The Power of Lakshmi: Monetary Incentives for Raising a Girl
Online Appendix

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Online Appendices

Appendix A   Why Was Dhanlakshmi Discontinued?

Our results suggest that Dhanlakshmi was successful in raising the prospect of girl births in Punjab without significantly increasing fertility. Nevertheless, it was discontinued in 2013. It is reasonable to ask why.

At the time, there was no existing independent evaluation of the program. The official reason given by the Indian government was that Dhanlakshmi was discontinued "w.e.f. 1/4/2013 as several state governments have schemes for girl children which are more attractive".[1] This exact wording is also repeated in media mentions of the program's ending.[2] Table 1 in the main paper documents that Assam, Bihar, Delhi, Goa and Himachal Pradesh started initiatives between 2008-13, and several of these states did not previously have a girl-child CCT. So, the officially stated reason for discontinuing Dhanlakshmi is plausible if the goal was to scale up the scheme to the national level, especially considering that a number of additional states had longstanding programs pre-dating Dhanlakshmi. When it was implemented, Dhanlakshmi was conceptualized as a pilot study, which accounts for its very limited geographic coverage. However, of the states covered under the scheme, only Bihar introduced a new program.

Political calculations likely also played a role. The last year of Dhanlakshmi also marked the last year of the United Progressive Alliance (UPA) government before the general elections in April-May 2014, which the incumbent government lost. Potentially, electoral considerations about the political payoff of a program like Dhanlakshmi may have contributed to its stop. As Sekher (2010) documents, many existing state girl-child schemes were popular and had direct buy-in from the Chief Ministers (the heads of the state government), who publicized the initiatives widely and used them in their own election campaigns. This was mostly not the case for Dhanlakshmi, which was generally poorly implemented outside of Punjab (Sekher, 2010). This gap in popularity and

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[1]Press Information Bureau, Government of India, Ministry of Women and Child Development, February 21, 2014. Available here: https://pib.gov.in/newsite/PrintRelease.aspx?relid=104044

[2]See e.g. IndiaSpend, 'Govt Incentives For Girls Appear to Work - Somewhat', June 16, 2016.

interest may have led the central government to decide that scaling up Dhanlakshmi was going to be expensive and not the best use of resources.

The party manifestos for the 2014 election for both the main government party and the main opposition party provide circumstantial evidence that a program like Dhanlakshmi was not considered a high priority. The main government party's election manifesto (INC) only made a vague reference to how it intended to tackle the issue of skewed sex ratios: "We will launch focused intervention to improve the Child Sex Ratio, within an overall "National Strategy for Care and Protection of the Girl Child" from birth to adolescence."[3] It made no direct mention of Dhanlakshmi or a program with similar features. Similarly, while the main opposition party, the BJP, mentioned the girl child in the election manifesto, it also did not encourage a CCT or similar intervention.[4] Both parties therefore did not seem to see a CCT as a priority to improve the child sex ratio and focused more on rhetoric rather than specific policy proposals in their election manifestos.

Appendix B Dhanlakshmi Scheme Details

Appendix B.1 Beneficiary Recruitment and Enrollment

The district administration was responsible for determining the local authorities that would provide proof of milestone achievement. Specifically, Dhanlakshmi required a birth certificate to prove registration, a domicile certificate to ensure that the household lives in a treatment block, and an immunization certificate to provide proof of immunizations. Birth and domicile certificates were both available from the local government (gram panchayat), and local health center (Anganwadi) workers were responsible for certifying the child's immunization record. School principals certify the beneficiary's school attendance and grade. A verification certificate that the girl is still unmarried at age 18 can be obtained from the gram panchayat (Sekher, 2010).

Implementation of the Dhanlakshmi scheme was shared between multiple tiers of government. Beneficiary households were enrolled at the local level, either in response to surveys in the treatment

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[3]https://www.thehinducentre.com/multimedia/archive/01816/Indian_National_Co_1816826a.pdf
[4]http://www.thehinducentre.com/multimedia/archive/03226/full_manifesto_eng_3226788a.pdf

block, through information provided by local teachers and health workers, or based on households presenting their case at the local government office. In most states Anganwadi workers were told to enroll as many beneficiaries as possible (Sekher and Ram, 2015). A list of beneficiaries was collected at the district level and reported to the state government, which receives money from the central government in a separate account earmarked specifically for the program. Households received a Dhanlakshmi registration card and a booklet containing blank verification certificates. Once households opened a zero-balance account at a bank or post office, the state government authorized those financial institutions to transfer the financial benefits to the recipients once formal proof of reaching a given milestone was produced. If possible, the bank account was supposed to be opened in the name of the child's mother. State- and district-level officials were instructed to provide training and monitor program implementation (Sekher, 2010).

Sekher and Ram (2015) describe Dhanlakshmi's recruitment and enrollment process based on surveys with key stakeholders and beneficiaries. Their Punjab sample included 628 beneficiary households from the treatment block. 19 percent of beneficiary girls were less than a year old at the time of enrollment and 32 percent were enrolled within two years of birth. 47 percent were enrolled in primary school and another 19 percent in secondary school. Almost 60 percent of beneficiary girls were the eldest child and about 31 percent were the second child. In Punjab, they note that school teachers played a key role in raising awareness of the program and in enrolling households.[5]

Appendix B.2   Skewed Sex Ratios and other Punjabi Distinctives

Table D.1 summarizes the key characteristics of the 11 treatment blocks, by state and district, using data from the 2001 Census and 2007/08 National Sample Survey.[6] Unless otherwise noted, all information is reported at the block level. For our purposes, the most important contrast to draw appears in the second row, which reports the district-level child sex ratio (CSR) from the 2001

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[5]See their Table 4.6 for the survey results from the other states where Dhanlakshmi was introduced.

[6]All figures, with the exception of consumer expenditures, were calculated from the Census data. The National Sample Survey contributed the consumer expenditure information.

Census, defined as the number of girls per 1000 boys in the zero–six-year age group. In 2001, Fatehgarh Sahib's CSR was 766, well below that of every other district in the table and the lowest in all of India. In the other districts, the CSR is at or much closer to the expected biological parity. Rae Bareilly had next lowest CSR at 943, which is 23 percent higher than Fatehgarh Sahib's. Further, Fatehgarh Sahib was explicitly chosen as the treated district, and Sirhind as the treated block, because of the high number of 'missing girls' (Ministry of Women and Child Development, 2015). The third row reports the child sex ratio at the block level, showing that Sirhind's CSR in 2001 was 749, substantially below the district average. The bottom line is that Punjab is the only treated state that presents an empirical setting suitable for testing Dhanlakshmi's effect on the sex ratio.

Fatehgarh Sahib and Sirhind are distinct from other treated areas in significant ways beyond the CSR as well. From Table D.1, we see that Sirhind had a far more urban population, greater female literacy rate and higher average monthly consumption level than every other treated block. No other block besides Jagdalpur had an urban population to speak of. Also, Sirhind had no Scheduled Tribes (ST), while the population of every other treated block (except Shivgarh in Rae Bareilly) had a meaningful share of this disadvantaged minority. The female literacy rate was between a third and five times higher than in the other treated blocks. Similarly, average district monthly consumption levels were between two-thirds and four times higher in Fatehgarh Sahib.[7]

One implication of contrasts in Table D.1 is that, while Fatehgarh Sahib was selected for its highly skewed sex ratio, the other ten treatment areas were chosen primarily because of their low female literacy rates. Many of Dhanlakshmi's milestones relate to education and the program explicitly allows older girls (not born under the scheme) to benefit. Thus, the scheme's goal outside Punjab was to improve educational outcomes of girls rather than affect the sex ratio. In any event, these contrasts reinforce the claim that Punjab should be the focus of our analysis.

