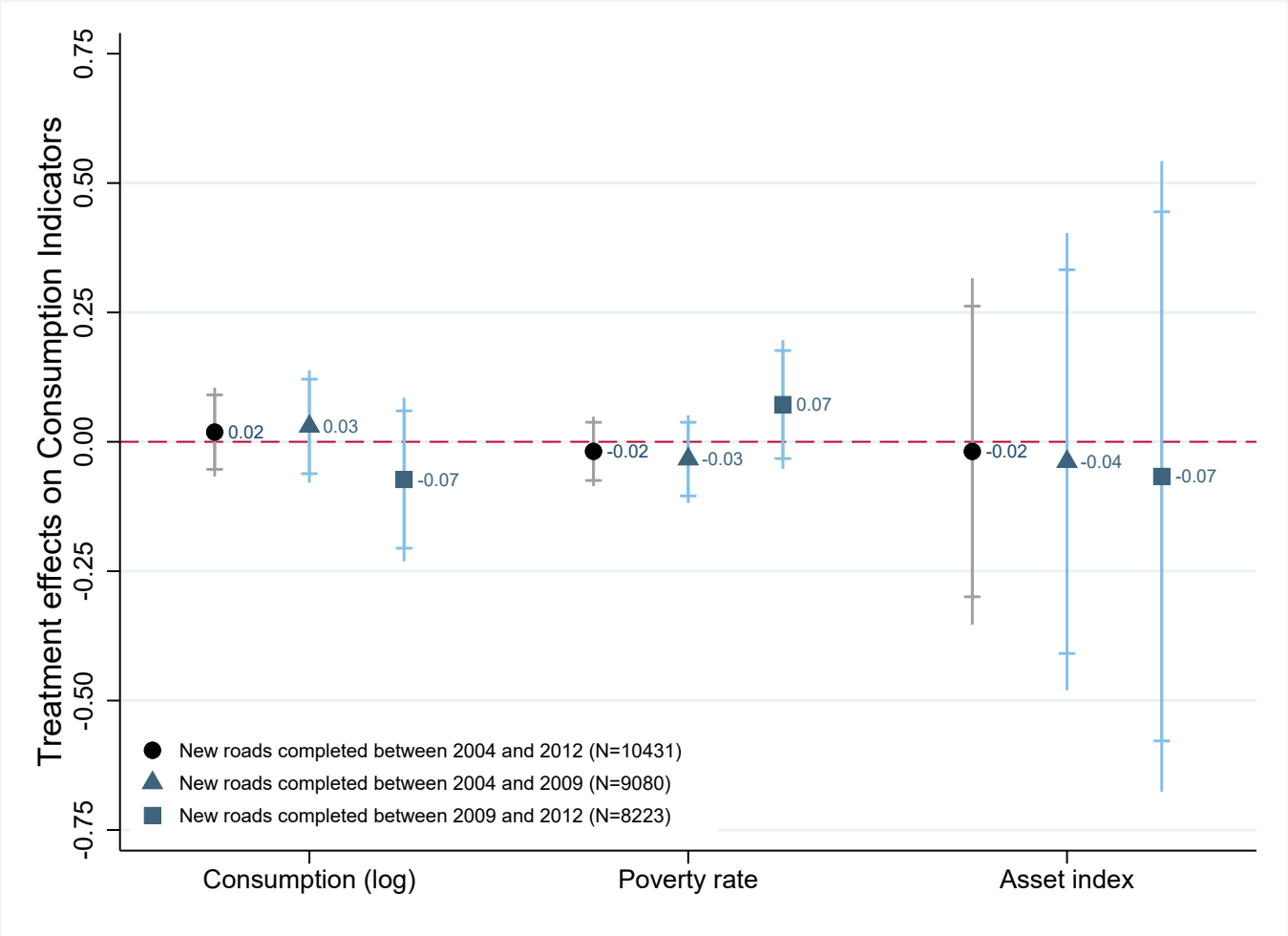
Consumption Indicators



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Robustness

- Results are consistent across a range of bandwidth and kernels.
- Excluding vector of covariates and fixed effects slightly increase standard errors but do not change the results.
- Placebo test shows no effects in States that built roads but did not adhere to the guidelines. ▸ Placebo Table

▸ Back

Robustness: Placebo Test

	First stage	Reduced form			
	Above population threshold	Political party		Incumbent	
		UPA	NDA	UPA	NDA
	(*binary*)	(*share*)	(*share*)	(*share*)	(*share*)
	(1)	(2)	(3)	(4)	(5)
Panel A: Main sample					
New road	0.225***	0.018**	-0.012	0.045***	0.019
	(0.019)	(0.009)	(0.009)	(0.013)	(0.020)
F-statistic	144.58				
N	10425	7532	7548	3011	1485
Panel B: Placebo sample					
New road	0.002	0.008	-0.016	0.023	-0.007
	(0.019)	(0.010)	(0.010)	(0.015)	(0.026)
F-statistic	0.02				
N	8173	7147	6879	2535	1298

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