

# The Political Economy of Deforestation in the Tropics

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## Online Appendix

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This Appendix presents additional tables that are discussed in the text, as follows:

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## Timing of district splits

**Appendix Table 1: Timing of District Splits**

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VARIABLES	(1) Year First Split	(2) Year First Split	(3) Year First Split
Population in 1996 (millions)	-0.537 (0.774)	-0.516 (0.770)	-0.737 (0.685)
Total area (millions pixels)	-0.0562 (0.697)	0.0202 (0.727)	0.265 (0.883)
Mean per-capita exp. 1996 (US\$)	-0.0169 (0.0652)	-0.0177 (0.0666)	-0.00933 (0.0762)
Oil and Gas 2001 (millionUS\$)	0.0142 (0.00923)	0.0147 (0.0100)	-0.0123 (0.0231)
Share of land forest in 2000	-3.727 (2.626)	-3.853 (3.000)	-1.488 (2.396)
Share of forest deforested in 2001	-10.25 (55.96)	-19.75 (65.49)	40.42 (80.14)
FE	None	Island	Province
Observations	72	72	72
R-squared	0.076	0.081	0.459

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Notes: An observation is a district at the 1996 borders, excluding cities, conditional on at least 1 split taking place from 2001-2008. The dependent variable is the year the first split took place, conditional on their being a split. Province FE are defined using 2008 provincial boundaries. Robust standard errors.

## Results using 1990 provincial border definitions

**Appendix Table 2: Satellite Data on Impact of Splits, Province Level, using 1990 Province Border Definitions**

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
<b>Panel A</b>							
Number of districts in province	0.0210 (0.0186)	0.0259 (0.0214)	0.0368 (0.0329)	0.0235 (0.0343)	0.0323 (0.0230)	0.0900*** (0.0301)	-0.0155 (0.0437)
Observations	504	240	264	104	136	128	136
<b>Panel B: Lags</b>							
Number of districts in province	0.0329 (0.0317)	0.0383 (0.0354)	0.102*** (0.0368)	0.0748 (0.0494)	0.0405 (0.0338)	0.102*** (0.0365)	0.0929** (0.0474)
Lag 1	0.0169 (0.0578)	0.0180 (0.0605)	-0.143** (0.0649)	-0.0120 (0.0776)	0.0147 (0.0562)	-0.140 (0.101)	-0.120*** (0.0426)
Lag 2	-0.0591*** (0.0216)	-0.0606*** (0.0213)	0.00960 (0.0684)	-0.0937*** (0.0219)	-0.0468** (0.0229)	0.0743 (0.113)	-0.0632 (0.0622)
Lag 3	0.0840** (0.0400)	0.0770* (0.0406)	0.150** (0.0613)	0.155** (0.0717)	0.0567 (0.0358)	0.109** (0.0549)	0.167*** (0.0542)
Observations	504	240	264	104	136	128	136
Joint p	0.00210	0.000570	0.00827	0	0.0227	0.00578	0
Sum of lags	0.0747** 0.0229	0.0727** 0.0232	0.118*** 0.0351	0.124** 0.0576	0.0650*** 0.0237	0.144*** 0.0440	0.0764** 0.0306

Notes: Provinces are defined here using the original 1990 province boundaries. Otherwise, see Notes to Table 3. \*\*\* 0.01, \*\* 0.05, \* 0.1

**Appendix Table 3: Satellite Data on Impact of Splits, Leads, using 1990 Province Border Definitions**

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
Number of districts in province	0.00767 (0.0420)	0.0115 (0.0477)	0.0576 (0.0406)	-0.0486 (0.0477)	0.0277 (0.0518)	0.0739 (0.0585)	0.0321 (0.0426)
Lag 1	-0.00833 (0.0658)	-0.0108 (0.0671)	-0.163* (0.0915)	-0.0245 (0.0789)	-0.0167 (0.0644)	-0.125 (0.101)	-0.171** (0.0791)
Lag 2	-0.0229 (0.0408)	-0.0194 (0.0417)	0.0480 (0.0636)	-0.0455 (0.0569)	-0.00327 (0.0425)	0.0728 (0.120)	-0.0177 (0.0497)
Lag 3	0.0836** (0.0385)	0.0743* (0.0382)	0.148** (0.0649)	0.184** (0.0745)	0.0544* (0.0327)	0.138* (0.0839)	0.171*** (0.0623)
Lead 1	0.0903 (0.0683)	0.0881 (0.0688)	0.0948 (0.126)	0.226** (0.0956)	0.0507 (0.0737)	0.0817 (0.100)	0.146 (0.146)
Lead 2	-0.215 (0.151)	-0.233 (0.151)	-0.205 (0.192)	-0.278 (0.231)	-0.224 (0.143)	0.0686 (0.349)	-0.273 (0.172)
Lead 3	0.116 (0.104)	0.129 (0.105)	0.126 (0.106)	0.237 (0.169)	0.123 (0.102)	0.0186 (0.200)	0.138 (0.106)
Observations	378	180	198	78	102	96	102
Joint p	4.31e-06	0	1.30e-07	0	0	0.210	6.56e-09
Sum of lags	0.0600** 0.0284	0.0556* 0.0297	0.0903* 0.0522	0.0653 0.0410	0.0621* 0.0366	0.160* 0.0832	0.0149 0.0582
Sum of leads	-0.00848 0.0520	-0.0164 0.0502	0.0158 0.0884	0.185* 0.104	-0.0497 0.0474	0.169 0.169	0.0106 0.0759
Joint p leads	0.438	0.422	0.700	0.0282	0.412	0.515	0.154

