

Poverty Hotspots and the Correlates of Subnational Development: Appendix

Table A1: Description of covariates and data sources

	Measurement	Source
<i>Geography</i>		
Agricultural suitability	The fraction of each grid cell with a resolution of 0.5 x 0.5 decimal degrees that is suitable to be used for agriculture, based on the temperature and soil conditions, averaged within each GADM3.6-1 polygon.	Data Basin (2010)
Elevation	Global elevation (in meters); 0.5 km resolution averaged within each GADM3.6-1 polygon.	AidData Geoquery (2019)
SPEI	Global 48-month standardized precipitation-evapotranspiration index, 2000-2015 average; 30 arc-minute resolution averaged within each GADM3.6-1 polygon.	SPEIbase v.2.5 (2017)
Oil or gas	Binary dummy variable measuring the presence of oil or gas deposits; 30 arc-minute resolution averaged within each GADM3.6-1 polygon.	Pierskalla, Schultz, and Wibbels (2017)
<i>Physical capital</i>		
Distance to port	Distance (in meters) from GADM3.6-1 polygon centroid to the nearest port	World Port Index Database (2019)
Travel time to city	Estimated travel time (in minutes) to the nearest city of 50,000 or more people in 2000; 30 arc-minute resolution averaged within each GADM3.6-1 polygon.	AidData Geoquery (2019)
<i>Human capital</i>		
Expected years of schooling	Expected years schooling children aged 6, 1998-2002 average; 5 arc-minute resolution averaged within each GADM3.6-1 polygon.	Global Data Lab (2020)
Malaria suitability	Predicted temperature suitability index for <i>plasmodium falciparum</i> transmission in 2010; 1 km resolution averaged within each GADM3.6-1 polygon.	Malaria Atlas Project (2020)
<i>Governance</i>		
Conflict deaths	Sum of fatalities resulting from conflict event between 1989-2000; 0.6 arc-minute resolution summed within GADM3.6-1 polygons. Converted to a binary dummy variable: 0 if no deaths and 1 otherwise.	AidData Geoquery (2019)
State exposure	Local historical capital city exposure (LHCE) with 5% discount rate; 30 arc-minute resolution averaged within each GADM3.6-1 polygon.	Pierskalla, Schultz, and Wibbels (2017)

Table A2: Lagrange multiplier tests for spatial dependence

	Test statistic	df	p-value
Lagrange multiplier (error)	4183.057	1	0.000
Robust LM (error)	2277.924	1	0.000
Lagrange multiplier (lag)	1913.326	1	0.000
Robust LM (lag)	8.193	1	0.004

Table A3: Benchmark regression table

	(A)	(B)
Subnational GDP per capita (2000, Ln)	-0.0069*** (0.0006)	-0.0076*** (0.0006)
Agriculture suitability	0.0085*** (0.0017)	0.0040** (0.0019)
State exposure (Ln)	0.0006** (0.0003)	-0.0004 (0.0005)
Malaria	-0.0072*** (0.0024)	-0.0127*** (0.0044)
Oil & gas deposits	0.0001 (0.0011)	0.0004 (0.0009)
Elevation (meters, Ln)	-0.0011*** (0.0004)	0.0001 (0.0005)
Distance to the nearest port (meters, Ln)	-0.0003 (0.0005)	0.0002 (0.0005)
Expected years of schooling (1998-2002, Ln)	0.0011*** (0.0002)	-0.0003 (0.0004)
Travel time to the nearest city (mins.)	-0.0002 (0.0006)	-0.0024*** (0.0006)
Conflict	-0.0021** (0.0010)	-0.0012 (0.0011)
Constant	0.0760*** (0.0083)	0.0993*** (0.0095)
W * Change in subnational GDP per capita (2000 – 2015)	0.6539*** (0.0482)	0.1779*** (0.0495)
Country-fixed effects	No	Yes
N	2,894	2,894

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Notes: Tables show coefficients from spatial autoregressive regressions prior to discerning spillover effects. Please note that these coefficients cannot be interpreted like a standard regression model. The dependent variable is real per capita GDP growth by subnational area, 2000-2015. Figure (B) shows the within-country effects.

