



# Principal Components of Institutions, Diversification, and Growth

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# Introduction I

Fresh look at cross-country relationship between natural resource dependence and economic growth

- Natural resource dependence, if excessive and not well enough managed, tends to retard economic growth within and across countries
  - Theory and empirical evidence
- Natural resources can impede growth directly as well as indirectly through their deleterious effect on institutions and also human and physical capital



## Introduction II

### Direct effects

- Natural resource rent raises equilibrium real exchange rate and also real wages

### Indirect effects via

- Human, physical, and social capital, incl. institutions
- Equality
- External debt

# Introduction III

New tack, using mostly new data

- Economic, social, political, and institutional indicators
- Macroeconomic performance better gauged by HDI than GDP or GNI
  - HDI reflects education and health as well as per capita income

From natural resource dependence to diversification of exports and other economic activity

- Strike balance between specialization, which entails risk, and diversification to reap benefits of both



# Double Diversification

## Economic diversification

- To protect society against dangers inherent in allowing a single sector, typically natural resources and oligarchs in charge of them, to dominate economic life to the detriment of other interests

## Political diversification

- To protect society from excessive dependence on and empowerment of narrowly based elites at expense of other citizens

Two sides of the same coin

# Data I

## Human Development Index

- Weighs together income per person, life expectancy, and two different measures of education:
  - 1) Mean years of schooling for adults aged 25 years and more
    - Backward-looking measure ranging from 0 to 15 years
  - 2) Expected years of schooling for children of school entry age
    - Forward-looking measure ranging from 0 to 18 years.



## Data II

### Economic Diversification Index

- Broad measure reflecting revenue, output, and trade diversification
  - From Dubai, covers 112 countries 2000-2021
  - Ranges from 78.2 for Angola to 153.2 for US

### Liberal Democracy Index

- Broad measure reflecting electoral, liberal, egalitarian, participatory, and deliberative democracy
  - From Gothenburg, covers same 112 countries 2021
  - Ranges from 4 for Belarus to 88 for Sweden

## Data III

### Natural resource intensity

Share of natural capital in total national wealth on average 1995-2018

Source: World Bank (2021)

### Distribution of income

Gini index average 1995-2021

Source: World Bank

### Interpersonal trust

Share of respondents saying Yes, most people can be trusted

Source: World Values Survey, 7<sup>th</sup> wave





# Data IV

## Rule of law

### Composite index for 2021

Based on expert opinion as well as public opinion concerning various aspects of rule of law, incl. constraints on government powers, open government, fundamental rights, regulatory enforcement, civil justice, and criminal justice

