Supplemental Materials to "Just in Time: Political Policy Cycles of Land Reform"

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Contents

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1 Summary Statistics

Table 1: Summary Statistics, Aggregate Data Analysis

Variable	Mean	Std. Dev.	Min	Max	N
Effective Number of Parties	2.63	1.37	1.15	9.14	515
% Owning No Land	13.48	8.18	0.96	41.58	515
% Land Owned By Bottom 50%	5.65	4.24	0.20	20.68	515
% Land Owned by Top 10%	49.37	7.03	29.30	66.92	515
Dummy Variables	Number of Occurrences				N
Land Reforms	48				515
Elections Held	126				515
Single-Party Dominant	146				515
Multiparty: Left-Center-Right	10				515
Two-Party: Left-Center	75				515
Two-Party: Center-Right	74				515
Leftist	33				515
Congress	348				515

Table 2: Summary Statistics, Survey Data Analysis

Variable	Surveys	Mean	Std. Dev.	Min	Max
Δ Land Reforms	1967 & 1971	0.44	0.71	0	2
	1971 & 1985	1.42	1.30	0	5
Education	1967 & 1971	1.67	1.06	1	5
	1971 & 1985	1.73	1.13	1	5
Political Interest	1967 & 1971	0.40	0.76	0	9
	1971 & 1985	0.38	0.76	0	9
Dummy Variables	**Surveys**	**Number of Occurrences**			
Dalit	1967 & 1971	981			
	1971 & 1985	808			
Backwards Caste	1967 & 1971	1149			
	1971 & 1985	825			
Brahmin Caste	1967 & 1971	419			
	1971 & 1985	381			
Male	1967 & 1971	4251			
	1971 & 1985	3070			
Hindu	1967 & 1971	5358			
	1971 & 1985	4537			
Muslim	1967 & 1971	765			
	1971 & 1985	578			
Farm Laborer/Cultivator	1967 & 1971	2219			
	1971 & 1985	2210			
Rural	1967 & 1971	5038			
	1971 & 1985	4185			
Aged 35 or Less	1967 & 1971	3174			
	1971 & 1985	2528			
Land/Inequality is the MIP	1967 & 1971	255			
Approve Land Grabs	1971 & 1985	2023			

Note: 6545 observations for the "1967 & 1971" surveys, and 5402 for the "1971 & 1985" surveys.

2 Preliminary Analysis

In the main paper, I presented a figure of the predicted probability of land reform, using only dummy variables for the election year and each of the four years before the election, similar to the approach taken by Khemani (2004). While this was designed to be a validity check on the theory, in Table 3 I show the full set of results of the OLS model with state and year fixed effects, with robust standard errors clustered by state. In the main paper, predicted probabilities were calculated, holding all fixed effects at their means.

Table 3: Evidence for Political Policy Cycles: A Simple Approach

	(1)
4 Years Before Election	-0.01
	(0.05)
3 Years Before Election	-0.05
	(0.05)
2 Years Before Election	0.01
	(0.04)
Year Before Election	0.07
	(0.06)
Election Year	0.01
	(0.03)
Constant	0.14
	(0.12)
N	529
States	16
R^2	.13
State FE	YES
Year FE	YES

Note: OLS with standard errors in parentheses, and standard errors clustered by state. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3 Robustness of the Aggregate Data Results

In the subsections below I probe the robustness of the aggregate data results in a variety of ways. The results in the main paper remain robust to these alternative specifications.

3.1 Linear Probability Model and Random Intercepts

In the main paper I estimate models with state and year fixed effects. To check the robustness of these results, in Table 4 I report the results of two alternative specifications. In the "RE" models, I use a generalized linear model (GLM) with a logistic link and using random intercepts rather than fixed intercepts. In the "LPM" models, I estimate linear probability models (i.e., OLS with a dichotomous dependent variable). The results are very similar—perhaps even stronger—than those in the main paper.

3.2 Alternative Monthly Election Coding

In the main paper the election variable was a dichotomous indicator equal to one in the election year. This indicator is somewhat course, since elections may take place throughout the year. In order to test whether this may influence the results, in Table 5, I re-specify the election indicator so that it is equal to $M/12$ in an election year (where M is the month of the election), and $(1-M/12)$ in the year before an election. All other years equal zero. Such an approach was first proposed by Franzese Jr (2000) and is common in political budget cycle articles. For all models, I use a time spline instead of year dummies. For each model specification, I estimate both a logistic model with random intercepts as well as fixed intercepts.

As shown in Table 5, the results are substantively very similar to those in the main paper. In fact, the coefficient on the year before an election is even more positive than in the main results. Land reforms are likely to occur in the year before the election, as shown by the positive and statistically significant coefficient across all specifications. Thus, the results remain robust to taking into account the month of Indian state elections.