Table A4: IV regression table

	(A)	(B)
Subnational GDP per capita (2000, Ln)	-0.0075*** (0.0006)	-0.0076*** (0.0006)
Agriculture suitability	0.0079*** (0.0018)	0.0040** (0.0019)
State exposure (Ln)	0.0006** (0.0003)	-0.0004 (0.0005)
Malaria	-0.0045* (0.0027)	-0.0127*** (0.0044)
Oil & gas deposits	0.0018 (0.0012)	0.0004 (0.0009)
Elevation (meters, Ln)	-0.0003 (0.0005)	0.0000 (0.0005)
Distance to the nearest port (meters, Ln)	-0.0006 (0.0005)	0.0002 (0.0005)
Expected years of schooling (1998-2002, Ln)	0.0007** (0.0003)	-0.0003 (0.0004)
Travel time to the nearest city (mins.)	-0.0006 (0.0006)	-0.0024*** (0.0006)
Conflict	-0.0154*** (0.0043)	-0.0007 (0.0022)
Constant	0.0918*** (0.0099)	0.0988*** (0.0098)
W * Change in subnational GDP per capita (2000 – 2015)	0.6541*** (0.0506)	0.1740*** (0.0496)
Country-fixed effects	No	Yes
N	2,894	2,894

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Notes: Tables show coefficients from generalized spatial two-stage least squares regressions prior to discerning spillover effects. Please note that these coefficients cannot be interpreted like a standard regression model. The dependent variable is real per capita GDP growth by subnational area, 2000-2015. Conflict is instrumented by the standardized evapotranspiration index (SPEI). Figure (B) shows the within-country effects.

Table A5: Benchmark regression table using alternative spatial weighting matrices

	<i>First-order contiguity</i>		<i>Rook contiguity</i>		<i>Inverse distance</i>	
Subnational GDP per capita (2000, Ln)	-0.0074*** (0.0006)	-0.0076*** (0.0006)	-0.0073*** (0.0006)	-0.0076*** (0.0006)	-0.0085*** (0.0006)	-0.0078*** (0.0006)
Agriculture suitability	0.0087*** (0.0017)	0.0036* (0.0019)	0.0087*** (0.0017)	0.0036* (0.0019)	0.0116*** (0.0019)	0.0040** (0.0019)
State exposure (Ln)	0.0007** (0.0003)	-0.0004 (0.0005)	0.0007** (0.0003)	-0.0004 (0.0005)	0.0011*** (0.0003)	-0.0004 (0.0005)
Malaria	-0.0096*** (0.0025)	-0.0129*** (0.0043)	-0.0092*** (0.0025)	-0.0130*** (0.0043)	-0.0092*** (0.0027)	-0.0143*** (0.0043)
Oil & gas deposits	0.0004 (0.0011)	0.0004 (0.0009)	0.0004 (0.0011)	0.0004 (0.0009)	0.0014 (0.0012)	0.0006 (0.0009)
Elevation (meters, Ln)	-0.0013*** (0.0004)	0.0001 (0.0005)	-0.0013*** (0.0004)	0.0001 (0.0005)	-0.0019*** (0.0005)	0.0002 (0.0005)
Distance to the nearest port (meters, Ln)	0.0006 (0.0005)	0.0003 (0.0005)	0.0006 (0.0005)	0.0003 (0.0005)	0.0015*** (0.0005)	0.0005 (0.0005)
Expected years of schooling (1998-2002, Ln)	0.0011*** (0.0002)	-0.0003 (0.0004)	0.0011*** (0.0002)	-0.0003 (0.0004)	0.0011*** (0.0003)	-0.0004 (0.0004)
Travel time to the nearest city (mins.)	0.0002 (0.0006)	-0.0024*** (0.0006)	0.0002 (0.0006)	-0.0024*** (0.0006)	0.0024*** (0.0007)	-0.0021*** (0.0006)
Conflict	-0.0023** (0.0010)	-0.0011 (0.0011)	-0.0023** (0.0010)	-0.0011 (0.0011)	-0.0021* (0.0011)	-0.0011 (0.0011)
Constant	0.0730*** (0.0084)	0.0977*** (0.0095)	0.0724*** (0.0084)	0.0975*** (0.0095)	0.0628*** (0.0094)	0.0962*** (0.0098)
W * Change in subnational GDP per capita (2000 – 2015)	0.3801*** (0.0473)	0.1343*** (0.0341)	0.3804*** (0.0476)	0.1334*** (0.0340)	0.5599*** (0.0695)	0.2102 (0.2115)
Country-fixed effects	No	Yes	No	Yes	No	Yes
N	2,894		2,894		2,895	

