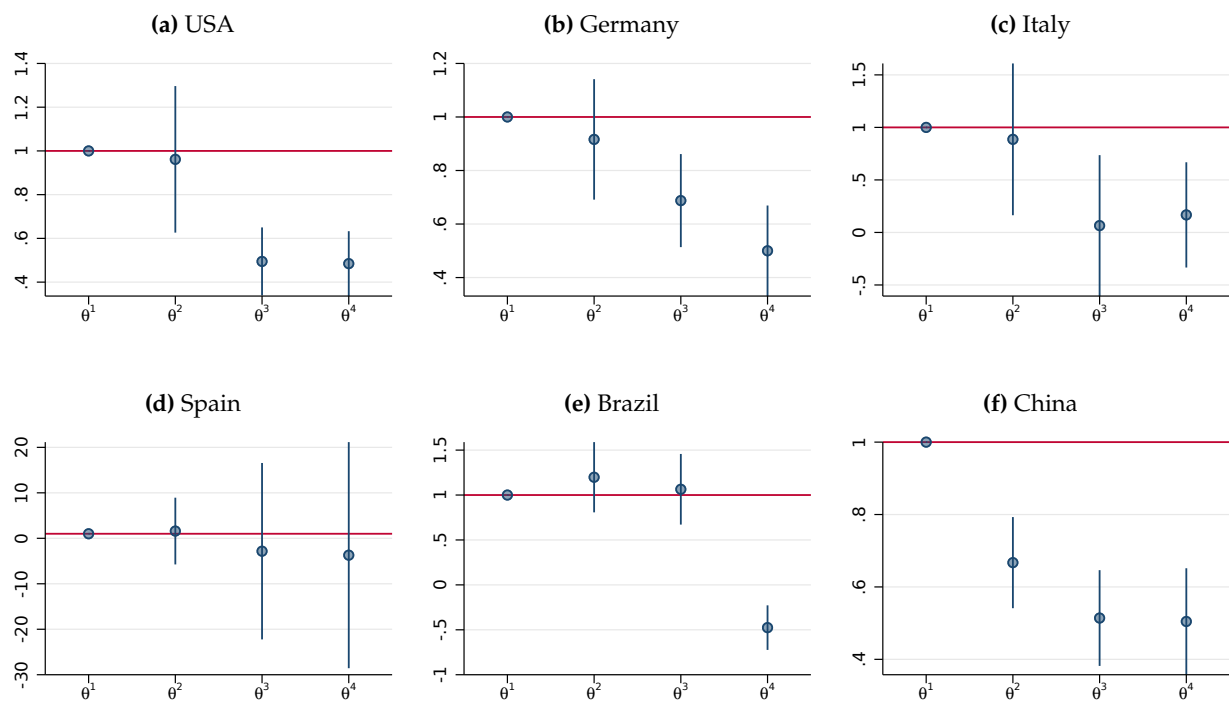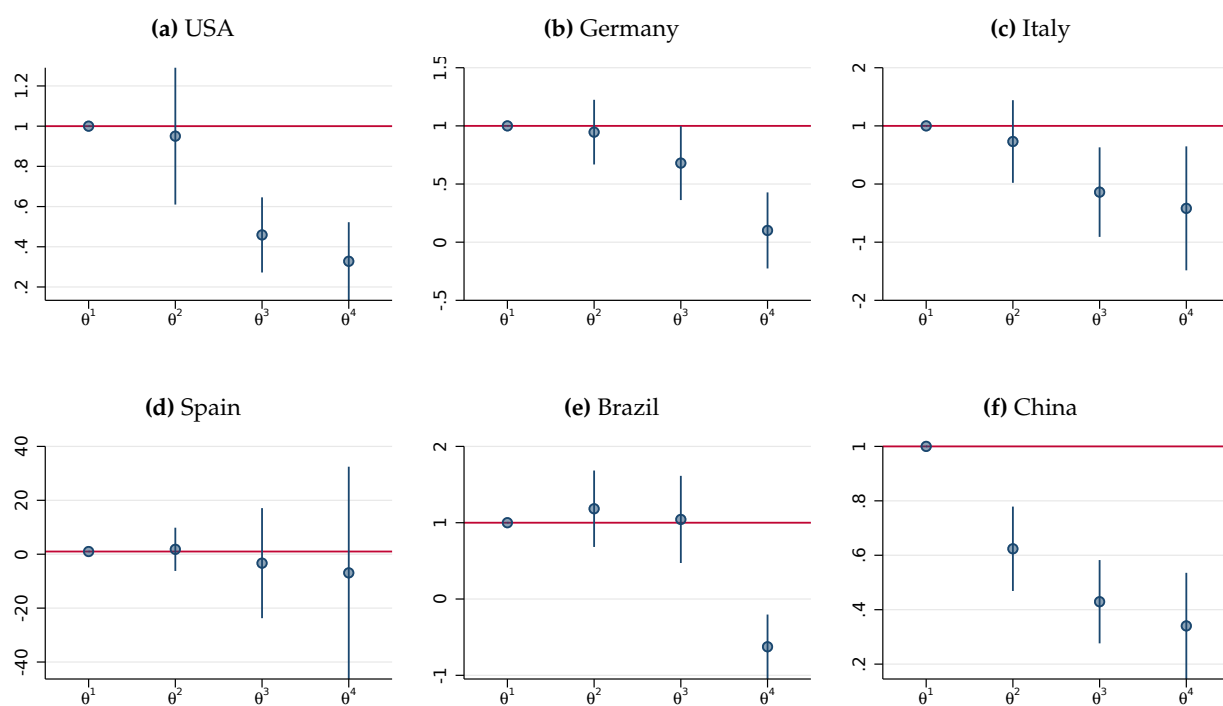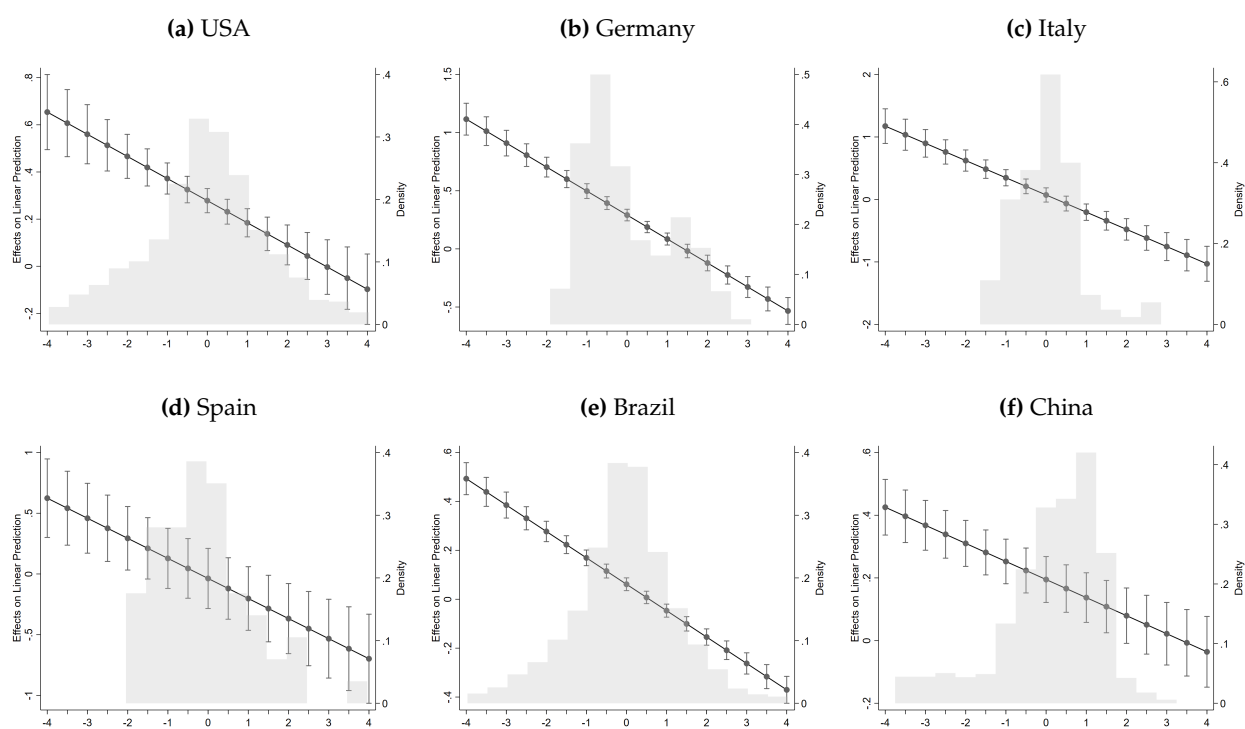# Supplementary Materials: What