Table 4: Robustness to Estimating Random Intercepts (RE) and Linear Probability Models (LPM)

	(1) RE	(2) LPM	(3) RE	(4) LPM	(5) RE	(6) LPM	(7) RE	(8) LPM
Year Before Election	1.09**	0.09**	1.06**	0.09**	1.09**	0.09**	1.14**	0.10**
	(0.52)	(0.04)	(0.53)	(0.04)	(0.54)	(0.04)	(0.56)	(0.04)
Election Year	0.44	0.02	0.60	0.02	0.64	0.02	0.63	0.03
	(0.63)	(0.04)	(0.64)	(0.04)	(0.65)	(0.04)	(0.65)	(0.04)
Single-Party Dominant	0.03	0.03	-0.09	0.01	-0.21	0.01	-0.16	0.02
	(0.45)	(0.04)	(0.43)	(0.04)	(0.45)	(0.04)	(0.44)	(0.04)
Multiparty: Left-Center-Right	0.55	-0.04						
	(0.95)	(0.11)						
Two-Party: Left-Center	0.81*	0.00						
	(0.47)	(0.15)						
Two-Party: Center-Right	-0.71	0.04						
	(0.70)	(0.05)						
% Owning No Land	0.02	0.01*	0.02	0.00	0.02	0.00		
	(0.02)	(0.00)	(0.03)	(0.00)	(0.03)	(0.00)		
Leftist			2.00***	0.12	2.31***	0.12	2.50***	0.11
			(0.75)	(0.08)	(0.86)	(0.08)	(0.84)	(0.08)
Congress			0.34	0.01	0.32	0.02	0.07	0.02
			(0.56)	(0.04)	(0.56)	(0.04)	(0.59)	(0.04)
Effective Number of Parties					-0.12	0.01	-0.06	-0.00
					(0.16)	(0.01)	(0.16)	(0.01)
% Land Owned by Bottom 50%							-0.10	-0.02
							(0.06)	(0.01)
% Land Owned by Top 10%							-0.04	-0.00
							(0.04)	(0.01)
Constant	-3.00**	-0.03	-3.15**	-0.01	-2.74*	-0.03	0.27	0.43
	(1.27)	(0.13)	(1.46)	(0.13)	(1.56)	(0.14)	(2.75)	(0.55)
N	320	515	320	515	320	515	320	515
States	15	15	15	15	15	15	15	15
State FE		YES		YES		YES		YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Log Lik.	-118.64	-45.33	-117.61	-44.18	-117.34	-44.08	-116.31	-43.44

Note: Dependent variable is dichotomous and equal to 1 if land reform was passed in state i in year t. Logit with standard errors in parentheses. Two-tail tests. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Results Remain Robust to Monthly Coding

	Model 1		Model 2		Model 3		Model 4	
	RE	FE	RE	FE	RE	FE	RE	FE
Year Before Election	1.03**	1.12**	1.14**	1.17**	1.13**	1.17**	1.04**	1.13**
Monthly Weight	(0.47)	(0.48)	(0.47)	(0.48)	(0.47)	(0.48)	(0.47)	(0.48)
Election Year	0.74	0.77	0.92	0.86	0.94	0.90	0.90	0.91
Monthly Weight	(0.94)	(0.96)	(0.96)	(0.97)	(0.96)	(0.98)	(0.96)	(0.98)
Single-Party	0.46	1.01**	0.10	0.46	0.13	0.51	0.19	0.59
Dominant	(0.40)	(0.50)	(0.38)	(0.43)	(0.40)	(0.44)	(0.38)	(0.44)
Multiparty:	1.62*	1.08						
Left-Center-Right	(0.87)	(1.03)						
Two-Party:	0.97**	1.25						
Left-Center	(0.43)	(1.63)						
Two-Party:	-0.38	1.00						
Center-Right	(0.66)	(0.91)						
% Owning No Land	0.03*	0.07**	0.04**	0.07***	0.04**	0.07***		
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)		
Leftist			1.74***	1.49*	1.68**	1.49*	1.93***	1.52*
			(0.63)	(0.78)	(0.68)	(0.78)	(0.65)	(0.80)
Congress			0.88*	0.88*	0.89*	0.89*	0.94*	1.04*
			(0.49)	(0.53)	(0.50)	(0.53)	(0.49)	(0.55)
Effective Number					0.03	0.11	0.05	0.02
of Parties					(0.13)	(0.15)	(0.13)	(0.15)
% Land Owned by							-0.07	-0.27
Bottom 50%							(0.06)	(0.20)
% Land Owned by							0.01	0.03
Top 10%							(0.03)	(0.09)
Constant	-4.36***		-5.13***		-5.25***		-5.01***	
	(0.74)		(0.89)		(1.01)		(1.81)	
State FE	–	YES	–	YES	–	YES	–	YES
Time Splines	YES	YES	YES	YES	YES	YES	YES	YES
N	515	515	515	515	515	515	515	515
States	15	15	15	15	15	15	15	15
Log Lik.	-147.94	-119.32	-148.17	-118.23	-148.14	-117.98	-148.69	-117.54
χ^2	22.10**	21.18**	19.60**	23.37***	19.28**	23.85***	19.35*	24.73***