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[7]Data in the National Sample Survey (NSS) is only available at the district level.

Appendix B.3   Challenges to Implementation Outside of Punjab

Dhanlakshmi was introduced in seven states: Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Odisha, Punjab, and Uttar Pradesh. Overall, implementation was highly uneven. For example, according to administrative sources, the central government had set a target of 100,000 beneficiaries across all treatment areas for the first year, but only about 80,000 were enrolled and 60 percent of the available financial resources had been spent. Disbursement remained an issue even after the first year. Sekher (2010) conducted interviews with state officials, finding that many complained about long delays in the transfer of funds from the central government.

Idiosyncratic state factors played a significant role in implementation effectiveness. In the Eastern states – Bihar, Jharkhand, Chhattisgarh and Odisha – a number of challenges frustrated implementation. There was no state government buy-in or NGO involvement, so creating awareness of the new program proved to be difficult. Post offices refused to open zero-balance bank accounts, substantially delaying payments to households. Program beneficiaries who migrated out of a treatment block, not uncommon in the poor rural areas of East India, automatically lost coverage.

In the South Indian state of Andhra Pradesh, two blocks were chosen for their low level of economic development and widespread custom of child marriage. Dhanlakshmi replaced a well-known state program in the designated blocks, while the pre-existing program remained active in all other areas of the state. This led to widespread confusion about enrollment, program characteristics, and differences in coverage. In one of the two blocks, post offices refused to open zero-balance bank accounts for program beneficiaries, leading to long delays in program enrollment and benefit disbursement (Sekher, 2010).

Some state governments did not make any progress toward implementation in the first two years. Uttar Pradesh did not use any Dhanlakshmi-related resources in the first year and had yet to implement the scheme at all by 2010 (Sekher, 2010). In interviews Sekher (2010) conducted with national and state-level officials about the implementation of Dhanlakshmi in Bihar and Odisha, a similar picture emerges. Bihar did not spend any money on the program in 2008-09, and had not initiated an awareness campaign by 2010. The few beneficiaries that were being enrolled learned

about the program through the Anganwadi center or a women's help group and reported long delays in enrollment. Officials also raised concerns that the low program awareness led to manipulation and corruption. The designated treatment block in Bihar had a high rate of migration, which also contributed to the low number of beneficiaries.

In Punjab, on the other hand, the roll-out and implementation avoided most of these problems. State officials reported that progress was monitored through cooperation across the block, district and state level and program information was disseminated through multiple channels. This activity also included public hearings to directly gather feedback from beneficiaries (Sekher, 2010). School teachers were key to raising awareness of the program and enrolling households, although health centers (Anganwadi or ICDS) also played a role. According to household self-reports, enrollment in Punjab typically took less than a week, whereas registration for the majority of households in other states took more than four months (Sekher and Ram, 2015). Existing state government schemes in Punjab were small and differed substantially in eligibility, so there was no confusion with other schemes. Consistent with these observations, Punjab accounted for the largest number of beneficiaries and budgeted allocations.

In addition to state-specific challenges to implementation, most of the treatment blocks outside of Punjab were located in states affected by a Maoist (Naxalite) insurgency. The key concern in these states is high levels of Maoist-related violence during the study period. Figure D.1 shows the location and intensity of Maoist violence in 2007, the year before Dhanlakshmi was implemented. In 2006, then Prime Minister Manmohan Singh had famously described the insurgency as 'the single biggest internal security challenge ever faced' by India.[8] The Maoists accuse the Indian government of a systematic disinterest in the economic development of many of its citizens, particularly members of the STs, and seek to overthrow the government to create an independent state. As guerrilla-type fighters, the dense forest cover in many high-ST areas also provides a good hiding ground for the Maoists. At various points in time, the local ST population has been accused by both government forces and the Maoists of supporting the other side. From the mid-2000s onwards, state and private militia groups engaged in large-scale counter-insurgency activities, especially in the

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[8]Hindustan Times, April 13, 2006: Naxalism biggest threat: PM.

Maoist strongholds. These actions have led to massive human rights violations against the tribal population.[9]

Figure D.1 documents that 5 out of the 7 treatment states were affected by the violence. The most intense conflict activity in 2007 occurred in a cluster of districts at the border of Chhattisgarh, Andhra Pradesh and Odisha, which encompasses the Dhanlakshmi treatment districts from all three states. The treatment areas in Bihar and Jharkhand, which lie directly on opposite sides of the border, were also heavily affected by violence. Among the Dhanlakshmi states, only Punjab and most of Uttar Pradesh were unaffected by Maoist-related violence. The geographical pattern of violence persisted throughout the period of our main analysis, which includes the pre-Dhanlakshmi years 2004-2007 and the program implementation years 2009-2012.[10]

The Maoist-related violence creates severe internal validity concerns for a difference-in-difference (DID) research design. Figure D.2 plots the average number of fatalities for treatment and control groups in all five conflict-affected states. Conflict intensity in the pre-Dhanlakshmi years (2004-2007) follows different trajectories in the treatment and the control group, suggesting that the parallel-trend assumption is likely violated in Andhra Pradesh, Bihar, Chhattisgarh, and Jharkhand. In Odisha, the pre-Dhanlakshmi fatalities follow a close to parallel trend in both groups, but the introduction of Dhanlakshmi coincides with a massive increase in fatalities in the treatment districts. We also observe a similar spike in violence in Bihar. Thus, it would be difficult if not impossible to disentangle Dhanlakshmi's effects from those related changes in conflict intensity in the treated areas.

Given the Maoist violence and other implementation challenges, it is not surprising that we find widespread violations of the parallel trends assumption outside of Punjab in the pre-treatment period. Table D.2 reports the results from pre-trend analyses for a girl-birth indicator (*isgirl*), our main outcome of interest. For each state, we test the null of no treatment effect for the years in 2004–2006 relative to 2007, the year before Dhanlakshmi was introduced. Punjab is the only state

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[9]This includes the burning down of entire villages, abductions, sexual violence and the forced migration of civilians to refugee camps. See for example Sundar (2016) for more details.

[10]See Appendix figures D.3a to D.4d.

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where we cannot reject the null. In the six other states, the estimated coefficients are large and statistically significantly different from 0 in at least two of the three time periods.

Appendix C   Dhanlakshmi Treatment Intensity and Survey Evidence

Appendix C.1   Back-of-the-Envelope Calculation

From Table ??, the baseline birth probability in Fatehgarh Sahib was 0.287. Given the 180 mothers in the baseline period, this translates into an average of 52 births per year. After Dhanlakshmi was introduced, the birth probability in Fatehgarh Sahib fell to 0.280, which implies 62 births per year (0.280×233 mothers). The change in the birth probability in the control group suggests a larger, 1.2 percentage-point decline and 61 births (0.275×223) in the no-CCT counterfactual. The extra birth due to Dhanlakshmi amounts to a relative fertility increase of 1.64 percent.

With a baseline girl-child probability of 0.456, there should be 24 girls among the 52 baseline children. Post-Dhanlakshmi, this probability rose to 0.501, implying 31 of the 62 treatment-period births were girls. However, in the counterfactual, the girl-birth probability rose only 0.01 percentage points, suggesting that without Dhanlakshmi only 28 of the 61 children – three fewer – would have been girls.

These figures also imply that the 3 additional girl births per year occurred because parents chose to have a girl instead of waiting on a boy, rather than from an overall fertility increase. If we ask how many girls would have been born if fertility had changed by the same amount, but the sex ratio had remained at its counterfactual level, we still get about 28 girl births, indicating that the extra girls come from the substitution of sons for daughters. Altogether, these calculations suggest that 4 more children and 12 more girls were born to the DLHS mothers over our four-year sample period.

