

Web Appendix

A Selected Maps

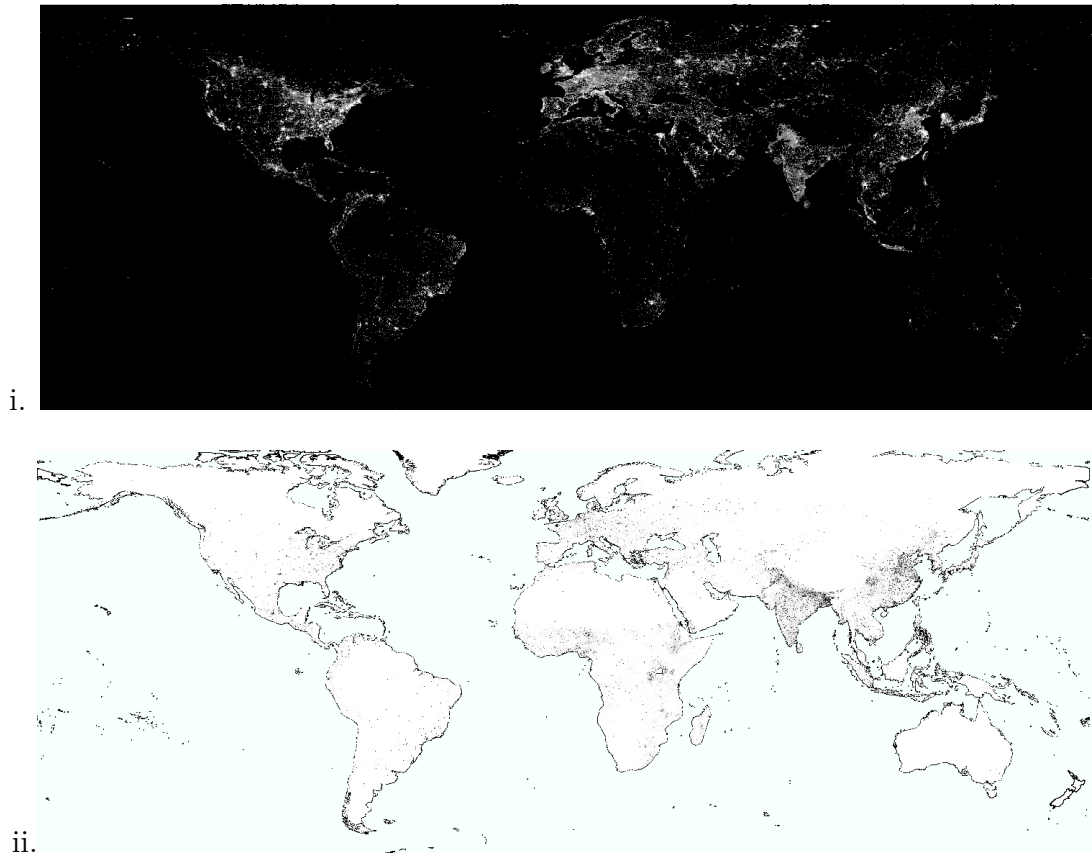


Figure A.1: i. Night-time lights and ii. population around the world.

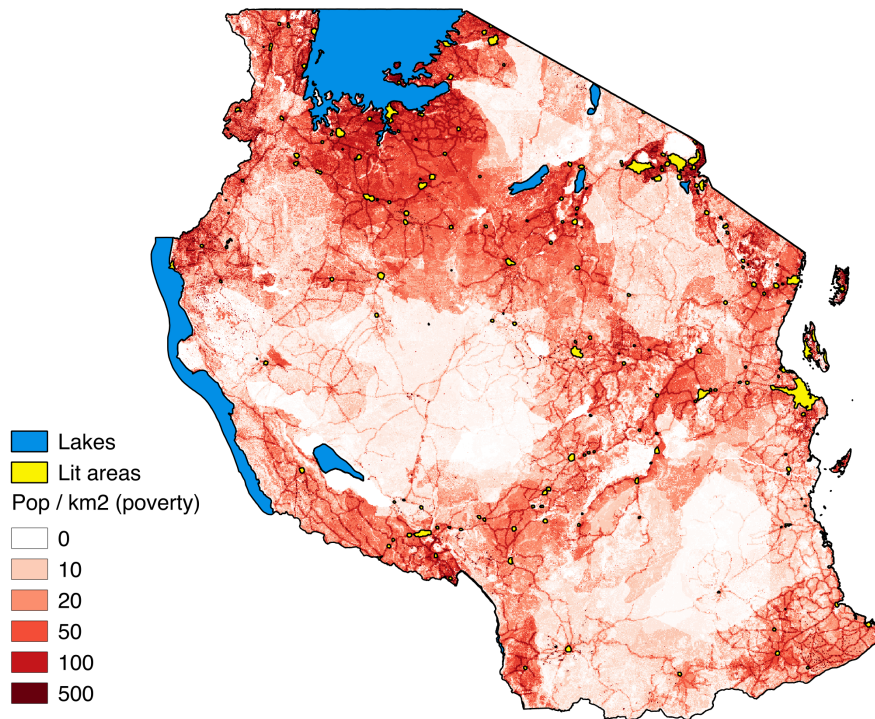


Figure A.2: Map of Tanzania (2010) showing the density of people living in darkness at night.

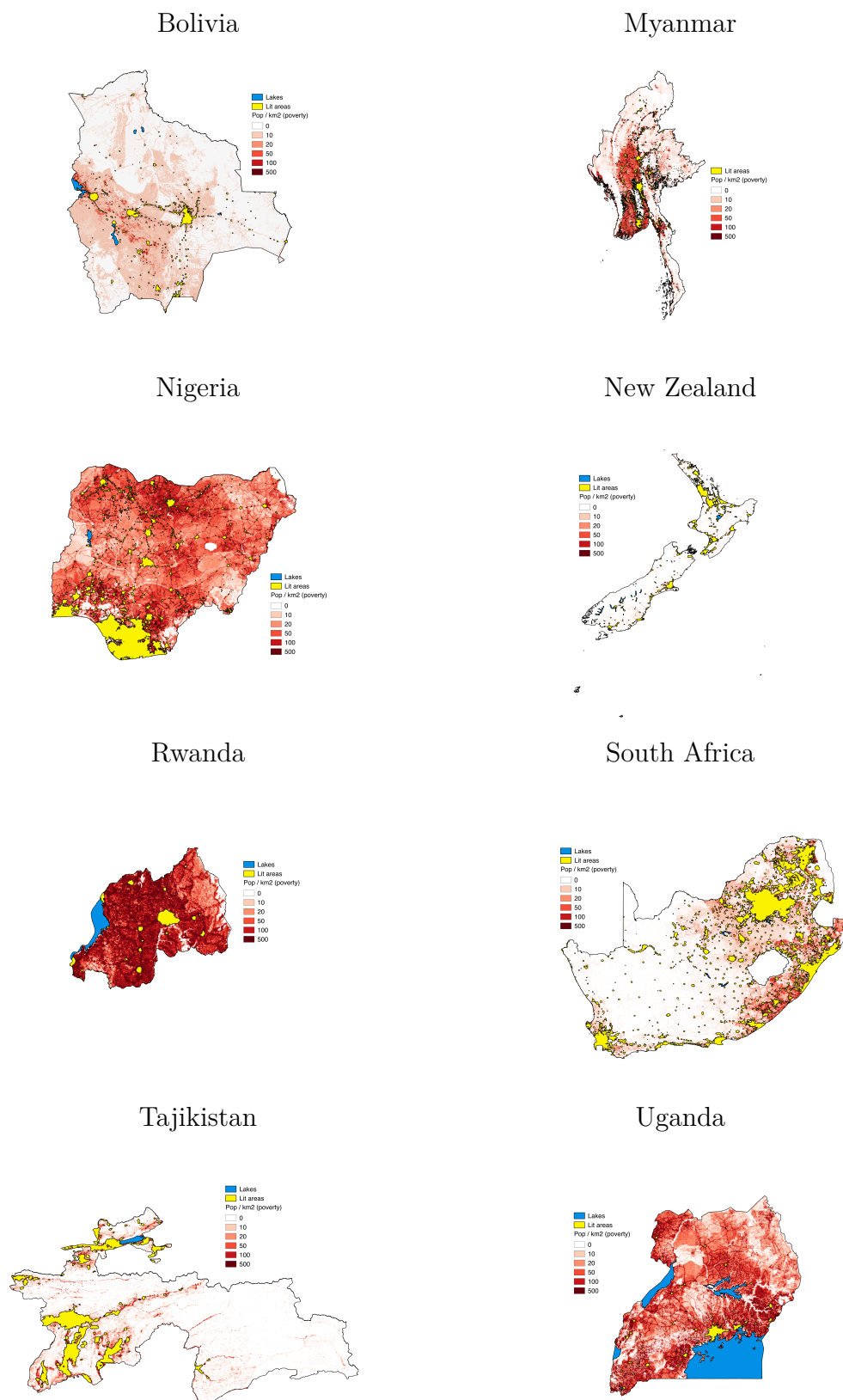


Figure A.3: Selected poverty maps, based on the population living in darkness at night in 2010. For more see <https://samuelwills.wordpress.com/poverty-and-darkness/>

B Oil-dependent countries and giant discoveries

Country	Resource Exports/ Total Exports (%, 2006-2010)	Commodity Revenues/ GDP (%, 2006-2010)
Algeria	98	30
Angola	95	35
Azerbaijan	94	26
Bahrain	81	23
Bolivia	5	11
Brunei	96	45
Cameroon	47	6
Chad	89	15
Congo, Republic of	94	3
Ecuador	55	7
Equatorial Guinea	99	31
Gabon	83	18
Indonesia	10	5
Iran	79	17
Kazakhstan	60	11
Kuwait	93	62
Libya	97	56
Malaysia	8	8
Mexico	15	8
Nigeria	97	22
Oman	73	37
Papua New Guinea	80	10
Qatar	88	23
Russia	50	11
Saudi Arabia	87	42
Sudan	97	11
Trinidad & Tobago	38	17
Turkmenistan	91	11
United Arab Emirates	41	24
Venezuela	93	19
Vietnam	14	6
Yemen	82	22

Table B.1: List of oil dependent countries (Baunsgaard et al., 2012).