Random-effects logit with standard errors in parentheses unless otherwise noted. Two-tail tests. Time-splines included but not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.3 Adding the Year After the Election

The coefficients in the main paper show the effect of the year before the election (holding constant the election year, and vice versa) relative to the omitted years. In this section, I create a placebo test by including a dummy variable equal to one for the year after an election.[1]

The results are shown in Table 6. Note that with the addition of this variable, we lose the first observations of the sample. However, even with the slight change in sample size, the coefficient on year before the election remains positive and statistically significant. Although the coefficient on the year after the election is negative—meaning that land reform is less likely to occur the year after the election—this effect is not statistically significantly different from zero. Overall, these results suggest that not only is land reform more likely in the year before the election as compared to all other years (not including the election year and the year after), the election year and year after the election indicators are not statistically significantly more or less likely to have land reform enacted as compared with all other off-election years (except year before the election).

[1] I thank an anonymous reviewer for suggesting this.

Table 6: Results Remain Robust to Including the Year After the Election

	Model 5		Model 6		Model 7		Model 8	
	RE	FE	RE	FE	RE	FE	RE	FE
Year Before Election	0.77**	0.81**	0.88**	0.89**	0.86**	0.88**	0.80**	0.93**
	(0.37)	(0.38)	(0.38)	(0.39)	(0.38)	(0.39)	(0.38)	(0.39)
Election Year	-0.26	-0.26	-0.13	-0.14	-0.15	-0.17	-0.19	-0.09
	(0.49)	(0.49)	(0.49)	(0.50)	(0.49)	(0.50)	(0.49)	(0.50)
Year After Election	-0.45	-0.48	-0.29	-0.34	-0.32	-0.39	-0.29	-0.33
	(0.44)	(0.44)	(0.44)	(0.44)	(0.45)	(0.45)	(0.44)	(0.45)
Single-Party	0.29	0.89*	0.02	0.51	0.08	0.57	0.13	0.68
Dominant	(0.41)	(0.51)	(0.41)	(0.45)	(0.43)	(0.46)	(0.39)	(0.46)
Multiparty:	1.61*	1.24						
Left-Center-Right	(0.88)	(1.07)						
Two-Party	0.90**	-12.77						
Left-Center	(0.44)	(1090.26)						
Two-Party	-0.41	0.82						
Center-Right	(0.66)	(0.92)						
% Owning No Land	0.04**	0.08**	0.04**	0.07**	0.05**	0.07**		
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)		
Leftist			1.64**	1.25	1.52**	1.25	1.88***	1.32
			(0.64)	(0.79)	(0.69)	(0.80)	(0.66)	(0.82)
Congress			0.78	0.77	0.79	0.79	0.86*	0.96*
			(0.50)	(0.55)	(0.50)	(0.55)	(0.50)	(0.56)
Effective Number					0.06	0.13	0.10	0.04
of Parties					(0.13)	(0.15)	(0.13)	(0.15)
% Land Owned by							-0.09	-0.29
Bottom 50%							(0.06)	(0.21)
% Land Owned by							0.01	0.04
Top 10%							(0.03)	(0.09)
Constant	-4.17***		-4.93***		-5.14***		-4.48**	
	(0.77)		(0.92)		(1.04)		(1.91)	
State FE	–	YES	–	YES	–	YES	–	YES
Time Splines	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	501	501	501	501	501	501	501	501
States	15	15	15	15	15	15	15	15
Log Lik.	-138.84	-110.52	-139.21	-110.16	-139.10	-109.82	-139.48	-108.63
χ^2	23.56**	21.91**	21.31**	22.62**	20.67**	23.30**	21.04**	25.69**

Random-effects logit with standard errors in parentheses (unless otherwise noted). Two-tail tests. Time-splines included but not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.4 Historic Changes in Land Reform

Although land reform is a policy that has been passed repeatedly in India at the state level, it does seem to have been most popular following independence and gradually become less common over time. To see how this influences the results, I split the data into pre- and post-1970 periods.[2] The time span from 1957-1970 comprises about 39 percent of the data.

