

# Measuring Economic Growth from Outer Space

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# Measuring Economic Growth Using Night Lights Intensity

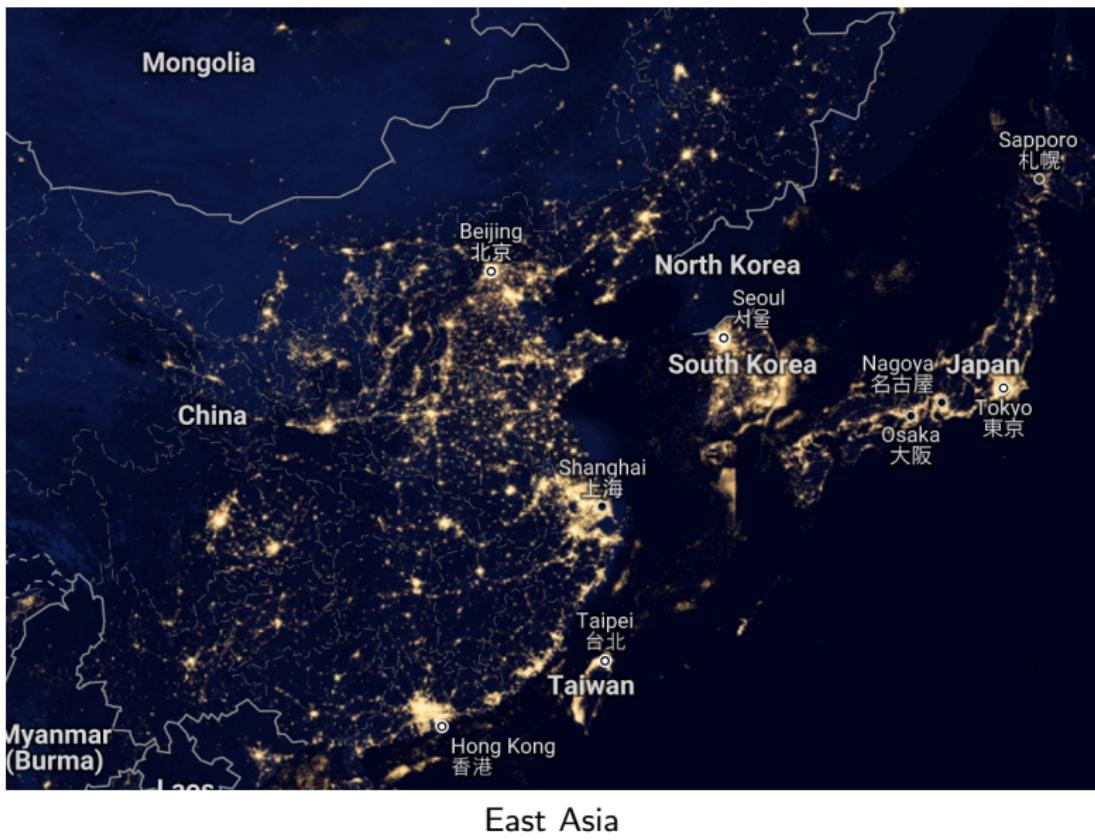
- GDP is often badly measured in many developing countries.
  - ▶ weak government statistical infrastructure
  - ▶ large underground economy
- One solution: use change in night lights intensity as a proxy for GDP growth. Combine satellite night lights data with official GDP statistics to improve estimates of true economic growth.