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Notes: Tables show coefficients from spatial autoregressive regressions using alternative spatial weighting matrices prior to discerning spillover effects. Please note that these coefficients cannot be interpreted like a standard regression model. The dependent variable is real per capita GDP growth by subnational area, 2000-2015.

	<i>Inverse distance truncated at 500 km</i>		<i>Inverse distance truncated at 1000 km</i>	
Subnational GDP per capita (2000, Ln)	-0.0086*** (0.0006)	-0.0078*** (0.0006)	-0.0085*** (0.0006)	-0.0078*** (0.0006)
Agriculture suitability	0.0117*** (0.0019)	0.0039** (0.0019)	0.0111*** (0.0019)	0.0039** (0.0019)
State exposure (Ln)	0.0012*** (0.0003)	-0.0003 (0.0005)	0.0012*** (0.0003)	-0.0003 (0.0005)
Malaria	-0.0124*** (0.0027)	-0.0140*** (0.0043)	-0.0114*** (0.0027)	-0.0143*** (0.0043)
Oil & gas deposits	0.0016 (0.0012)	0.0006 (0.0009)	0.0016 (0.0012)	0.0006 (0.0009)
Elevation (meters, Ln)	-0.0021*** (0.0005)	0.0002 (0.0005)	-0.0020*** (0.0005)	0.0002 (0.0005)
Distance to the nearest port (meters, Ln)	0.0016*** (0.0005)	0.0004 (0.0005)	0.0016*** (0.0005)	0.0005 (0.0005)
Expected years of schooling (1998-2002, Ln)	0.0010*** (0.0003)	-0.0004 (0.0004)	0.0011*** (0.0003)	-0.0004 (0.0004)
Travel time to the nearest city (mins.)	0.0020*** (0.0007)	-0.0019*** (0.0006)	0.0021*** (0.0007)	-0.0021*** (0.0006)
Conflict	-0.0022* (0.0011)	-0.0011 (0.0011)	-0.0020* (0.0011)	-0.0011 (0.0011)
Constant	0.0727*** (0.0093)	0.0979*** (0.0095)	0.0709*** (0.0093)	0.0978*** (0.0095)
W * Change in subnational GDP per capita (2000 – 2015)	0.4886*** (0.0796)	0.4757** (0.2090)	0.4891*** (0.0722)	0.2405 (0.2066)
Country-fixed effects	No	Yes	No	Yes
N	2,894		2,896	

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table A6: Benchmark regression results using alternative spatial weighting matrices

	<i>First-order contiguity</i>					
	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.007*** (0.001)	-0.003*** (0.000)	-0.010*** (0.001)	-0.008*** (0.001)	-0.001*** (0.000)	-0.008*** (0.001)
Agriculture suitability	0.009*** (0.002)	0.003*** (0.001)	0.012*** (0.002)	0.004 (0.002)	0.000 (0.000)	0.004 (0.002)
State exposure (Ln)	0.001* (0.000)	0.000* (0.000)	0.001* (0.000)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.001)
Malaria	-0.010*** (0.002)	-0.003*** (0.001)	-0.013*** (0.003)	-0.013** (0.004)	-0.001* (0.001)	-0.014** (0.005)
Oil & gas deposits	0.000 (0.001)	0.000 (0.000)	0.001 (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Elevation (meters, Ln)	-0.001** (0.000)	-0.000** (0.000)	-0.002** (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Distance to the nearest port (meters, Ln)	0.001 (0.000)	0.000 (0.000)	0.001 (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Expected years of schooling (1998-2002, Ln)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Travel time to the nearest city (mins.)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)	-0.002*** (0.001)	-0.000** (0.000)	-0.003*** (0.001)
Conflict	-0.002* (0.001)	-0.001* (0.000)	-0.003* (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)
W_A * Change in subnational GDP per capita (2000 – 2015)		0.3801*** (0.0473)			0.1343*** (0.0341)	
Country-fixed effects		No			Yes	
Observations			2,894			