Source: World Justice Project

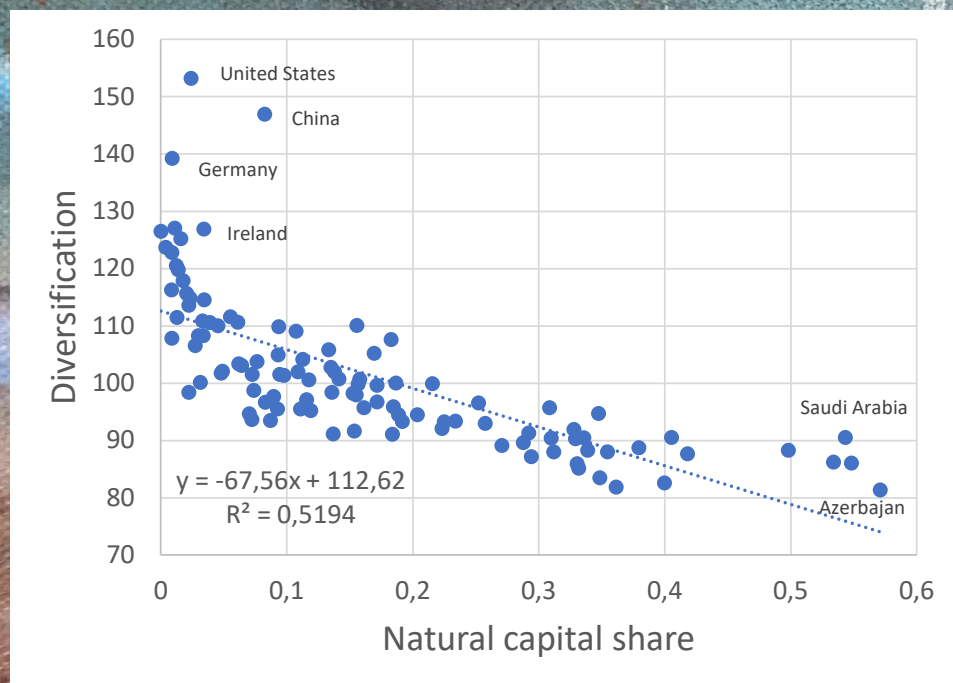
## Transparency

### Corruption Perceptions Index for 2021

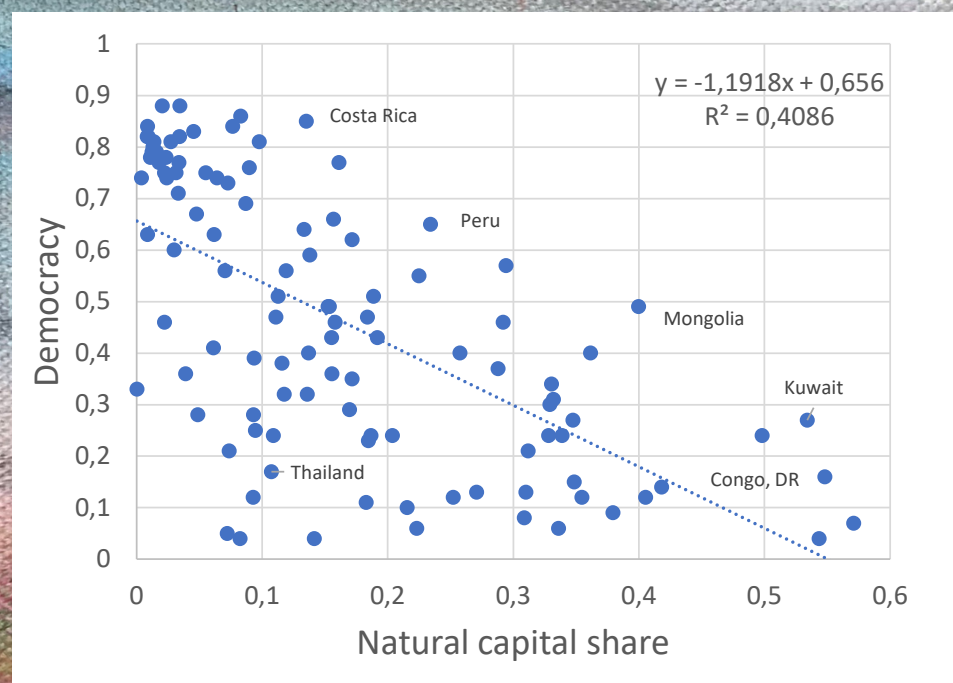
Source: Transparency International

# Diversification, democracy, and natural capital