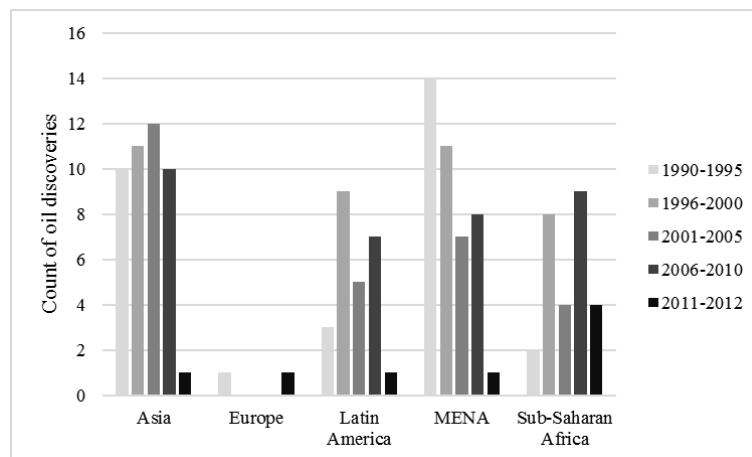


Figure B.1: Count of giant oil discoveries by region included in our sample (excluding OECD countries).

C Evaluating darkness as a poverty measure

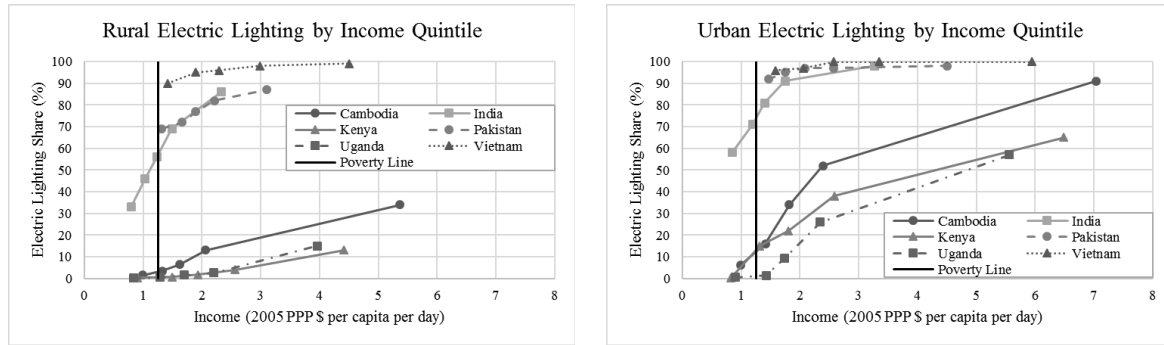


Figure C.1: Share of rural and urban households using electricity as main source of lighting (Bacon et al., 2010; own calculations).

		CWI Poor (1 × 1)					UBN≥2 Poor (12 × 12)			
		Yes	No	Total			Yes	No	Total	
i.	Unlit	Yes	44%	7%	52%	ii.	Yes	36%	7%	44%
		No	9%	39%	48%		No	26%	30%	56%
		Total	54%	46%	100%		Total	63%	37%	100%

Table C.1: Summary of how accurately darkness measures extreme poverty according to i. the CWI definition at 1×1 pixel resolution and the ii. $UBN \geq 2$ definition at 12×12 pixel resolution.

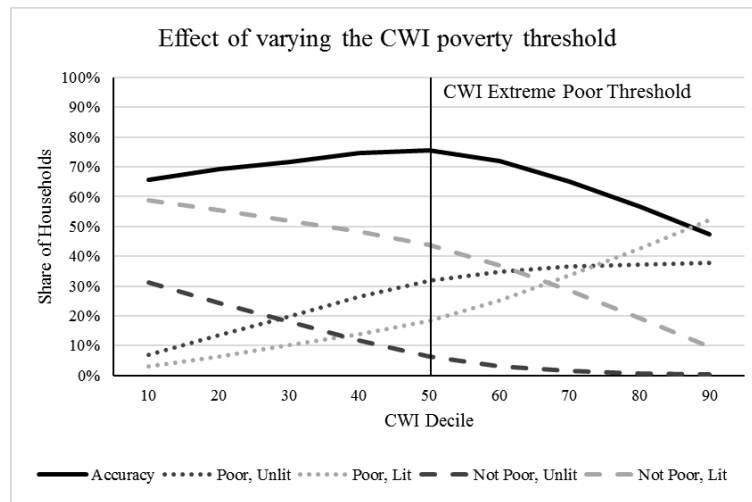


Figure C.2: The effect of varying the CWI poverty threshold on accuracy at 12×12 pixel resolution. Accuracy is the sum of the “Poor, Unlit” and “Not Poor, Lit” lines. Also shown are Type I (“Not Poor, Unlit”) and Type II (“Poor, Lit”) errors.

Country	Survey Year	Poor		Rich		Accuracy	Poverty Share	
		Unlit	Lit	Unlit	Lit		Unlit	Lit
Angola	2011	28%	15%	6%	50%	78%	82%	23%
Bangladesh	2011	10%	61%	1%	29%	39%	93%	68%
Benin	2012	30%	38%	2%	30%	60%	94%	56%
Bolivia	2008	23%	11%	5%	61%	84%	82%	15%
Cambodia	2010	32%	29%	7%	32%	64%	82%	48%
Cameroon	2011	44%	12%	7%	37%	82%	87%	24%
Colombia	2010	5%	8%	4%	83%	88%	56%	9%
Congo, Dem. Rep.	2013	74%	8%	3%	15%	90%	97%	33%
Dominican Republic	2013	1%	11%	1%	87%	88%	59%	11%
Ethiopia	2011	60%	18%	2%	20%	80%	97%	47%
Gabon	2012	33%	11%	8%	48%	81%	81%	18%
Ghana	2008	22%	29%	3%	46%	69%	89%	38%
Guinea	2012	49%	5%	13%	33%	82%	79%	13%
Guyana	2009	14%	3%	24%	59%	72%	36%	5%
Haiti	2012	30%	35%	3%	32%	62%	91%	52%
Honduras	2012	10%	36%	2%	52%	63%	86%	41%
Kenya	2009	42%	20%	5%	32%	74%	89%	39%
Lesotho	2009	41%	23%	6%	31%	71%	88%	43%
Madagascar	2009	69%	6%	7%	18%	87%	90%	25%
Malawi	2010	50%	37%	3%	10%	60%	95%	79%
Mali	2013	59%	15%	2%	24%	83%	96%	38%
Morocco	2003	10%	22%	7%	62%	71%	59%	26%
Mozambique	2011	47%	22%	2%	29%	76%	96%	44%
Namibia	2013	21%	23%	9%	47%	67%	69%	33%
Nepal	2011	44%	17%	8%	31%	75%	84%	35%
Nigeria	2008	37%	21%	6%	36%	74%	87%	36%
Peru	2009	21%	23%	3%	53%	74%	87%	30%
Philippines	2008	13%	20%	8%	60%	72%	62%	25%
Rwanda	2010	65%	20%	3%	12%	77%	96%	63%
Senegal	2011	35%	29%	2%	33%	68%	94%	47%
Sierra Leone	2013	64%	14%	2%	20%	84%	96%	40%
Swaziland	2006	12%	29%	4%	55%	67%	74%	35%
Tajikistan	2012	5%	7%	7%	81%	86%	40%	7%
Tanzania	2010	53%	23%	3%	21%	74%	94%	52%
Zambia	2013	45%	19%	5%	31%	76%	90%	37%
Zimbabwe	2010	38%	7%	16%	38%	76%	70%	16%

Table C.2: Effectiveness of darkness as a poverty measure by country at 12×12 pixel resolution, using the CWI definition of extreme poverty from 636,448 household DHS surveys. The sum of “Poor” and “Rich” columns equals 100% (errors due to rounding).

