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Devolution and Collective Action in Forest Management: The Case of China - June 2019

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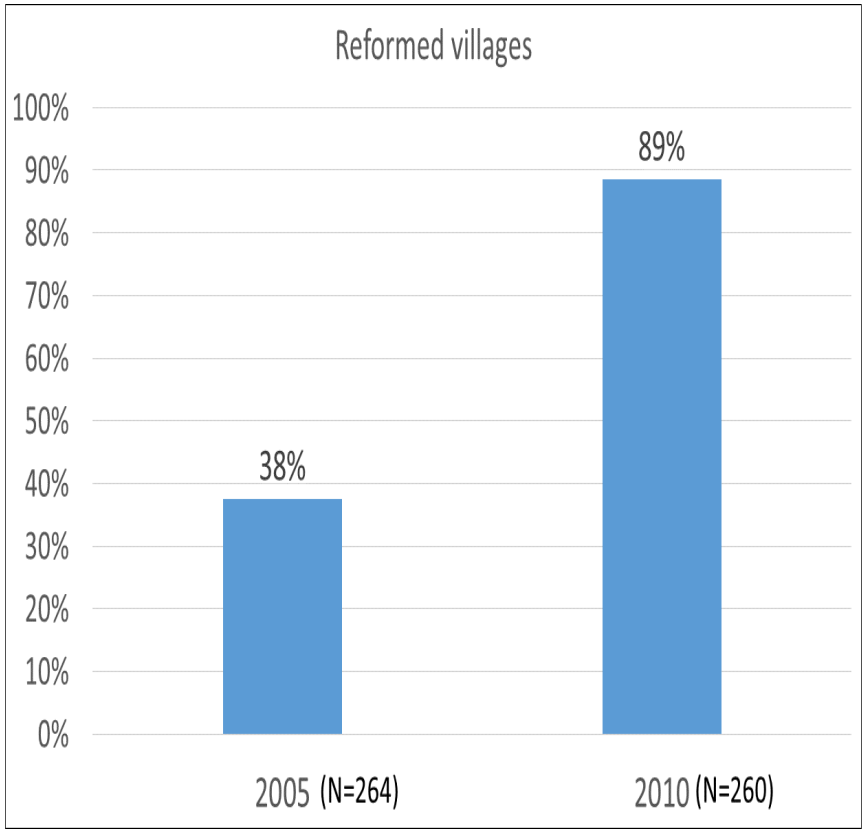
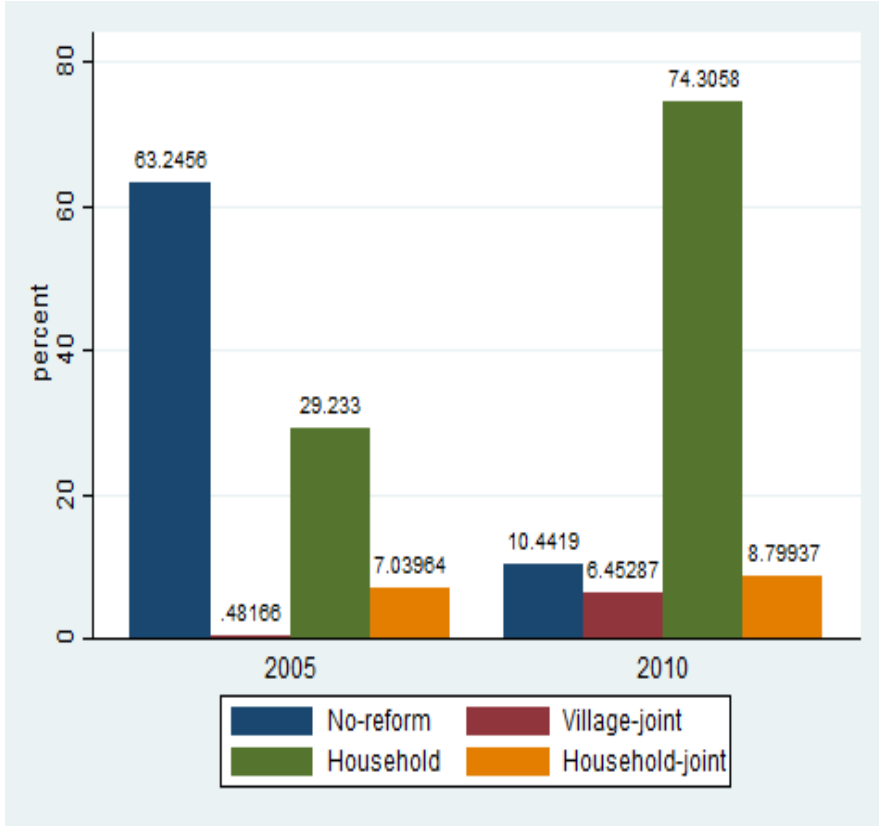
Motivation and Background