# Measuring Economic Growth Using Night Lights Intensity

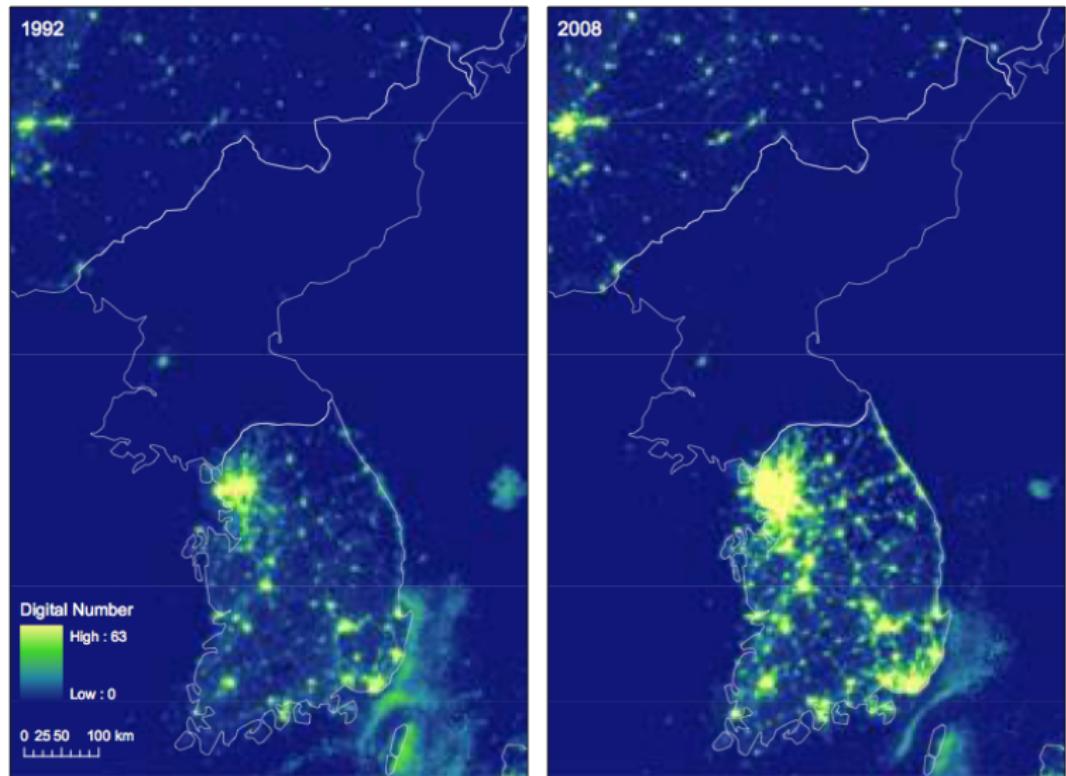


World

# Measuring Economic Growth Using Night Lights Intensity

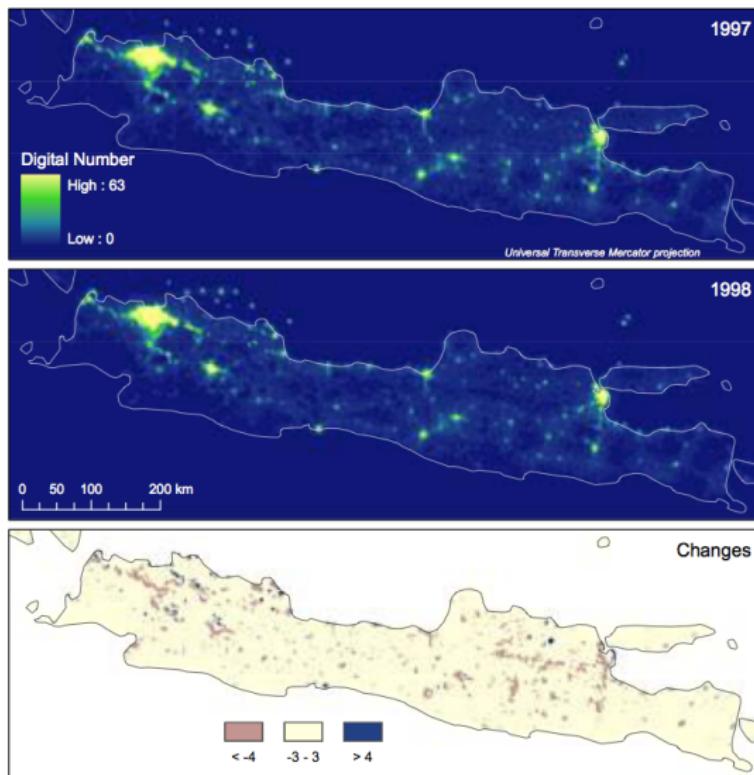


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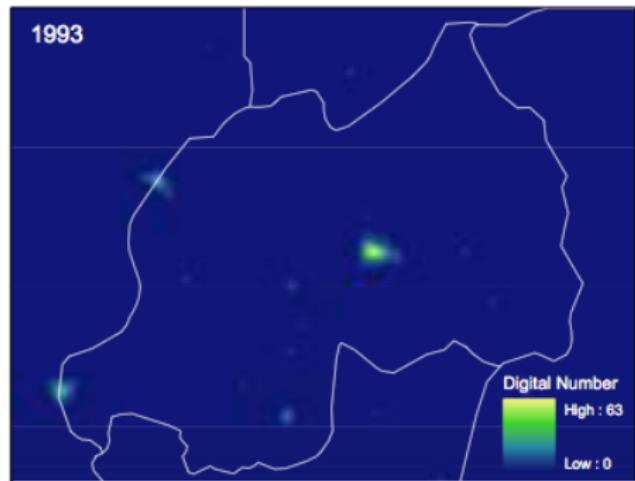
Korean Peninsula. Source: [Henderson et al. \(2012\)](#)