## Diversification and natural capital



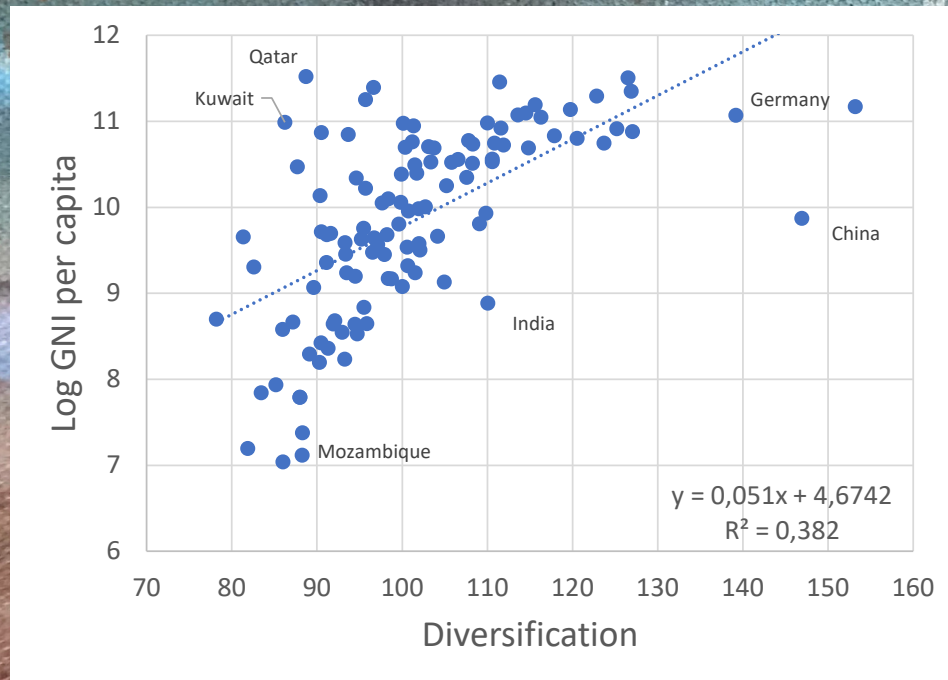
## Democracy and natural capital



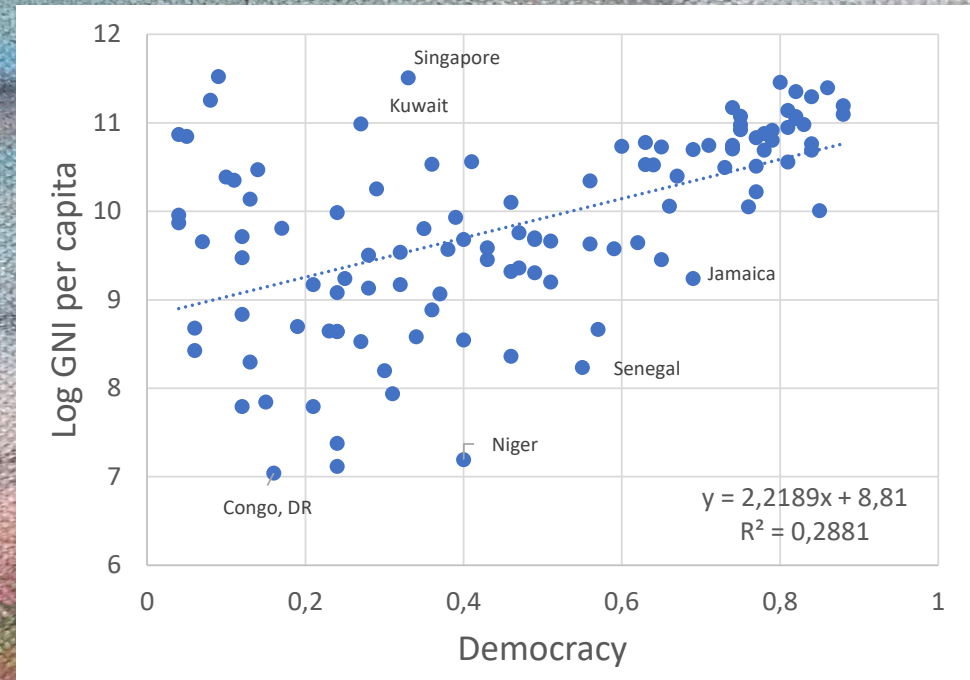
Note: Natural capital refers to share of natural capital in total national wealth on average 1995-2018

