

Module 2: Geography

Williams College ECON 204:
Global Poverty and Economic Development
Professor: Pamela Jakiela

Why Might Tropical Geography Have a Direct Effect on Development?

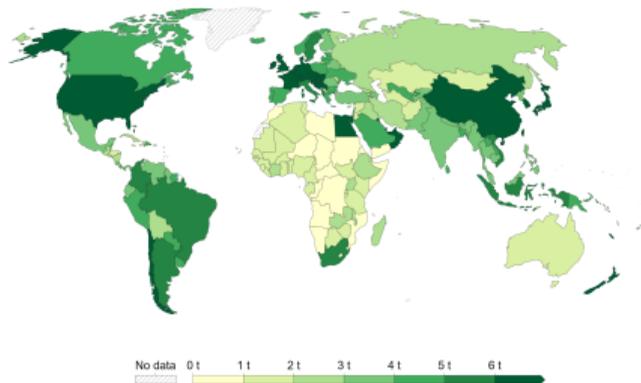
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Agricultural Productivity

Cereal yield, 2020

Cereal yields are measured in tonnes per hectare. Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains.

Our World in Data



Source: Food and Agriculture Organization of the United Nations

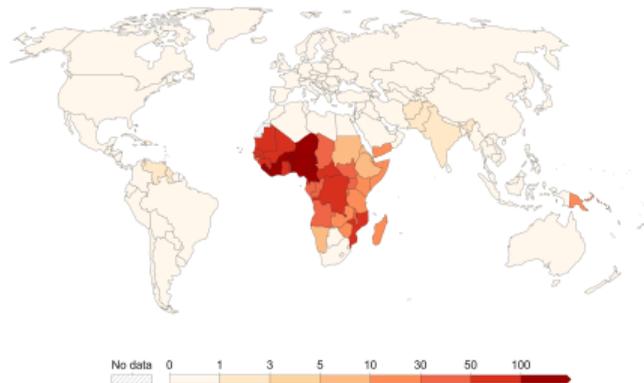
OurWorldInData.org/crop-yields • CC BY

Tropical Diseases

Death rate from malaria, 2019

The number of deaths from malaria¹ per 100,000 people.

Our World in Data



Source: IHME, Global Burden of Disease (2019)

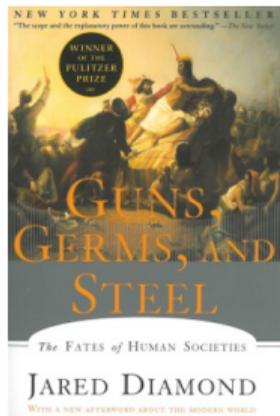
Note: To allow comparisons between countries and over time this metric is age-standardized.

OurWorldInData.org/malaria • CC BY

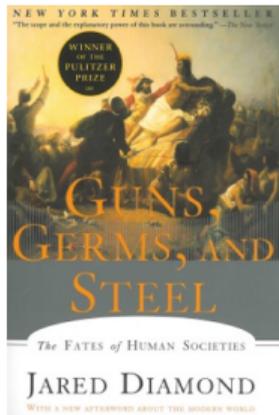
¹ **Malaria:** Malaria is a life-threatening disease caused by parasites that are transmitted through the bites of infected female Anopheles mosquitoes. There are five parasite species that cause malaria in humans. Two of these species – *P. falciparum* and *P. vivax* – pose the greatest threat. The first symptoms – fever, headache and chills – usually appear 10 to 15 days after the infective mosquito bite and may be mild and difficult to recognize as malaria. Left untreated, *P. falciparum* malaria can progress to severe illness and death within 24 hours.

Why Might Geography Have an Indirect Effect on Development?

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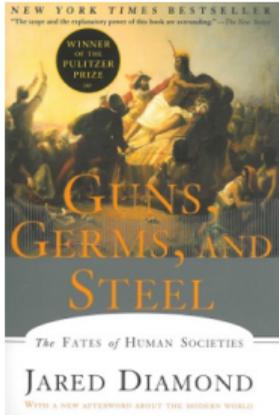


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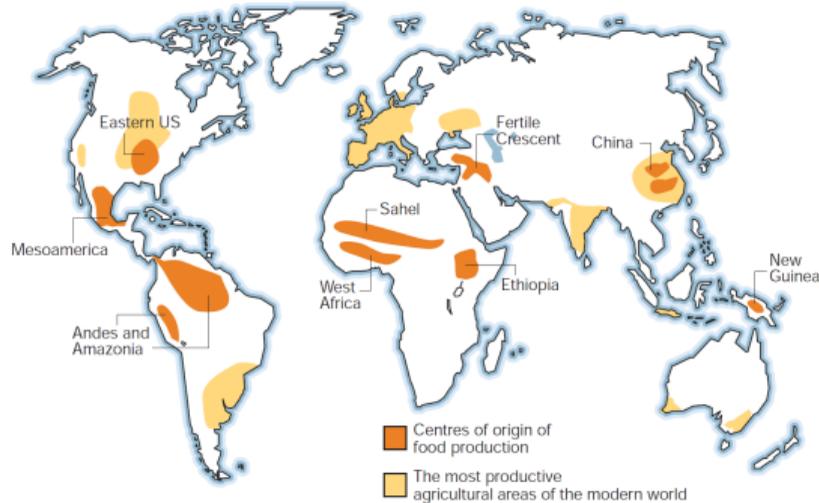


Geography \Rightarrow European exceptionalism \Rightarrow European conquest

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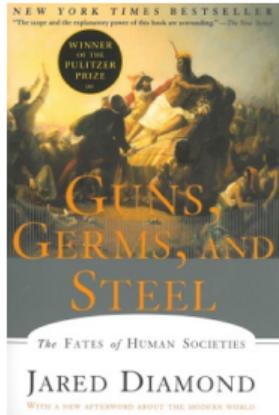


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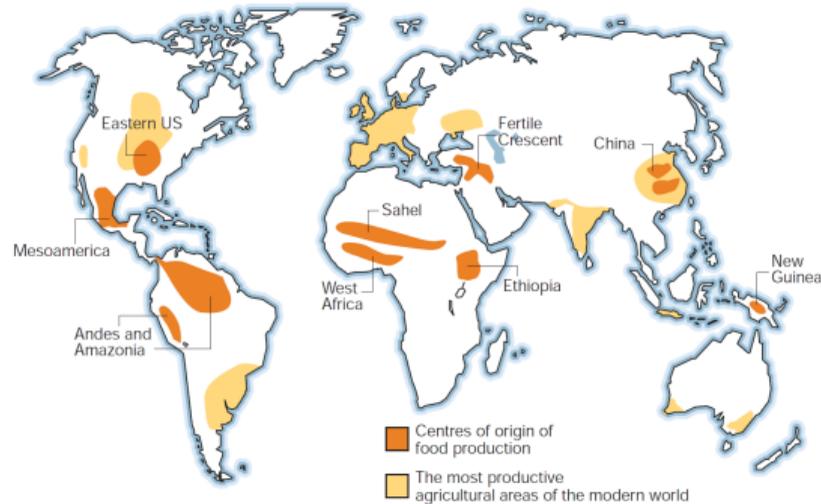


source: Diamond (2002)