# Measuring Economic Growth Using Night Lights Intensity



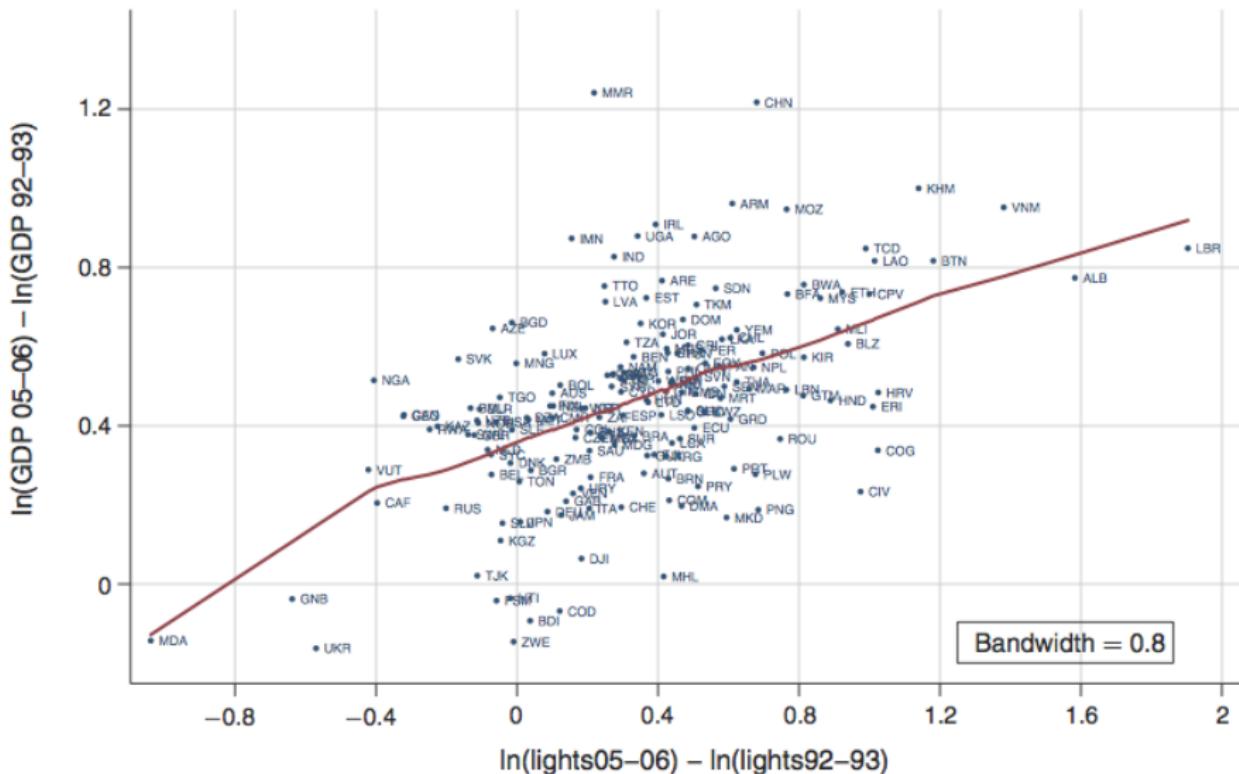
Asian Financial Crisis: Java, Indonesia. Source: [Henderson et al. \(2012\)](#)

# Measuring Economic Growth Using Night Lights Intensity



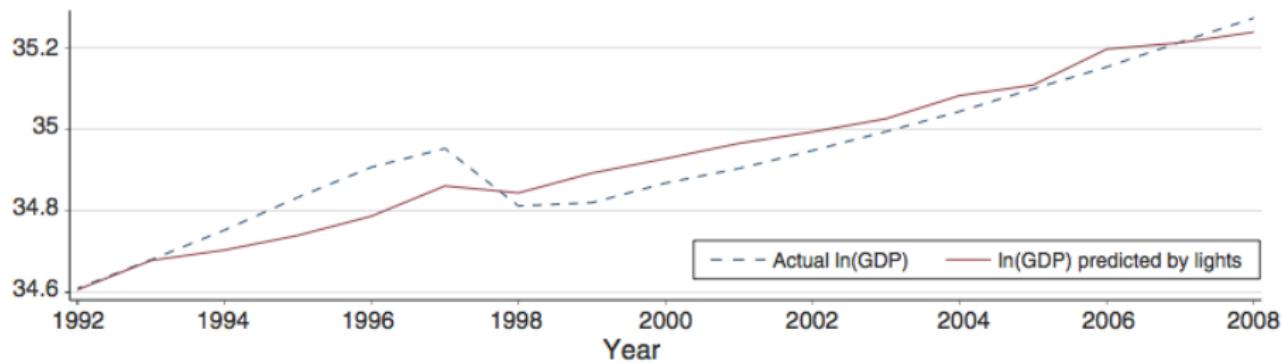
Genocide Event: Rwanda. Source: [Henderson et al. \(2012\)](#)