# Diversification, democracy, and gross national income

GNI per capita and diversification



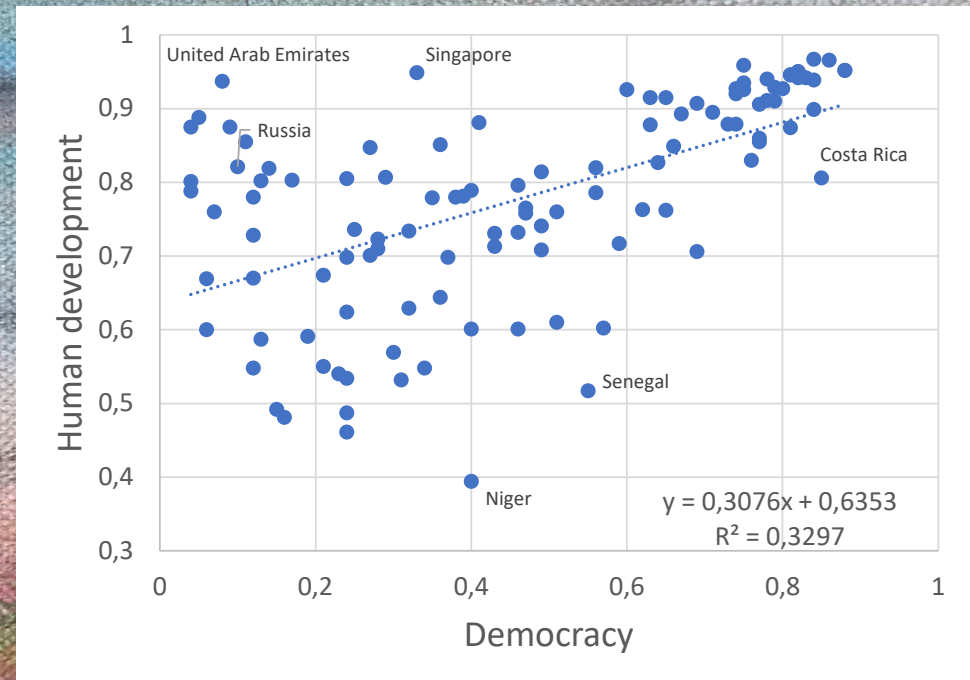
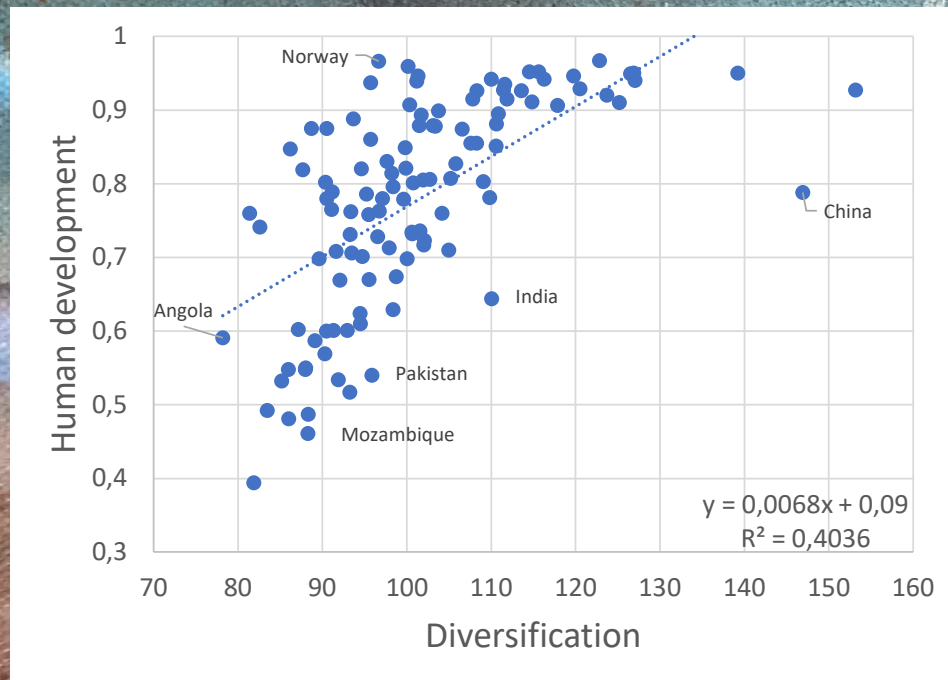
GNI per capita and democracy