The results are shown in Table 7.[3] The results are consistent with those using the full sample; land reform is most likely in the year before an election. Interestingly, this effect seems to be slightly stronger before 1970. A number of other variables are of interest in Table 7. Single-party dominance has no effect on the likelihood of land reform, nor do most of the other competition variables. Leftist and Congress-controlled states make land reform more likely, but only after 1970. Greater numbers of poor citizens also increase the likelihood of land reform, but only before 1970. The effective number of parties is positive and statistically significant only in Model 12 (post-1970), as are the land inequality measures, though they make reform less likely.

[2] I thank an anonymous reviewer for suggesting such an analysis.

[3] For brevity, only the random effects logit specification is shown. Multiparty: Left-Center-Right is dropped from Model 1 due to collinearity issues (it only comprises about two percent of the full sample).

Table 7: Pre-1970 Policy Cycle More Common Than Post-1970

	Model 9		Model 10		Model 11		Model 12	
	1957-1970	Post-1970	1957-1970	Post-1970	1957-1970	Post-1970	1957-1970	Post-1970
Year Before Election	1.11*	0.87*	1.09*	0.92*	1.15**	0.90*	1.05*	0.83*
	(0.58)	(0.49)	(0.58)	(0.50)	(0.58)	(0.51)	(0.57)	(0.50)
Election Year	-0.06	0.21	-0.07	0.32	-0.01	0.32	0.02	0.33
	(0.63)	(0.56)	(0.64)	(0.56)	(0.64)	(0.57)	(0.64)	(0.57)
Single-Party Dominant	0.08	0.59	0.11	0.32	-0.05	0.69	-0.22	1.03
	(0.62)	(0.67)	(0.53)	(0.67)	(0.57)	(0.77)	(0.56)	(0.78)
Two-Party Left-Center	-0.22	1.63***						
	(0.74)	(0.61)						
Two-Party Center-Right	-0.13	-0.55						
	(1.21)	(0.83)						
% Owning No Land	0.06**	-0.01	0.05**	-0.00	0.05*	0.00		
	(0.03)	(0.04)	(0.02)	(0.05)	(0.03)	(0.05)		
Leftist			1.10	1.85**	1.41	1.46	1.77	1.79**
			(1.51)	(0.90)	(1.59)	(0.94)	(1.64)	(0.83)
Congress			0.48	1.17*	0.33	1.19*	0.26	1.10*
			(0.89)	(0.63)	(0.92)	(0.65)	(0.93)	(0.62)
Effective Number of Parties					-0.20	0.29	-0.36	0.54**
					(0.29)	(0.23)	(0.30)	(0.23)
% Land Owned by Bottom 50%							0.01	-0.30***
							(0.08)	(0.11)
% Land Owned by Top 10%							0.04	-0.14**
							(0.04)	(0.07)
Constant	-5.12***	-3.81***	-5.66***	-4.65***	-4.92**	-5.68***	-5.73**	2.33
	(1.41)	(1.01)	(1.64)	(1.17)	(1.93)	(1.49)	(2.84)	(3.56)
Time Splines	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	200	315	200	315	200	315	200	315
States	15	15	15	15	15	15	15	15
Log Lik.	-62.65	-81.19	-62.40	-81.63	-62.13	-80.73	-63.18	-77.10
χ^2	11.61	13.96	11.83	11.24	12.03	11.63	10.35	19.16*

Random-effects logit with standard errors in parentheses. Two-tail tests. Time-splines included but not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.5 The Emergency

One particularly important national event in India during the period analyzed in the aggregate was the Emergency. This refers to a 21 month period from 1975 to 1977 when Prime Minister Indira Gandhi declared a state of emergency throughout the country. During this time, civil liberties were curtailed, the press was censored, the judiciary was suppressed, and mass arrests occurred. Following the Emergency, and in the elections of 1977, there was a big political shift away from the Congress-I Party (Gandhi's party ended up losing about 200 seats in parliament) which led to the growth of opposition parties (Klieman, 1981).

To see if this period in Indian history affected the passage of land reforms, I split the data into the time before the Emergency (1957-1974), and the period during and after the Emergency.[4] The results are shown in Table 8.[5] Only results from a random effects logit specification (with time splines) are shown. As is clear from Table 8, while the coefficient on year before the election is positive across the split samples, the coefficient is statistically significant only for the post-Emergency sample. This is somewhat interesting since the results in Table 7 indicated that the 1957-1970 period show the strongest evidence for a political policy cycle in the year before the election. In general, many of the other variables point in the same direction as those in Table 7, though they tend to be statistically significantly different from zero less often; for instance, the Congress party variable is positive but not statistically significant across all models.

[4] I thank a reviewer for suggesting an analysis of the potential consequences of the Emergency.

[5] As with Multiparty: Left-Center-Right, Two-Party: Center-Right is also dropped from Model 1 due to collinearity issues.