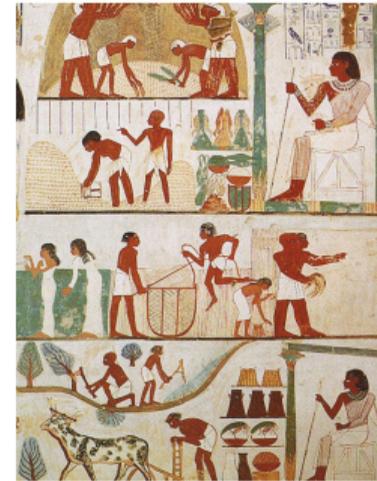
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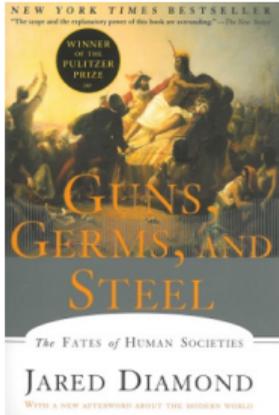


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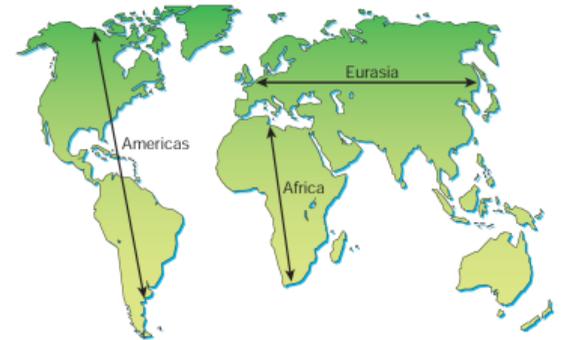
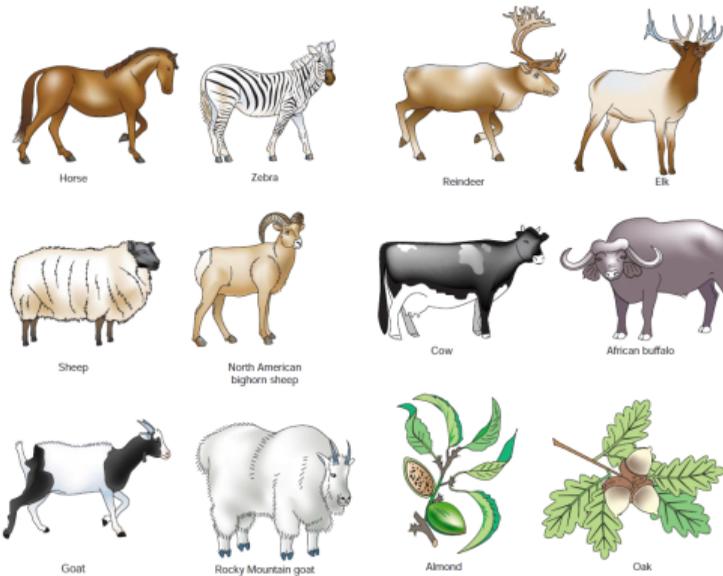


source: wikimedia commons

Why Might Geography Have an Indirect Effect on Development?



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source: Diamond (2002)

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Does Geography Impact Development?

What explains the correlation between latitude and GDP per capita? Three possible hypothesis:

- The **geography** hypothesis: tropical geography (today) leads to lower agricultural productivity and a higher disease burden, limiting productivity, growth, and development
- **European exceptionalism**: geography gave Europe an edge thousands of years ago, and that head start is still relevant (or perhaps European imperialism messed everyone else up)
- None of the above: more tropical countries just happen to have bad policies (today)

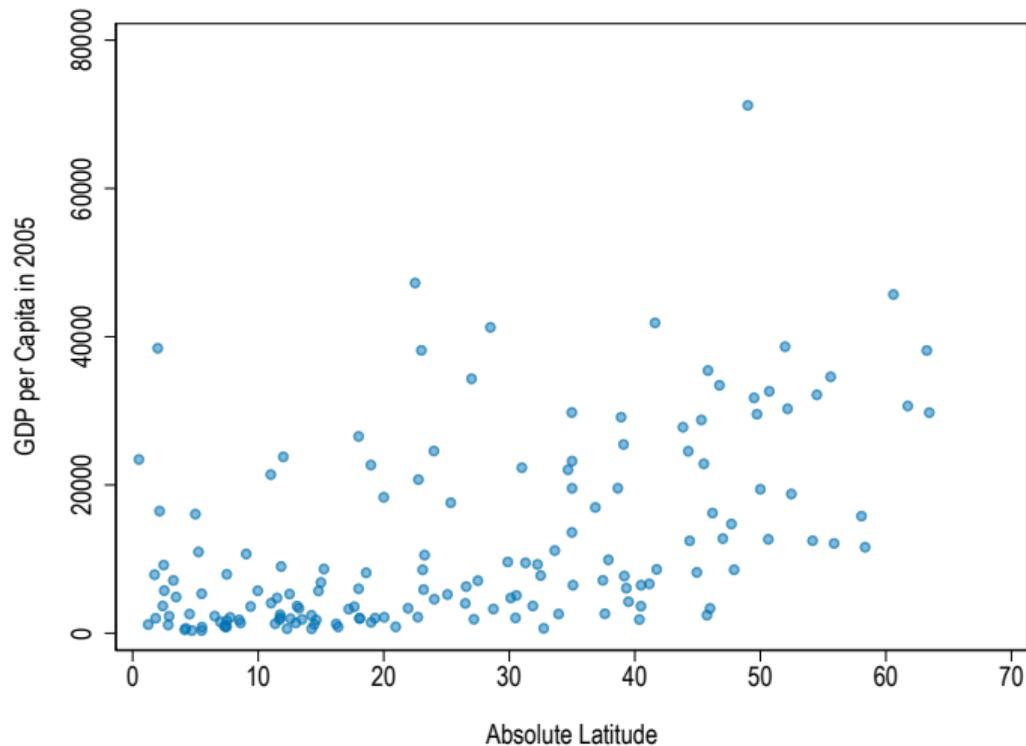
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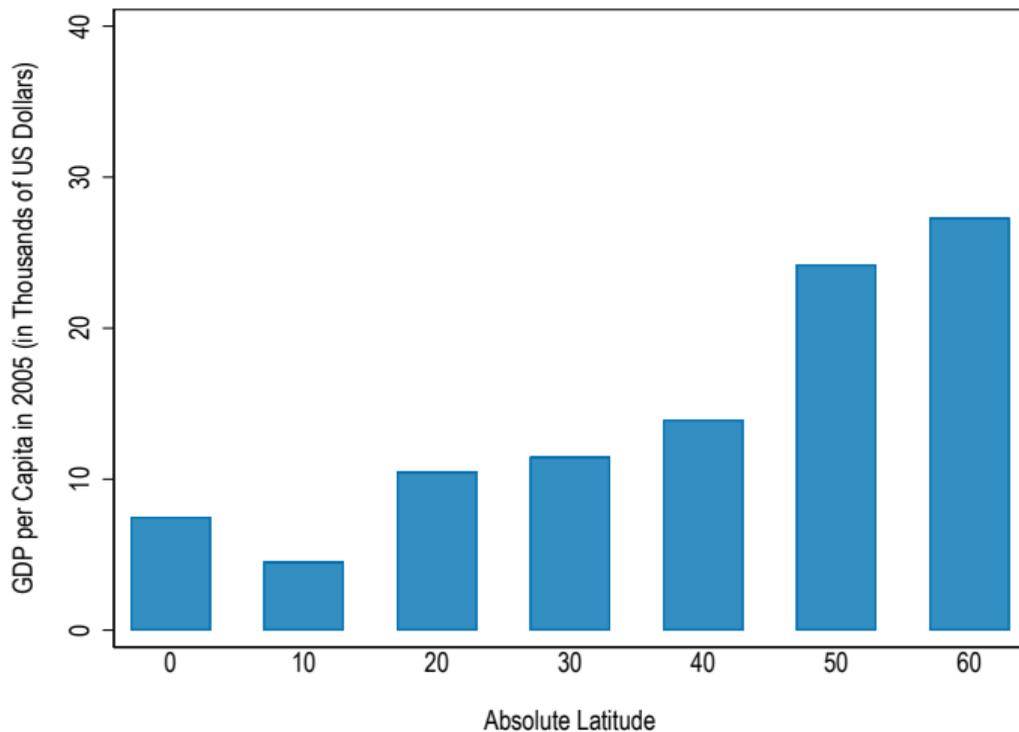
How can we use data to distinguish between these possibilities?