Notes: Provinces are defined here using the original 1990 province boundaries. Otherwise, see Notes to Table 4. \*\*\* 0.01, \*\* 0.05, \* 0.1

**Appendix Table 4: District Level Analysis: Direct versus Indirect Effects, using 1990 Province Border Definitions**

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
<b>Panel A</b>							
Number of districts in original district boundaries	-0.0810 (0.0796)	-0.132 (0.105)	0.0655 (0.0531)	-0.00419 (0.147)	-0.166 (0.109)	0.143* (0.0765)	-0.0346 (0.0830)
Number of districts elsewhere in province	0.0434 (0.0286)	0.0607* (0.0342)	0.0312 (0.0329)	0.0285 (0.0429)	0.0771** (0.0383)	0.0821** (0.0375)	-0.0111 (0.0423)
Observations	3152	1488	1664	536	952	688	976
<b>Panel B: Lags</b>							
Number of districts in original district boundaries	-0.0504 (0.0873)	-0.0792 (0.118)	0.118** (0.0598)	0.0493 (0.151)	-0.112 (0.117)	0.156* (0.0869)	0.0663 (0.0672)
Lag 1	0.0242 (0.129)	-0.00407 (0.154)	-0.0853 (0.106)	0.249 (0.247)	-0.0621 (0.130)	-0.0792 (0.136)	-0.0505 (0.0719)
Lag 2	-0.0908 (0.120)	-0.136 (0.152)	0.0302 (0.0869)	-0.433 (0.284)	-0.0702 (0.130)	0.145 (0.147)	-0.119 (0.0887)
Lag 3	0.142** (0.0630)	0.149** (0.0730)	0.188** (0.0768)	0.107 (0.146)	0.170** (0.0797)	0.153 (0.0973)	0.234*** (0.0887)
Number of districts elsewhere in province	0.0553 (0.0381)	0.0685 (0.0442)	0.105*** (0.0353)	0.0600 (0.0625)	0.0835** (0.0412)	0.113*** (0.0379)	0.0970** (0.0452)
Lag 1	0.0152 (0.0521)	0.0236 (0.0550)	-0.159*** (0.0541)	-0.0586 (0.0771)	0.0320 (0.0515)	-0.167** (0.0793)	-0.132*** (0.0461)
Lag 2	-0.0518 (0.0383)	-0.0439 (0.0408)	0.00704 (0.0605)	-0.0215 (0.0514)	-0.0398 (0.0427)	0.0629 (0.0879)	-0.0440 (0.0761)
Lag 3	0.0679* (0.0374)	0.0562 (0.0395)	0.141** (0.0616)	0.160** (0.0718)	0.0239 (0.0395)	0.104** (0.0440)	0.144** (0.0619)
Observations	3152	1488	1664	536	952	688	976
Joint p original	0.232 (0.0254)	0.224 (-0.0701)	0.0853 (0.251**)	0.248 (-0.0280)	0.203 (-0.0744)	0.203 (0.375**)	0.0111 (0.131*)
Sum of lags original	0.113 (0.0426)	0.128 (0.0380)	0.104 (0.0166)	0.194 (0.164)	0.138 (0.0445)	0.179 (0.00254)	0.0701 (0.00901)
Joint p elsewhere	0.0867** (0.0374)	0.104** (0.0395)	0.0945** (0.0616)	0.140** (0.0718)	0.0996** (0.0395)	0.114** (0.0440)	0.0650* (0.0619)

Notes: Provinces are defined here using the original 1990 province boundaries. Otherwise, see Notes to Table 6. \*\*\* 0.01, \*\* 0.05, \* 0.1

## Leads and other robustness checks

**Appendix Table 5: Impact of Splits in Non-Cities and Cities using Satellite data**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	All Forest	Production /Conversion	Conservation /Protection	Conversion	Production	Conservation	Protection
<b>Panel A</b>							
Number of districts excluding cities	0.0352* (0.0189)	0.0402* (0.0215)	0.0541 (0.0377)	0.0243 (0.0340)	0.0523** (0.0237)	0.106** (0.0415)	0.0113 (0.0419)
Observations	608	296	312	128	168	144	168
<b>Panel B</b>							
Number of city districts	0.139 (0.134)	0.171 (0.114)	0.116 (0.290)	-0.475* (0.282)	0.162 (0.108)	0.00295 (0.709)	0.218 (0.214)
Observations	608	296	312	128	168	144	168

Notes: See notes to Table 3.