We can use the Census data to estimate how many girl and total births in Fatehgarh Sahib can be attributed to Dhanlakshmi. In 2011, there were 63,271 children 0-6 years-old in the district. If there were no fertility and child mortality differences between the age cohorts in this group, we

would have an average of 9,039 children in each cohort. Thus, each of the 62 annual births implied in the DLHS sample translates into approximately 146 annual births in the Census, for a total of 584 during the sample period. Similarly, the 3 additional girls per year in the DLHS map to 438 additional girls per year in the Census, totaling 1,752 over four years.[11]

What do these calculations imply for Dhanlakshmi's impact on girl births and fertility in Sirhind? The 2011 Census reports 21,055 children in Sirhind aged 0-6, 9,538 of them girls. Adopting the same uniform distribution of births across age cohorts, we have about 3,008 children and 1,363 girls in each. If all of the annual additional births calculated for the district came from Sirhind, we would conclude that Dhanlakshmi accounted for 4.85 percent of all births and 32.13 percent of girl births.[12]

Appendix C.2   Collapsing Survey Data to District Level

A more conservative way of dealing with intracluster correlation is to collapse the analysis to the district level (Bertrand et al., 2004). In this case, the outcome variables are the district-level share of female births and the district-level share of mothers giving birth in any given year. The exercise compares the change in each outcome between the periods 2004-07 and 2009-12 in Fategarh Sahib with the corresponding changes in the control districts, controlling for district-level averages of birth parity, mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). Table D.7 reports the results. The estimated girl-birth effect rises to 8.2 percentage points and we still reject the null at the 5-percent level. The fertility effect estimate is negative, but small in magnitude and less precisely estimated than in Table **??**. The bottom line is that the these results are consistent with our main findings, namely that Dhanlakshmi led to an improvement in the sex ratio without a corresponding increase in fertility.

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[11]This is consistent with the Census fertility result in Table **??**. Keeping in mind that the Census was held in 2011 while the household survey data covers births up to 2012, the corresponding number of additional births is 438 (146×3). This figure falls inside the 95 percent confidence interval of the DID estimate in Column (6): $[-3680.39, 468.95]$.

[12]We find no evidence of spillovers outside of Sirhind, supporting this assumption.

Appendix C.3   Survey Evidence on Dhanlakshmi and Gender Attitudes

Sekher and Ram (2015) not only provide valuable information on the implementation of Dhanlakshmi, they also carried out an assessment of the scheme's impact on attitudes towards gender equality and investing in girl children. Their study is based on a survey of beneficiary and non-beneficiary households in five Dhanlakshmi states – Punjab, Bihar, Odisha, Andhra Pradesh and Jharkhand – covering eight of the 11 treatment blocks. As much as possible, beneficiary and non-beneficiary households were matched on household characteristics and other factors such as access to education and health facilities. Beneficiary households are households with at least one enrolled girl at the time of the survey. Non-beneficiary households have no enrolled household members, but had at least one girl aged 1-14 years when the survey was conducted. The interviews were conducted between September 2013 and February 2014, at a time when Dhanlakshmi had just been discontinued.

Sekher and Ram (2015) compare beneficiary and non-beneficiary households on attitudes toward gender equality. They find beneficiary households were statistically significantly more likely to agree that: daughters are equally important as sons; boys and girls should be taken to the doctor immediately when they fall sick; girls should be given nutritious food like boys; daughters should be served food along with sons; daughters should be educated equally like sons; it is the responsibility of both sons and daughters to look after their parents in their old age; like sons, daughters can go to college if they wish; daughters can also take up employment outside like sons; like sons, daughters should economically support their parents; daughters and sons should be given equal share in property; like daughters, sons should be taught cooking, cleaning and doing household chores; like sons, daughters should be allowed to perform funeral rites of parents. While program beneficiaries could feel more pressure to agree with gender equality statements because of Dhanlakshmi, their responses are consistent with the behavioral changes implied by our empirical results.

Appendix D   Appendix Figures and Tables

Appendix D.1   Comparison of Punjab to Other Program Areas

Table D.1: Overview of Dhanlakshmi Treatment Areas: District Child Sex Ratios and Block-Level Key Characteristics

	Punjab	Andhra Pradesh		Bihar	Chhattisgarh		Jharkhand		Odisha		Uttar Pradesh
	Fatehgarh Sahib (1)	Khammam (2)	Warangal (3)	Jamui (4)	Bastar (5)	Dantewada (6)	Giridih (7)	Koderma (8)	Malkangiri (9)	Koraput (10)	Rae Bareilly (11)
Treated block	Sirhind	Aswaraopeta	Narsampet	Sono	Jagdalpur	Bhopalpattnam	Tisri	Markacho	Kalimela	Semiliguda	Shivgarh
Child sex ratio	766	971	955	963	1009	1014	978	975	982	983	943
Urban	28.1	0	0	0	14.6	0	0	0	0	0	0
ST	0	38.0	13.2	3.3	62.1	80.9	22.9	1.6	48.65	50.88	0
Female literacy	62.6	45.1	47.1	17.6	32.2	21.6	17.2	23.2	22.8	13.3	38.4
Consumer Expenditure	5397	3159	3220	2827	1945	1396	2876	3660	1154	1680	2770

Notes: Data comes from 2001 Census, except for consumer expenditure, which is drawn from 2007/08 National Sample Survey. Child sex ratio and consumer expenditure reported at the district level, remaining variables reported at block level. Block-level child sex ratios from left to right are 749, 1040, 944, 961, 1009, 999, 964, 999, 971, 1011, 944.

Table D.2: Girl-birth Pre-trends, DLHS 2007-08

	Punjab	Uttar Pradesh	Andhra Pradesh	Bihar	Jharkhand	Chhattisgarh	Odisha
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$2004 \times$ DL	-0.047	-0.087	-0.185	0.019	0.068	0.006	-0.250
	(0.112)	(0.000)	(0.000)	(0.241)	(0.163)	(0.957)	(0.094)
$2005 \times$ DL	-0.019	0.029	0.179	-0.200	-0.034	-0.146	0.007
	(0.528)	(0.017)	(0.005)	(0.000)	(0.272)	(0.000)	(0.801)
$2006 \times$ DL	0.034	0.059	0.151	-0.123	0.036	-0.163	-0.106
	(0.141)	(0.000)	(0.007)	(0.000)	(0.070)	(0.038)	(0.044)
Observations	4772	18266	3545	8983	4851	3835	4909
R^2	0.016	0.004	0.018	0.008	0.013	0.020	0.011

Notes: The sample consists of all pre-program births to mothers between 2004 and 2007. The outcome variable is a binary indicator for a female birth to the sampled women. DID estimates are from a regression of the outcome variable on the interaction dummies for treated district and year with 2007 as the reference category. Controls: child's birth order, mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). District-clustered p-values in parentheses.