GDP per Capita and Absolute Latitude: A Scatterplot



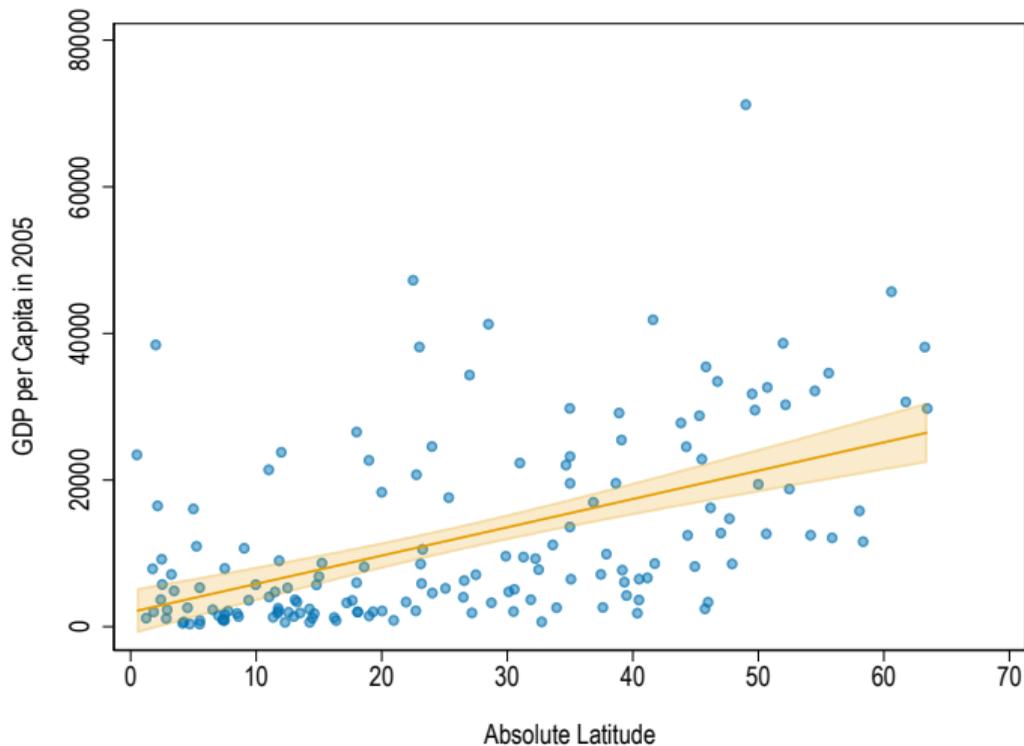
data from: Spolaore and Wacziarg (2013)

GDP per Capita and Absolute Latitude: Summarizing the Data



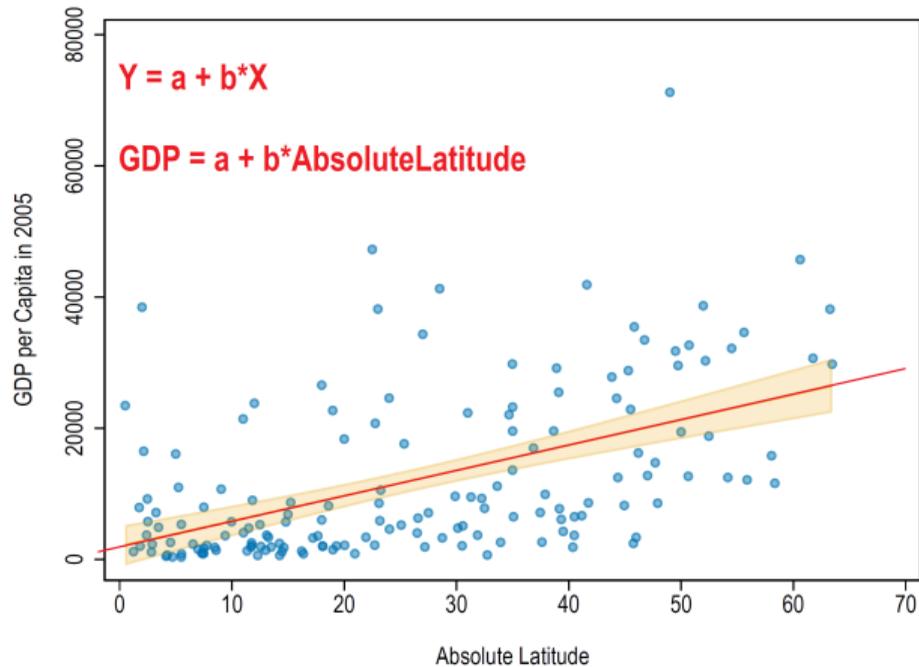
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GDP per Capita and Absolute Latitude: Linear Regression