can we learn from nighttime lights for small geographies? Measurement errors and heterogeneous elasticities
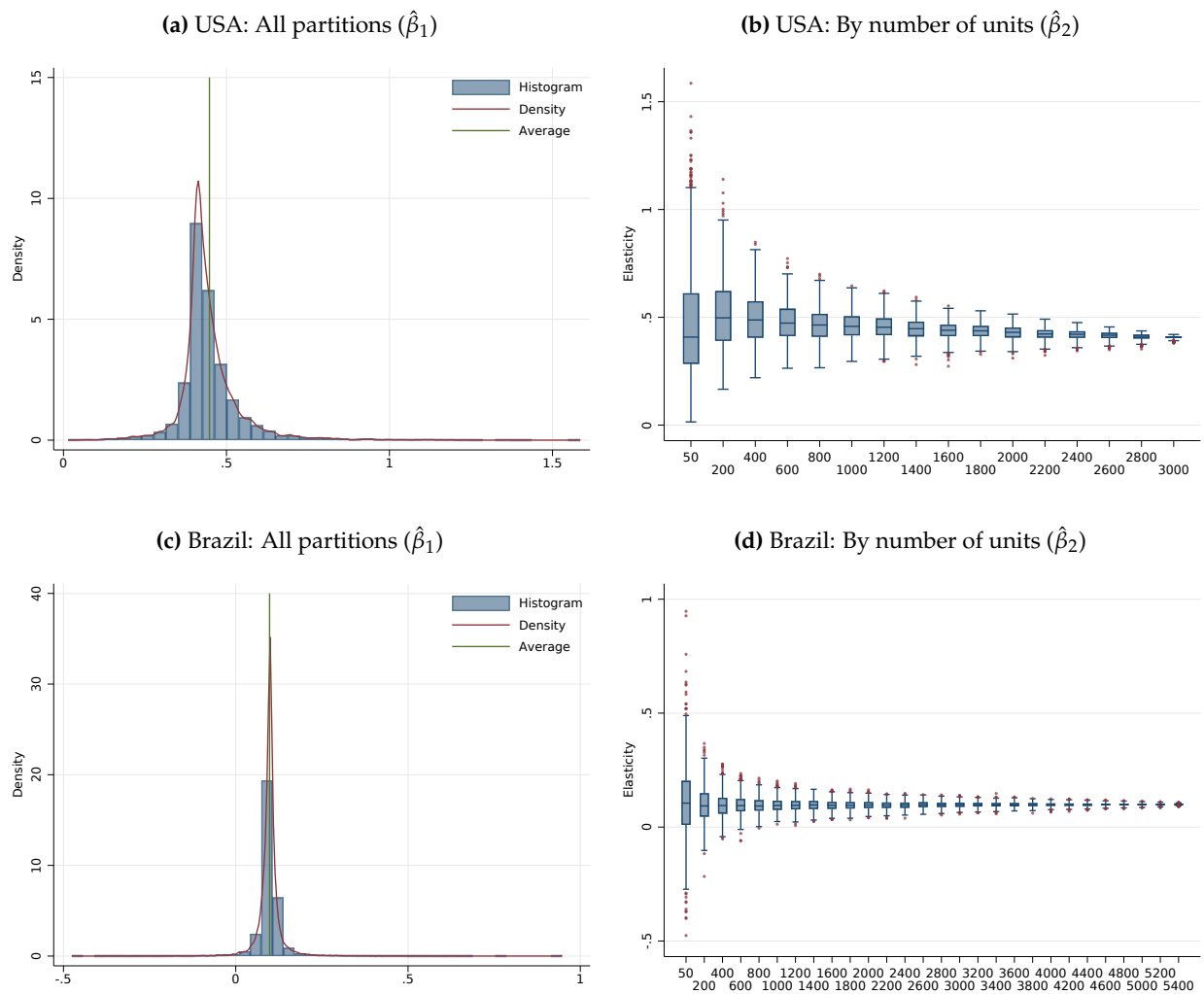