Appendix D.2   Additional Summary Statistics

Table D.3: Summary Statistics for DLHS Alternative Control Group Samples, 2007/08 & 2012/13

	(1) none-pre	(2) none-post	(3) nochange-pre	(4) nochange-post	(5) northwest-pre	(6) northwest-post
isgirl	0.476	0.474	0.466	0.463	0.448	0.449
isbirth	0.296	0.289	0.306	0.296	0.306	0.293
Mother's age	26.297	26.916	25.500	26.557	26.025	26.842
	(5.082)	(5.043)	(4.324)	(4.402)	(4.141)	(4.223)
Mothers educated below primary	0.151	0.068	0.080	0.031	0.051	0.023
Mothers educated till primary	0.501	0.425	0.456	0.368	0.432	0.350
Mothers educated beyond primary	0.345	0.502	0.464	0.597	0.516	0.621
Share of hindus	0.506	0.529	0.764	0.765	0.707	0.699
Share of muslims	0.099	0.093	0.073	0.083	0.017	0.022
Share of christians	0.227	0.198	0.021	0.019	0.003	0.003
Share of sikhs	0.083	0.103	0.138	0.129	0.259	0.273
Share of low caste	0.155	0.205	0.230	0.285	0.264	0.326
Share of backward tribes	0.323	0.296	0.025	0.054	0.023	0.044
Share of rural households	0.749	0.613	0.661	0.571	0.745	0.626
Share of *Kaccha* houses	0.295	0.253	0.104	0.071	0.065	0.045
Share of *Pucca* houses	0.347	0.404	0.484	0.551	0.647	0.704
No. of mothers	23078	18633	15125	15792	8182	7561
No. of live births	33998	32244	23092	28072	12404	13194

Table D.4: Summary Statistics for Census Sample

	Treated		Control	
	Pre	Post	Pre	Post
sgirls06	0.431	0.453	0.444	0.458
pop06	23307	21055	44345.4	43030.5
Share of low caste	0.293	0.311	0.301	0.336
Share of backward tribes	0	0	0	0
Share of literate women	0.676	0.745	0.615	0.692
Share of literate men	0.781	0.835	0.740	0.793
Share of working women	0.226	0.103	0.208	0.142
Share of working men	0.549	0.554	0.535	0.550
Observations		2		142

Note: The sample consists of all blocks in the state of Punjab with Fategarh Sahib/Sirhind as the treated block. The pre and post samples refer to Census 2001 and 2011, respectively.

Table D.5: Summary Statistics for Immunization Samples, Punjab

| | DLHS 07/08 and 12/13 | | | |
| | Fatehgarh Sahib | | Control | |
	Pre	Post	Pre	Post
imm1	0.400	0.430	0.417	0.379
imm2	0.400	0.380	0.417	0.337
imm3	0.400	0.350	0.417	0.318
Mother's age	26.218	28.800	27.150	27.664
	(3.398)	(4.353)	(3.926)	(4.162)
Below primary educated mothers	0.073	0.000	0.037	0.028
Primary educated mothers	0.309	0.340	0.430	0.366
Above primary educated mothers	0.618	0.650	0.529	0.601
Share of Hindus	0.309	0.270	0.354	0.370
Share of Muslims	0.055	0.010	0.008	0.015
Share of Christians	0	0	0.007	0.009
Share of Sikhs	0.636	0.720	0.628	0.606
Share of low caste	0.418	0.440	0.318	0.422
Share of backward tribes	0	0	0.007	0.022
Share of rural households	0.582	0.670	0.688	0.584
Share of *Kachha* houses	0.018	0.010	0.021	0.025
Share of *Pucca* houses	0.764	0.740	0.728	0.658
Observations	155		2510	

Note: *Kaccha* and *Pucca* houses refer to unengineered and engineered dwelling-place construction. Pre and post refer to the periods 2004-2007 and 2009-2012.

Table D.6: Summary Statistics for Education Sample, Punjab

| | DLHS 07/08 and 12/13 | | | |
| | Fatehgarh Sahib | | Control | |
	Pre	Post	Pre	Post
isn	1	0.969	0.997	0.927
Child's age	6.949	6.046	7.013	6.050
	(0.807)	(0.759)	(0.819)	(0.802)
Share of Hindus	0.229	0.323	0.321	0.367
Share of Muslims	0.013	0.031	0.019	0.016
Share of Christians	0	0	0.010	0.012
Share of Sikhs	0.745	0.646	0.649	0.604
Share of low caste	0.433	0.477	0.428	0.463
Share of backward tribes	0	0	0.005	0.002
Share of rural households	0.694	0.538	0.728	0.632
Family head with primary education	0.121	0.108	0.116	0.102
Family head with secondary education	0.166	0.138	0.183	0.174
Share of high-income households	0.599	0.615	0.511	0.519
Share of low-income households	0	0.015	0.005	0.014
Observations	222		4205	

Note: Pre and post refer to the periods 2004-2007 and 2009-2012.

Appendix D.3   Further Extensions and Robustness Checks

Table D.7: Dhanlakshmi Effects on Births and Fertility, DLHS 07/08 and 12/13 collapsed to district level, Punjab

	share of girl births (1)	share of mothers giving birth (2)
DL $\times$ post	0.082	-0.020
	(0.018)	(0.061)
District FE	x	x
Year FE	x	x
Controls	x	x
Observations	160	160
R^2	0.120	0.585

Note: The outcome variables are the district-level share of female births and share of mothers giving birth in a given year. The DID estimates compare the change in each outcome between the periods 2004-07 and 2009-12 in Fategarh Sahib with the corresponding changes in the control districts. The controls added include district-level averages of birth parity, mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). *p*-values in parentheses.

Table D.8: Tests for spillover effects in blocks contiguous to Sirhind, Census 2001 & 2011

	PANEL A: Share of girl births		
	(1)	(2)	(3)
	Case (i)	Case (ii)	Case (iii)
DL $\times$ Post	0.0077	0.0030	0.0062
	(0.2090)	(0.4318)	(0.0000)
Observations	142	142	134
R^2	0.865	0.858	0.870
	PANEL B: Size of the 0-6 population		
	(1)	(2)	(3)
	Case (i)	Case (ii)	Case (iii)
DL $\times$ Post	353.7402	2306.0480	-1503.9277
	(0.8283)	(0.5637)	(0.1627)
Observations	142	142	134
R^2	0.231	0.240	0.273

Note: The outcome variables are share of girls in the 0-6–year-old population (Panel A) and the size of the 0-6 population (Panel B). The controls are male and female literacy rates, labor-force participation by gender, rural population share, and scheduled caste or tribe share, and block fixed effects. *p*-values in parentheses.

Table D.9: Post-Program Effects of Dhanlakshmi on Births and Fertility, DLHS 2007/08 & NFHS 2015/16, Punjab

	(1) isgirl	(2) isgirl	(3) isgirl	(4) isbirth	(5) isbirth
DL $\times$ post	-0.005	0.014	0.095	-0.011	-0.004
	(0.740)	(0.382)	(0.000)	(0.002)	(0.454)
DL $\times$ post $\times$ bo=2			-0.161		
			(0.000)		
DL $\times$ post $\times$ bo>2			-0.123		
			(0.013)		
District FE		x	x		x
Year FE		x	x		x
Controls		x	x		x
Observations	5721	5721	5721	15170	15170
R^2	0.000	0.017	0.018	0.000	0.078

Note: The DID estimates compare the change in each outcome between the periods 2005-07 and 2014-16 in Fatehgarh Sahib with the corresponding changes in the control districts. The controls are the child's birth order, mother's age and education, household's caste, religion, location (rural or urban) and an indicator of household wealth ranking provided in the surveys. The treated area is Fatehgarh Sahib and the treatment period is 2014-2016. The sample includes 3,468 mothers in Punjab. *p*-values from CR standard errors in parentheses.