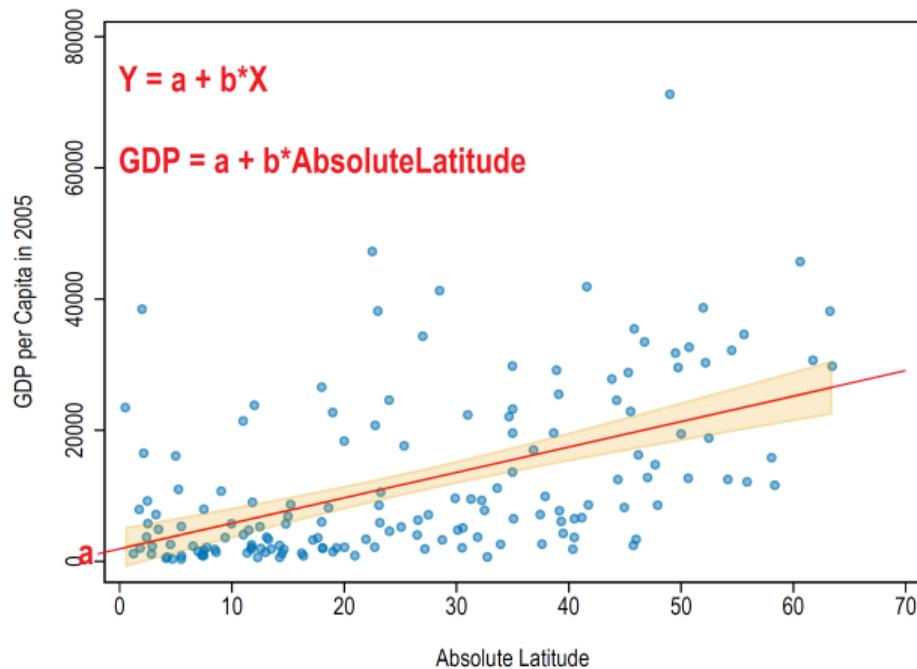


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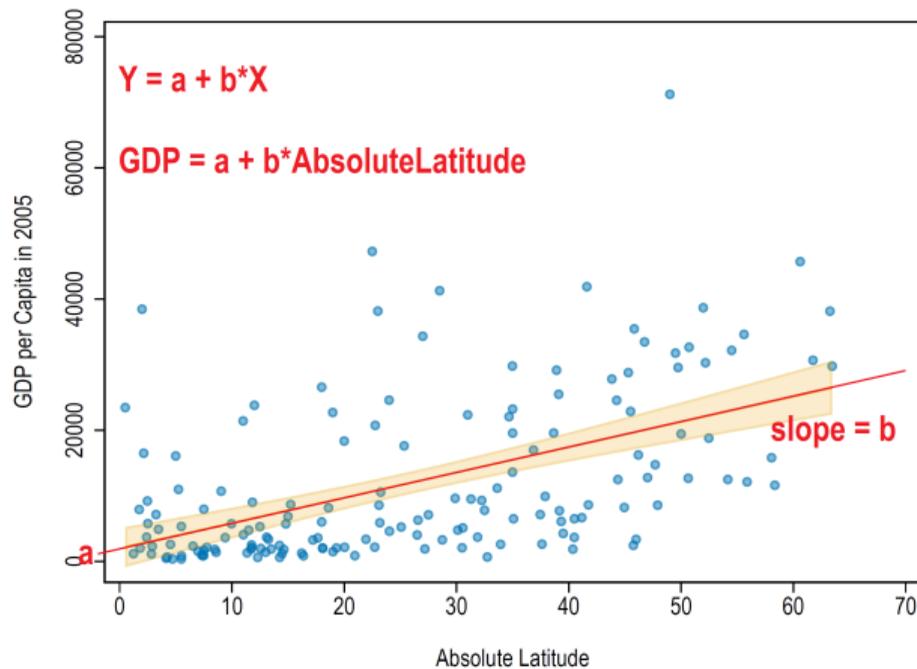
Linear Regression: An Explainer



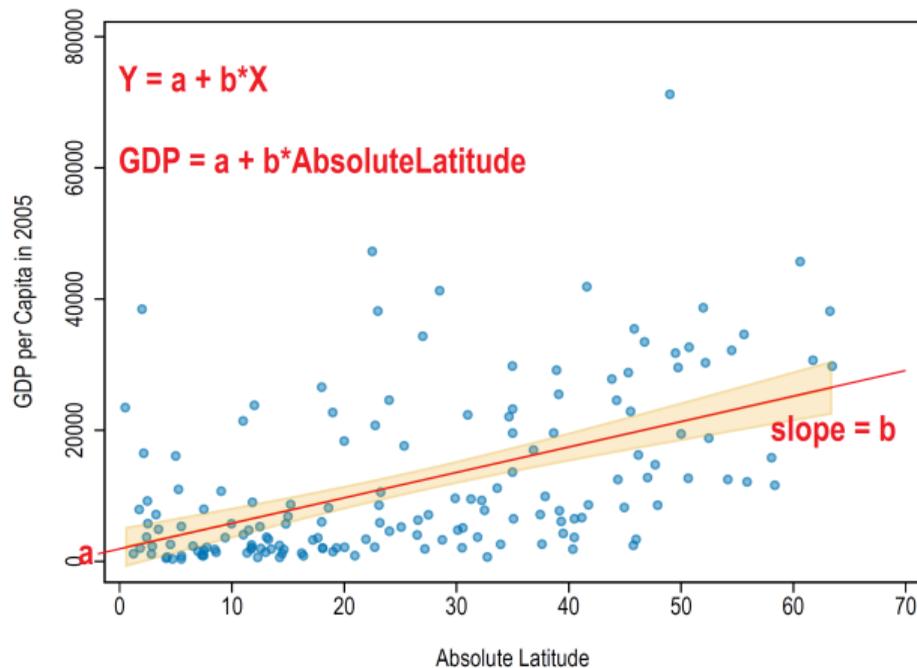
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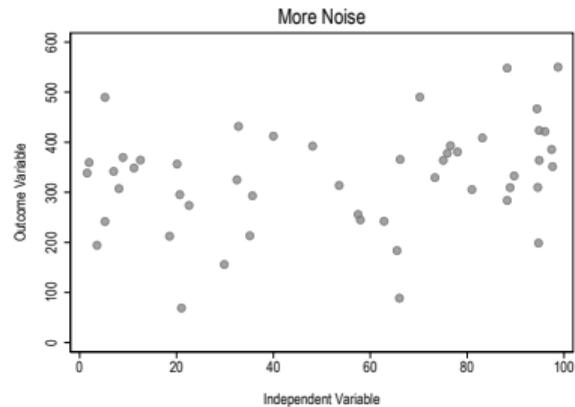
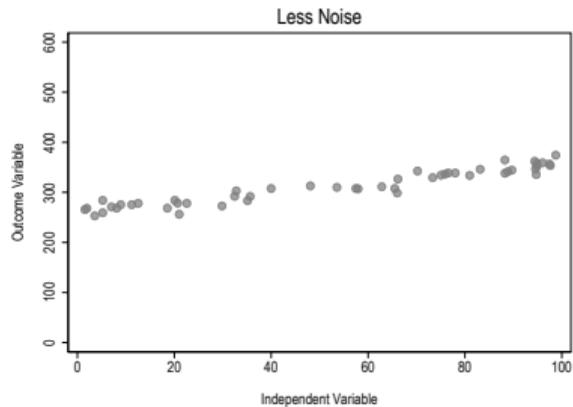
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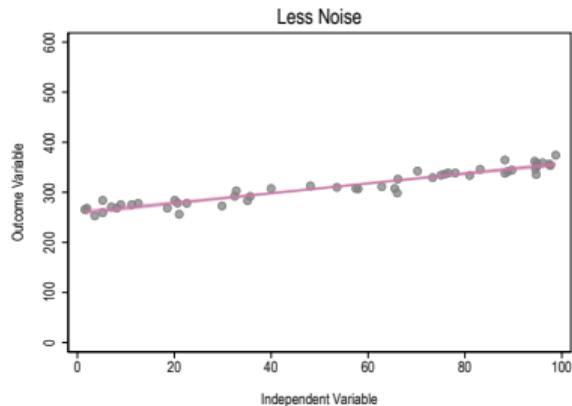
	(1)
	OLS
Absolute Latitude	386***
Constant	1974
	(1569)

Standard errors in parentheses.