D Calibrated Poverty Rate

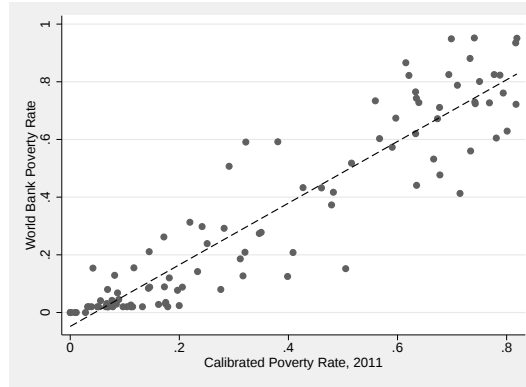


Figure D.1: Less than \$2 per day percentage (World Bank) vs 2011 Calibrated Poverty Rate (CPR)

For robustness we also calculate a second calibrated poverty measure, building on Elvidge et al. (2009). We first relate observed lights per capita to World Bank \$2 per day poverty rates at a national level. Then we apply this relation at a cell level. Finally, we correct for issues with the spatial data to produce a Calibrated Poverty Rate (CPR) for each cell. We then use the CPR in robustness exercises in Appendix G.

First we use a non-parametric, decile-based approach to link observed lights per capita to World Bank \$2 per day poverty rates at a national level each year. This involves, each year, calculating the ratio of total lights to total population for each country that has a World Bank poverty rate estimate made in or after 2005 (103 countries). We then rank the countries and assign them to a decile. We then regress the World Bank poverty rate, which is the percentage of people living on less than \$2 per day, on the indicator for each decile, effectively calculating the mean World Bank poverty rate for each decile. We find this non-parametric decile-based approach performs better than the linear specification used in Elvidge et al. (2009).

Then, we apply the national-level relationship between lights per capita and the World Bank poverty rate to each cell (12×12 pixels). This produces an estimate of the World Bank poverty rate for each cell, in a globally balanced panel from 2000-2013 at a 12×12 pixel resolution.

Finally, we make adjustments to correct some issues with the spatial data. In cells with zero lights we assume that 90% of the population lives below the poverty line. This is more than the lowest decile (which is 76% in 2011), but less than the 100% assumed by Elvidge et al. (2009) which causes the CPR to overestimate poverty in very poor countries. In highly lit cells we assume that the poverty rate is zero if the average light reading exceeds 50 (out of 63). This addresses top-coding which biases lights per capita downwards, and overestimates poverty in highly urbanized countries. While top-coding does not affect many pixels in developing countries it may affect a lot of people, as those pixels will be in densely populated areas. We also assume that the final poverty rate

in urban cells is 60% of that given by the calibration procedure. This further helps our measure fit national World Bank poverty rates in highly urbanized countries. Overall the CPR involves some arbitrary assumptions but has a close relationship with World Bank poverty rates at a national level, as shown in Figure D.1. The regression line is close to the ideal of a 45 degree line passing through the origin, and the adjusted r-squared is 0.86. Because the CPR involves these assumptions we have a preference for the unlit rural percentage due to its simplicity, transparency and intuitiveness, and use the CPR for robustness.

E Further Results

E.1 Summary Statistics

Summary Statistics					
	Treatment		Control		Difference
Variable (as of 2000)	Mean (Std. Dev)	Max [Min]	Mean (Std. Dev)	Max [Min]	p-values
ln(Lights per capita)	-3.94 (1.53)	-1.67 [-7.13]	-4.61 (1.48)	-2.09 [-7.92]	0.066
Unlit Rural Percentage	0.36 (0.29)	0.81 [0.06]	0.42 (0.29)	0.92 [0.05]	0.350
Calibrated Poverty Rate	0.44 (0.26)	0.82 [0.09]	0.52 (0.24)	0.86 [0.06]	0.164
ln(Population)	16.17 (1.67)	19.19 [12.73]	15.61 (1.98)	20.95 [9.66]	0.174
World Bank Urbanization Rate	0.51 (0.20)	0.88 [0.13]	0.41 (0.21)	0.92 [0.08]	0.045
Population Share: Rural	0.36 (0.29)	0.81 [0.06]	0.42 (0.29)	0.92 [0.05]	0.350
Population Share: Town	0.22 (0.16)	0.67 [0.02]	0.26 (0.18)	0.68 [0.01]	0.264
Population Share: City	0.42 (0.23)	0.81 [0.10]	0.32 (0.21)	0.80 [0.01]	0.061
Observations	24	24	81	81	

Table E.1: Summary statistics for key variables in 2000, split between Treatment and Control countries used in the price shock specification. The p-values are from t-tests of mean differences assuming unequal variance.

E.2 Results Tables

X

Price Boom (Part I)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Dependent ×										
2013	0.339***			-0.017	0.010	0.305*	0.140*	-0.009	0.005	0.004
	(0.12)			(0.021)	(0.018)	(0.17)	(0.08)	(0.02)	(0.01)	(0.01)
2012	0.287**			-0.018	0.006	0.266*	0.124*	-0.006	0.004	0.002
	(0.11)			(0.019)	(0.016)	(0.16)	(0.07)	(0.02)	(0.01)	(0.01)
2011	0.278**	0.249**	0.358***	-0.022	0.000	0.207	0.113	-0.015	0.009	0.006
	(0.11)	(0.11)	(0.09)	(0.018)	(0.017)	(0.13)	(0.08)	(0.01)	(0.01)	(0.01)
2010	0.205**	0.179*	0.339***	-0.009	-0.014	0.142	0.086	-0.012	0.01	0.001
	(0.10)	(0.10)	(0.09)	(0.018)	(0.017)	(0.12)	(0.07)	(0.01)	(0.01)	(0.01)
2009	0.256***	0.232**	0.290***	-0.032*	0.010	0.238*	0.143**	-0.012	0.01	0.002
	(0.09)	(0.09)	(0.08)	(0.017)	(0.012)	(0.13)	(0.07)	(0.01)	(0.01)	(0.01)
2008	0.181**	0.160**	0.385***	-0.024	0.010	0.166*	0.116**	-0.012	0.014	-0.002
	(0.07)	(0.08)	(0.08)	(0.016)	(0.009)	(0.10)	(0.05)	(0.01)	(0.01)	(0.01)
2007	0.155**	0.137**	0.334***	-0.024	0.005	0.153*	0.131***	-0.012	0.012	-0.001
	(0.06)	(0.06)	(0.08)	(0.015)	(0.009)	(0.09)	(0.04)	(0.01)	(0.01)	(0.01)
2006	0.088**	0.074*	0.349***	-0.019	0.010	0.075	0.087**	-0.015	0.009	0.006
	(0.04)	(0.04)	(0.07)	(0.014)	(0.008)	(0.06)	(0.04)	(0.01)	(0.01)	(0.01)
2005	0.063*	0.052	0.318***	-0.017	-0.003	0.062	0.059**	-0.015	0.01	0.005
	(0.04)	(0.04)	(0.06)	(0.014)	(0.008)	(0.05)	(0.03)	(0.01)	(0.01)	(0.01)
2004	0.045*	0.038	0.178***	-0.022*	-0.001	0.039	0.054**	-0.017	0.011	0.006
	(0.03)	(0.03)	(0.05)	(0.013)	(0.007)	(0.04)	(0.02)	(0.01)	(0.01)	(0.01)
2003	0.019	0.016	0.057*	-0.002	-0.003	0.04	0.027	-0.001	0	0
	(0.02)	(0.02)	(0.03)	(0.007)	(0.006)	(0.03)	(0.02)	(0.01)	(0.00)	(0.01)
2001	-0.029	-0.026	-0.065*	0.018**	-0.010*	-0.02	-0.03	0.006	-0.004	-0.002
	(0.03)	(0.03)	(0.03)	(0.008)	(0.006)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)
2000	-0.108*	-0.103*	-0.084	0.019	0.010	-0.112	-0.047	0.011	-0.003	-0.008
	(0.06)	(0.06)	(0.05)	(0.011)	(0.010)	(0.08)	(0.03)	(0.01)	(0.01)	(0.02)
N	2068	1880	1980	1470	1470	1469	1456	1470	1470	1456
r2	0.74	0.59	0.48	0.49	0.35	0.64	0.77	0.45	0.17	0.34

Table E.2: Price Boom estimation results accompanying Figures 6, 7 and 8. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

ix.