- China's Collective Forest Tenure Reform and Main Tenure Types
  1. *No-reform*: no reform in village, forests collectively owned as before;
  2. **Household private**: villages adopted the reform and devolved forests to households;
  3. **Household-joint**: villages adopted the reform and devolved forests, where some of these households formed joint-management
  4. *Village-collective*: villages adopted the reform and collectively manage the forests

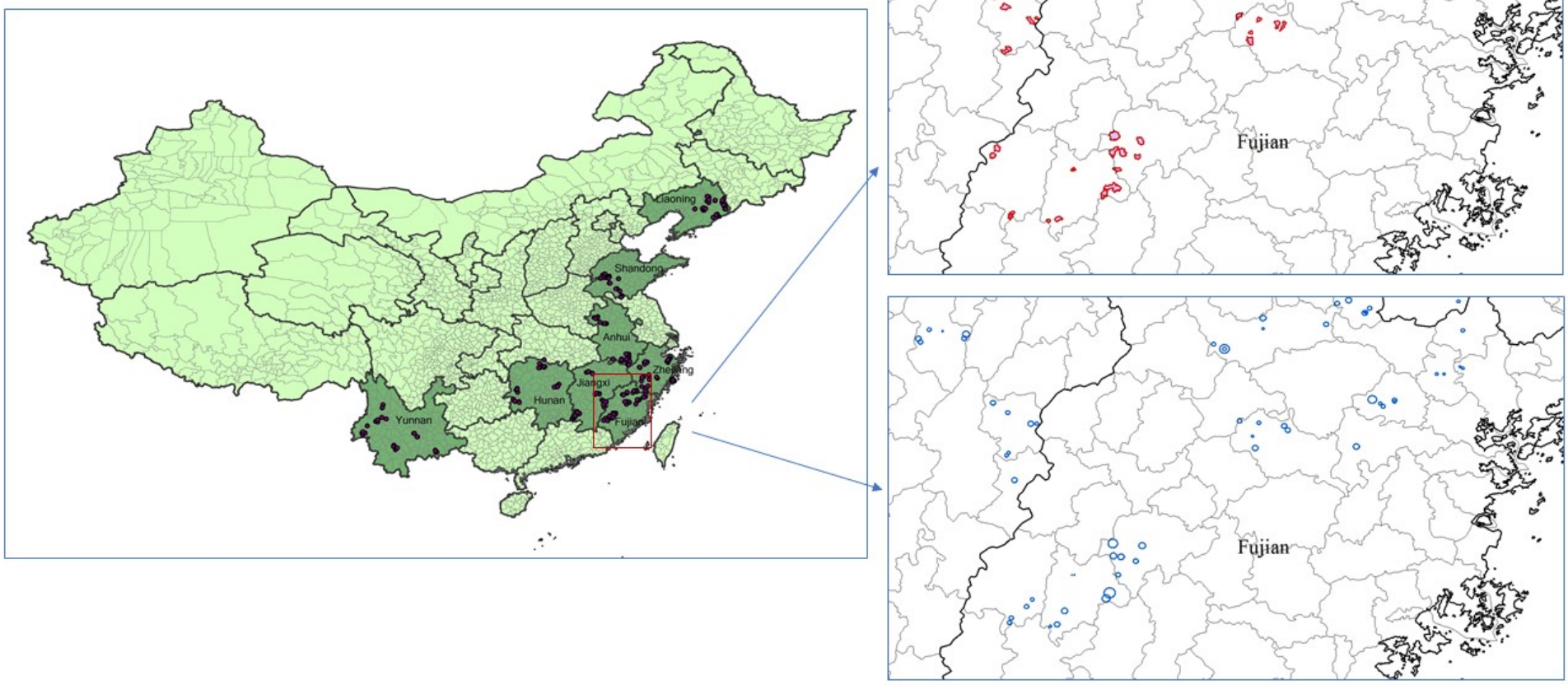
- This paper examines: Can further devolution trigger collective action in forest management and benefit member households?