Statistical Significance: An Explainer

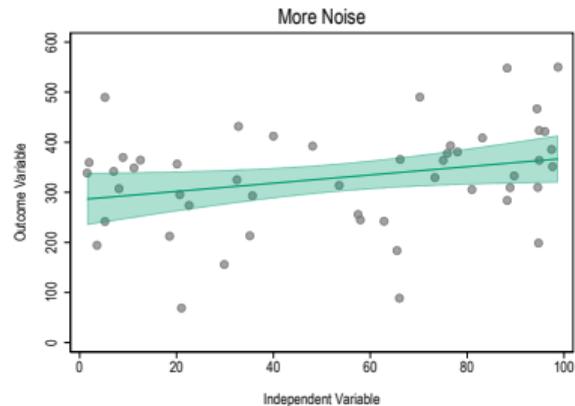


Statistical Significance: An Explainer



=====	
(1)	
OLS	
Independent Variable	0.982*** (0.042)
Constant	258.9*** (2.7)

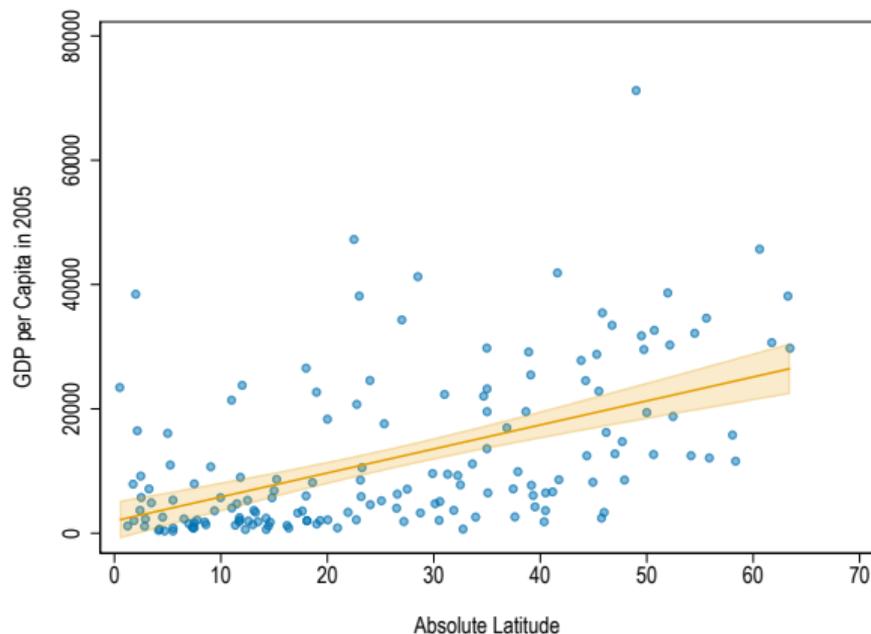
Standard errors in parentheses.



=====	
(1)	
OLS	
Independent Variable	0.823* (0.419)
Constant	285.4*** (26.5)

Standard errors in parentheses.