Table 8: Examining the Effects of the Emergency

	Model 13		Model 14		Model 15		Model 16	
	Pre-Emergency	Post-Emergency	Pre-Emergency	Post-Emergency	Pre-Emergency	Post-Emergency	Pre-Emergency	Post-Emergency
Year Before Election	0.57	1.61**	0.62	1.59**	0.62	1.60**	0.61	1.66**
	(0.47)	(0.68)	(0.47)	(0.69)	(0.47)	(0.68)	(0.47)	(0.69)
Election Year	0.12	0.05	0.17	0.06	0.16	0.03	0.19	0.05
	(0.47)	(0.92)	(0.47)	(0.92)	(0.47)	(0.92)	(0.47)	(0.94)
Single-Party Dominant	-0.33	1.01	-0.43	0.79	-0.42	0.59	-0.43	0.89
	(0.43)	(0.96)	(0.41)	(0.92)	(0.43)	(0.89)	(0.43)	(1.05)
Two-Party Left-Center	0.05	2.37***						
	(0.53)	(0.87)						
% Owning No Land	0.03	-0.06	0.03	-0.06	0.03	-0.07		
	(0.02)	(0.07)	(0.02)	(0.07)	(0.02)	(0.06)		
Leftist			1.32	2.53**	1.28	2.99***	1.97	2.39***
			(1.08)	(1.02)	(1.16)	(1.00)	(1.28)	(0.92)
Congress			0.68	0.59	0.70	0.58	0.64	0.53
			(0.69)	(0.77)	(0.72)	(0.75)	(0.73)	(0.78)
Effective Number of Parties					0.02	-0.19	-0.04	0.25
					(0.18)	(0.23)	(0.18)	(0.32)
% Land Owned by Bottom 50%							-0.06	-0.22
							(0.07)	(0.14)
% Land Owned by Top 10%							0.02	-0.16*
							(0.03)	(0.09)
Constant	-3.79***	-4.47***	-4.52***	-4.25***	-4.60***	-3.60**	-4.49*	3.70
	(0.91)	(1.44)	(1.15)	(1.50)	(1.39)	(1.40)	(2.41)	(4.52)
Time Splines	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	260	255	260	255	260	255	260	255
States	15	15	15	15	15	15	15	15
Log Lik.	-95.86	-44.59	-94.99	-45.14	-94.99	-44.92	-95.17	-43.72
χ^2	9.07	14.11*	10.44	14.10	10.45	16.04*	9.61	17.47*

Random-effects logit with standard errors in parentheses. Two-tail tests. Time-splines included but not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.6 Disaggregating Land Reform

In the main paper, the dependent variable in the aggregate-level analysis was land reform, which was a combination of four categories: tenancy reform, the abolishing of intermediaries, ceilings on landholdings, and the consolidation of landholdings. In Table 9 I parse out the dependent variable further. I first create a dependent variable that equals 1 if a tenancy reform is passed in the state-year, and 0 otherwise. The other dependent variable is a combination of intermediary abolition, landholding ceilings, and consolidation—done so since these were the three least-common categories. The results from Table 1 in the main paper are shown here in Table 9, using random effects logit with time splines for all models.

As clear from Table 9, even disaggregating land reform out further, substantive results remain identical to those in the main paper. Land reform is likely in the year before the election, and left-leaning governments are the most likely likely to carry out reforms. Interestingly, the Congress party seems to have favored reforms other than tenancy reform, as evidenced by the significance of the Congress dummy variable for the "Other" three types of land reform. States with two-party left-center political competition also tend to make both tenancy and other types of reform more likely than other types of competition.