Appendix D.4 Additional Results Using Alternative Control Groups

Table D.10: Dhanlakshmi Effects on the Girl Share and Size of the 0-6 Population, Census 2001 & 2011, Alternative Control Groups

	PANEL A: Share of girls 0-6 years old			
	Punjab	None	No changes	Northwest
	(1)	(2)	(3)	(4)
DL $\times$ Post	0.0062	0.0121	0.0092	0.0076
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observations	144	2057	906	496
R^2	0.860	0.0886	0.373	0.480
	PANEL B: Size of the 0-6 Population			
	Punjab	None	No changes	Northwest
	(1)	(2)	(3)	(4)
DL $\times$ Post	-1605.7226	-14654.3867	7308.1370	-1197.0801
	(0.1272)	(0.0002)	(0.0133)	(0.0351)
Observations	144	2057	906	496
R^2	0.233	0.116	0.175	0.0275

Note: The outcome variables are share of girls in the 06yearold population (Panel A) and the size of the 06 population (Panel B). The DID estimates compare the change in each outcome between 2001 and 2011 in Sirhind with the corresponding changes in the other blocks in the control states. The controls are male and female literacy rates, labor-force participation by gender, rural population share, and scheduled caste or tribe share, and block fixed effects. The treated area is the Sirhind block and the treatment period is 2011. *p*-values in parentheses.

Table D.11: Dhanlakshmi Effects on Immunization, DLHS 2007/08 & 2012/13, Alternative Control Groups

	(1) Imm 1	(2) Imm 2	(3) Imm 3
Panel A: None			
DL × post	0.1114	0.0940	0.0919
	(0.0000)	(0.0000)	(0.0000)
Observations	18450	18450	18450
R^2	0.022	0.026	0.030
Panel B: No changes			
	(1) Imm 1	(2) Imm 2	(3) Imm 3
DL × post	0.0957	0.0734	0.0712
	(0.0000)	(0.0000)	(0.0000)
Observations	13107	13107	13107
R^2	0.026	0.027	0.029
Panel C: Northwest			
	(1) Imm 1	(2) Imm 2	(3) Imm 3
DL × post	0.1273	0.1058	0.1012
	(0.0000)	(0.0000)	(0.0000)
Observations	6507	6507	6507
R^2	0.036	0.040	0.044

Note: DLHS 07/08 and 12/13 samples restricted to girls aged two years or older in Punjab. Outcome variables Imm 1 - 3 are binary indicators for the recorded vaccine doses. Imm 1 covers BCG and DPT 1; Imm 2 adds DPT 2-3 and Polio 1-3 to the earlier doses; Imm 3 includes all previous doses and the Measles vaccine. DID estimates compare the change in child immunization, and any girl-boy differential therein, between 2004-07 and 2009-12 in Fatehgarh Sahib district with the corresponding changes in the control districts. All specifications include district and year fixed effects along with controls for the child's birth order and age, mother's age and education, household's caste, religion, location and an indicator of dwelling construction type (wealth proxy). *p*-values from CR standard errors in parentheses.

Table D.12: Dhanlakshmi Effects on Survival and Education, DLHS 2012/13 & NFHS 2015/16, Alternate Control Groups

	Panel A: isgirl5		
	(1) None	(2) No changes	(3) Northwest
DL × post	0.0307 (0.007)	0.0428 (0.009)	0.0369 (0.010)
Specification	None	No changes	Northwest
Observations	75435	45144	27212
R^2	0.001	0.001	0.001
	Panel B: isn		
	(1) None	(2) No changes	(3) Northwest
DL × post	0.0824 (0.009)	0.0357 (0.006)	0.0272 (0.005)
Observations	36009	21139	12355
R^2	0.607	0.719	0.640

Note: DLHS-NFHS samples comprise all 5-7–year-olds in the surveyed households. *isgirl5* is the share of girls in the selected age group and *isn* is a binary indicator for whether a girl belonging to this age cohort is currently attending school. DID estimates compare the change in outcomes for birth cohorts between 2000-02 and 2009-11 in Fatehgarh Sahib district with the corresponding changes in the control districts. All specifications include district and year fixed effects alongwith controls for child's age, household head's education, caste, religion, location and an indicator of household wealth. *p*-values from CR standard errors in parentheses.

Appendix D.5   Additional Results Using Wild-Cluster Bootstrap

Table D.13: Dhanlakshmi Effects on Girl Births and Fertility by Birth Order and Urban/Rural Residency, DLHS 2007/08 & 2012/13, Punjab

	(1) isgirl		(2) isgirl	(3) isbirth
DL × post	0.043	DL × post	0.074	0.010
CR	(0.006)		(0.000)	(0.001)
Wild R	(0.541)		(0.083)	(0.342)
Wid U	(0.537)		(0.040)	(0.334)
DL × post × bo=2	0.058	DL × post×urban	-0.066	-0.007
CR	(0.015)		(0.024)	(0.072)
Wild R	(0.442)		(0.460)	(0.603)
Wid U	(0.0098)		(0.432)	(0.600)
DL × post × bo>2	-0.054			
CR	(0.122)			
Wild R	(0.464)			
Wild U	(0.125)			
District FE	x		x	x
Year FE	x		x	x
Controls	x		x	x
Observations	10678		10678	36768
R^2	0.008		0.008	0.006

Notes: The DID estimates compare the change in each outcome between the periods 2004-07 and 2009-12 in Fatehgarh Sahib with the corresponding changes in the other Punjabi districts. The controls are the child's birth order, mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). The treated area is Fatehgarh Sahib and the treatment period is 2009-2012. The sample includes 6,701 mothers in Punjab. *p*-values in parentheses.

Table D.14: Dhanlakshmi effects on son preference, DLHS 2007/08 & 2012/13

	Panel A: Overall son preference				
	(1)	(2)	(3)	(4)	(5)
	Punjab	Punjab	None	No changes	Northwest
DL × Post	-0.0329	-0.0539	-0.0138	-0.0402	0.0206
CR	(0.0903)	(0.0036)	(0.0589)	(0.0008)	(0.2182)
Wild R	(0.462)	(0.400)	(0.494)	(0.486)	(0.504)
Wild U	(0.084)	(0.003)	(0.060)	(0.001)	(0.220)
District FE		x	x	x	x
Year FE		x	x	x	x
Controls		x	x	x	x
Observations	3020	3020	24404	14945	7099
R^2	0.000	0.436	0.322	0.336	0.402
	Panel B: Son preference by gender of older sibling				
	(1)	(2)	(3)	(4)	(5)
	Punjab	Punjab	None	No changes	Northwest
DL × Post × hasdaughter	0.0354	0.0195	-0.0171	-0.0192	0.0510
CR	(0.2360)	(0.5586)	(0.3590)	(0.3133)	(0.0461)
Wild R	(0.474)	(0.606)	(0.534)	(0.505)	(0.491)
Wild U	(0.235)	(0.546)	(0.371)	(0.322)	(0.0476)
DL × Post	-0.0554	-0.0592	0.0003	-0.0244	-0.0056
CR	(0.0044)	(0.0072)	(0.9709)	(0.0030)	(0.6757)
Wild R	(0.426)	(0.451)	(0.971)	(0.498)	(0.703)
Wild U	(0.004)	(0.009)	(0.972)	(0.002)	(0.669)
hasdaughter	0.7217	0.8944	0.7731	0.8285	0.8636
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Wild R	0.0000	0.0000	0.0000	0.0000	0.0000
Wild U	0.0000	0.0000	0.0000	0.0000	0.0000
District FE		x	x	x	x
Year FE		x	x	x	x
Controls		x	x	x	x
Observations	3020	3020	24404	14945	7099
R^2	0.418	0.438	0.324	0.338	0.407

Notes: DLHS sample of mothers who responded to the fertility survey. The outcome variable is a binary indicator for whether a mother desired a son at the next birth. The controls are the number of daughters from previous births, mother's age, education, religion, caste and a proxy for household wealth. *p*-values in parentheses.