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Notes: Tables show direct, indirect, and total effects based on spatial autoregressive regressions using alternative spatial weighting matrices. The dependent variable is real per capita GDP growth by subnational area, 2000-2015. The last 3 columns show the within-country effects.

Rook contiguity

	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.007*** (0.001)	-0.003*** (0.000)	-0.010*** (0.001)	-0.008*** (0.001)	-0.001*** (0.000)	-0.008*** (0.001)
Agriculture suitability	0.009*** (0.002)	0.003*** (0.001)	0.012*** (0.002)	0.004 (0.002)	0.000 (0.000)	0.004 (0.002)
State exposure (Ln)	0.001* (0.000)	0.000* (0.000)	0.001* (0.000)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.001)
Malaria	-0.009*** (0.003)	-0.003*** (0.001)	-0.013*** (0.003)	-0.013** (0.004)	-0.001* (0.001)	-0.014** (0.005)
Oil & gas deposits	0.000 (0.001)	0.000 (0.000)	0.001 (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Elevation (meters, Ln)	-0.001** (0.000)	-0.000** (0.000)	-0.002** (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Distance to the nearest port (meters, Ln)	0.001 (0.000)	0.000 (0.000)	0.001 (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Expected years of schooling (1998-2002, Ln)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Travel time to the nearest city (mins.)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)	-0.002*** (0.001)	-0.000** (0.000)	-0.003*** (0.001)
Conflict	-0.002* (0.001)	-0.001* (0.000)	-0.003* (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)
W_B * Change in subnational GDP per capita (2000 – 2015)		0.3804*** (0.0476)			0.1334*** (0.0340)	
Country-fixed effects		No			Yes	
Observations			2,895			

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

	<i>Inverse distance</i>					
	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.009*** (0.001)	-0.003*** (0.001)	-0.012*** (0.001)	-0.008*** (0.001)	-0.001 (0.001)	-0.009*** (0.001)
Agriculture suitability	0.012*** (0.002)	0.004*** (0.001)	0.016*** (0.003)	0.004* (0.002)	0.000 (0.000)	0.004* (0.002)
State exposure (Ln)	0.001*** (0.000)	0.000** (0.000)	0.002*** (0.000)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.001)
Malaria	-0.009*** (0.003)	-0.003** (0.001)	-0.013*** (0.004)	-0.014** (0.004)	-0.001 (0.002)	-0.016** (0.005)
Oil & gas deposits	0.001 (0.001)	0.001 (0.000)	0.002 (0.002)	0.001 (0.001)	0.000 (0.000)	0.001 (0.001)
Elevation (meters, Ln)	-0.002*** (0.000)	-0.001** (0.000)	-0.003*** (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Distance to the nearest port (meters, Ln)	0.002** (0.000)	0.001** (0.000)	0.002** (0.001)	0.000 (0.001)	0.000 (0.000)	0.001 (0.001)
Expected years of schooling (1998-2002, Ln)	0.001*** (0.000)	0.000** (0.000)	0.002*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Travel time to the nearest city (mins.)	0.002*** (0.001)	0.001* (0.000)	0.003** (0.001)	-0.002*** (0.001)	-0.000 (0.000)	-0.002*** (0.001)
Conflict	-0.002 (0.001)	-0.001 (0.000)	-0.003 (0.002)	-0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)
W_C * Change in subnational GDP per capita (2000 – 2015)		0.5599*** (0.0695)			0.2102 (0.2115)	
Country-fixed effects		No			Yes	
Observations			2,896			

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Inverse distance truncated at 500 km