**Appendix Table 6: Impact of Splits on Prices and Quantities: Alternative Specifications**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	2001-2007 All wood observations		2001-2007 Balanced panel of wood observations		1994-2007 All wood observations	
	Log Price	Log Quantity	Log Price	Log Quantity	Log Price	Log Quantity
<b>Panel A: Contemporaneous weights</b>						
Number of districts in province	-0.017 (0.013)	0.092* (0.048)	-0.022 (0.014)	0.106* (0.049)	-0.024*** (0.008)	0.055** (0.019)
Observations	1003	1003	532	532	2357	2357
<b>Panel B: No cities</b>						
Number of districts in province	-0.018* (0.008)	0.088* (0.042)	-0.020* (0.009)	0.106** (0.036)	-0.026*** (0.008)	0.073*** (0.020)
Observations	1003	1003	532	532	2355	2355
<b>Panel C: Cities only (falsification)</b>						
Number of districts in province	0.098 (0.131)	0.420 (0.353)	0.157 (0.130)	0.494 (0.319)	-0.001 (0.043)	0.184** (0.084)
Observations	1003	1003	532	532	2355	2355

**Appendix Table 6 continued**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	2001-2007 All wood observations		2001-2007 Balanced panel of wood observations		1994-2007 All wood observations	
	Log Price	Log Quantity	Log Price	Log Quantity	Log Price	Log Quantity
<b>Panel D: Leads</b>						
Number of districts in province	-0.020** (0.007)	0.118 (0.078)	-0.020** (0.009)	0.160* (0.073)	-0.019** (0.009)	0.096* (0.048)
Lag 1	0.007 (0.006)	-0.044 (0.034)	0.006 (0.007)	-0.040 (0.042)	0.008 (0.005)	-0.016 (0.039)
Lag 2	-0.003 (0.005)	0.027 (0.053)	-0.002 (0.008)	-0.001 (0.028)	-0.007 (0.005)	0.017 (0.030)
Lag 3	-0.016** (0.007)	0.051 (0.050)	-0.017* (0.008)	0.060 (0.047)	-0.019* (0.009)	0.036 (0.036)
Lead 1	0.016 (0.014)	0.092 (0.131)	0.033 (0.025)	0.290* (0.151)	-0.011 (0.010)	0.002 (0.023)
Lead 2	-0.018 (0.048)	-0.086 (0.207)	-0.028 (0.055)	-0.192 (0.159)	-0.009* (0.005)	-0.043 (0.063)
Lead 3	0.003 (0.026)	-0.057 (0.140)	0.004 (0.045)	-0.087 (0.161)	-0.016* (0.008)	0.019 (0.041)
Observations	865	865	456	456	1822	1822
Joint p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sum of lags	-0.0326*** (0.0111)	0.152** (0.0633)	-0.0338** (0.0108)	0.178** (0.0740)	-0.0372** (0.0152)	0.133** (0.0484)
Sum of leads	0.000675 (0.0435)	-0.0501 (0.188)	0.00960 (0.0440)	0.0111 (0.283)	-0.0363*** (0.0110)	-0.0209 (0.0414)

*Notes:* The price and quantity data has been compiled from the 'Statistics of Forest and Concession Estate'. The price data The *Number of districts in province* variable counts the number of districts within each province. In Panel B the *Number of districts in province* variable only counts the number of *kabupaten* (rural districts) within each province. In Panel C the *Number of districts in province* variable only counts the number of *kota* (major cities) within each province. The regression also includes wood-type-by-province and wood-type-by-island-by-year fixed effects and are weighted by the first volume reported by wood type and province. The robust standard errors are clustered at the 1990 province boundaries and reported in parentheses. \*\*\* 0.01, \*\* 0.05, \* 0.1