Price Boom (Part II)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Dependent ×										
1999	-0.098	-0.092	-0.207**							
	(0.06)	(0.06)	(0.08)							
1998	-0.105**	-0.100*	-0.311***							
	(0.05)	(0.05)	(0.11)							
1997	-0.105*	-0.101	-0.263**							
	(0.06)	(0.07)	(0.10)							
1996	-0.113	-0.109	-0.286**							
	(0.07)	(0.08)	(0.14)							
1995	-0.116	-0.11	-0.313*							
	(0.08)	(0.08)	(0.16)							
1994	-0.109	-0.099	-0.313							
	(0.08)	(0.07)	(0.20)							
1993	-0.052	-0.035	-0.239							
	(0.10)	(0.10)	(0.19)							
1992	-0.106	-0.082	-0.201							
	(0.16)	(0.16)	(0.19)							
N	2068	1880	1980	1470	1470	1469	1456	1470	1470	1456
r2	0.74	0.59	0.48	0.49	0.35	0.64	0.77	0.45	0.17	0.34

Table E.3: (Continued from previous page) Price Boom estimation results accompanying Figures 6, 7 and 8. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

Price Boom (Part III, for Online Appendix)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Year×										
Cent. Asia	0.003 (0.011)	0.015 (0.014)	-0.010 (0.011)	-0.003 (0.002)	0.007*** (0.003)	-0.010 (0.020)	-0.021 (0.014)	-0.003* (0.002)	0.004*** (0.001)	-0.001 (0.002)
E. Asia	0.018** (0.008)	0.029*** (0.008)	-0.004 (0.011)	0.000 (0.002)	0.008*** (0.003)	-0.015 (0.036)	-0.017 (0.014)	-0.005*** (0.002)	-0.000 (0.002)	0.006*** (0.002)
+Pac.										
E. Eur.	0.045*** (0.010)	0.071*** (0.011)	0.034*** (0.005)	-0.004 (0.002)	0.022*** (0.006)	0.023** (0.011)	0.000 (0.009)	-0.003*** (0.000)	0.002** (0.001)	0.001 (0.001)
Lat Am.	0.026*** (0.009)	0.032*** (0.009)	-0.008 (0.005)	-0.005** (0.002)	0.007*** (0.001)	0.015 (0.012)	-0.014 (0.011)	-0.006*** (0.001)	0.000 (0.001)	0.006*** (0.001)
+Carib.										
MENA	0.029*** (0.010)	0.034*** (0.012)	-0.007 (0.016)	-0.002 (0.002)	0.007*** (0.002)	0.031 (0.023)	-0.011 (0.015)	-0.003*** (0.001)	0.004 (0.003)	-0.001 (0.003)
N. Am.	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
S. Asia	0.005 (0.012)	0.017 (0.013)	-0.004 (0.011)	-0.001 (0.004)	0.012*** (0.003)	-0.019 (0.021)	-0.029 (0.019)	-0.005** (0.002)	0.003 (0.002)	0.003** (0.001)
S.S. Af.	0.000 (.)	0.000 (.)	-0.023*** (0.008)	0.000 (.)	0.005*** (0.001)	0.010 (0.019)	-0.016 (0.012)	-0.008*** (0.001)	0.003*** (0.001)	0.005*** (0.001)
W. Eur.	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Other	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
N	2068	1880	1980	1470	1470	1469	1456	1470	1470	1456
r2	0.74	0.59	0.48	0.49	0.35	0.64	0.77	0.45	0.17	0.34

Table E.4: (Continued from previous page) Price Boom estimation results accompanying Figures 6, 7 and 8. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

Price Boom (Part IV, for Online Appendix)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Y_initial year×										
2013	0.000	0.000	0.000	0.000		-0.086	0.000			
	(.)	(.)	(.)	(.)		(0.054)	(.)			
2012	0.031***	0.000	0.000	0.011		-0.080	0.019			
	(0.012)	(.)	(.)	(0.008)		(0.049)	(0.014)			
2011	0.034***	0.000	0.000	0.028**		-0.064	0.014			
	(0.010)	(.)	(.)	(0.013)		(0.045)	(0.023)			
2010	0.049**	0.013	-0.002	0.046***		-0.060	0.032			
	(0.019)	(0.011)	(0.008)	(0.016)		(0.041)	(0.023)			
2009	0.074***	0.036**	-0.005	0.070***		-0.039	0.037			
	(0.021)	(0.017)	(0.011)	(0.025)		(0.040)	(0.024)			
2008	0.096***	0.056***	0.017	0.093***		-0.034	0.064**			
	(0.023)	(0.019)	(0.018)	(0.023)		(0.039)	(0.025)			
2007	0.136***	0.095***	0.015	0.108***		-0.002	0.096***			
	(0.027)	(0.023)	(0.018)	(0.027)		(0.037)	(0.024)			
2006	0.147***	0.103***	0.013	0.124***		0.004	0.105***			
	(0.035)	(0.030)	(0.022)	(0.029)		(0.029)	(0.025)			
2005	0.161***	0.116***	0.010	0.144***		0.016	0.115***			
	(0.034)	(0.028)	(0.027)	(0.031)		(0.027)	(0.028)			
2004	0.171***	0.124***	0.010	0.150***		0.014	0.126***			
	(0.041)	(0.036)	(0.028)	(0.035)		(0.024)	(0.032)			
2003	0.194***	0.144***	0.023	0.170***		0.016	0.155***			
	(0.046)	(0.042)	(0.033)	(0.037)		(0.025)	(0.033)			
2002	0.185***	0.133***	0.028	0.195***		-0.005	0.119***			
	(0.045)	(0.041)	(0.039)	(0.041)		(0.018)	(0.030)			
2001	0.194***	0.140***	0.047	0.215***		-0.006	0.140***			
	(0.050)	(0.046)	(0.041)	(0.044)		(0.016)	(0.038)			
N	2068	1880	1980	1470	1470	1469	1456	1470	1470	1456
r2	0.74	0.59	0.48	0.49	0.35	0.64	0.77	0.45	0.17	0.34

Table E.5: (Continued from previous page) Price Boom estimation results accompanying Figures 6, 7 and 8. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

Price Boom (Part V, for Online Appendix)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Y_initial year×										
2000	0.220*** (0.061)	0.163*** (0.058)	0.073 (0.046)	0.242*** (0.047)		0.000 (.)	0.137*** (0.038)			
1999	0.237*** (0.063)	0.177*** (0.060)	0.074 (0.051)							
1998	0.254*** (0.058)	0.192*** (0.054)	0.098* (0.056)							
1997	0.277*** (0.061)	0.211*** (0.058)	0.109* (0.056)							
1996	0.274*** (0.070)	0.207*** (0.066)	0.156** (0.065)							
1995	0.278*** (0.073)	0.208*** (0.070)	0.153** (0.070)							
1994	0.330*** (0.071)	0.259*** (0.068)	0.177** (0.077)							
1993	0.296*** (0.079)	0.225*** (0.076)	0.181** (0.076)							
1992	0.363*** (0.096)	0.292*** (0.094)	0.193** (0.080)							
N	2068	1880	1980	1470	1470	1469	1456	1470	1470	1456
r2	0.74	0.59	0.48	0.49	0.35	0.64	0.77	0.45	0.17	0.34

Table E.6: (Continued from previous page) Price Boom estimation results accompanying Figures 6, 7 and 8. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

ΔX

Quantity Boom (Part I)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Size×										
0 yr	0.019 (0.015)	0.022 (0.018)	-0.001 (0.009)	-0.004** (0.002)	-0.001 (0.001)	0.024 (0.022)	0.021 (0.013)	-0.004* (0.002)	0.002 (0.002)	0.002 (0.002)
1 yr	0.006 (0.025)	0.009 (0.026)	-0.015 (0.022)	-0.002 (0.003)	-0.002 (0.002)	-0.000 (0.034)	0.021 (0.016)	-0.004* (0.002)	0.001 (0.002)	0.003* (0.002)
2 yrs	0.009 (0.014)	0.012 (0.016)	-0.011 (0.011)	0.001 (0.005)	-0.003 (0.002)	0.012 (0.017)	0.010 (0.013)	-0.002 (0.004)	0.001 (0.003)	0.001 (0.002)
3 yrs	0.016 (0.015)	0.025 (0.018)	0.016 (0.014)	-0.001 (0.004)	-0.001 (0.002)	0.009 (0.023)	0.015 (0.012)	-0.003 (0.004)	0.002 (0.002)	0.001 (0.003)
4 yrs	0.028 (0.018)	0.033 (0.020)	0.024 (0.015)	-0.002 (0.002)	-0.005** (0.002)	0.033 (0.026)	0.031** (0.012)	-0.007*** (0.002)	0.003** (0.002)	0.003 (0.002)
5 yrs	0.040* (0.023)	0.045* (0.026)	0.041 (0.025)	-0.005 (0.003)	-0.003 (0.003)	0.037 (0.028)	0.034** (0.013)	-0.007*** (0.003)	0.004** (0.002)	0.004 (0.003)
6 yrs	0.057* (0.031)	0.060* (0.035)	0.100** (0.047)	-0.005 (0.004)	-0.003 (0.003)	0.056 (0.034)	0.047** (0.021)	-0.008*** (0.003)	0.004 (0.002)	0.004 (0.003)
7 yrs	0.096*** (0.031)	0.108*** (0.032)	0.100*** (0.036)	-0.005 (0.005)	-0.005 (0.005)	0.101*** (0.036)	0.088*** (0.025)	-0.007 (0.005)	0.007** (0.003)	0.000 (0.003)
8 yrs	0.137** (0.053)	0.139** (0.057)	0.109*** (0.032)	-0.010 (0.008)	-0.002 (0.004)	0.144** (0.059)	0.112*** (0.035)	-0.009* (0.004)	0.007** (0.004)	0.001 (0.003)
9 yrs	0.176*** (0.064)	0.173*** (0.063)	0.112** (0.045)	-0.015 (0.010)	0.002 (0.005)	0.181*** (0.063)	0.130*** (0.040)	-0.010** (0.005)	0.007* (0.004)	0.003 (0.003)
10 yrs	0.177** (0.086)	0.178** (0.084)	0.076*** (0.026)	-0.012 (0.010)	-0.001 (0.007)	0.190* (0.102)	0.143** (0.063)	-0.009* (0.005)	0.006 (0.005)	0.002 (0.004)
N	1323	1323	1147	1323	1330	1329	1317	1330	1330	1317
r2	0.78	0.69	0.56	0.47	0.35	0.66	0.79	0.45	0.17	0.36