Table D.15: Post-program Effects of Dhanlakshmi on Girl Births and Fertility, DLHS 12/13 & NFHS 15/16, Punjab

	(1) isgirl	(2) isgirl	(3) isgirl	(4) isbirth	(5) isbirth
DL × Post	-0.0304	-0.0272	0.0733	-0.0104	-0.0151
CR	(0.029)	(0.126)	(0.011)	(0.001)	(0.001)
Wild R	(0.521)	(0.673)	(0.656)	(0.210)	(0.386)
Wild U	(0.490)	(0.640)	(0.579)	(0.208)	(0.411)
DL × Post × bo=2			-0.259		
CR			(0.000)		
Wild R			(0.066)		
Wild U			(0.0003)		
DL × Post × bo>2			-0.00486		
CR			(0.932)		
Wild R			(0.986)		
Wild U			(0.985)		
District FE		x	x		x
Year FE		x	x		x
Controls		x	x		x
Observations	6482	6482	6482	17669	17669
R^2	0.000553	0.0160	0.0174	0.000745	0.0669

Note: The DID estimates compare the change in each outcome between the periods 2010-12 and 2014-16 in Fatehgarh Sahib with the corresponding changes in the control districts. The controls are the child's birth order, mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). The treated area is Fatehgarh Sahib and the treatment period is 2014-2016. The sample includes 6,102 mothers in Punjab. *p*-values in parentheses.

Table D.16: Dhanlakshmi Effects on Immunization, Survival and School attendance, Punjab

	(1)	(2)	(3)	(4)	(5)	(6)
	Imm 1	Imm 2	Imm 3	Breastfeeding	isgirl5	isn
DL × post	0.0713	0.0502	0.0508	0.024	0.045	0.040
CR	(0.0117)	(0.0448)	(0.0425)	(0.051)	(0.000)	(0.000)
Wild R	(0.437)	(0.436)	(0.499)	(0.467)	(0.413)	(0.368)
Wild U	(0.359)	(0.376)	(0.489)	(0.0536)	(0.000)	(0.000)
District FE	x	x	x	x	x	x
Interview Year FE	x	x	x	x	x	x
Controls	x	x	x	x	x	x
Observations	2665	2665	2665	2844	9814	4427
R^2	0.046	0.049	0.050	0.028	0.003	0.115

Note: DLHS 07/08 and 12/13 samples in columns (1)-(4) include girls aged two years or older in Punjab. Outcome variables Imm 1 - 3 are binary indicators for the recorded vaccine doses. Imm 1 covers BCG and DPT 1; Imm 2 adds DPT 2-3 and Polio 1-3 to the earlier doses; Imm 3 includes all previous doses and the Measles vaccine. Outcome variable breastfeeding is a binary indicator for whether the child was breastfed within three days after birth. DID estimates compare the change in girls' immunization and breastfeeding between 2004-06 and 2009-11 in Fatehgarh Sahib district with the corresponding changes in the control districts. Controls: child's birth order, mother's age and education, household's caste, religion, location and an indicator of dwelling construction type (wealth proxy). *p*-values in reported.

DLHS-NFHS samples in columns (5) and (6) comprise all 5-7-year-olds in the surveyed households. *isgirl5* is the share of girls in the selected age group and *isn* is a binary indicator for whether a girl belonging to this age cohort is currently attending school. DID estimates compare the change in outcomes for birth cohorts between 2000-02 and 2009-11 in Fatehgarh Sahib district with the corresponding changes in the control districts. Controls: child's age, household head's education, caste, religion, location and an indicator of household wealth. *p*-values in parentheses.

Table D.17: Dhanlakshmi Effects on Education Outcomes of Older Girls, DLHS 2007/08 & NFHS 2015/16, Punjab

	(1) isn	(2) yos
DL × post	-0.011	0.345
CR	(0.280)	(0.000)
Wild R	(0.405)	(0.380)
Wild U	(0.256)	(0.000)
District FE	x	x
Interview Year FE	x	x
Controls	x	x
Observations	9191	9191
R^2	0.249	0.000

Note: DLHS 07/08 and NFHS 15/16 samples comprise 8-14–year-old girls in the surveyed households. *isn* is a binary indicator for whether a girl belonging to this age cohort is currently attending school and *yos* is grades completed. DID estimates compare the change in outcomes for birth cohorts between 1994-99 and 2002-07 in Fatehgarh Sahib district with the corresponding changes in the control districts. Controls: child's age, household head's education, caste, religion, location and an indicator of household wealth. *p*-values in parentheses.

Table D.18: Program Effects on Prenatal and Pregnancy Outcomes

	(1) DL × post	(2) p-val	(3) N	(4) R²	(5) Wild R p-val	(6) Wild U p-val
No. of days ifa tablets taken	8.416	(0.039)	4562	0.0989	0.431	0.0439
Received tetanus injection	0.137	(0.000)	6701	0.0430	0.371	0.000
swelling of hands, feet and face	-0.0526	(0.003)	6651	0.011	0.423	0.004
paleness/giddiness/weakness	-0.0757	(0.003)	6651	0.0525	0.433	0.0044
visual disturbances	-0.0327	(0.016)	6651	0.0183	0.443	0.011
excessive fatigue	-0.131	(0.000)	6651	0.040	0.374	0.000
convulsions not from fever	0.0696	(0.000)	6651	0.0203	0.372	0.000
weak or no movement of fetus	-0.0405	(0.000)	6651	0.0122	0.317	0.000
abnormal fetal position	-0.0503	(0.000)	6651	0.0115	0.242	0.000
malaria	0.00239	(0.565)	6651	0.0104	0.598	0.565
excessive vomiting	-0.0146	(0.375)	6651	0.0235	0.506	0.362
hypertension/high bp	-0.0805	(0.000)	6651	0.0108	0.308	0.000
jaundice	-0.0229	(0.000)	6651	0.00612	0.271	0.000
excessive bleeding	-0.00242	(0.582)	6651	0.00823	0.599	0.594
vaginal discharge	-0.0167	(0.001)	6651	0.0121	0.361	0.0008

Note: DLHS sample of mothers (6701) who responded to the prenatal care questionnaire. The outcome variable is a binary indicator for whether a mother received antenal care or reported having a problem at her most recent pregnancy. DID estimates compare the change in each outcome between 2004-07 and 2009-12 in Fatehgarh Sahib with the corresponding changes in the control districts. Added controls include mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). *p*-values based on CR standard errors in parentheses.

Table D.19: Program Effects on Delivery and Post-delivery Care

	(1) DL × post	(2) *p*-val	(3) *N*	(4) R^2	(5) Wild R p-val	(6) Wild U p-val
Had a normal delivery	-0.0250	(0.175)	6619	0.0357	0.453	0.178
Delivered at a medical facility	-0.0712	(0.000)	6620	0.138	0.396	0.0002
premature labor	-0.128	(0.000)	6651	0.0442	0.335	0.000
excessive bleeding	-0.0671	(0.000)	6651	0.0129	0.289	0.000
prolonged labor	-0.111	(0.000)	6651	0.0403	0.327	0.000
obstructed labor	-0.0332	(0.110)	6651	0.135	0.439	0.111
breech presentation	-0.0227	(0.011)	6651	0.0162	0.408	0.007
convulsion/high bp	-0.0293	(0.000)	6651	0.00787	0.366	0.000
high fever	0.0709	(0.000)	6651	0.0200	0.340	0.000
lower abdomen pain	-0.0844	(0.000)	6651	0.0364	0.382	0.0001
vaginal discharge	-0.00615	(0.170)	6651	0.00841	0.452	0.169
excess bleeding	0.00180	(0.845)	6651	0.0147	0.849	0.845
convulsion	-0.0190	(0.000)	6651	0.00817	0.374	0.001
severe headache	-0.0601	(0.000)	6651	0.0122	0.345	0.000

Note: DLHS sample of mothers (6701) who responded to the delivery and postnatal care questionnaire. The outcome variable is a binary indicator for whether a mother experienced problems with childbirth at her most recent pregnancy. DID estimates compare the change in each outcome between 2004-07 and 2009-12 in Fatehgarh Sahib with the corresponding changes in the control districts. Added controls include mother's age and education, household's caste, religion, location (rural or urban) and an indicator of dwelling construction type (wealth proxy). *p*-values based on CR standard errors in parentheses.