**Appendix Table 7: District Level Results with 5 Lags**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All Forest	Production/ Conversion	Conservation/ Protection	Conversion	Production	Conservation	Protection
Number of districts in original district boundaries	-0.0375	-0.0677	0.110**	0.0394	-0.109	0.131	0.0354
Lag 1	(0.0803)	(0.105)	(0.0546)	(0.160)	(0.103)	(0.0811)	(0.0598)
Lag 2	-0.0323	-0.0906	-0.0590	0.191	-0.150	-0.103	0.0182
Lag 3	(0.123)	(0.148)	(0.102)	(0.231)	(0.136)	(0.129)	(0.0827)
Lag 4	-0.0500	-0.0936	0.0149	-0.396	-0.0436	0.0957	-0.101
Lag 5	(0.101)	(0.135)	(0.0791)	(0.281)	(0.118)	(0.152)	(0.0955)
Lag 6	0.207***	0.232**	0.176**	0.0874	0.274***	0.226***	0.214*
Lag 7	(0.0770)	(0.0909)	(0.0839)	(0.179)	(0.0881)	(0.0836)	(0.113)
Lag 8	-0.0371	-0.0451	0.0431	-0.0109	-0.0473	-0.0442	-0.0470
Lag 9	(0.0811)	(0.0891)	(0.106)	(0.178)	(0.0912)	(0.101)	(0.0671)
Lag 10	0.0397	0.0531	-0.0282	0.153	0.0132	-0.166	0.205**
Number of districts elsewhere in province	(0.0794)	(0.0905)	(0.120)	(0.155)	(0.0893)	(0.115)	(0.0923)
Lag 1	0.0602	0.0759*	0.0900***	0.0322	0.100**	0.0891**	0.0573
Lag 2	(0.0379)	(0.0442)	(0.0333)	(0.0610)	(0.0401)	(0.0427)	(0.0372)
Lag 3	0.0653	0.0899	-0.139**	-0.0198	0.104*	-0.194**	-0.0509
Lag 4	(0.0583)	(0.0623)	(0.0577)	(0.0925)	(0.0610)	(0.0946)	(0.0581)
Lag 5	-0.0474	-0.0377	0.0366	0.00345	-0.0390	0.100	-0.0322
Lag 6	(0.0450)	(0.0484)	(0.0729)	(0.0625)	(0.0515)	(0.115)	(0.0900)
Lag 7	0.0186	-0.00978	0.0863	0.116	-0.0576	0.0701	0.0950
Lag 8	(0.0475)	(0.0491)	(0.0746)	(0.0944)	(0.0475)	(0.0786)	(0.0831)
Lag 9	-0.0140	0.00248	-0.0203	-0.0412	0.0215	-0.0234	-0.0328
Lag 10	(0.0350)	(0.0336)	(0.0599)	(0.0513)	(0.0426)	(0.0789)	(0.0585)
Lag 11	0.0617*	0.0538	0.0594	0.0440	0.0453	0.0295	0.0640
Lag 12	(0.0339)	(0.0346)	(0.0688)	(0.0493)	(0.0361)	(0.0856)	(0.0661)
Observations	3152	1488	1664	536	952	688	976
Joint p original	0.118	0.0164	0.0674	0.0317	0.0219	0.0134	0.00334
Sum of lags original	0.0896	-0.0121	0.256*	0.0644	-0.0630	0.140	0.325**
	(0.123)	(0.120)	(0.147)	(0.207)	(0.122)	(0.186)	(0.133)
Joint p elsewhere	0.0143	0.00721	0.0251	0.565	0.00415	0.0161	0.238
Sum of lags elsewhere	0.144***	0.175***	0.113*	0.135*	0.175***	0.0714	0.100
	(0.0456)	(0.0486)	(0.0637)	(0.0722)	(0.0524)	(0.0883)	(0.0625)

Notes: See Notes to Table 6. A unit of observation is a 1990-borders district \* forest zone. Robust standard errors clustered at 1990 district borders in parentheses. *Number of districts in original district boundaries* variable counts the number of districts the district split into and the *Number of districts elsewhere in province* variable counts the number of districts all other districts within the same province split into. The regression also includes district-by-forest zone and island-by-year fixed effects. \*\*\* 0.01, \*\* 0.05, \* 0.1