# Diversification, democracy, and human development

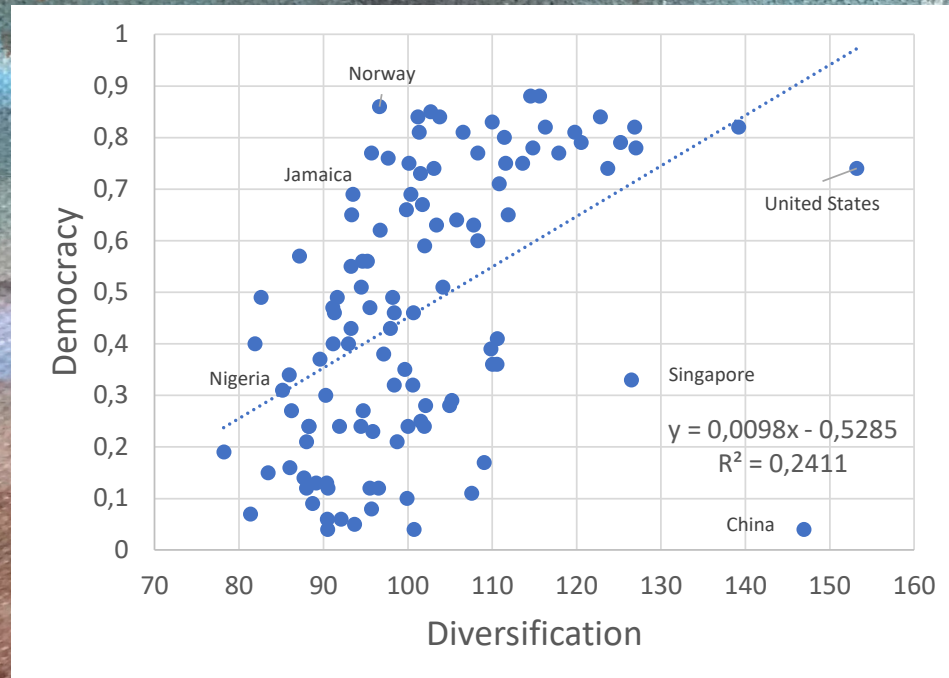
HDI and diversification

HDI and democracy

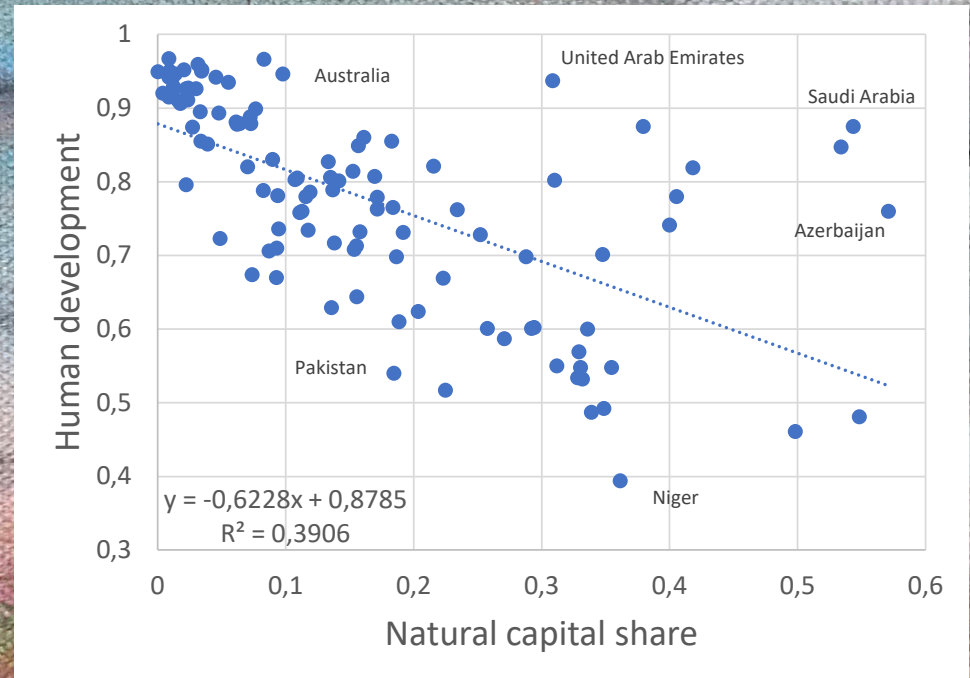


# Diversification, democracy, human development, and natural capital

## Democracy and diversification



## HDI and natural capital



# Aspects of diversification

Specialization boosts economic efficiency via gains from trade ...  
... but there can be too much of a good thing

Three types of diversification, two economic, one political

- 1) Away from heavy dependence on a single sector or a few typically natural resource-based commodities (also, destinations)
- 2) Change toward increased complexity, quality, and variety of output
- 3) Away from dependence on political elites toward more democracy

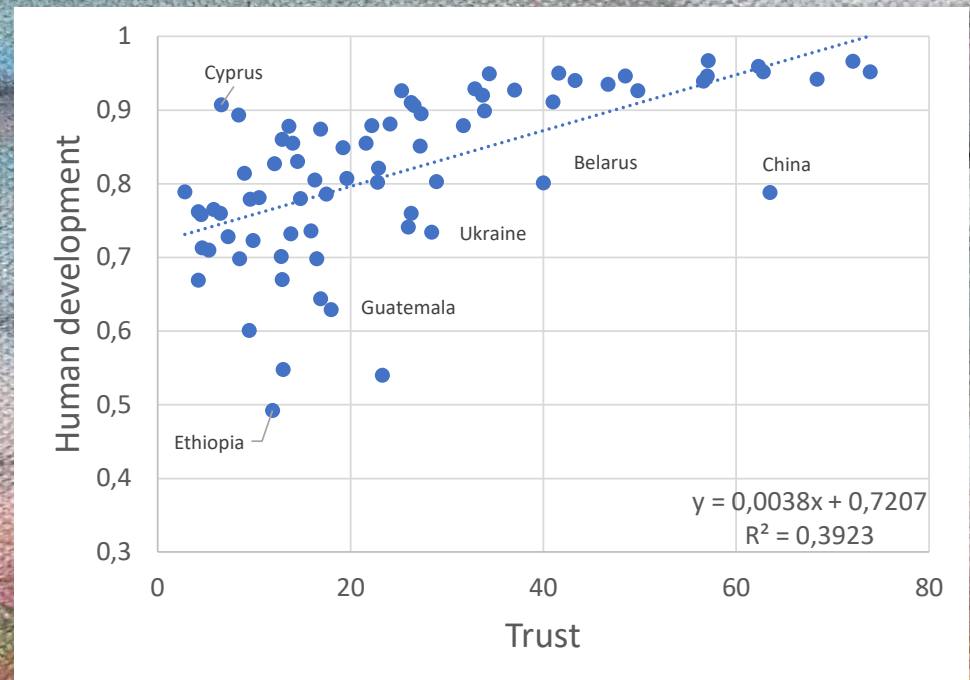
Benefits of economic diversification for growth