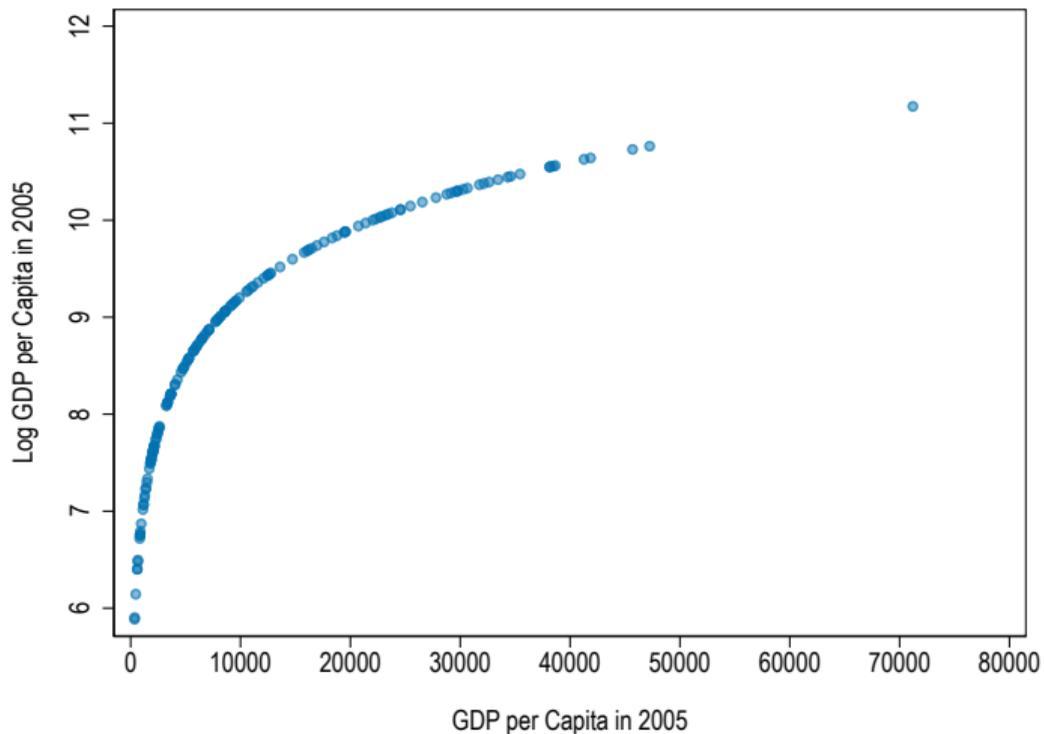
GDP per Capita and Absolute Latitude



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Absolute Latitude	386***
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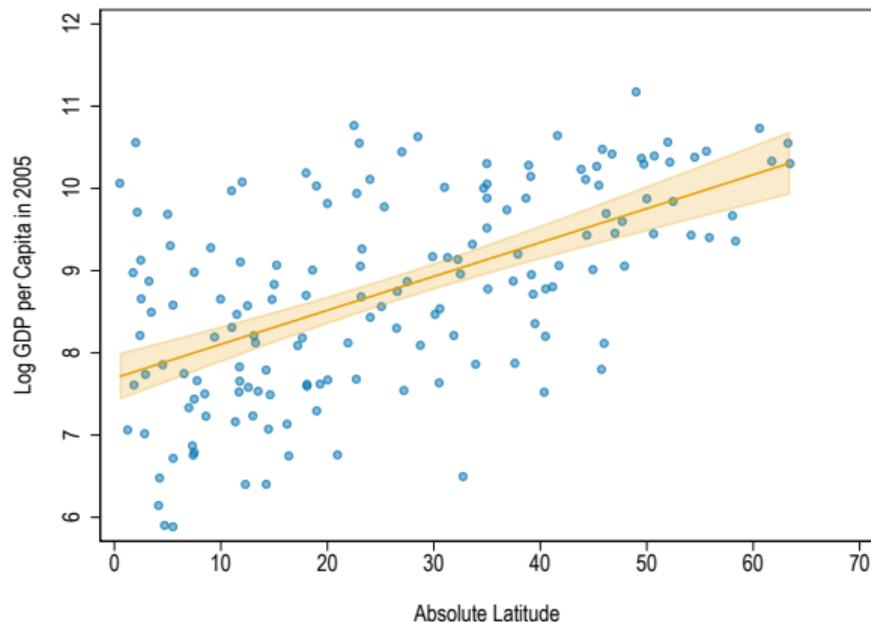
Standard errors in parentheses.

Log GDP per Capita: Reducing the Influence of Outliers



data from: Spolaore and Wacziarg (2013)

Log GDP per Capita and Absolute Latitude



	(1)
	OLS
Absolute Latitude	0.041*** (0.004)
Constant	7.693*** (0.146)

Standard errors in parentheses.

Fact: Per Capita Income and Absolute Latitude Are Correlated

Possible explanations for the association between GDP per capita and absolute latitude:

- A causal relationship: latitude (or not being tropical) **causes** economic development
- Reverse causality: economic development causes absolute latitude
- Omitted variables: some other factor is correlated with latitude and causes development
- A spurious relationship: correlation is just noise in the data (but: statistical significance)

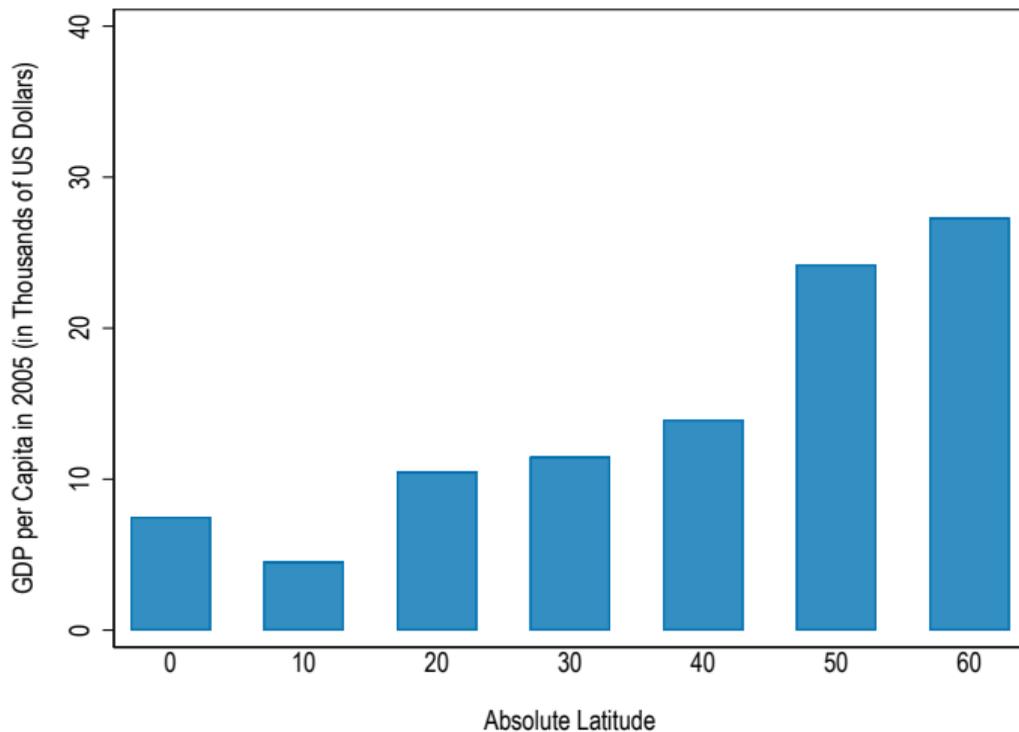
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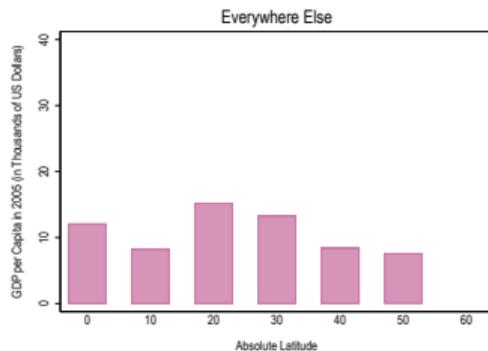
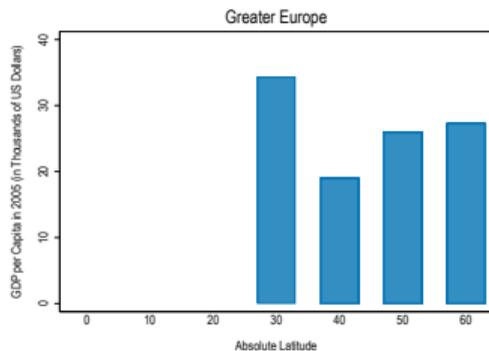
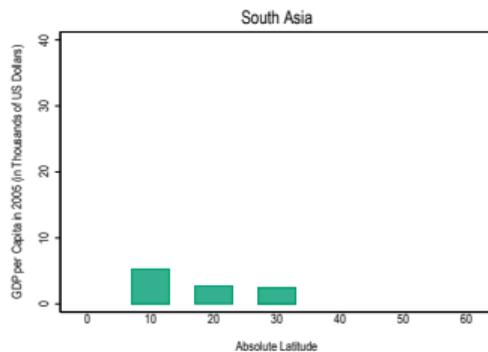
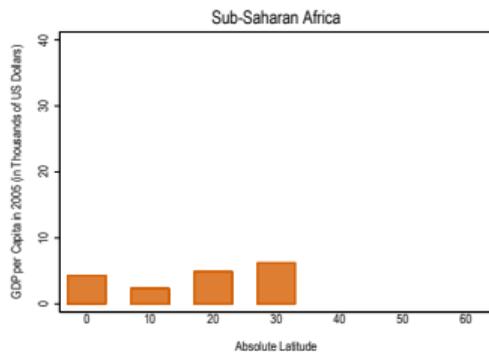
Which of these possibilities can we rule out?

