

TITLE
Supporting Information

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April 14, 2018

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A1 Formal Model

In our decision-theoretic model, the federal government decides on the value of a single variable, the proportion of a municipal area protected, $s \in [0, 1]$. For each unit of avoided deforestation, the federal government gains a (normalized) unit of benefits. These benefits include domestic political gains, international reputation, and climate finance. The federal government also pays two types of electoral costs, one for federal and the other for local elections. These costs are quadratic and the costs are set at $\frac{1}{2}c_F, \frac{1}{2}c_L > 0$. The federal government's quadratic utility function is written as:

$$u = s - \frac{1}{2}c_F s^2 - \frac{1}{2}c_L s^2. \quad (1)$$

Differentiating with respect to s , the first-order condition is

$$s^* = \frac{1}{c_F + c_L}. \quad (2)$$

Thus, s^* is strictly decreasing in c_F and c_L . Under the assumption that c_F and/or c_L are higher for aligned than for non-aligned municipalities, our primary hypothesis holds.

A2 Identifying Assumptions

- Table A1 presents the codebook for the variables used in the balance tests.
- Table A2 shows the results from the balance tests for the year 2000 mayoral elections. Similarly, Tables A3-A4 show the results for the years 2004 and 2008.

Variable	Source	Measurement
Rainfall	FAO-GAEZ	Mm., annual mean 1960-1991
Evapotranspiration	FAO-GAEZ	Mm., annual mean 1960-1991
Temperature	FAO-GAEZ	Celsius, annual mean 1960-1991
Climate aggressiveness	IBGE	Index (z-score)
Altitude	GDEM-NASA	Meters
Slope	FAO-GAEZ	Index (z-score)
Accessibility	FAO-GAEZ	Index (z-score)
Workability	FAO-GAEZ	Index (z-score)
Nutrients	FAO-GAEZ	Index (z-score)
Water bodies	IBGE	% of hexagon's area
Vegetation	IBGE	% of hexagon's area, 1995
Cacao suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Cacao suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Coffee suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Coffee suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Pasture grasses suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Pasture grasses suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Pasture legumes suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Pasture legumes suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Maize suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Maize suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Rice suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Rice suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Soybeans suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Soybeans suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Sugarcane suitability (irrigated)	FAO-GAEZ	Kg/ha, 1960-1991
Sugarcane suitability (rain fed)	FAO-GAEZ	Kg/ha, 1960-1991
Threatened amphibians	Jenkins et al. (2015)	Mean number of species
Threatened birds	Jenkins et al. (2015)	Mean number of species
Threatened mammals	Jenkins et al. (2015)	Mean number of species
Minimum distance from urban areas	NASA-CIESIN	Km., 1995
Urban hexagon	NASA-CIESIN	1-0, 1995
State roads	Walker, Reis, and Caldas (2011)	1-0, 1993
Ethnolinguistic fractionalization	Weidmann, Rød, and Cederman (2010)	ELF index
Population (count)	NASA-CIESIN	Num. of inhab., 1995
Population (density)	NASA-CIESIN	Inhab. per squared km., 1995

Table A1: Codebook for variables used in the balance tests.

	N	Diff.	p.value
Rainfall	38342.000	-0.349	0.937
Evapotranspiration	38342.000	-0.034	0.014
Temperature	38342.000	-0.032	0.294
Climate aggressiveness	38342.000	-0.051	0.304
Altitude	38342.000	0.168	0.971
Slope	38342.000	-0.044	0.412
Accessibility	38342.000	0.058	0.157
Workability	38342.000	0.077	0.229
Nutrients	38342.000	0.095	0.060
Water bodies	38342.000	0.000	0.901
Vegetation	38342.000	0.025	0.517
Cacao suitability (irrigated)	38342.000	13.862	0.250
Cacao suitability (rain fed)	38342.000	15.938	0.173
Coffee suitability (irrigated)	38342.000	5.122	0.058
Coffee suitability (rain fed)	38342.000	6.402	0.018
Pasture grasses suitability (irrigated)	38342.000	2.204	0.251
Pasture grasses suitability (rain fed)	38342.000	3.737	0.209
Pasture legumes suitability (irrigated)	38342.000	1.522	0.192
Pasture legumes suitability (rain fed)	38342.000	2.186	0.129
Maize suitability (irrigated)	38342.000	-0.743	0.920
Maize suitability (rain fed)	38342.000	1.055	0.882
Rice suitability (irrigated)	38342.000	13.498	0.200
Rice suitability (rain fed)	38342.000	17.946	0.077
Soybeans suitability (irrigated)	38342.000	-3.179	0.570
Soybeans suitability (rain fed)	38342.000	-2.800	0.597
Sugarcane suitability (irrigated)	38342.000	57.474	0.333
Sugarcane suitability (rain fed)	38342.000	59.005	0.239
Threatened amphibians	38342.000	0.001	0.918
Threatened birds	38342.000	-0.028	0.779
Threatened mammals	38342.000	-0.006	0.881
Minimum distance from urban areas	38342.000	2.458	0.213
Urban	38342.000	-0.005	0.183
Roads	38342.000	-0.001	0.927
Ethnolinguistic fractionalization	38342.000	-0.004	0.300
Population count	38342.000	-33.846	0.151
Population density	38342.000	-1.618	0.146

Table A2: Test of randomization balance: coalition alignment, 2000 mayoral elections. Out of the 36 covariates, none is statistically significant at the $p < 0.05$ level.