Exemplified by widely observed inverse relationship between heavy natural resource dependence and long-run economic growth

# Human development, equality, and trust

HDI and equality

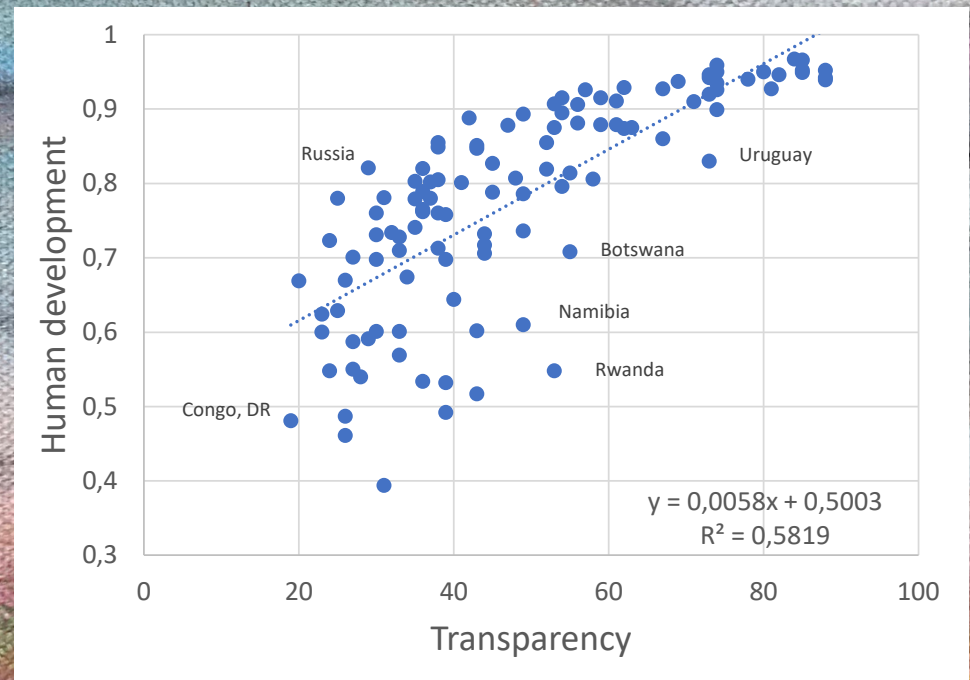
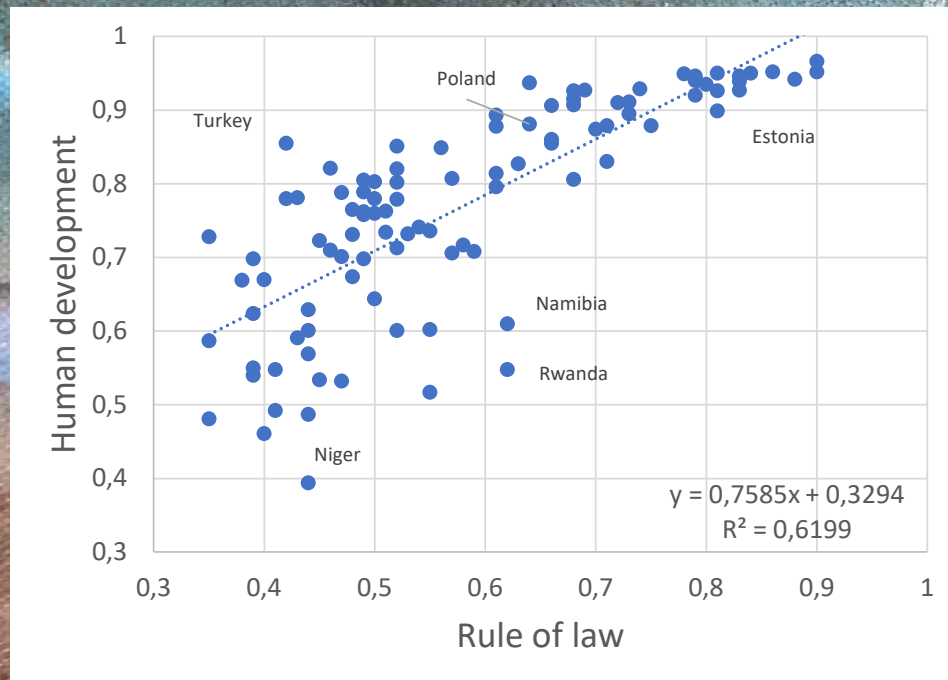
HDI and trust