Table 9: Parsing out the Type of Land Reform

	Model 17		Model 18		Model 19		Model 20	
	Tenancy	Other	Tenancy	Other	Tenancy	Other	Tenancy	Other
Year Before	1.16***	1.35***	1.26***	1.49***	1.26***	1.49***	1.24***	1.38***
Election	(0.41)	(0.44)	(0.42)	(0.46)	(0.42)	(0.46)	(0.41)	(0.44)
Election Year	0.14	0.21	0.21	0.31	0.21	0.31	0.24	0.32
	(0.49)	(0.53)	(0.50)	(0.54)	(0.50)	(0.54)	(0.49)	(0.53)
Single-Party	0.20	0.50	0.04	0.16	0.06	0.18	0.02	0.23
Dominant	(0.47)	(0.48)	(0.48)	(0.47)	(0.50)	(0.51)	(0.46)	(0.46)
Multiparty:	0.73	1.18						
Left-Center-Right	(1.13)	(1.15)						
Two-Party:	1.18**	0.99*						
Left-Center	(0.47)	(0.51)						
Two-Party:	-0.63	-1.03						
Center-Right	(0.79)	(1.07)						
% Owning	0.01	0.04*	0.02	0.05	0.02	0.05		
No Land	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.04)		
Leftist			1.95***	2.68***	1.92**	2.66***	2.22***	2.97***
			(0.71)	(0.89)	(0.75)	(0.94)	(0.69)	(0.90)
Congress			0.73	1.52*	0.74	1.52*	0.74	1.62**
			(0.56)	(0.78)	(0.56)	(0.79)	(0.55)	(0.78)
Effective No.					0.02	0.02	0.07	0.07
of Parties					(0.15)	(0.18)	(0.15)	(0.17)
% Land Owned							-0.11	-0.09
Bottom 50%							(0.07)	(0.07)
% Land Owned							-0.01	-0.01
Top 10%							(0.04)	(0.04)
Constant	-4.05***	-5.21***	-4.99***	-6.91***	-5.07***	-6.99***	-3.84*	-5.36**
	(0.80)	(0.96)	(0.98)	(1.33)	(1.11)	(1.57)	(2.11)	(2.34)
Time Splines	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	515	515	515	515	515	515	515	515
States	15	15	15	15	15	15	15	15
Log Lik.	-117.18	-103.84	-116.63	-101.33	-116.62	-101.33	-115.54	-102.31
χ^2	21.39**	23.89***	18.93**	22.93***	18.86**	22.61**	23.51**	25.34***

Random-effects logit with standard errors in parentheses. Two-tail tests. Time-splines included but not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.7 Robustness to Recoding Party Competition, as Well as Additional Control Variables

In Table 10, I probe the robustness of the results with a number of additional control variables. First, another way of operationalizing party competition is by dichotomizing the effective number of parties. In the models below, I add Multiparty (CN), which is a dichotomous variable equal to one if a state has more than three effective parties in year t. Such a coding scheme was introduced by Chhibber and Nooruddin (2004, p. 166).[6]

The results of this recoded competition measure are shown in Table 10. The coefficient is positive and statistically significant across nearly all model specifications in Table 10, suggesting that more than three effective parties makes land reform more likely. However, these effects are substantively small compared to many of the other coefficients. Also note that the coefficient on the year before an election remains statistically significant and positive across all model specifications in Table 10, as does Leftist and the percent that do not own any land. All three of these coefficients are positively signed indicating that they make reform more likely.

To investigate the effect of early elections, in Model 22 I add a dummy variable that equals one if there were Early Elections in that year. Early elections most commonly occur due to a vote of no confidence or a collapse of a majority coalition. It can also be caused by the imposition of President's Rule, which is discussed below. As shown in Model 22, accounting for early elections does not affect the previous findings. Nor is this variable statistically significant across the various model specifications in Table 10. This suggests that early (i.e., endogenous) elections are not driving the findings.

In Model 23 I control for President's Rule, which occurs when, "the president of India, upon receipt of a report by the governor of the state or otherwise, may be satisfied that constitutional breakdown has occurred at the state level. This leads to the temporary imposition of President's Rule and, eventually, fresh elections" (Arulampalam et al., 2009, p. 10). Accounting for this seems especially important given the results during the

[6] I thank an anonymous reviewer for suggesting this alternative measure.