## Appendix Table 8: District Level Analysis, Leads

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
Number of districts in original district boundaries	-0.0206 (0.112)	0.0556 (0.181)	-0.00354 (0.0506)	0.0136 (0.295)	0.0669 (0.175)	0.103 (0.0713)	-0.0549 (0.0913)
Lag 1	-0.0680 (0.153)	-0.209 (0.195)	-0.0207 (0.0957)	0.0391 (0.322)	-0.285 (0.178)	-0.000855 (0.114)	0.00891 (0.0802)
Lag 2	-0.0599 (0.139)	-0.103 (0.194)	-0.0223 (0.0989)	-0.258 (0.326)	-0.0658 (0.173)	0.0527 (0.124)	-0.144 (0.0968)
Lag 3	0.242*** (0.0717)	0.281*** (0.0894)	0.167 (0.106)	0.294** (0.148)	0.301*** (0.0913)	0.202* (0.109)	0.242* (0.128)
Lead 1	0.135 (0.245)	0.0802 (0.250)	0.398 (0.282)	0.827* (0.454)	0.0151 (0.236)	0.909** (0.418)	0.253 (0.180)
Lead 2	-0.311 (0.246)	-0.397 (0.295)	-0.0823 (0.257)	-0.653 (0.400)	-0.370 (0.272)	0.279 (0.188)	-0.306 (0.342)
Lead 3	0.0982 (0.124)	0.124 (0.120)	-0.145 (0.218)	0.425** (0.213)	0.0331 (0.140)	-0.485** (0.238)	0.224 (0.317)
Number of districts elsewhere in province	0.0595 (0.0486)	0.0451 (0.0664)	0.107*** (0.0378)	-0.0204 (0.0870)	0.0693 (0.0661)	0.145*** (0.0438)	0.0311 (0.0630)
Lag 1	0.0554 (0.0609)	0.0958 (0.0645)	-0.118** (0.0544)	-0.0191 (0.101)	0.119* (0.0656)	-0.136* (0.0702)	-0.0607 (0.0629)
Lag 2	-0.0537 (0.0557)	-0.0355 (0.0631)	-0.00613 (0.0819)	-0.00204 (0.0917)	-0.0292 (0.0640)	0.0254 (0.0932)	-0.0425 (0.0935)
Lag 3	0.0272 (0.0370)	-0.00194 (0.0399)	0.129* (0.0683)	0.104 (0.0967)	-0.0342 (0.0421)	0.151** (0.0752)	0.0838 (0.0700)
Lead 1	0.0967 (0.0858)	0.118 (0.100)	-0.0199 (0.112)	0.254** (0.124)	0.0731 (0.0983)	0.110 (0.132)	-0.0114 (0.105)
Lead 2	-0.0520 (0.104)	-0.0516 (0.112)	-0.0187 (0.112)	-0.265 (0.169)	-0.0288 (0.113)	0.0340 (0.164)	-0.0217 (0.129)
Lead 3	-0.00336 (0.0857)	-0.0172 (0.0913)	0.00239 (0.0962)	0.106 (0.152)	-0.0164 (0.0916)	-0.0396 (0.132)	-0.0341 (0.118)

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
Observations	2322	1104	1218	390	714	498	720
Joint p original	0.0776	0.000136	0.000700	0.0763	0.000464	0.000142	0.547
Sum of lags original	0.0932	0.0256	0.120	0.0888	0.0167	0.357**	0.0523
	(0.126)	(0.157)	(0.106)	(0.237)	(0.158)	(0.159)	(0.101)
Sum of leads original	-0.0771	-0.193	0.171	0.599	-0.322	0.703*	0.171
	(0.263)	(0.294)	(0.311)	(0.406)	(0.298)	(0.415)	(0.174)
Joint p leads original	0.532	0.590	0.0693	0.122	0.561	0.107	0.522
Joint p elsewhere	0.356	0.241	0.0114	0.0504	0.147	0.00101	0.622
Sum of lags elsewhere	0.0884*	0.104*	0.112*	0.0624	0.125**	0.186**	0.0118
	(0.0471)	(0.0571)	(0.0578)	(0.0927)	(0.0606)	(0.0795)	(0.0670)
Sum of leads elsewhere	0.0413	0.0488	-0.0362	0.0947	0.0279	0.105	-0.0672
	(0.0656)	(0.0833)	(0.0722)	(0.123)	(0.0840)	(0.121)	(0.0771)
Joint p leads elsewhere	0.688	0.676	0.941	0.0496	0.897	0.825	0.650