	N	Diff.	p.value
Rainfall	38342.000	-1.119	0.837
Evapotranspiration	38342.000	-0.005	0.771
Temperature	38342.000	-0.064	0.098
Climate aggressiveness	38342.000	-0.000	0.998
Altitude	38342.000	-4.267	0.368
Slope	38342.000	-0.015	0.753
Accessibility	38342.000	-0.013	0.718
Workability	38342.000	-0.044	0.485
Nutrients	38342.000	-0.037	0.376
Water bodies	38342.000	-0.004	0.395
Vegetation	38342.000	-0.045	0.141
Cacao suitability (irrigated)	38342.000	-0.690	0.953
Cacao suitability (rain fed)	38342.000	3.157	0.787
Coffee suitability (irrigated)	38342.000	6.036	0.053
Coffee suitability (rain fed)	38342.000	9.034	0.015
Pasture grasses suitability (irrigated)	38342.000	0.586	0.819
Pasture grasses suitability (rain fed)	38342.000	1.330	0.699
Pasture legumes suitability (irrigated)	38342.000	1.151	0.420
Pasture legumes suitability (rain fed)	38342.000	1.748	0.284
Maize suitability (irrigated)	38342.000	-10.973	0.474
Maize suitability (rain fed)	38342.000	-10.037	0.480
Rice suitability (irrigated)	38342.000	12.308	0.125
Rice suitability (rain fed)	38342.000	11.237	0.099
Soybeans suitability (irrigated)	38342.000	7.611	0.228
Soybeans suitability (rain fed)	38342.000	7.998	0.177
Sugarcane suitability (irrigated)	38342.000	37.822	0.605
Sugarcane suitability (rain fed)	38342.000	40.359	0.505
Threatened amphibians	38342.000	0.010	0.353
Threatened birds	38342.000	0.085	0.397
Threatened mammals	38342.000	0.003	0.918
Minimum distance from urban areas	38342.000	-3.206	0.255
Urban	38342.000	0.001	0.802
Roads	38342.000	0.003	0.771
Ethnolinguistic fractionalization	38342.000	0.009	0.069
Population count	38342.000	42.940	0.018
Population density	38342.000	2.043	0.017

Table A3: Test of randomization balance: coalition alignment, 2004 mayoral elections. Out of the 36 covariates, none is statistically significant at the $p < 0.05$ level.

	N	Diff.	p.value
Rainfall	38342.000	3.741	0.487
Evapotranspiration	38342.000	0.018	0.162
Temperature	38342.000	0.018	0.526
Climate aggressiveness	38342.000	0.031	0.367
Altitude	38342.000	-0.822	0.814
Slope	38342.000	-0.039	0.410
Accessibility	38342.000	-0.027	0.404
Workability	38342.000	0.090	0.077
Nutrients	38342.000	-0.036	0.389
Water bodies	38342.000	0.002	0.459
Vegetation	38342.000	-0.036	0.118
Cacao suitability (irrigated)	38342.000	-5.204	0.605
Cacao suitability (rain fed)	38342.000	-7.118	0.484
Coffee suitability (irrigated)	38342.000	0.054	0.992
Coffee suitability (rain fed)	38342.000	-2.016	0.710
Pasture grasses suitability (irrigated)	38342.000	1.806	0.516
Pasture grasses suitability (rain fed)	38342.000	0.659	0.818
Pasture legumes suitability (irrigated)	38342.000	0.805	0.598
Pasture legumes suitability (rain fed)	38342.000	0.248	0.867
Maize suitability (irrigated)	38342.000	8.672	0.574
Maize suitability (rain fed)	38342.000	7.235	0.624
Rice suitability (irrigated)	38342.000	-2.485	0.873
Rice suitability (rain fed)	38342.000	1.914	0.861
Soybeans suitability (irrigated)	38342.000	0.680	0.887
Soybeans suitability (rain fed)	38342.000	0.625	0.892
Sugarcane suitability (irrigated)	38342.000	17.050	0.731
Sugarcane suitability (rain fed)	38342.000	15.126	0.709
Threatened amphibians	38342.000	0.012	0.124
Threatened birds	38342.000	0.007	0.930
Threatened mammals	38342.000	0.001	0.985
Minimum distance from urban areas	38342.000	3.218	0.248
Urban	38342.000	-0.002	0.476
Roads	38342.000	-0.003	0.752
Ethnolinguistic fractionalization	38342.000	0.000	0.918
Population count	38342.000	16.588	0.239
Population density	38342.000	0.752	0.258

Table A4: Test of randomization balance: coalition alignment, 2008 mayoral elections. Out of the 36 covariates, none is statistically significant at the $p < 0.05$ level.