Table E.7: Quantity Boom estimation results accompanying Figures 9, 10 and 11. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

Quantity Boom (Part II, for Online Appendix)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Size×										
11 yrs	0.195** (0.082)	0.186** (0.087)	0.071* (0.037)	-0.015* (0.009)	0.001 (0.007)	0.188** (0.079)	0.147** (0.057)	-0.011** (0.004)	0.003 (0.005)	0.008 (0.005)
12 yrs	0.210** (0.091)	0.199** (0.096)	0.036* (0.022)	-0.018* (0.010)	0.005 (0.009)	0.222** (0.095)	0.156** (0.066)	-0.012*** (0.004)	0.005 (0.004)	0.007 (0.006)
13 yrs	0.257*** (0.086)	0.249*** (0.090)	0.077 (0.051)	-0.017 (0.014)	0.008 (0.009)	0.234** (0.097)	0.170*** (0.058)	-0.005 (0.007)	0.001 (0.006)	0.003 (0.005)
14 yrs	0.108* (0.062)	0.064 (0.053)	0.029 (0.074)	0.002 (0.014)	-0.002 (0.009)	0.138** (0.065)	0.095*** (0.032)	0.005 (0.016)	-0.004 (0.010)	-0.001 (0.007)
15 yrs	0.155** (0.069)	0.097* (0.052)	0.024 (0.095)	-0.014 (0.010)	-0.000 (0.006)	0.164** (0.077)	0.098*** (0.021)	0.002 (0.011)	0.002 (0.008)	-0.004 (0.006)
16 yrs	0.114* (0.067)	0.079 (0.066)	-0.014 (0.085)	-0.002 (0.010)	0.003 (0.006)	0.124* (0.069)	0.071*** (0.018)	0.008 (0.009)	-0.005 (0.005)	-0.003 (0.007)
17 yrs	0.052 (0.036)	0.050 (0.033)	0.037 (0.045)	0.008 (0.030)	0.012** (0.005)	0.075* (0.044)	0.062*** (0.018)	0.007 (0.023)	-0.003 (0.012)	-0.004 (0.011)
18 yrs	0.042 (0.036)	0.049* (0.028)	0.030 (0.076)	0.012 (0.032)	0.005 (0.003)	0.079** (0.038)	0.055*** (0.018)	0.005 (0.026)	-0.005 (0.014)	-0.000 (0.012)
19 yrs	-0.001 (0.035)	0.007 (0.022)	0.008 (0.056)	0.012 (0.028)	0.004 (0.004)	0.019 (0.044)	0.037** (0.015)	0.007 (0.024)	-0.005 (0.012)	-0.001 (0.012)
20 yrs	0.000 (0.032)	0.018 (0.031)	-0.002 (0.062)	0.014 (0.027)	0.005 (0.004)	0.019 (0.045)	0.033* (0.019)	0.009 (0.023)	-0.002 (0.013)	-0.007 (0.011)
21 yrs	-0.001 (0.032)	0.021 (0.032)	0.028 (0.063)	-0.018 (0.014)	0.002 (0.003)	-0.003 (0.040)	0.041** (0.017)	-0.012 (0.014)	0.005 (0.009)	0.007 (0.007)
22 yrs	-0.022 (0.039)	-0.037 (0.036)	0.075 (0.050)	-0.012 (0.015)	0.002 (0.003)	-0.028 (0.038)	-0.000 (0.019)	-0.013 (0.013)	0.004 (0.009)	0.009 (0.006)
23 yrs	-0.046 (0.033)	-0.063** (0.030)	0.101** (0.045)	-0.003 (0.011)	-0.008 (0.009)	-0.051 (0.033)	-0.023 (0.017)	-0.012 (0.013)	0.006 (0.008)	0.005 (0.006)
N	1323	1323	1147	1323	1330	1329	1317	1330	1330	1317
r2	0.78	0.69	0.56	0.47	0.35	0.66	0.79	0.45	0.17	0.36

Table E.8: Quantity Boom estimation results accompanying Figures 9, 10 and 11. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

Quantity Boom (Part III, for Online Appendix)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Year×										
Cent. Asia	-0.008 (0.028)	0.004 (0.032)	0.027* (0.016)	-0.002 (0.003)	0.002 (0.004)	-0.029 (0.031)	-0.014 (0.019)	0.005** (0.002)	0.003 (0.002)	-0.008** (0.003)
E. Asia	0.011 (0.011)	0.022** (0.010)	0.030*** (0.010)	-0.000 (0.002)	0.002 (0.003)	-0.014 (0.023)	0.005 (0.006)	0.002 (0.002)	-0.003* (0.002)	0.001 (0.002)
+Pac.										
E. Eur.	0.035*** (0.012)	0.057*** (0.013)	0.031*** (0.005)	-0.002 (0.002)	0.018*** (0.007)	0.011 (0.013)	0.017*** (0.005)	0.005*** (0.001)	-0.000 (0.001)	-0.005*** (0.001)
Lat Am.	0.013 (0.009)	0.021** (0.009)	0.009 (0.007)	-0.004* (0.003)	0.002 (0.002)	0.002 (0.010)	0.002 (0.005)	0.002 (0.001)	-0.003*** (0.001)	0.001 (0.001)
+Carib.										
MENA	0.044*** (0.012)	0.044*** (0.014)	0.026 (0.021)	-0.003 (0.002)	0.002 (0.003)	0.044*** (0.016)	0.019*** (0.007)	0.003** (0.001)	0.003 (0.003)	-0.006** (0.003)
N. Am.	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
S. Asia	-0.011 (0.016)	0.015 (0.028)	0.016* (0.009)	0.001 (0.004)	0.007* (0.004)	-0.029** (0.014)	-0.011 (0.014)	0.004 (0.003)	-0.001 (0.002)	-0.003* (0.001)
S.S. Af.	0.000 (.)	0.000 (.)	0.012 (0.009)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
W. Eur.	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Other	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
N	1323	1323	1147	1323	1330	1329	1317	1330	1330	1317
r2	0.78	0.69	0.56	0.47	0.35	0.66	0.79	0.45	0.17	0.36

Table E.9: Quantity Boom estimation results accompanying Figures 9, 10 and 11. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

Quantity Boom (Part IV, for Online Appendix)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ln(lights)	ln(lights/cap)	ln(GDP/cap)	URP	Rural Switch %	ln(lights): Town	ln(lights): City	Rural Pop %	Town Pop %	City Pop %
Y_initial year×										
2000	0.160*** (0.038)	0.137*** (0.041)	-0.009 (0.043)	0.212*** (0.047)		0.027 (0.148)	0.336*** (0.117)			
2001	0.147*** (0.034)	0.125*** (0.036)	-0.023 (0.040)	0.187*** (0.044)		0.030 (0.149)	0.340*** (0.116)			
2002	0.136*** (0.033)	0.113*** (0.035)	-0.018 (0.037)	0.171*** (0.040)		0.031 (0.147)	0.320*** (0.115)			
2003	0.151*** (0.032)	0.128*** (0.034)	-0.017 (0.032)	0.146*** (0.035)		0.056 (0.147)	0.360*** (0.115)			
2004	0.137*** (0.029)	0.116*** (0.031)	-0.007 (0.027)	0.135*** (0.034)		0.057 (0.147)	0.336*** (0.115)			
2005	0.133*** (0.025)	0.113*** (0.026)	0.010 (0.022)	0.126*** (0.030)		0.062 (0.147)	0.326*** (0.115)			
2006	0.118*** (0.025)	0.105*** (0.027)	0.008 (0.020)	0.108*** (0.029)		0.047 (0.145)	0.316*** (0.115)			
2007	0.107*** (0.023)	0.096*** (0.025)	0.011 (0.016)	0.092*** (0.026)		0.044 (0.144)	0.309*** (0.115)			
2008	0.073*** (0.019)	0.061*** (0.019)	0.020 (0.014)	0.081*** (0.021)		0.011 (0.143)	0.279** (0.114)			
2009	0.053*** (0.016)	0.042** (0.017)	-0.015 (0.011)	0.060** (0.023)		0.010 (0.141)	0.252** (0.112)			
2010	0.024 (0.016)	0.016 (0.016)	-0.011 (0.007)	0.034* (0.019)		-0.024 (0.139)	0.242** (0.115)			
2011	0.004 (0.008)	-0.001 (0.009)	0.000 (.)	0.016 (0.014)		-0.022 (0.139)	0.225** (0.113)			
2012	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)		-0.039 (0.137)	0.230** (0.114)			
N	1323	1323	1147	1323	1330	1329	1317	1330	1330	1317
r2	0.78	0.69	0.56	0.47	0.35	0.66	0.79	0.45	0.17	0.36

Table E.10: Quantity Boom estimation results accompanying Figures 9, 10 and 11. Regressions includes country and year fixed effects. Robust standard errors clustered at the country level are reported in parenthesis. *, **, *** represent significance at 10%, 5%, and 1%, respectively.