Table 10: Robustness to Party Competition Recoding and Additional Controls

	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Year Before	0.99***	1.02***	1.01***	1.01***	0.94**	0.98***	1.08*	0.94**
Election	(0.38)	(0.38)	(0.38)	(0.38)	(0.37)	(0.38)	(0.56)	(0.37)
Election Year	0.04	-0.26	-0.27	-0.30	-0.28	-0.29	-0.47	-0.27
	(0.42)	(0.53)	(0.53)	(0.53)	(0.53)	(0.53)	(0.93)	(0.53)
Single-Party	0.77	0.80*	0.76	0.78	0.39	0.78	0.73	0.83*
Dominant	(0.48)	(0.48)	(0.48)	(0.49)	(0.41)	(0.49)	(0.59)	(0.48)
Leftist	1.52*	1.52*	1.45*	1.62*	1.31*	1.58*	2.01**	1.81**
	(0.80)	(0.80)	(0.81)	(0.84)	(0.70)	(0.84)	(0.98)	(0.86)
Congress	0.82	0.87	0.85	0.07	-0.23	-0.04	-0.55	0.07
	(0.53)	(0.53)	(0.53)	(0.84)	(0.79)	(0.83)	(1.05)	(0.86)
% Owning	0.09***	0.09***	0.09***	0.08***	0.05**	0.08***	0.13**	
No Land	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.05)	
Multiparty (CN)	0.86*	0.82*	0.82*	0.85*	0.54	0.83*	0.48	0.72
	(0.47)	(0.47)	(0.47)	(0.47)	(0.40)	(0.47)	(0.62)	(0.46)
Early Elections		0.76	0.78	0.82	0.81	0.84	1.07	0.77
		(0.72)	(0.72)	(0.72)	(0.72)	(0.72)	(1.10)	(0.72)
President's Rule			-0.38	-0.39	-0.23	-0.37	-0.40	-0.52
			(0.71)	(0.72)	(0.65)	(0.72)	(0.90)	(0.72)
Strictly Affiliated				1.01	1.28	1.08	1.24	1.19
				(0.89)	(0.81)	(0.89)	(1.05)	(0.92)
West Bengal					1.06**			
					(0.51)			
Gini								12.47**
								(5.72)
Constant					-5.61***			
					(0.93)			
State FE	YES	YES	YES	YES	–	YES	YES	YES
Time Splines	YES	YES	YES	YES	YES	–	–	YES
Lowess Smoother	–	–	–	–	–	YES	–	–
Year FE	–	–	–	–	–	–	YES	–
Obs	515	515	515	515	515	515	515	515
States	15	15	15	15	15	15	15	15
Log Lik.	-115.69	-115.14	-114.99	-114.34	-143.16	-114.45	-86.19	-115.96
χ^2	28.44***	29.54***	29.84***	31.14***	28.45**	30.92***	87.44***	27.89***

Fixed-effects logit with standard errors in parentheses unless otherwise noted. Two-tail tests. Time-splines included unless otherwise noted. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Emergency in Table 8, when President's Rule was often enacted. However, inclusion of this control does not change the results either. Similar to early elections, this coefficient is not statistically significantly different from zero across all model specifications.

Another control variable important to the Indian context is based off Khemani's (2004; 2007) Strictly Affiliated indicator, and shown in Model 24. This dummy variable equals one if the subnational party in government is the same as the party in government at the national level. Existing literature suggests competing expectations in regards to political control in India's federal system. On the one hand, a coattails effect may exist whereby state parties aligned with the central government benefit from the additional popularity of the national stage, and therefore should be less likely to need to win over voters through land reforms. On the other hand, if we hold the view that the national party determines state policy, there may exist strong pressure for aligned states to implement land reform to benefit the party on the national stage; yet, as discussed in the main paper, national governments had little influence over state land reform policies. Although the strictly affiliated dummy lies in the positive direction, it is not statistically significant, and its inclusion has no substantive effect on the political timing variables.

As a further check, in Model 25 I add a dummy variable for West Bengal, since the colonial history of zamandari estates in this region gave rise in the 20^{th} century to leftist and communist groups, who often championed land reforms.[7] Its inclusion has no effect on the substantive impact of the findings, although the coefficient is statistically significant and positive, suggesting that West Bengal is more likely than other states to enact land reform, all else equal.

In Model 26 and 27 I probe the sensitivity of accounting for temporal duration. I continue to use state fixed effects in Model 26 but substitute out the cubic splines for a single lowess smoother. The results remain unchanged. In Model 27 I include both state and year fixed effects. It too has no substantive impact on the results.

Last, in Model 28 I include a measure of inequality as measured through the Gini

[7]Note that Model 25 is the only model in Table 10 estimated using random effects, all others employ state fixed effects.

coefficient (where 0 means perfect equality and 1 means perfect inequality). The coefficient on Gini is positive and statistically significant, which suggests that more unequal states are more likely to enact land reforms. This is consistent with most of the other measures of inequality and poverty used in the main paper. Overall, the main findings are robust to all of the alternative specifications shown in Table 10.

4 Are Voters Aware of Reform?

One question is whether voters are actually aware of reform.[8] Other than anecdotal evidence (eg., Bandyopadhyay, 1986; Bardhan and Mookherjee, 2010; Banerjee, Gertler and Ghatak, 2002), it is hard to quantify this. To proxy for awareness—especially among the poor—I use the Indian National Election Study data's question on whether respondents approve of land grabs. As shown in Figure 1, across levels of education (a proxy for income; unfortunately coverage using income is poor), only about 17 percent of the least-educated voters are unaware—or do not have an opinion on—land grabs. This suggests that, although the "don't know" category is much higher for the least educated than for other education groups, voters tend to have some opinion (either positive or negative) about it.

5 Data Sources

Aggregate data sources are from Besley and Burgess (2000, 2002, 2004) and the EOPP Indian States Data Base, as well as Chhibber and Nooruddin (2004).[9] The following states were included in the aggregate analysis: Andhra Pradesh, Assam, Bihar, Gujarat, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. Although Jammu and

[8] I thank an anonymous reviewer for this suggestion.