A3 Additional Analysis

- Table A5 shows the results for different types of federal protected areas.
- Table A6 shows the results for different types of state protected areas.
- Table A7 shows the results for varying the bandwidth for the geographic local regression discontinuity.
- Tables A8-A10 show the results for varying the bandwidth when different types of federal protected areas are analyzed.
- Tables A11 and A12 show results for a restricted subset for just years corresponding to the governments of Fernando Henrique Cardoso (1997-2002) and Luiz Inácio Lula da Silva (2002-2012), respectively.

	<i>Dependent variable:</i>								
	Federal Protected Area (All)			Strict Protection Area			Sustainable Use Area		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
p_coal	-0.009*	-0.013*	-0.014*	-0.005	-0.008	-0.008	-0.004	-0.005	-0.006
	(0.004)	(0.005)	(0.006)	(0.003)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)
federal_pre97	-0.027**								
	(0.010)								
federal.sp_pre97				-0.008					
				(0.005)					
federal.su_pre97							-0.016		
							(0.015)		
Muni Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes
State-Year FE	-	-	Yes	-	-	Yes	-	-	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muni. Pairs	1553	1553	1553	1553	1553	1553	1553	1553	1553
Observations	735,915	735,915	735,915	735,915	735,915	735,915	735,915	735,915	735,915
Adjusted R ²	0.328	0.635	0.670	0.286	0.580	0.616	0.262	0.682	0.707

Note:

*p<0.05; **p<0.01; ***p<0.001

Table A5: Full output for analysis of main models using different types of Federal protected areas (Strictly Protected vs. Sustainable Use).

	<i>Dependent variable:</i>								
	State Protected Area (All)			Strict Protection Area			Sustainable Use Area		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
s_align	0.002 (0.003)	0.002 (0.003)	0.001 (0.003)	-0.002 (0.001)	-0.002 (0.002)	-0.002 (0.002)	0.004 (0.002)	0.004 (0.003)	0.004 (0.003)
state_pre97	-0.030* (0.013)								
state.sp_pre97	-0.0003 (0.0002)								
state.su_pre97	-0.037* (0.017)								
Muni Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes
State-Year FE	-	-	Yes	-	-	Yes	-	-	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muni. Pairs	1153	1153	1153	1153	1153	1153	1153	1153	1153
Observations	347,440	347,440	347,440	347,440	347,440	347,440	347,440	347,440	347,440
Adjusted R ²	0.387	0.731	0.756	0.287	0.666	0.685	0.390	0.751	0.771

Note:

*p<0.05; **p<0.01; ***p<0.001

Table A6: Full output for analysis of main models using different types of State protected areas (Strictly Protected vs. Sustainable Use)

	<i>Dependent variable:</i>								
	20km Bandwidth			15km Bandwidth			10km Bandwidth		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coalition Alignment	-0.007 (0.004)	-0.012* (0.005)	-0.013* (0.005)	-0.006 (0.003)	-0.011* (0.005)	-0.012* (0.005)	-0.005 (0.003)	-0.010* (0.004)	-0.011** (0.004)
Fed. Prot. Area ('97)				-0.027* (0.011)			-0.026* (0.013)		
Muni Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes
State-Year FE	-	-	Yes	-	-	Yes	-	-	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muni. Pairs	1552	1552	1552	1551	1551	1551	1551	1551	1551
Observations	662,612	662,612	662,612	565,231	565,231	565,231	433,715	433,715	433,715
Adjusted R ²	0.333	0.637	0.671	0.340	0.638	0.673	0.347	0.641	0.674

Note:

*p<0.05; **p<0.01; ***p<0.001

Table A7: Comparison of main models at different bandwidths of running variable (20km, 15km, and 10km distance from neighboring municipality).