# Human development, rule of law, and transparency

HDI and rule of law

HDI and transparency





# Multiple regression analysis I

$$GNI = a_0 + a_1 EDI + a_2 DEM$$

$$HDI = b_0 + b_1 EDI + b_2 DEM$$

	CONST	EDI	DEM	R <sup>2</sup>
GNI	5.346 (8.6)	0.039 (5.7)	0.013 (3.8)	0.45
HDI	0.188 (2.4)	0.005 (6.0)	0.002 (4.4)	0.49

Note: 112 countries, t-values within parentheses

# Multiple regression analysis II

Ten-point increase in EDI goes along with

- 39% rise in GNI per capita
  - $\Delta\text{GNI} = 0.039 * 10 = 0.39$
- Rise in HDI by 0.05
  - $\Delta\text{HDI} = 0.005 * 10 = 0.05$
  - Equals ca. 9% of range of HDI from 0.394 (Niger) to 0.967 (Switzerland)

Ten-point rise in DEM goes along with

- 13% rise in GNI per capita
  - $\Delta\text{GNI} = 0.013 * 10 = 0.13$
- Rise in HDI by 0.02
  - $\Delta\text{HDI} = 0.002 * 10 = 0.02$
  - Small effect

Both types of diversification seem good for growth

# Resources, institutions, and economic growth I

Extractive and inclusive economies

- “Rule by law” vs. “Rule of law”

Economic rent

- Generated by entry barriers to industries or by natural resources

Institutions reflect economic history

- With good institutions, natural resources can increase demand for manufactured goods and services and enhance growth
- With bad institutions natural resources tend to encourage extractive industries

# Resources, institutions, and economic growth II

Assume two independent variables affect institutions as well as possibly having direct effect on economic performance

- Distance from the equator
- Share of natural resources in national wealth

Measure quality of institutions by

- Democracy
- Diversification and complexity
- Inequality
- Rule of law
- Transparency and trust

# Principal components analysis

Number	Value	Difference	Proportion	Variable	PC 1	PC2	PC3
1	4.51	3.56	0.64	Democracy	0.38	-0.42	0.34
2	0.94	0.12	0.13	Country complexity	0.37	0.51	0.00
3	0.83	0.37	0.12	Economic diversification	0.33	0.65	0.22
4	0.46	0.32	0.07	Gini	-0.26	0.06	0.88
5	0.15	0.06	0.02	Rule of law	0.45	-0.28	0.09
6	0.09	0.07	0.01	Transparency	0.44	-0.23	0.15
7	0.02	---	0.00	Trust	0.38	0.00	-0.19

# Income, human development, and determinants of institutional quality

	Constant	Institutions	Natural capital	Distance from equator	Obs	R <sup>2</sup>
GNI	10.04 (195.2)	0.33 (13.81)			67	0.75
HDI	0.81 (108.2)	0.04 (12.4)			67	0.70
Institutions	-0.09 (0.2)		-12.26 (7.7)	0.45 (5.5)	66	0.71

Note: t-values within parentheses

# Income, human development, geography, and natural capital

	Constant	Natural capital	Distance from equator	(1)*(2)	Obs	R <sup>2</sup>
GNI	9.90 (38.3)	-4.89 (4.6)	0.16 (2.5)	0.67 (2.0)	108	0.53
HDI	0.78 (25.1)	-0.64 (4.9)	0.02 (3.1)	0.08 (2.1)	108	0.59

Note: t-values within parentheses

# Multiple regression results III

## Ten-point increase in NAT

- Reduces HDI by 0.05
  - $\Delta\text{HDI} = 0.10 * (-12.26) * 0.04 = -0.05$
- Reduces GNI per capita by 40%
  - $\Delta\text{GNI} = 0.10 * (-12.26) * 0.33 = -0.40$

## Increase in distance from equator by 1000 km

- Raises HDI by 0.02
  - $\Delta\text{HDI} = 0.45 * 0.04 = 0.02$
- Raises income per capita by 15%
  - $\Delta\text{GNI} = 0.45 * 0.33 = 0.15$