[9] The Chhibber and Nooruddin (2004) data are available in the Appendix of the article. The EOPP dataset is available at
http://www.lse.ac.uk/economics/people/facultyPersonalPages/facultyFiles/EOPPIndianStatesData/EOPPIndianSta

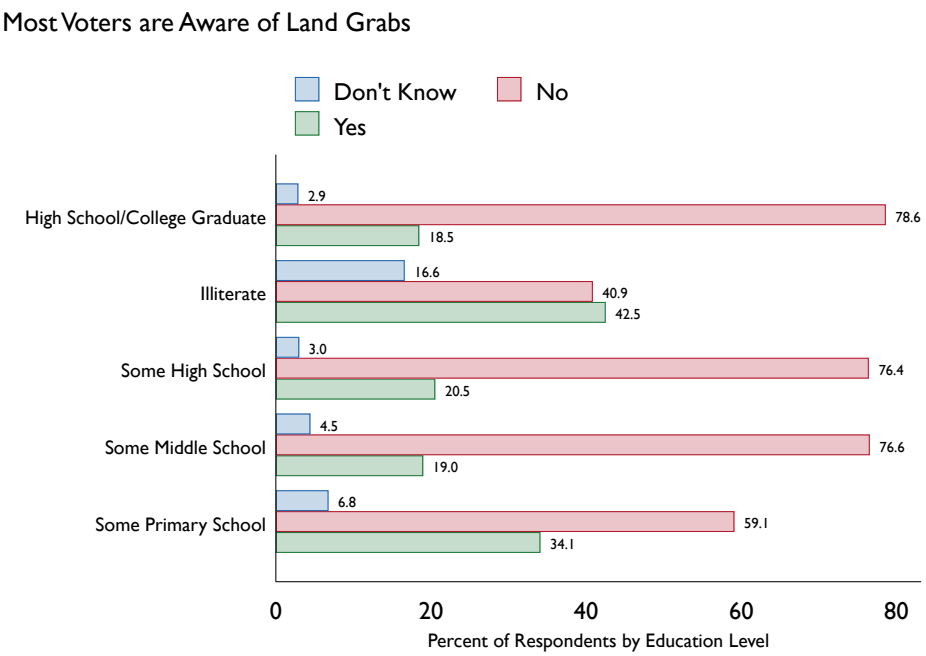

Figure 1: Less Educated Voters Appear to be Aware of Land Policies

Respondent observations: 1408 (illiterate), 1340 (some primary school), 337 (some middle school), 365 (some high school), 276 (high school/college grad)

Kashmir may be considered a "special category" due to its unique status enshrined in the constitution, results do not change if it is dropped from the analysis.

The inequality variables (% Owning No Land, % Land Owned Bottom 50%, and % Land Owned Top 10%), are from Besley and Burgess (2000) (the EOPP dataset discussed above).[10] These are continuous measures available over the range of the sample.

The individual-level analysis in the main paper used survey results from the Indian National Election Study (Eldersveld et al., 2011), and available at the ICPSR website (No. 25402). Interviews were fact-to-face and followed national elections in 1967, 1971, 1979, and 1985.

Only the 1967 and 1971 surveys contained questions about the most-important problem facing an individual's village, including a specific category for issues of land reform and issues of inequality. Issues of land included a variety of responses such as land tenure, consolidation of land, protecting the landless, the size of landholdings, and the desire to

[10]These variables themselves are from the World Bank, the Indian Ministry of Law and Justice, and a number of additional sources, in particular Zaidi (1985) and Haque and Sirohi (1986).

get more land. Issues of inequality could include responses such as an increase in economic disparities, or the gap between the rich and poor. Since these were open-ended questions, each type of response was grouped into an overall category. As mentioned in the main paper, this was turned into a dichotomous indicator with 1 indicating the respondent thought inequality or issues of land reform were the most important issue facing their village, and 0 indicating some other issue was the most important.

Only the 1971 and 1985 surveys asked the following question, "Some political leaders and parties have been advocating that people with no land and property should occupy a part of land and property of those who have a large amount of land and property. Do you approve of this or do you disapprove?" Respondents could choose either "approve", "disapprove", or "uncertain". I recoded this into the Approve of Land Grabs indicator, where 1 means a respondent "approves of land grabs" and 0 means they either "disapprove" or are "uncertain".

Although most of the control variables are dichotomous, there were two multi-category variables used. Education is an 5-category indicator coded as follows. 1 is illiterate, 2 has some primary education, 3 has some middle-level education, 4 is some high school, 5 is a high-school or college graduate. The political interest variable asks about the respondent's interest in politics between campaigns. This is a trichotomous indicator with 0 indicating no interest, 1 indicating some political interest, and 2 indicating a lot of political interest.

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