	<i>Dependent variable:</i>								
	Federal Protected Area (All)			Strict Protection Area			Sustainable Use Area		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coalition Alignment	-0.007 (0.004)	-0.012* (0.005)	-0.013* (0.005)	-0.004 (0.003)	-0.007 (0.004)	-0.007 (0.004)	-0.003 (0.003)	-0.005 (0.003)	-0.006 (0.003)
Fed. Prot. Area ('97)	-0.027* (0.011)								
Strict Prot. Area ('97)				-0.009 (0.006)					
Sust. Use Area ('97)							-0.014 (0.014)		
Muni Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes
State-Year FE	-	-	Yes	-	-	Yes	-	-	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muni. Pairs	1552	1552	1552	1552	1552	1552	1552	1552	1552
Observations	662,612	662,612	662,612	662,612	662,612	662,612	662,612	662,612	662,612
Adjusted R ²	0.333	0.637	0.671	0.295	0.584	0.622	0.265	0.683	0.707

Note:

*p<0.05; **p<0.01; ***p<0.001

Table A8: Comparison of models with different types of federal protected areas (strict protection vs. sustainable use) at different bandwidths of running variable (20km distance from neighboring municipality).

	<i>Dependent variable:</i>								
	Federal Protected Area (All)			Strict Protection Area			Sustainable Use Area		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coalition Alignment	-0.006 (0.003)	-0.011* (0.005)	-0.012* (0.005)	-0.003 (0.002)	-0.006 (0.004)	-0.006 (0.004)	-0.003 (0.002)	-0.005 (0.003)	-0.006 (0.003)
Fed. Prot. Area ('97)	-0.027* (0.012)								
Strict Prot. Area ('97)				-0.009 (0.007)					
Sust. Use Area ('97)							-0.012 (0.014)		
Muni Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes
State-Year FE	-	-	Yes	-	-	Yes	-	-	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muni. Pairs	1551	1551	1551	1551	1551	1551	1551	1551	1551
Observations	565,231	565,231	565,231	565,231	565,231	565,231	565,231	565,231	565,231
Adjusted R ²	0.340	0.638	0.673	0.305	0.588	0.626	0.271	0.685	0.708

Note:

*p<0.05; **p<0.01; ***p<0.001

Table A9: Comparison of models with different types of federal protected areas (strict protection vs. sustainable use) at different bandwidths of running variable (15km).

	<i>Dependent variable:</i>								
	Federal Protected Area (All)			Strict Protection Area			Sustainable Use Area		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Coalition Alignment	-0.005 (0.003)	-0.010* (0.004)	-0.011** (0.004)	-0.002 (0.002)	-0.005 (0.004)	-0.006 (0.004)	-0.003 (0.002)	-0.005 (0.003)	-0.005 (0.003)
Fed. Prot. Area ('97)	-0.026* (0.013)								
Strict Prot. Area ('97)	-0.010 (0.008)								
Sust. Use Area ('97)	-0.007 (0.014)								
Muni Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	-	Yes	Yes	-	Yes	Yes	-	Yes	Yes
State-Year FE	-	-	Yes	-	-	Yes	-	-	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muni. Pairs	1551	1551	1551	1551	1551	1551	1551	1551	1551
Observations	433,715	433,715	433,715	433,715	433,715	433,715	433,715	433,715	433,715
Adjusted R ²	0.347	0.641	0.674	0.316	0.592	0.629	0.279	0.686	0.709

Note:

*p<0.05; **p<0.01; ***p<0.001

Table A10: Comparison of models with different types of federal protected areas (strict protection vs. sustainable use) at different bandwidths of running variable (10km).

	<i>Dependent variable:</i>		
	Fed. Protected Area		
	(1)	(2)	(3)
Coalition Alignment	0.007 (0.004)	0.002 (0.007)	0.0005 (0.005)
Fed. Prot. Area ('97)	-0.009* (0.004)		
Muni Pair FE	Yes	Yes	Yes
Grid FE	-	Yes	Yes
State-Year FE	-	-	Yes
Cluster SE	Yes	Yes	Yes
Muni. Pairs	1177	1177	1177
Observations	251,040	251,040	251,040
Adjusted R ²	0.237	0.432	0.496

Note: *p<0.05; **p<0.01; ***p<0.001

Table A11: Re-analysis of models (1)-(3) for the effects of Coalition Alignment on Federal Protected Areas for a subset of years corresponding to the government of Fernando Henrique Cardoso (1997-2002).

	<i>Dependent variable:</i>		
	Fed. Protected Area		
	(1)	(2)	(3)
Coalition Alignment	-0.010 (0.005)	-0.007 (0.006)	-0.007 (0.006)
Fed. Prot. Area ('97)	-0.040* (0.017)		
Muni Pair FE	Yes	Yes	Yes
Grid FE	-	Yes	Yes
State-Year FE	-	-	Yes
Cluster SE	Yes	Yes	Yes
Muni. Pairs	1377	1377	1377
Observations	379,389	379,389	379,389
Adjusted R ²	0.407	0.845	0.852

Note: *p<0.05; **p<0.01; ***p<0.001

Table A12: Re-analysis of models (1)-(3) for the effects of Coalition Alignment on Federal Protected Areas for a subset of years corresponding to the government of Luiz Inácio Lula da Silva (2003-2010).

Supplementary Appendix: References

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