Notes: \*\*\* 0.01, \*\* 0.05, \* 0.1

## District splits and capital cities

**Appendix Table 9: District Level Analysis: New versus Old Part of the District**

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
<b>Panel A</b>							
Number of districts in original district boundaries	-0.0527 (0.0774)	-0.0707 (0.0993)	0.0594 (0.0520)	0.0336 (0.160)	-0.0730 (0.107)	0.124** (0.0591)	-0.0209 (0.100)
Number of districts in orig. district boundaries	-0.0383 (0.0836)	-0.0508 (0.0846)	-0.00116 (0.0855)	-0.0190 (0.118)	-0.0740 (0.107)	0.00417 (0.0469)	-0.125 (0.0802)
× has original capital in 2008							
Observations	5488	2512	2816	896	1568	1072	1616
<b>Panel B: Lags</b>							
Number of districts in original district boundaries	-0.00514 (0.0943)	-0.0192 (0.128)	0.113 (0.0690)	0.0654 (0.178)	-0.0229 (0.127)	0.182** (0.0843)	0.0305 (0.0526)
Lag 1	0.106 (0.150)	0.106 (0.176)	0.0600 (0.126)	0.371 (0.252)	0.0430 (0.142)	0.0526 (0.126)	0.104 (0.0830)
Lag 2	-0.285*** (0.110)	-0.366*** (0.131)	-0.105* (0.0617)	-0.777*** (0.244)	-0.268** (0.120)	-0.0312 (0.0681)	-0.204** (0.102)
Lag 3	0.207*** (0.0671)	0.260*** (0.0741)	0.101 (0.0849)	0.334** (0.144)	0.211** (0.0850)	0.0405 (0.119)	0.191 (0.129)
Number of districts × has original capital in 2008	-0.167* (0.0879)	-0.177 (0.127)	-0.138*** (0.0440)	-0.134 (0.101)	-0.201 (0.160)	-0.189** (0.0932)	-0.169*** (0.0546)
Lag 1	-0.0160 (0.126)	-0.00289 (0.160)	-0.168* (0.0885)	-0.0485 (0.188)	-0.00209 (0.169)	-0.122 (0.105)	-0.154 (0.124)
Lag 2	0.357*** (0.0744)	0.416*** (0.0987)	0.313*** (0.0940)	0.446*** (0.0879)	0.412*** (0.141)	0.340*** (0.113)	0.0818 (0.0859)
Lag 3	-0.107 (0.0871)	-0.202* (0.104)	0.178* (0.0971)	-0.217** (0.102)	-0.196* (0.115)	0.180 (0.141)	0.251** (0.127)
Observations	5488	2512	2816	896	1568	1072	1616
Joint p original	0.000419	0.000183	0.0882	<0.001	0.0683	0.137	0.0856
Sum of lags original	0.0219 (0.114)	-0.0188 (0.121)	0.168* (0.0910)	-0.00702 (0.229)	-0.0372 (0.121)	0.244 (0.149)	0.122 (0.0910)
Joint p interaction	0	<0.001	<0.001	<0.001	<0.001	0.0139	0.00623
Sum of lags interaction	0.0668 (0.121)	0.0339 (0.0898)	0.186 (0.158)	0.0463 (0.171)	0.0127 (0.0886)	0.210** (0.105)	0.0103 (0.147)

*Notes:* See Notes to Table 6. A unit of observation is a 2008-borders district \* forest zone. Robust standard errors clustered at 1990 district borders in parentheses. *Number of districts in original district boundaries* variable counts the number of districts the original 1990 district split into as of year  $t$  and the *Has original capital in 2008* is a dummy for whether the capital city of the original 1990 district is located within the borders of the district in 2008. The regression also includes 2008 district-by-forest zone and island-by-year fixed effects. \*\*\* 0.01, \*\* 0.05, \* 0.1

## Additional Results on the Political Economy Implications of Oil and Gas Revenue

### Appendix Table 10: How Do Oil and Gas Revenues Affect Direct Elections?

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Number of Candidates		Number of Parties in Winning Coalition		Incumbent Re-elected	
<i>Panel A: Oil and Gas in Year of Election</i>						
Oil and Gas Per Capita in Election Year	-0.00230*** (0.000505)	-0.00290*** (0.000938)	0.000789 (0.00110)	0.00194* (0.00113)	0.000270 (0.000390)	-4.50e-05 (0.000471)
Island and Year FE	NO	YES	NO	YES	NO	YES
Observations	241	241	220	220	242	242
<i>Panel B: Initial level and changes</i>						
Oil and Gas Per Capita in 2003	-0.00107 (0.00258)	0.00246 (0.00279)	-0.0127*** (0.00205)	-0.0132*** (0.00262)	-0.000643 (0.00154)	-0.00125 (0.00185)
Annual change in Oil and Gas Per capita between Election Year and 2003	-0.00985** (0.00473)	-0.0199*** (0.00612)	0.0306*** (0.00382)	0.0361*** (0.00444)	0.00284 (0.00289)	0.00248 (0.00331)
Island and Year FE	NO	YES	NO	YES	NO	YES
Observations	241	241	220	220	242	242

Notes: Each column reports OLS cross-sectional regressions of the dependent variable listed in the column. Robust standard errors in parentheses. Even-numbered columns also include year FE and island FE.