F Mechanisms

In addition to the hazard model described in Section 4.6, which studies the marginal effect of various variables on the probability of a rural cell becoming lit, we also study the cumulative effect of each variable individually. To do this we run the following specification at the grid-cell level:

$$RuralSwitch\%_{c,i,t} = \alpha + \sum_{s=2000}^{2013} \beta_s(\lambda_s \times X_c) + \Lambda_t + \Phi_i + \epsilon_{c,i,t} \quad (1)$$

Where X_c is one of the dependent variables described in Section 4.6, and the other variables are defined in Section 4.2. This specification estimates, for example, the likelihood of an unlit rural cell that is next to a lit cell switching on relative to other unlit cells, controlling for country-level averages. Standard errors are clustered at the country level. We run this specification separately for dependent and non-dependent countries, and then assess whether the effect differs between the two using a triple-difference specification.¹

¹This takes, for example, the difference in rural illumination between cells that are/are not adjacent to lit cells, relative to their difference in 2000, and assesses how much this differs between oil dependent and non-dependent countries. The specification is run for all sample countries and includes dummies for being in a dependent country and being adjacent to a lit cell, dependence-by-year interactions, adjacency-by-year interactions, and triple interactions for which the coefficients are shown in Figure F.1, iii.

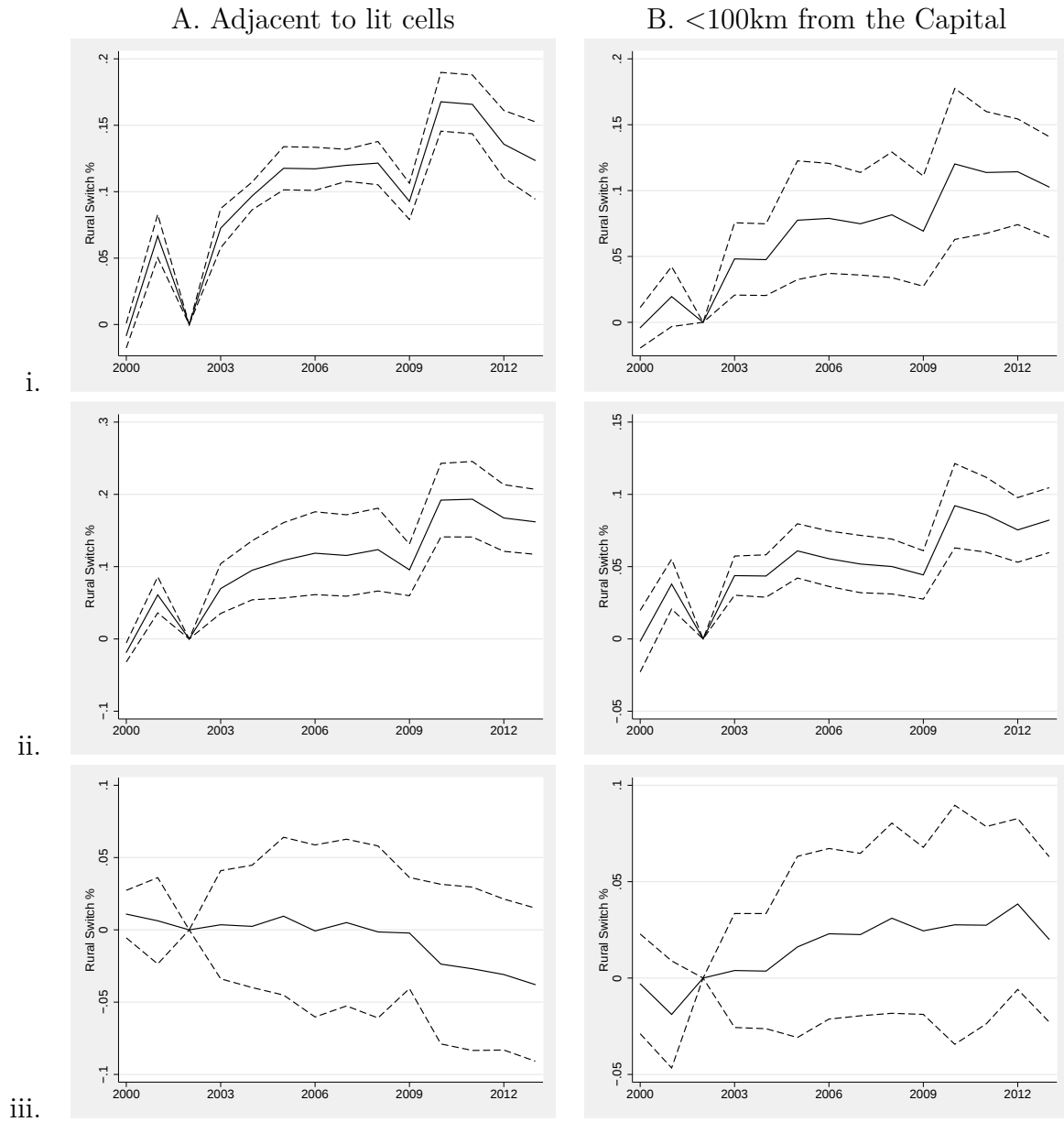


Figure F.1: The difference in switch-on percentage for rural areas that are A. adjacent vs not-adjacent to lit squares and B. near (<100km) vs far (>100km) from the capital city, in i. oil-dependent countries, ii. non-dependent countries and iii. the difference between i. and ii..

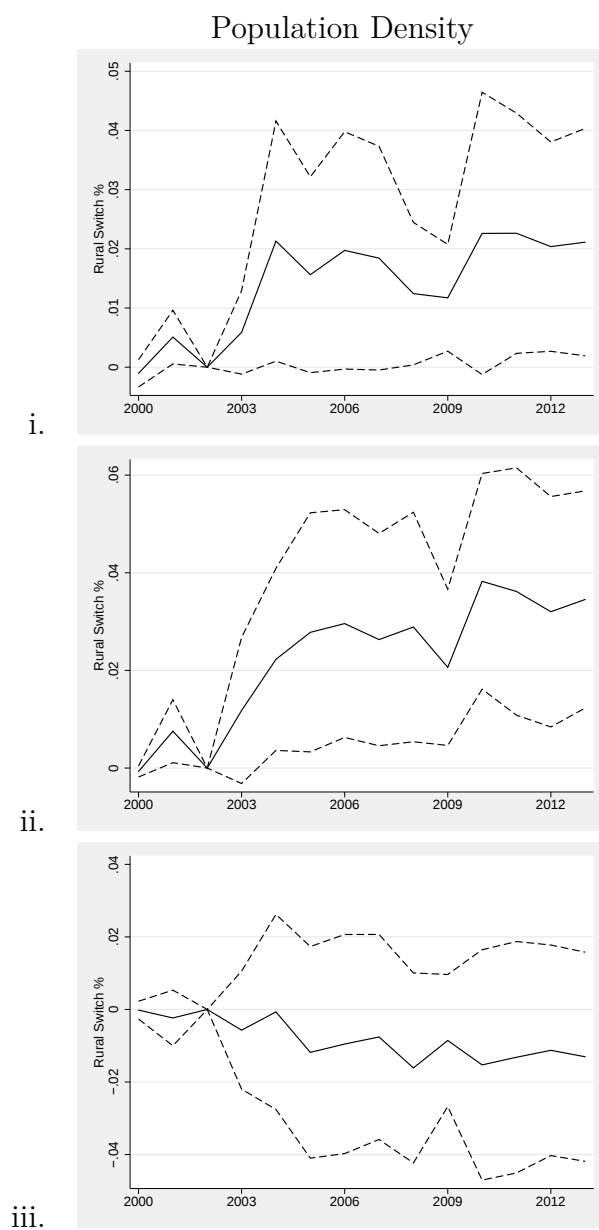


Figure F.2: The difference in rural switch-on percentage for a one standard-deviation increase in population density in i. oil-dependent countries, ii. non-dependent countries and iii. the difference between i. and ii..