# Measuring Economic Growth Using Night Lights Intensity



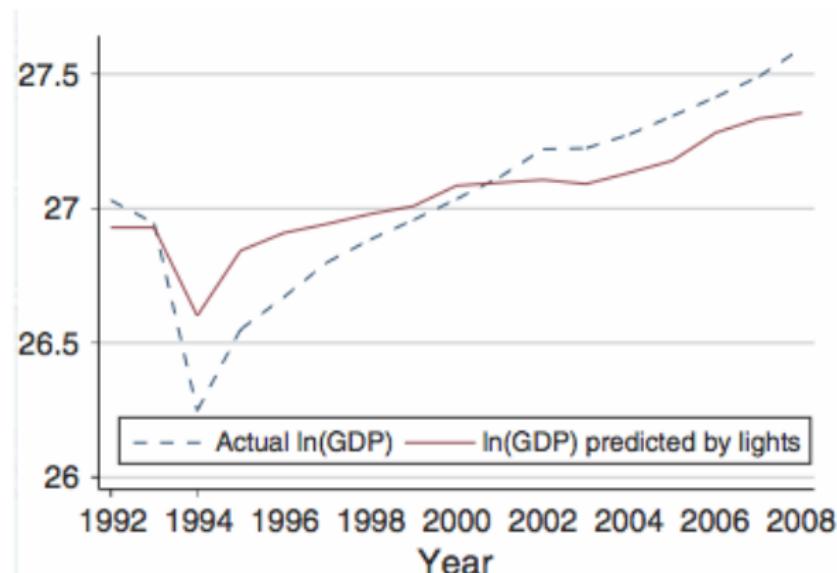
Source: Henderson et al. (2012)

# Measuring Economic Growth Using Night Lights Intensity



Asian Financial Crisis: Java, Indonesia. Source: [Henderson et al. \(2012\)](#)

# Measuring Economic Growth Using Night Lights Intensity



Genocide Event: Rwanda. Source: [Henderson et al. \(2012\)](#)

# Measuring Economic Growth Using Night Lights Intensity

Country	ISO code	WDI (LCU)	Fitted lights	Optimal combination of WDI and fitted lights	Difference
Myanmar	MMR	10.02	3.26	6.48	-3.22
Angola	AGO	6.99	3.88	5.37	-1.51
Nigeria	NGA	4.04	1.92	2.94	-1.06
Sudan	SDN	5.92	4.01	4.93	-0.94
Vietnam	VNM	7.60	5.80	6.67	-0.87
Burkina Faso	BFA	5.80	4.45	5.10	-0.66
Benin	BEN	4.52	3.49	3.99	-0.51
Ghana	GHA	4.60	3.71	4.14	-0.44
Rwanda	RWA	3.06	2.25	2.64	-0.40
Oman	OMN	4.28	3.83	4.05	-0.22
Algeria	DZA	3.29	2.85	3.06	-0.22
Mali	MLI	5.08	4.76	4.92	-0.16
Iran, Islamic Rep.	IRN	4.03	3.74	3.88	-0.15
Cameroon	CMR	3.29	3.00	3.14	-0.14
Niger	NER	3.48	3.21	3.34	-0.14
Sierra Leone	SLE	3.04	2.78	2.91	-0.13
Gambia, The	GMB	3.80	3.73	3.76	-0.03

"WDI": official real GDP growth rate statistics; "Fitted lights": estimate based on night lights data only; "Optimal combination of WDI and fitted lights": estimate by combining night lights data with official statistics. Source: [Henderson et al. \(2012\)](#)

# Measuring Economic Growth Using Night Lights Intensity

Liberia	LBR	6.75	7.03	6.89	0.14
Central African Republic	CAF	1.59	1.94	1.77	0.18
Mauritania	MRT	3.68	4.04	3.86	0.18
Swaziland	SWZ	3.42	3.93	3.68	0.26
Lebanon	LBN	3.85	4.43	4.15	0.29
Madagascar	MDG	2.74	3.38	3.07	0.32
Eritrea	ERI	3.51	4.97	4.26	0.73
Guinea-Bissau	GNB	-0.29	1.40	0.58	0.87
Congo, Rep.	COG	2.63	5.03	3.86	1.20
Haiti	HTI	-0.28	2.73	1.27	1.55
Côte d'Ivoire	CIV	1.82	4.91	3.40	1.56
Congo, Dem. Rep.	COD	-0.52	3.05	1.30	1.84
Burundi	BDI	-0.71	2.89	1.13	1.85

Source: Henderson et al. (2012)