- Data sources:
  1. Village & household survey in 8 provinces, 2005 and 2010
  2. MODIS MCD12Q1 on land cover type classification (500m): 2001-2012
  3. Landsat 7 32-Day EVI Composite (30m): 1999-2017

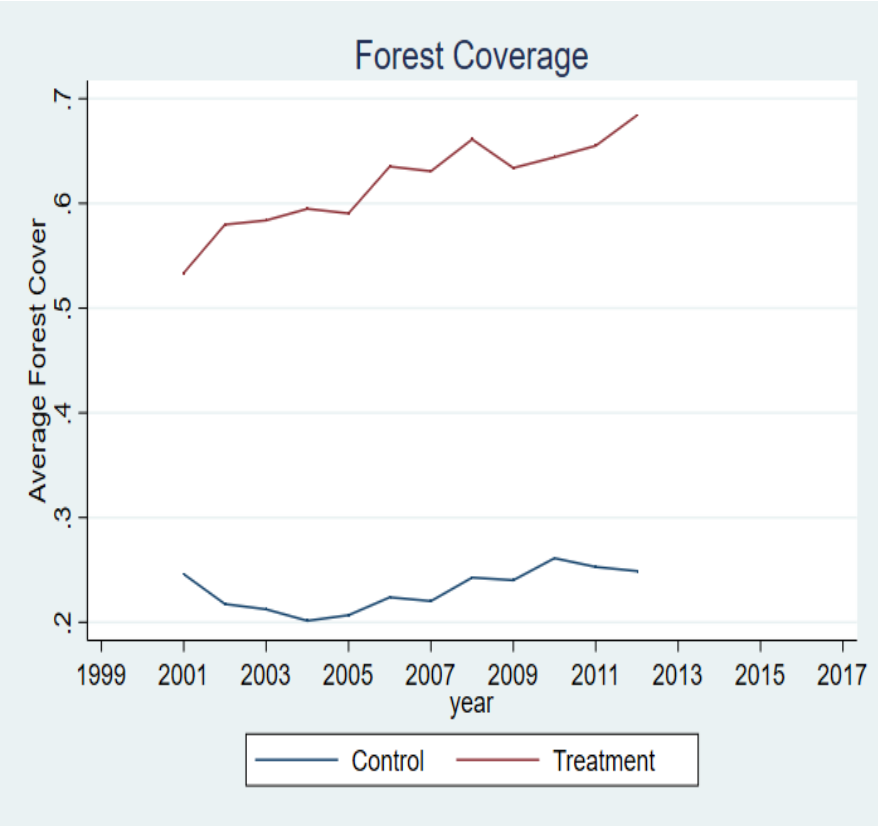

Reformed villages
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
38%
89%
2005 (N=264)
2010 (N=260)