Appendix D.6 Additional Figures

Figure D.1: Maoist-Related Violence in 2007

Maoist Insurgency in India
Fatalities by District, 2007
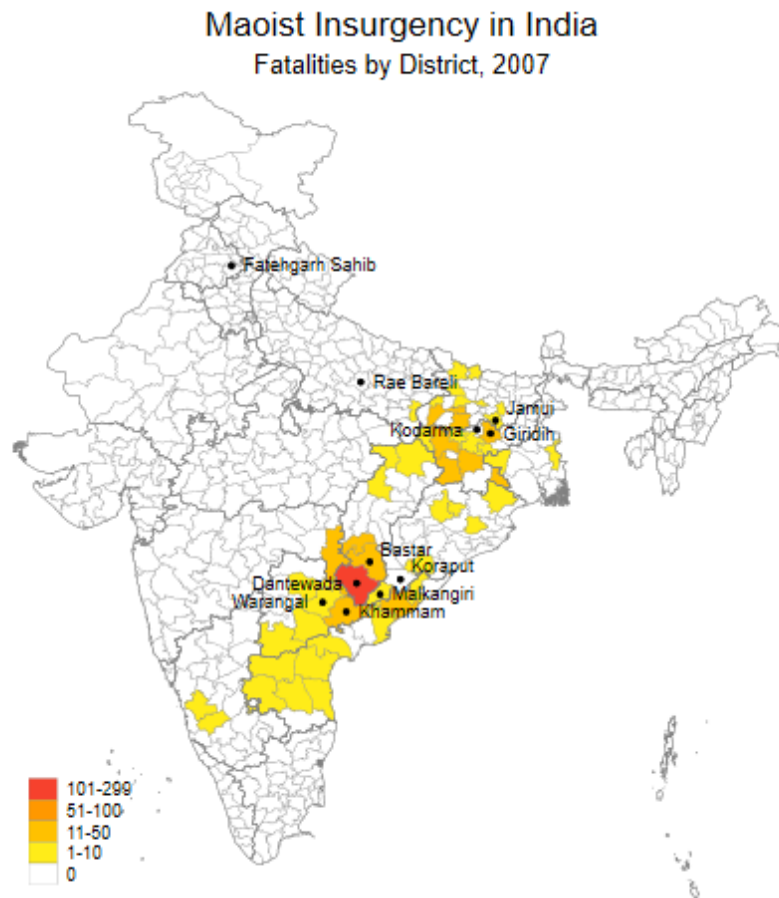
Note: Data from South Asian Terrorism Portal (SATP). Map shows the total number of attacks related to India's Maoist insurgency.

Figure D.2: Trends in Maoist-Related Violence over Time

(a) Andhra Pradesh

(b) Bihar

**(c)** Chhattisgarh

(d) Jharkhand

(e) Odisha
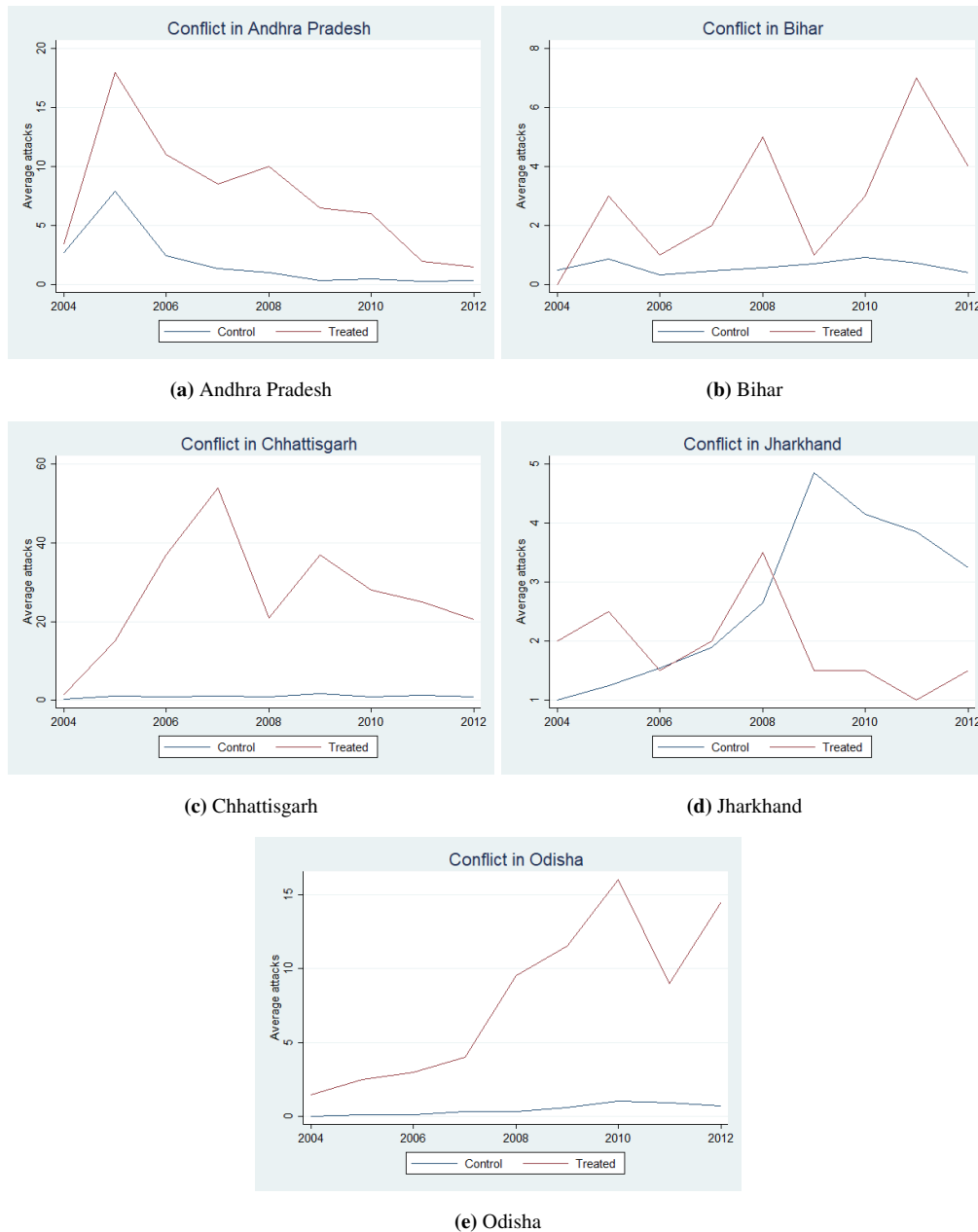
Note: South Asian Terrorism Portal (SATP). Figures plot average number of Maoist-related violent incidents over time separately for treatment and control districts in each of the 5 states Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand and Odisha.