G Robustness

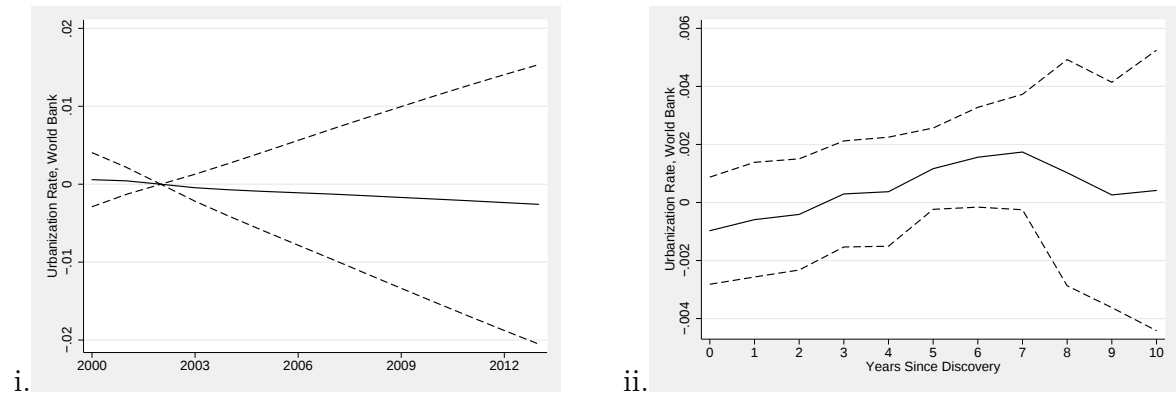


Figure G.1: The effect of i. the 2000s oil price boom and ii. giant oil and gas discoveries on World Bank urbanization rates. The result in i. is a linear combination of quite linear trends over the same time period, while ii. is in “discovery time” so has different countries moving in and out of the sample.

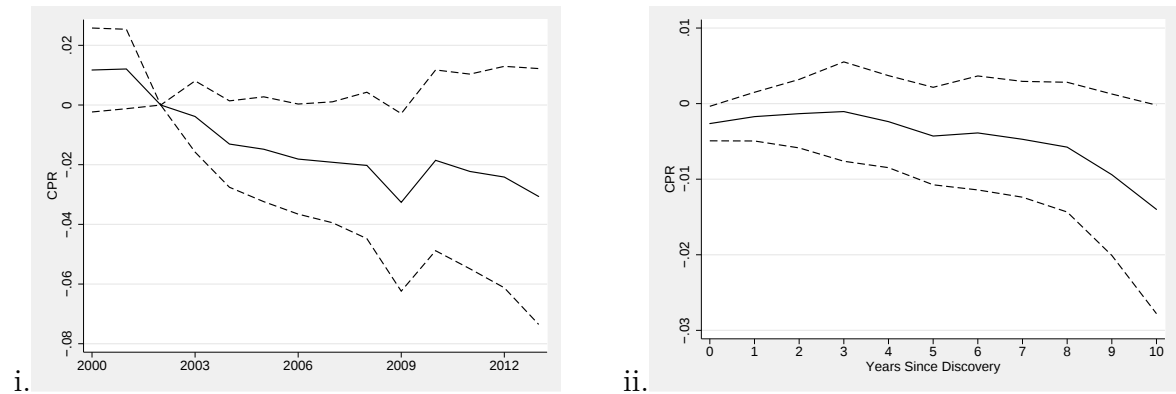


Figure G.2: Changes in the Calibrated Poverty Rate due to i. the 2000s oil price boom and ii. giant oil discoveries.

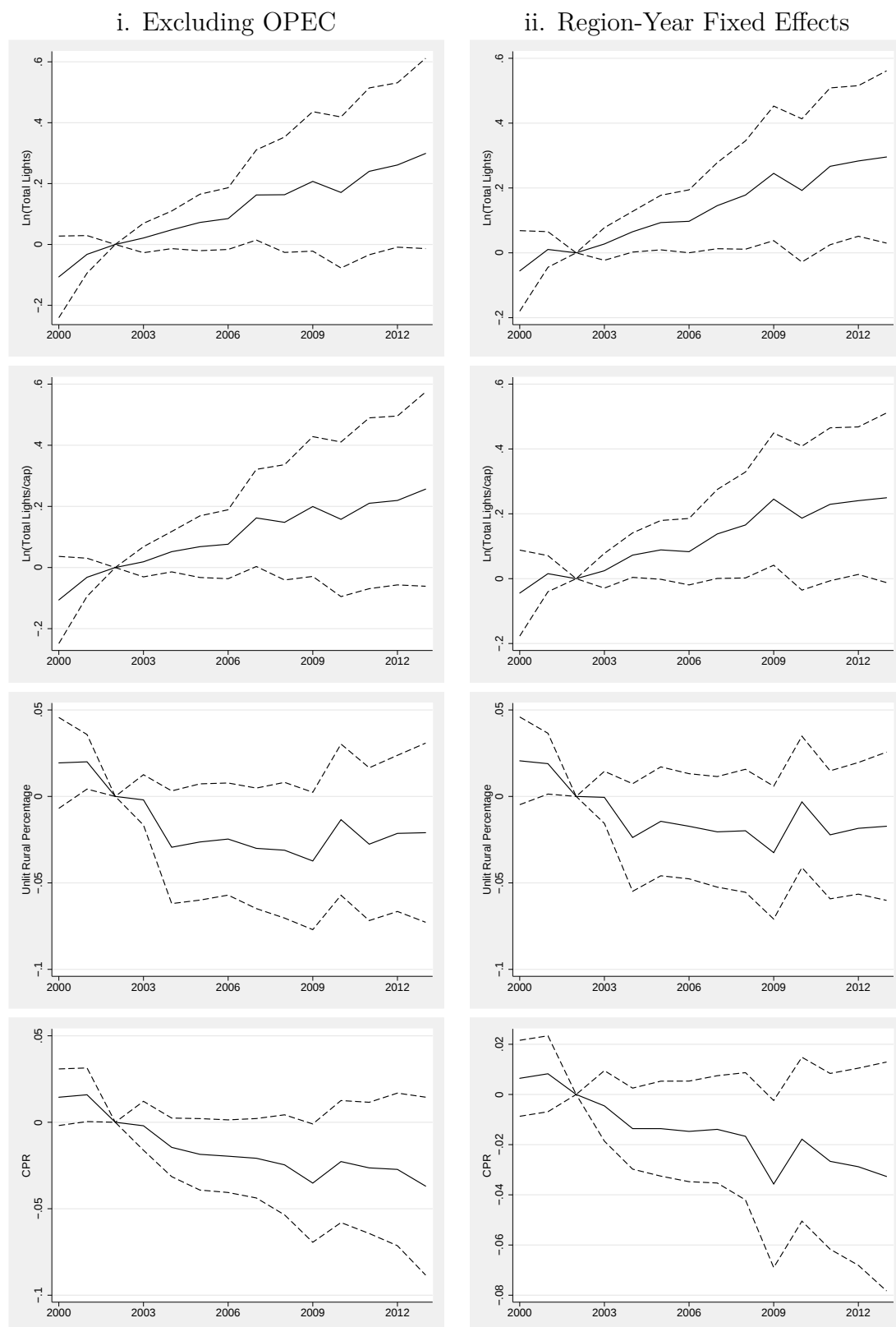


Figure G.3: Effect of 2000s oil price boom on key variables i. excluding OPEC and ii. using region-year instead of year fixed effects.