**Appendix Table 11: How Do Political Changes Affect Deforestation?**

VARIABLES	(1) All Forest	(2) Production /Conversion	(3) Conservation /Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
<i>Panel A: Number of candidates</i>							
Post election	0.699** (0.277)	0.491* (0.255)	1.727*** (0.497)	0.528* (0.294)	0.503* (0.299)	2.441*** (0.646)	0.607 (0.468)
Post election × Number of Candidates	-0.115 (0.0716)	-0.0649 (0.0659)	-0.311*** (0.107)	-0.142* (0.0849)	-0.0538 (0.0685)	-0.527*** (0.102)	-0.0775 (0.0869)
Observations	4707	2230	2477	792	1438	1017	1460
<i>Panel B: Number of parties in winning coalition</i>							
Post election	0.197 (0.139)	0.154 (0.149)	0.509* (0.296)	-0.156 (0.231)	0.255 (0.185)	-0.0515 (0.438)	0.474 (0.290)
Post election × Number of Parties	0.0209 (0.0627)	0.0295 (0.0667)	-0.0288 (0.0691)	0.0378 (0.0780)	0.0154 (0.0802)	0.119 (0.134)	-0.0643 (0.0930)
Observations	4204	1966	2238	664	1302	914	1324
<i>Panel C: Incumbent re-elected</i>							
Post election	0.110 (0.198)	0.146 (0.202)	0.00669 (0.264)	-0.00223 (0.348)	0.175 (0.190)	-0.646 (0.468)	0.177 (0.225)
Post election × Incumbent re-elected	0.255 (0.159)	0.178 (0.152)	0.599** (0.272)	-0.0188 (0.209)	0.252 (0.165)	0.920** (0.383)	0.212 (0.173)
Observations	4739	2246	2493	800	1446	1025	1468

Notes: see Notes to Tables 7, 8 and 9 in the paper. Post-election is a dummy that takes a value of 1 in the year of or after the direct election.

## Changing the Oil Per Capita variable to missing rather than 0 prior to 2001

**Appendix Table 12: Re-Estimating Oil and Gas Results Assuming Missing Data Prior to 2001, Rather than 0**

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
<b>Panel B</b>							
Oil and Gas							
Revenue	-0.00450**	-0.00371*	-0.0127***	-0.0130***	-0.00317*	-0.00994**	-0.0174***
per capita	(0.00203)	(0.00196)	(0.00400)	(0.00312)	(0.00174)	(0.00390)	(0.00386)
Lag 1	0.00132	0.00101	0.00406***	0.00403*	0.00155	0.00528**	-0.00307
	(0.000943)	(0.00110)	(0.00142)	(0.00233)	(0.000958)	(0.00225)	(0.00254)
Lag 2	0.00147	0.00144	0.00461***	-0.000225	0.00141	0.00592***	0.00317
	(0.000929)	(0.00102)	(0.00150)	(0.00254)	(0.00105)	(0.00157)	(0.00211)
Lag 3	0.0175**	0.0218**	-0.0292***	0.00239	0.0234**	-0.0288***	-0.0501***
	(0.00887)	(0.00947)	(0.00979)	(0.0129)	(0.00939)	(0.0104)	(0.0186)
Observations	3885	1855	2030	675	1180	795	1235
Joint P	8.51e-08	1.63e-07	0	0	5.00e-06	0	9.02e-09
Sum of lags	0.0158	0.0205*	-0.0332***	-0.00682	0.0232**	-0.0275***	-0.0674***
Std error	(0.0107)	(0.0111)	(0.0127)	(0.0154)	(0.0109)	(0.00957)	(0.0212)
Sum of lagsP	0.138	0.0644	0.00910	0.658	0.0341	0.00401	0.00147



## Dropping 2001 (so dejure no power period)

**Appendix Table 13: Satellite Data on Impact of Splits, Province Level, Dropping 2001**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	All Forest	Production/ Conversion	Conservation/ Protection	Conversion	Production	Conservation	Protection
<b>Panel A</b>							
Numdistinprov	0.0553** (0.0265)	0.0587** (0.0284)	0.0961** (0.0432)	0.100*** (0.0348)	0.0537** (0.0264)	0.151** (0.0755)	0.0754** (0.0375)
Observations	532	259	273	112	147	126	147
<b>Panel B</b>							
Numdistinprov	0.0367 (0.0346)	0.0419 (0.0376)	0.104** (0.0436)	0.0804 (0.0573)	0.0408 (0.0355)	0.131* (0.0748)	0.0885** (0.0426)
L1Numdistinprov	0.0460 (0.0528)	0.0481 (0.0561)	-0.133* (0.0769)	0.0251 (0.0791)	0.0458 (0.0519)	-0.168 (0.143)	-0.0758 (0.0768)
L2Numdistinprov	-0.0698* (0.0397)	-0.0728* (0.0378)	0.00762 (0.106)	-0.0758 (0.0529)	-0.0633* (0.0372)	0.103 (0.160)	-0.0985 (0.126)
L3Numdistinprov	0.0684 (0.0681)	0.0610 (0.0690)	0.137 (0.113)	0.0910 (0.124)	0.0442 (0.0628)	0.101 (0.0725)	0.170 (0.139)
Observations	532	259	273	112	147	126	147
Joint P	1.98e-06	6.39e-09	0.00851	5.60e-05	8.67e-07	0.0801	0.00123
Sum lags	0.0812***	0.0782***	0.116***	0.121***	0.0675***	0.167**	0.0846*
Sum lags SE	(0.0182)	(0.0189)	(0.0471)	(0.0263)	(0.0180)	(0.0818)	(0.0480)