Figure D.3: Maoist-Related Violent Attacks over Time (Pre-Dhanlakshmi)
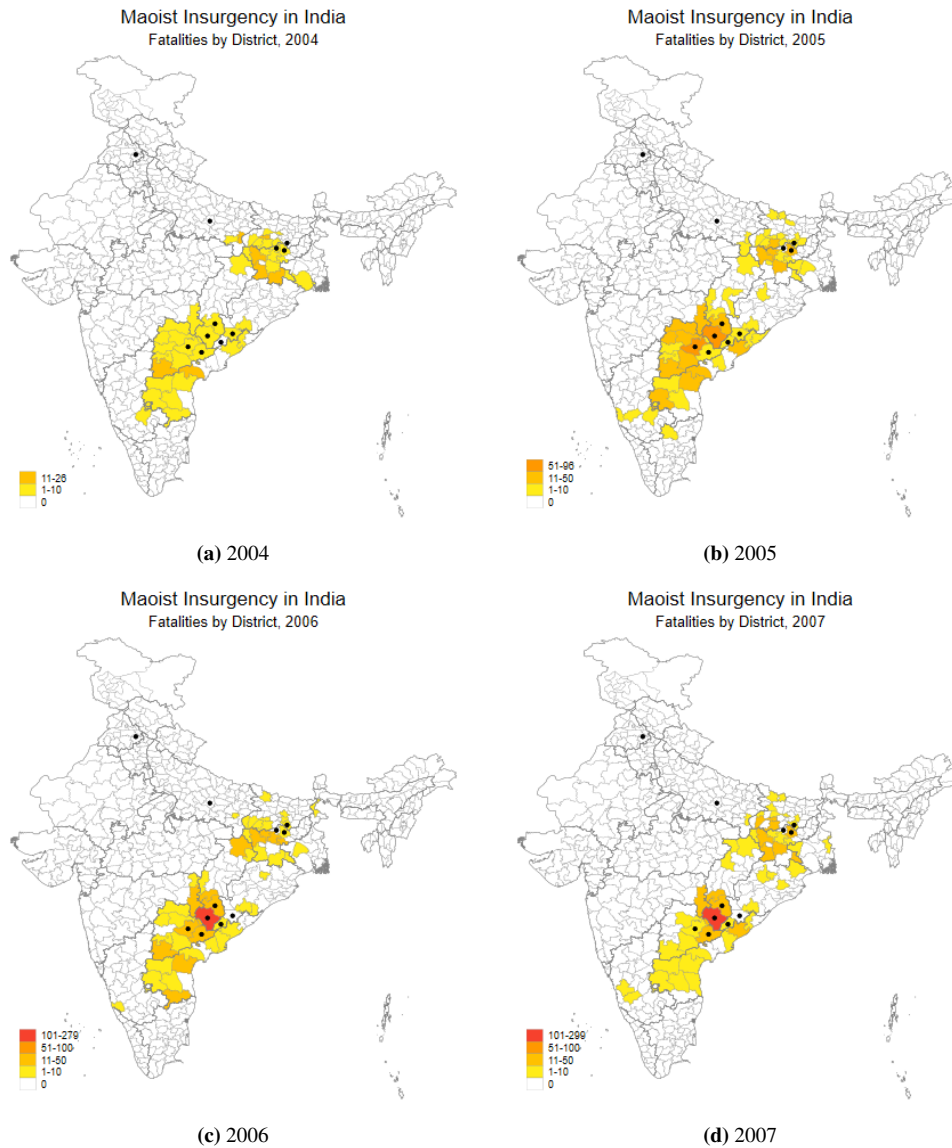
(a) 2004

(b) 2005

(c) 2006

(d) 2007

Note: Data from South Asian Terrorism Portal (SATP). Maps show the district-level number of Maoist-related violent incidents for a given year.

Figure D.4: Maoist-Related Violent Attacks over Time (Post-Dhanlakshmi)
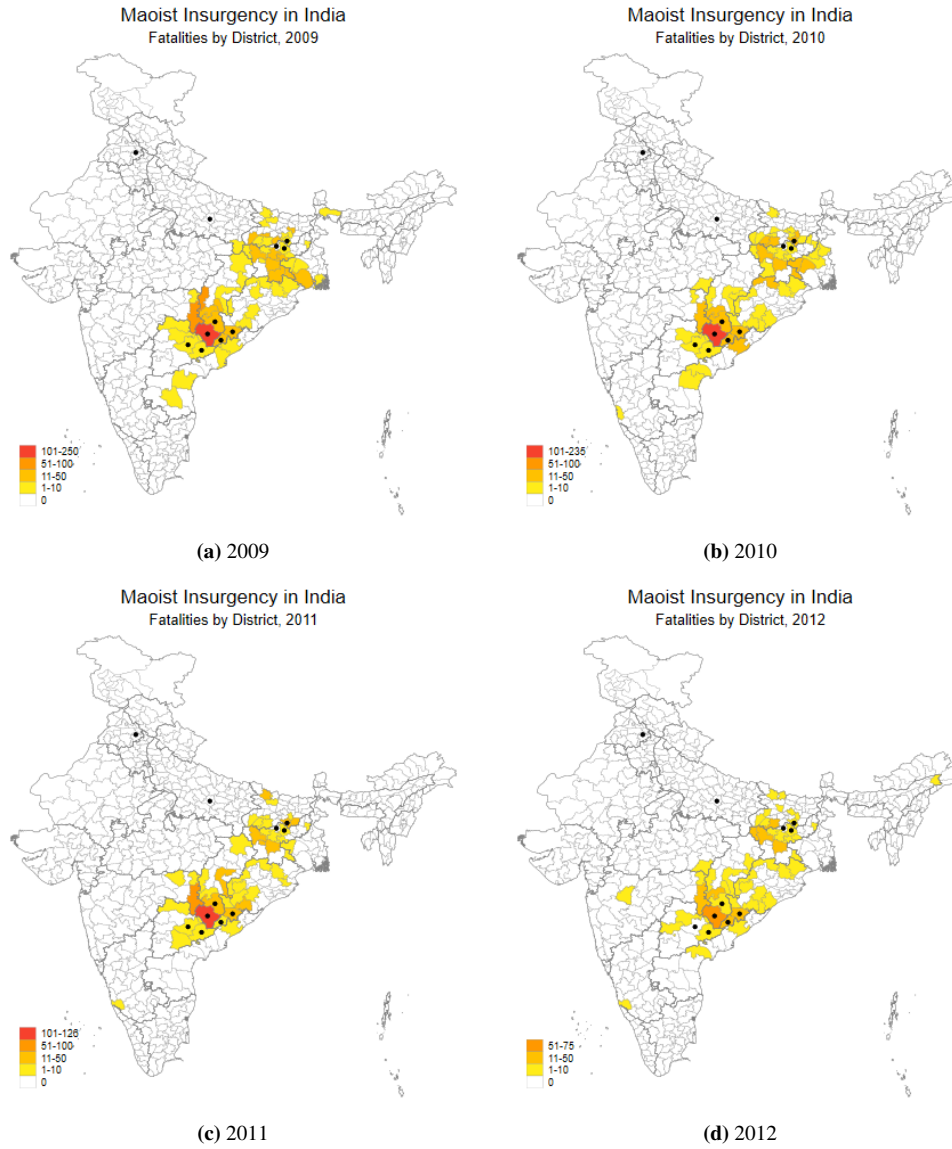
(a) 2009

(b) 2010

(c) 2011

(d) 2012

Note: Data from South Asian Terrorism Portal (SATP). Maps show the district-level number of Maoist-related violent incidents for a given year.

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