GDP per Capita and Absolute Latitude



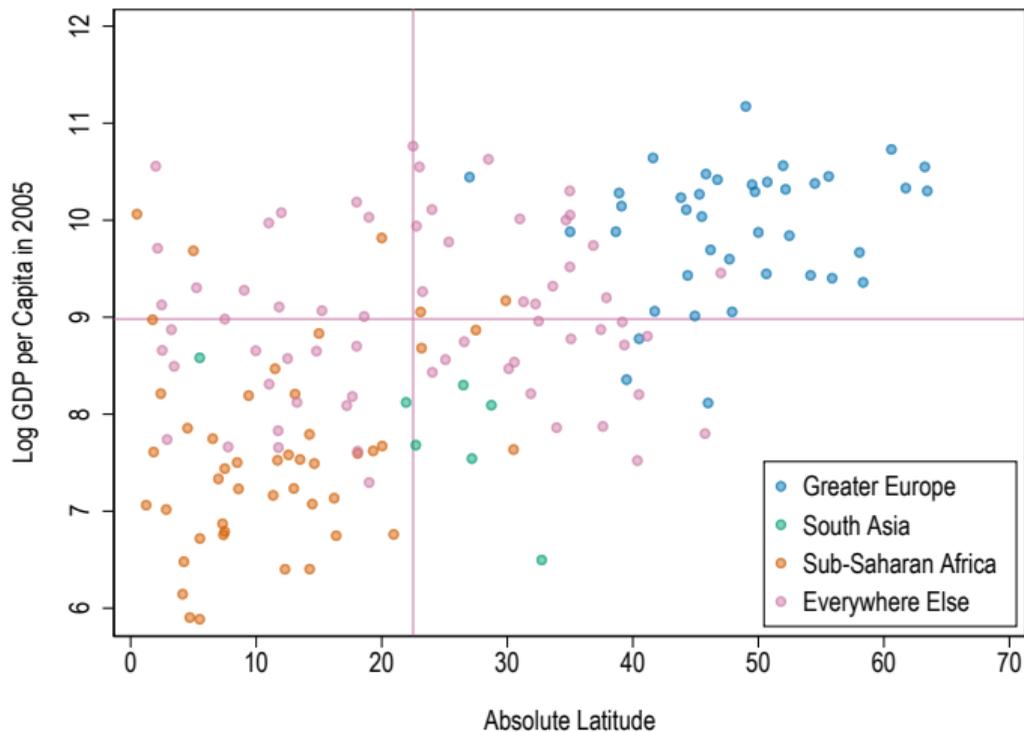
data from: Spolaore and Wacziarg (2013)

GDP per Capita and Absolute Latitude by Region



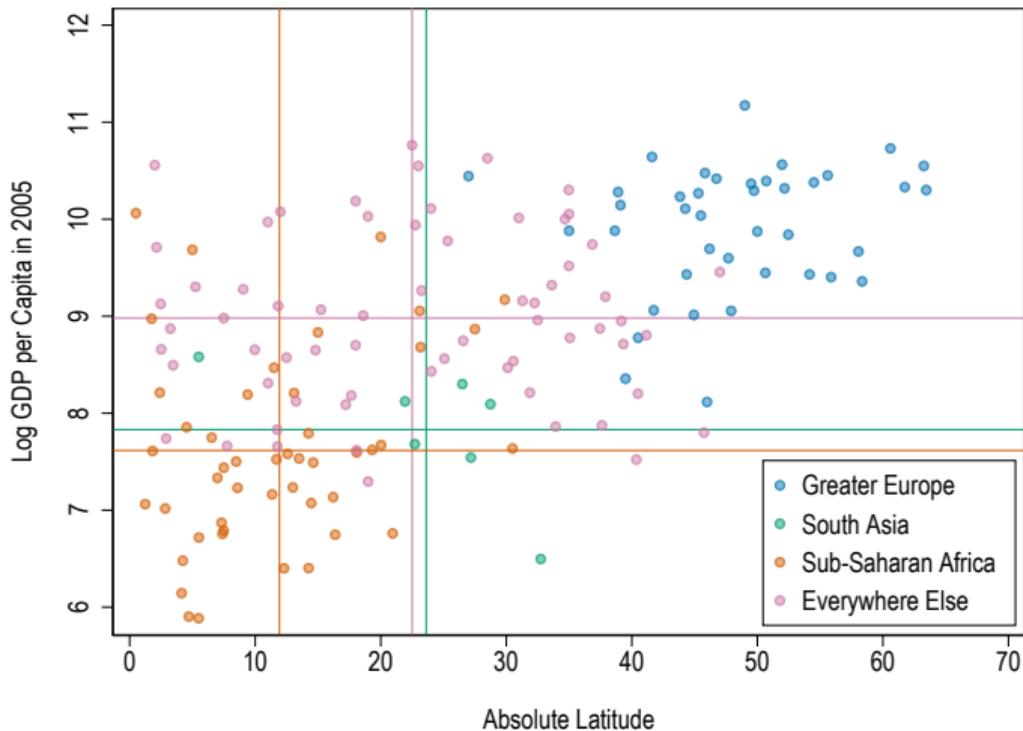
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GDP per Capita and Absolute Latitude Within Regions



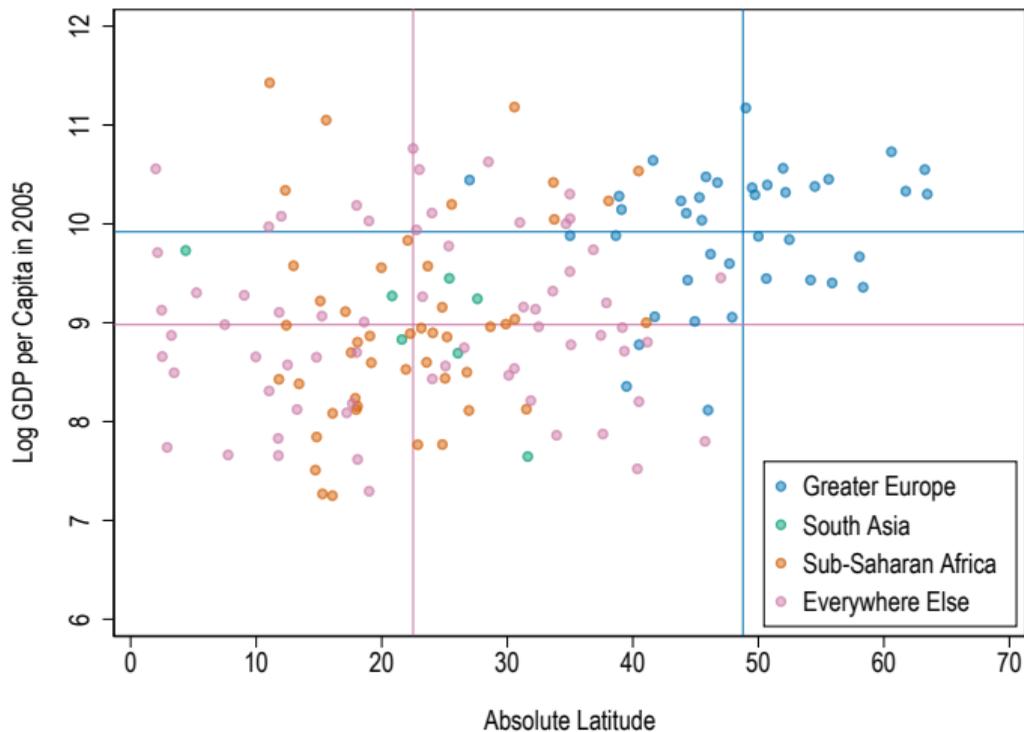
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GDP per Capita and Absolute Latitude Within Regions