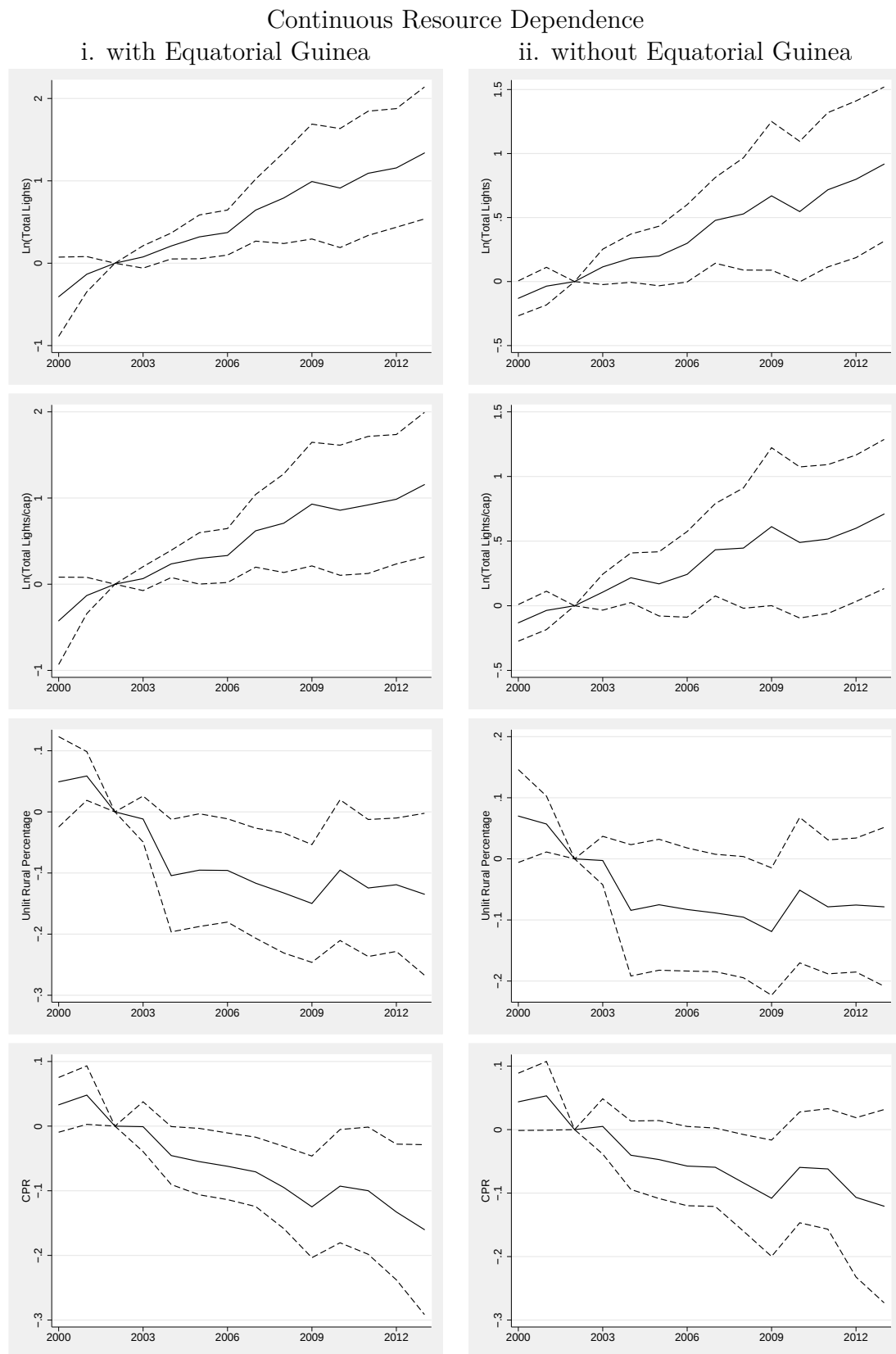


Figure G.4: Effect of 2000s price boom on key variables, using a continuous measure of resource dependence i. with and ii. without Equatorial Guinea.

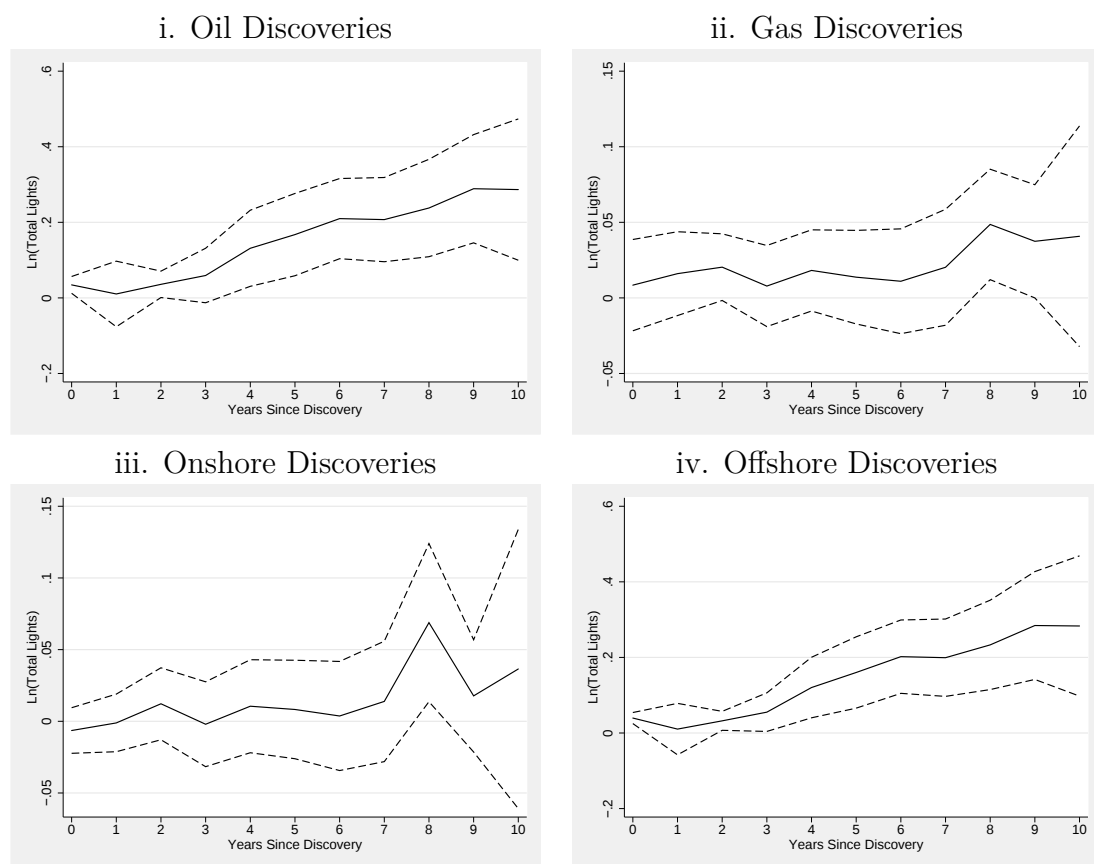


Figure G.5: The effect on aggregate (log) lights of i. oil, ii. gas, iii. onshore, iv. offshore discoveries.

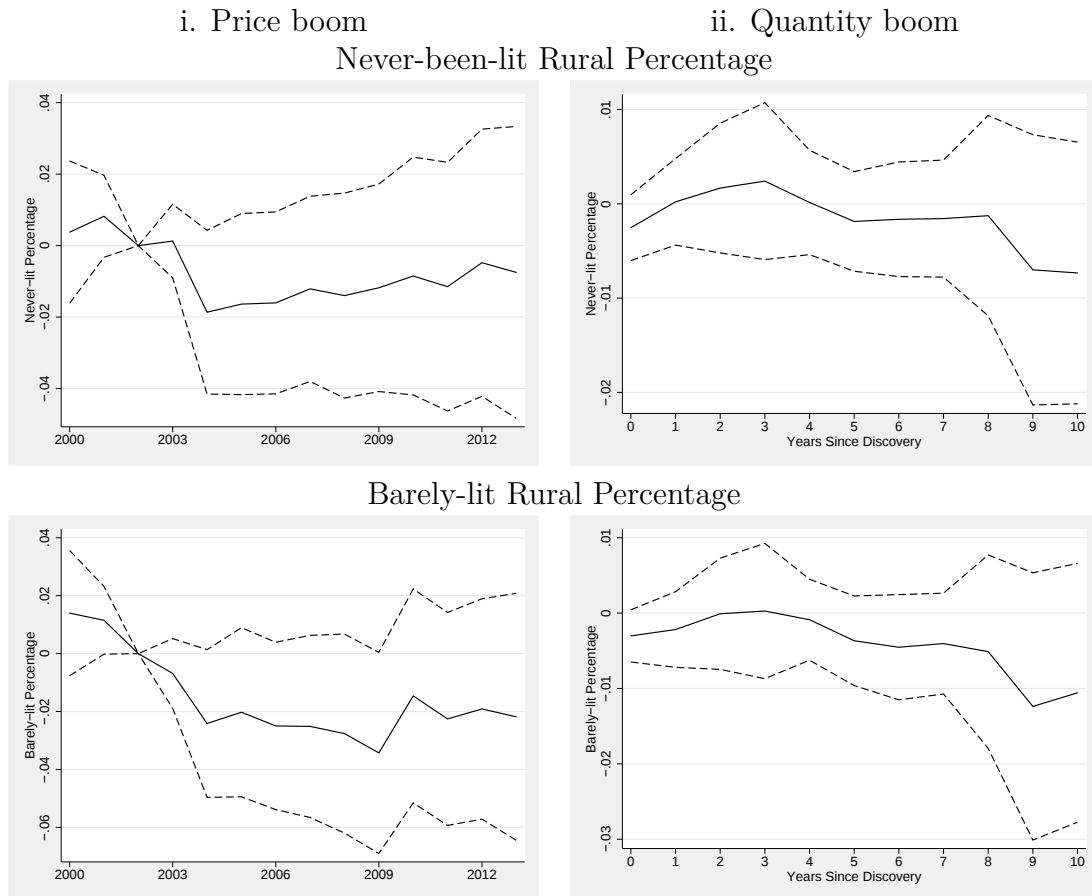


Figure G.6: The share of national population living in rural areas that have never been lit, or are barely-lit, in i. resource-dependent relative to non-dependent countries during the 2003-2013 oil price boom; and ii. in countries after they discover a giant oil field worth 100% of GDP, relative to countries that have not yet discovered oil. The specifications controls for convergence and include year and country fixed effects and regional linear trends (see Equation 3).