	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.009*** (0.001)	-0.001*** (0.000)	-0.009*** (0.001)	-0.008*** (0.001)	-0.001 (0.000)	-0.008*** (0.001)
Agriculture suitability	0.012*** (0.002)	0.001*** (0.000)	0.013*** (0.002)	0.004* (0.002)	0.000 (0.000)	0.004* (0.002)
State exposure (Ln)	0.001*** (0.000)	0.000** (0.000)	0.001*** (0.000)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.001)
Malaria	-0.012*** (0.003)	-0.001*** (0.000)	-0.013*** (0.003)	-0.014** (0.004)	-0.001 (0.001)	-0.015** (0.005)
Oil & gas deposits	0.002 (0.001)	0.000 (0.000)	0.002 (0.001)	0.001 (0.001)	0.000 (0.000)	0.001 (0.001)
Elevation (meters, Ln)	-0.002*** (0.000)	-0.000** (0.000)	-0.002*** (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Distance to the nearest port (meters, Ln)	0.002** (0.000)	0.000** (0.000)	0.002** (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Expected years of schooling (1998-2002, Ln)	0.001*** (0.000)	0.000** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Travel time to the nearest city (mins.)	0.002** (0.001)	0.000* (0.000)	0.002** (0.001)	-0.002** (0.001)	-0.000 (0.000)	-0.002*** (0.001)
Conflict	-0.002 (0.001)	-0.000 (0.000)	-0.002 (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)
W_D * Change in subnational GDP per capita (2000 – 2015)		0.4886*** (0.0796)			0.4757** (0.2090)	
Country-fixed effects		No			Yes	
Observations			2,897			

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Inverse distance truncated at 1,000 km

	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.009*** (0.001)	-0.001*** (0.000)	-0.010*** (0.001)	-0.008*** (0.001)	-0.000 (0.000)	-0.008*** (0.001)
Agriculture suitability	0.011*** (0.002)	0.001*** (0.000)	0.012*** (0.002)	0.004* (0.002)	0.000 (0.000)	0.004* (0.002)
State exposure (Ln)	0.001*** (0.000)	0.000** (0.000)	0.001*** (0.000)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.001)
Malaria	-0.011*** (0.003)	-0.001*** (0.000)	-0.013*** (0.003)	-0.014** (0.004)	-0.001 (0.001)	-0.015** (0.005)
Oil & gas deposits	0.002 (0.001)	0.000 (0.000)	0.002 (0.001)	0.001 (0.001)	0.000 (0.000)	0.001 (0.001)
Elevation (meters, Ln)	-0.002*** (0.000)	-0.000** (0.000)	-0.002*** (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.001)
Distance to the nearest port (meters, Ln)	0.002** (0.000)	0.000** (0.000)	0.002** (0.001)	0.000 (0.001)	0.000 (0.000)	0.001 (0.001)
Expected years of schooling (1998-2002, Ln)	0.001*** (0.000)	0.000** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Travel time to the nearest city (mins.)	0.002** (0.001)	0.000* (0.000)	0.002** (0.001)	-0.002*** (0.001)	-0.000 (0.000)	-0.002*** (0.001)
Conflict	-0.002 (0.001)	-0.000 (0.000)	-0.002 (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)
W_E * Change in subnational GDP per capita (2000 – 2015)		0.4891*** (0.0722)			0.2405 (0.2066)	
Country-fixed effects		No			Yes	
Observations			2,898			

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table A7: Benchmark regression table by income groups