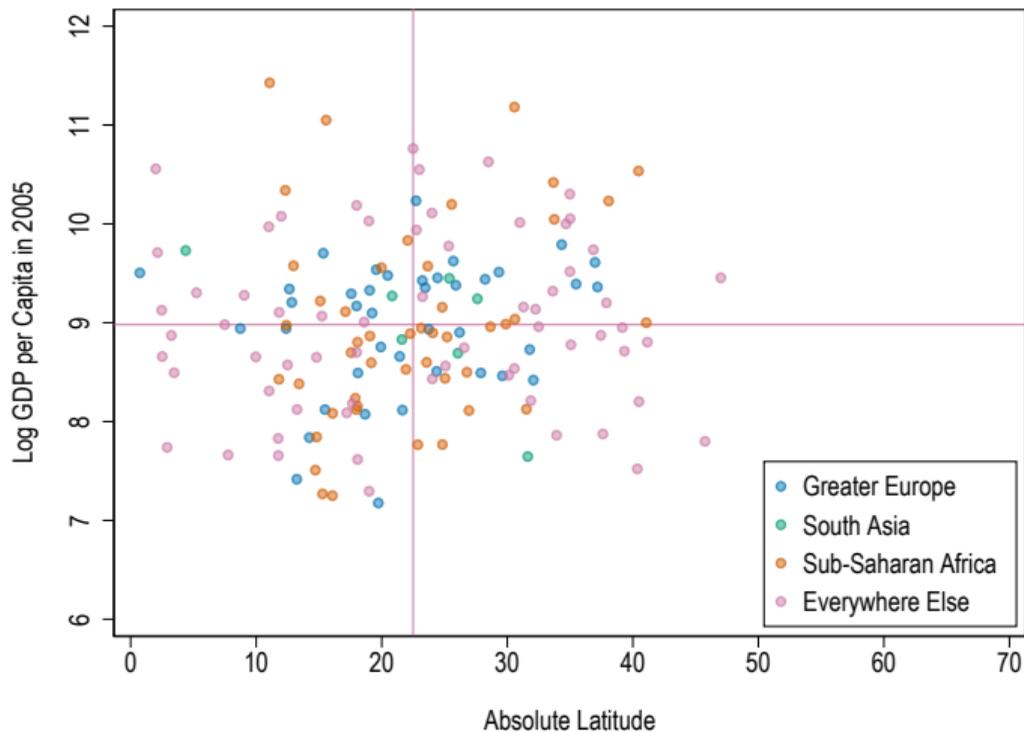
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GDP per Capita and Absolute Latitude Within Regions



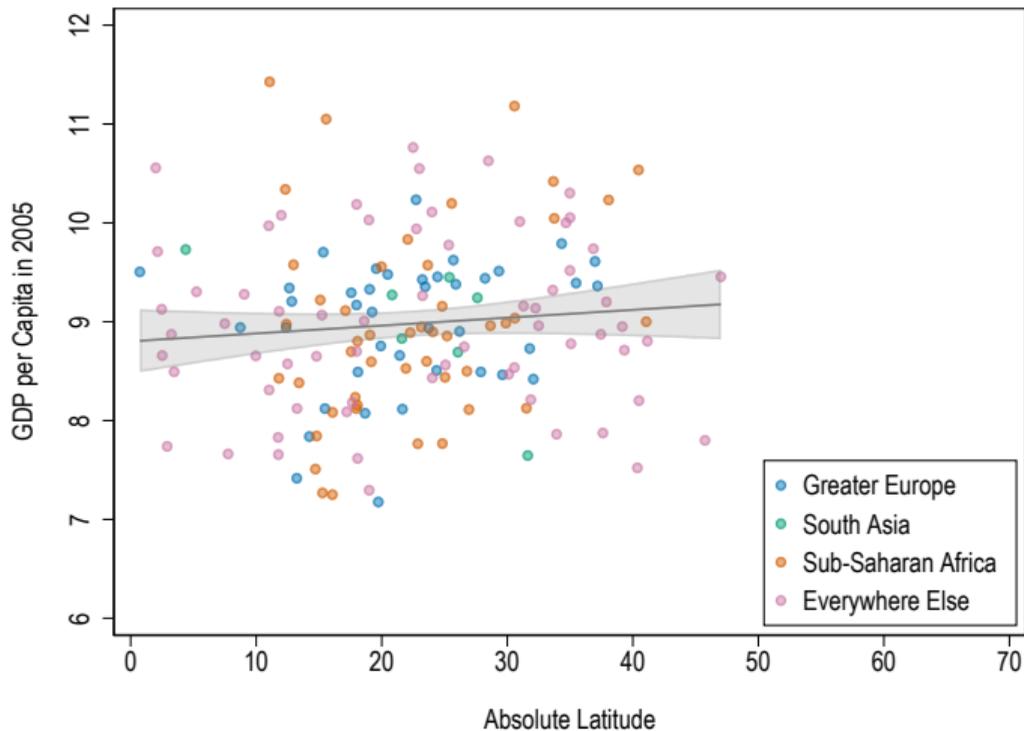
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GDP per Capita and Absolute Latitude Within Regions



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GDP per Capita and Absolute Latitude Within Regions



data from: Spolaore and Wacziarg (2013)

GDP per Capita and Absolute Latitude Within Regions

	(1)	(2)	(3)	(4)
	GDP PER CAPITA		LOG GDP	
Absolute Latitude	386 (51)	53 (79)	0.041*** (0.004)	0.008 (0.007)
Sub-Saharan Africa		-73571*** (2096)		-1.277*** (0.181)
South Asia		-8576** (3960)		-1.157*** (0.341)
Greater Europe		11500*** (2844)		0.736*** (0.245)
Constant	1974 (1568)	10282*** (2182)	7.693*** (0.146)	8.799*** (0.188)

Standard errors in parentheses.

data from: Spolaore and Wacziarg (2013)

Conclusions

- Geography does not explain why some nations are poor, except through European history
- Incomes are lower in Sub-Saharan Africa and South Asia, relative to the rest of the world
- Incomes are higher in Europe and neo-Europe, relative to the rest of the world
 - ▶ Does this suggest that the presence of Europeans is key to economic development?

Conclusions

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- Incomes are lower in Sub-Saharan Africa and South Asia, relative to the rest of the world
- Incomes are higher in Europe and neo-Europe, relative to the rest of the world
 - ▶ Does this suggest that the presence of Europeans is key to economic development?
 - ▶ What would Native Americans and Aboriginal Australians think of that argument?