Figure S1. Estimates of relative measurement errors using topcoding corrected nighttime lights

Figure S2. Estimates of relative measurement errors using spatially correlated standard errors

(a) USA

(b) Germany

(c) Italy

(d) Spain

(e) Brazil

(f) China

Figure S3. Income elasticity of nighttime lights by log population density.

(a) USA: All partitions ($\hat{\beta}_1$)

(b) USA: By number of units ($\hat{\beta}_2$)

(c) Brazil: All partitions ($\hat{\beta}_1$)

(d) Brazil: By number of units ($\hat{\beta}_2$)

Figure S4. Unconditional and conditional distribution of estimated elasticities across simulated partitions

Table S1. Income elasticity of topcoding corrected nighttime lights by population density

	(1) USA	(2) Germany	(3) Italy	(4) Spain	(5) Brazil	(6) China
	Panel A: Real GDP density without interaction					
GDP	0.410***	0.338***	0.168***	-0.056	0.102***	0.327***
	(0.042)	(0.029)	(0.061)	(0.125)	(0.015)	(0.044)
Regions	3080	392	110	58	5569	342
Observations	40039	8624	2420	1276	66398	4802
	Panel B: Real GDP density interacted with Pop Dens					
GDP	0.302***	0.308***	0.155***	-0.021	0.071***	0.244***
	(0.026)	(0.025)	(0.057)	(0.125)	(0.013)	(0.040)
GDP × PopDens	-0.080***	-0.106***	-0.143***	-0.102**	-0.088***	-0.049***
	(0.019)	(0.018)	(0.039)	(0.051)	(0.006)	(0.009)
Regions	3080	392	110	58	5569	342
Observations	40039	8624	2420	1276	66398	4802

Notes: Nightlights, GDP, and population density are all in logarithms. GDP refers to GDP density (GDP divided by region area) in constant prices. All regressions use the sum of corrected nighttime lights divided by region area as the dependent variable. Panel A shows the constant elasticity model, while Panel B interacts GDP with the population density in the first year that region is included in the regression. All regressions include region and year fixed effects. Standard errors in parenthesis are clustered at the region level, and significance levels are denoted at conventional levels *** $p<0.01$, ** $p<0.05$, * $p<0.1$