	<i>Low income</i>		<i>Lower-middle income</i>	
Subnational GDP per capita (2000, Ln)	-0.0042*** (0.0012)	-0.0099*** (0.0011)	-0.0111*** (0.0011)	-0.0107*** (0.0011)
Agriculture suitability	0.0049 (0.0038)	0.0039 (0.0034)	0.0075** (0.0030)	0.0082** (0.0037)
State exposure (Ln)	0.0021*** (0.0006)	0.0004 (0.0010)	-0.0004 (0.0005)	-0.0018* (0.0009)
Malaria	-0.0208*** (0.0049)	-0.0131* (0.0070)	-0.0035 (0.0042)	-0.0219*** (0.0080)
Oil & gas deposits	0.0051** (0.0025)	-0.0027 (0.0020)	0.0015 (0.0017)	0.0021 (0.0017)
Elevation (meters, Ln)	-0.0026*** (0.0009)	-0.0009 (0.0009)	-0.0020*** (0.0007)	-0.0004 (0.0009)
Distance to the nearest port (meters, Ln)	0.0000 (0.0010)	-0.0004 (0.0010)	0.0016* (0.0009)	0.0004 (0.0009)
Expected years of schooling (1998-2002, Ln)	0.0022*** (0.0004)	-0.0001 (0.0006)	0.0013** (0.0005)	-0.0006 (0.0009)
Travel time to the nearest city (mins.)	0.0019 (0.0012)	-0.0027*** (0.0010)	-0.0009 (0.0011)	-0.0019* (0.0011)
Conflict	-0.0018 (0.0018)	-0.0021 (0.0016)	-0.0043** (0.0017)	-0.0004 (0.0023)
Constant	0.0512*** (0.0180)	0.1364*** (0.0177)	0.0970*** (0.0148)	0.0000 (0.0000)
W * Change in subnational GDP per capita (2000 – 2015)	0.6276*** (0.0806)	0.1650** (0.0734)	0.4689*** (0.0707)	0.2809*** (0.0744)
Country-fixed effects	No	Yes	No	Yes
N	985		952	

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Notes: Tables show coefficients from spatial autoregressive regressions by income groups prior to discerning spillover effects. Please note that these coefficients cannot be interpreted like a standard regression model. The dependent variable is real per capita GDP growth by subnational area, 2000-2015.

	<i>Upper-middle income</i>		<i>High income</i>	
Subnational GDP per capita (2000, Ln)	-0.0013 (0.0015)	0.0005 (0.0014)	-0.0007 (0.0012)	0.0010 (0.0011)
Agriculture suitability	-0.0042 (0.0036)	-0.0025 (0.0052)	0.0028 (0.0026)	-0.0006 (0.0025)
State exposure (Ln)	0.0015* (0.0008)	-0.0016 (0.0016)	0.0001 (0.0005)	-0.0012 (0.0008)
Malaria	0.0075 (0.0055)	0.0261** (0.0123)	0.0074 (0.0061)	-0.0134 (0.0127)
Oil & gas deposits	-0.0022 (0.0022)	0.0003 (0.0021)	-0.0058*** (0.0015)	-0.0010 (0.0012)
Elevation (meters, Ln)	-0.0006 (0.0011)	0.0032** (0.0016)	-0.0001 (0.0006)	-0.0012 (0.0008)
Distance to the nearest port (meters, Ln)	-0.0020** (0.0009)	-0.0018 (0.0012)	-0.0014* (0.0008)	-0.0012 (0.0008)
Expected years of schooling (1998-2002, Ln)	-0.0001 (0.0007)	-0.0006 (0.0011)	-0.0001 (0.0005)	-0.0010 (0.0009)
Travel time to the nearest city (mins.)	-0.0014 (0.0013)	-0.0038*** (0.0014)	0.0026*** (0.0010)	0.0006 (0.0010)
Conflict	-0.0020 (0.0026)	0.0009 (0.0028)	-0.0013 (0.0024)	-0.0018 (0.0023)
Constant	0.0589** (0.0241)	0.0000 (0.0000)	0.0138 (0.0161)	0.0000 (0.0000)
W * Change in subnational GDP per capita (2000 – 2015)	1.0915*** (0.0749)	0.4512*** (0.1040)	2.0865*** (0.1401)	0.9926*** (0.1961)
Country-fixed effects	No	Yes	No	Yes
N	468		418	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A8: Benchmark regression results by income groups: Upper-middle income and high income