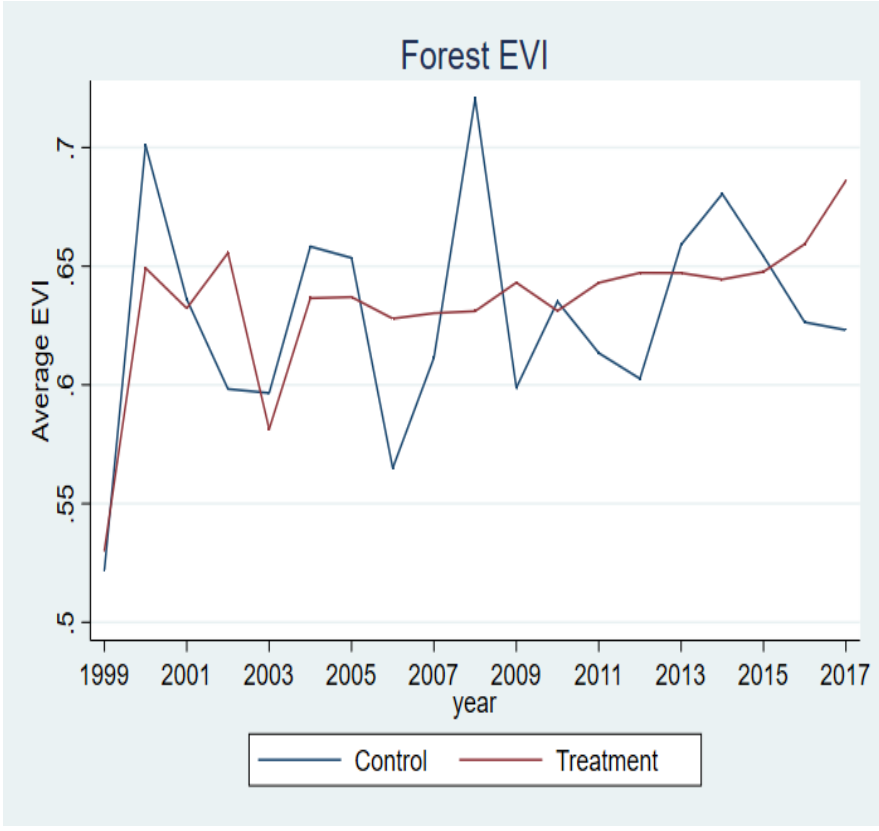

percent
0
20
40
60
80
63.2466
.48166
29.233
7.03964
10.4419
6.45287
74.3058
8.79937
2005
2010
No-reform
Village-joint
Household
Household-joint

Methodology



Treatment Vs. Control





Results: Treatment effect on forest

Table: ATE estimates based on matching

	Coef.	Std.Err.	Obs. (N)	Villages (N)	R-squared
Forest coverage					
Year 0	0.035***	(0.0109)	528	44	0.178
Year 1	0.033**	(0.0110)	528	44	0.175
Year 2	0.020*	(0.0114)	528	44	0.165
Year 3	0.018*	(0.0107)	484	44	0.218
EVI					
Year 0	-0.005	(0.0112)	836	44	0.159
Year 1	0.004	(0.0113)	792	44	0.099
Year 2	0.002	(0.0114)	748	44	0.079
Year 3	0.007	(0.0117)	704	44	0.087
Year 4	0.022**	(0.0121)	660	44	0.091
Year 5	0.015	(0.0127)	616	44	0.074
Year 6	-0.005	(0.0132)	572	44	0.072
Year 7	0.012	(0.0139)	528	44	0.079

Results: Treatment effect on household income

Table: ATE estimates based on matching

	(1) Total income	(2) Relative poverty	(3) Off-farm income	(4) Off-farm income (%)	(5) Farming income	(6) Forest prod. value
Panel A. 2005-2010						
Devolution-based collective action	2,326.304*	-0.042	2,221.130**	0.045	134.895	436.398*
	(1,248.151)	(0.074)	(975.002)	(0.058)	(330.702)	(238.614)
R-squared	0.181	0.041	0.164	0.167	0.104	0.080
Observations	586	586	586	586	586	586
Number of household	298	298	298	298	298	298
Panel B. 2000-2010						
Devolution-based collective action	1,821.805	-0.024	2,214.822**	0.055	154.677	459.397*
	(1,137.009)	(0.074)	(928.311)	(0.056)	(382.615)	(256.637)
R-squared	0.246	0.091	0.208	0.121	0.088	0.084
Observations	881	881	881	881	881	881
Number of household	298	298	298	298	298	298
Household FE	Yes	Yes	Yes	Yes	Yes	Yes
Year trend	Yes	Yes	Yes	Yes	Yes	Yes