**Appendix Table 14: Elections, Dropping 2001**

VARIABLES	(1) All Forest	(2) Production/ Conversion	(3) Conservation/ Protection	(4) Conversion	(5) Production	(6) Conservation	(7) Protection
<b>Panel A</b>							
ElectionYear	-0.134 (0.0955)	-0.0734 (0.112)	-0.589*** (0.159)	0.124 (0.153)	-0.129 (0.107)	-0.379*** (0.116)	-0.655*** (0.215)
Observations	5621	2667	2954	973	1694	1190	1764
<b>Panel B</b>							
ElectionYear	0.0393 (0.149)	0.0894 (0.163)	-0.321** (0.158)	0.345 (0.262)	0.0274 (0.156)	-0.104 (0.190)	-0.414** (0.194)
F1ElectionYear	0.215 (0.136)	0.185 (0.148)	0.459** (0.218)	0.200 (0.246)	0.168 (0.151)	0.248 (0.179)	0.565*** (0.218)
F2ElectionYear	0.143 (0.180)	0.130 (0.203)	0.316** (0.133)	0.243 (0.265)	0.119 (0.196)	0.233 (0.152)	0.344** (0.140)
L1ElectionYear	0.296* (0.175)	0.314 (0.195)	0.194 (0.222)	0.471 (0.291)	0.290 (0.206)	0.349 (0.284)	0.00613 (0.222)
L2ElectionYear	-0.0290 (0.199)	-0.0358 (0.226)	0.0612 (0.268)	-0.0110 (0.350)	-0.0146 (0.228)	0.0858 (0.355)	-0.0255 (0.239)
Observations	5621	2667	2954	973	1694	1190	1764
Lags Joint P	0.00213	0.00304	0.000682	1.41e-05	0.0290	0.106	0.0489
Sum lags	0.306	0.368	-0.0658	0.805	0.303	0.331	-0.433
Sum lags SE	(0.484)	(0.540)	(0.560)	(0.862)	(0.543)	(0.688)	(0.544)
Leads joint P	0.252	0.429	0.0455	0.649	0.515	0.259	0.0205
Sum leads	0.358	0.315	0.775**	0.443	0.288	0.481	0.909**
Sum leads SE	(0.294)	(0.325)	(0.320)	(0.483)	(0.322)	(0.296)	(0.326)
Sum leadsp	0.224	0.332	0.0156	0.359	0.371	0.104	0.00532

**Appendix Table 15: The Income Elasticity of Corruption, Dropping 2001**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	All Forest	Production/ Conversion	Conservation/ Protection	Conversion	Production	Conservation	Protection
<b>Panel A</b>							
PC_OilGas	-0.00335** (0.00158)	-0.00300* (0.00160)	-0.00633** (0.00264)	-0.00915*** (0.00161)	-0.00235* (0.00142)	-0.00496** (0.00222)	-0.0103*** (0.00141)
	-0.114 (0.0920)	-0.0914 (0.118)	-0.131 (0.0903)	0.0885 (0.200)	-0.121 (0.110)	-0.0116 (0.140)	-0.228* (0.122)
Observations	5621	2667	2954	973	1694	1190	1764
<b>Panel D</b>							
PC_OilGas	-0.00450** (0.00203)	-0.00371* (0.00196)	-0.0127*** (0.00400)	-0.0130*** (0.00312)	-0.00317* (0.00174)	-0.00994** (0.00390)	-0.0174*** (0.00386)
L1PC_OilGas	0.00132 (0.000943)	0.00101 (0.00110)	0.00406*** (0.00142)	0.00403* (0.00233)	0.00155 (0.000958)	0.00528** (0.00225)	-0.00307 (0.00254)
L2PC_OilGas	0.00147 (0.000929)	0.00144 (0.00102)	0.00461*** (0.00150)	-0.000225 (0.00254)	0.00141 (0.00105)	0.00592*** (0.00157)	0.00317 (0.00211)
L3PC_OilGas	0.0175** (0.00887)	0.0218** (0.00947)	-0.0292*** (0.00979)	0.00239 (0.0129)	0.0234** (0.00939)	-0.0288*** (0.0104)	-0.0501*** (0.0186)
Observations	3885	1855	2030	675	1180	795	1235
Joint P	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sum of lags	0.0158	0.0205*	-0.0332***	-0.00682	0.0232**	-0.0275***	-0.0674***
Std error	(0.0107)	(0.0111)	(0.0127)	(0.0154)	(0.0109)	(0.00957)	(0.0212)
Sum of lagsP	0.138	0.0644	0.00910	0.658	0.0341	0.00401	0.00147