	<i>Upper-middle income</i>					
	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.003 (0.057)	-0.087 (3.456)	-0.090 (3.513)	0.001 (0.001)	0.000 (0.001)	0.001 (0.002)
Agriculture suitability	-0.009 (0.184)	-0.276 (11.102)	-0.285 (11.286)	-0.003 (0.005)	-0.001 (0.003)	-0.004 (0.008)
State exposure (Ln)	0.003 (0.063)	0.096 (3.838)	0.099 (3.901)	-0.002 (0.002)	-0.001 (0.001)	-0.002 (0.002)
Malaria	0.017 (0.331)	0.495 (19.974)	0.511 (20.305)	0.026* (0.012)	0.013 (0.008)	0.040* (0.019)
Oil & gas deposits	-0.005 (0.093)	-0.142 (5.658)	-0.146 (5.751)	0.000 (0.002)	0.000 (0.001)	0.000 (0.003)
Elevation (meters, Ln)	-0.001 (0.028)	-0.042 (1.670)	-0.043 (1.698)	0.003* (0.002)	0.002 (0.001)	0.005* (0.002)
Distance to the nearest port (meters, Ln)	-0.005 (0.088)	-0.133 (5.332)	-0.137 (5.419)	-0.002 (0.001)	-0.001 (0.001)	-0.003 (0.002)
Expected years of schooling (1998-2002, Ln)	-0.000 (0.006)	-0.009 (0.371)	-0.010 (0.378)	-0.001 (0.001)	-0.000 (0.001)	-0.001 (0.002)
Travel time to the nearest city (mins.)	-0.003 (0.059)	-0.089 (3.568)	-0.092 (3.627)	-0.004** (0.001)	-0.002* (0.001)	-0.006** (0.002)
Conflict	-0.005 (0.087)	-0.133 (5.299)	-0.137 (5.386)	0.001 (0.003)	0.000 (0.001)	0.001 (0.004)
W * Change in subnational GDP per capita (2000 – 2015)		1.0915*** (0.0749)			0.4512*** (0.1040)	
Country-fixed effects		No			Yes	
Observations			468			

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Notes: Tables show direct, indirect, and total effects based on spatial autoregressive regressions by income groups. The dependent variable is real per capita GDP growth by subnational area, 2000-2015. The last 3 columns show the within-country effects.

High income

	Direct	Indirect	Total	Direct	Indirect	Total
Subnational GDP per capita (2000, Ln)	-0.001 (0.001)	0.002 (0.005)	0.001 (0.004)	0.001 (0.008)	0.026 (0.656)	0.027 (0.664)
Agriculture suitability	0.002 (0.003)	-0.007 (0.012)	-0.004 (0.012)	-0.001 (0.006)	-0.015 (0.405)	-0.016 (0.410)
State exposure (Ln)	0.000 (0.00)	-0.000 (0.001)	-0.000 (0.001)	-0.002 (0.010)	-0.031 (0.786)	-0.032 (0.796)
Malaria	0.007 (0.006)	-0.019 (0.033)	-0.012 (0.033)	-0.018 (0.114)	-0.348 (8.904)	-0.366 (9.017)
Oil & gas deposits	-0.005* (0.002)	0.015 (0.024)	0.009 (0.025)	-0.001 (0.009)	-0.026 (0.675)	-0.028 (0.684)
Elevation (meters, Ln)	-0.000 (0.001)	0.000 (0.002)	0.000 (0.001)	-0.002 (0.011)	-0.032 (0.827)	-0.034 (0.837)
Distance to the nearest port (meters, Ln)	-0.001 (0.001)	0.004 (0.005)	0.002 (0.006)	-0.002 (0.010)	-0.031 (0.801)	-0.033 (0.812)
Expected years of schooling (1998-2002, Ln)	-0.000 (0.000)	0.000 (0.001)	0.000 (0.001)	-0.001 (0.009)	-0.027 (0.697)	-0.028 (0.707)
Travel time to the nearest city (mins.)	0.002 (0.001)	-0.007 (0.010)	-0.004 (0.011)	0.001 (0.006)	0.017 (0.431)	0.018 (0.437)
Conflict	-0.001 (0.002)	0.003 (0.008)	0.002 (0.007)	-0.003 (0.016)	-0.048 (1.236)	-0.051 (1.252)
W * Change in subnational GDP per capita (2000 – 2015)		2.0865*** (0.1401)			0.9926*** (0.1961)	
Country-fixed effects		No			Yes	
Observations			418			

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1