# Multiple regression results IV

## Ten-point increase in NAT

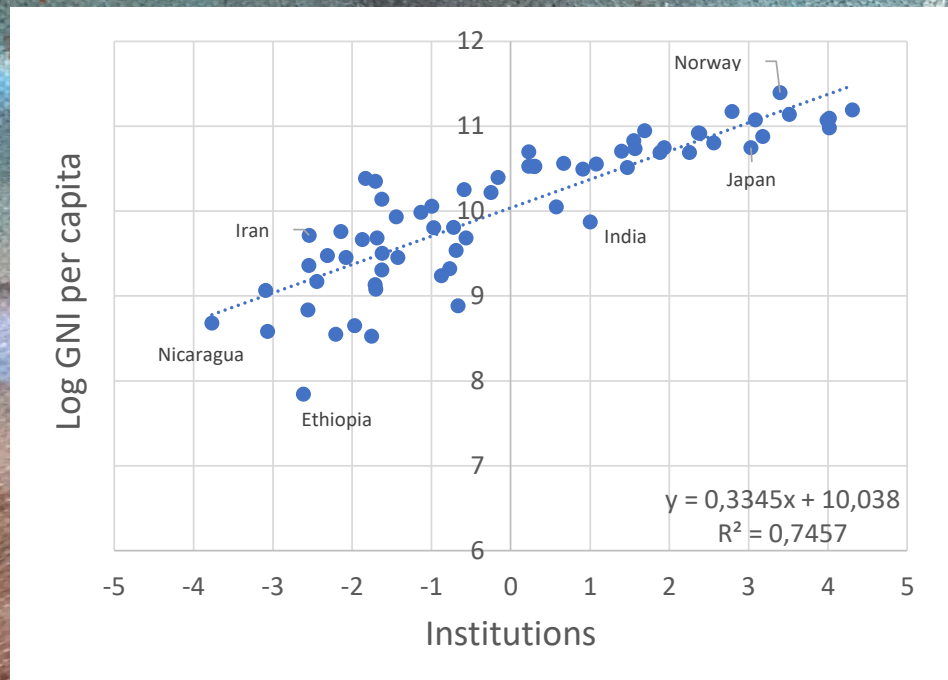
- Reduces HDI by 0.04, like before
  - $\Delta\text{HDI} = 0.10 * (-0.64 + 0.08 * 3.08) = -0.04$
- Reduces GNI per capita by 28%, less than before
  - $\Delta\text{GNI} = 0.10 * (-4.89 + 0.67 * 3.08) = -0.28$

## Increase in distance from equator by 1000 km

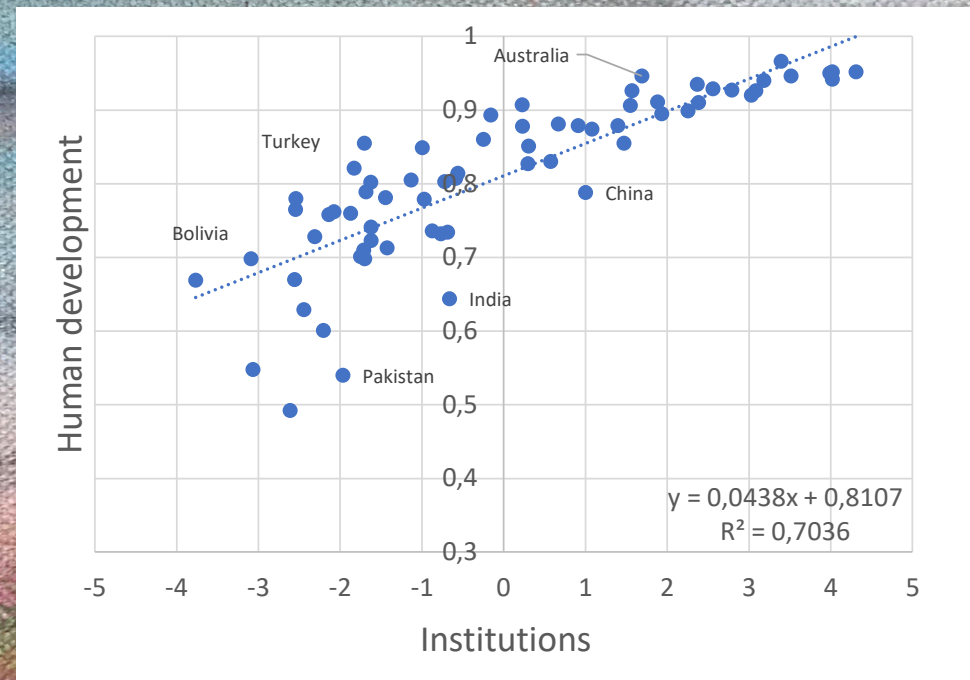
- Raises HDI by 0.03, like above
  - $\Delta\text{HDI} = 0.02 + 0.08 * 0.16 = 0.03$
- Raises GNI per capita by 27%, like above
  - $\Delta\text{GNI} = 0.16 + 0.67 * 0.16 = 0.27$
- Resources and institutions both matter for HDI and GNI

# Institutions, income, and human development

GNI per capita and institutions

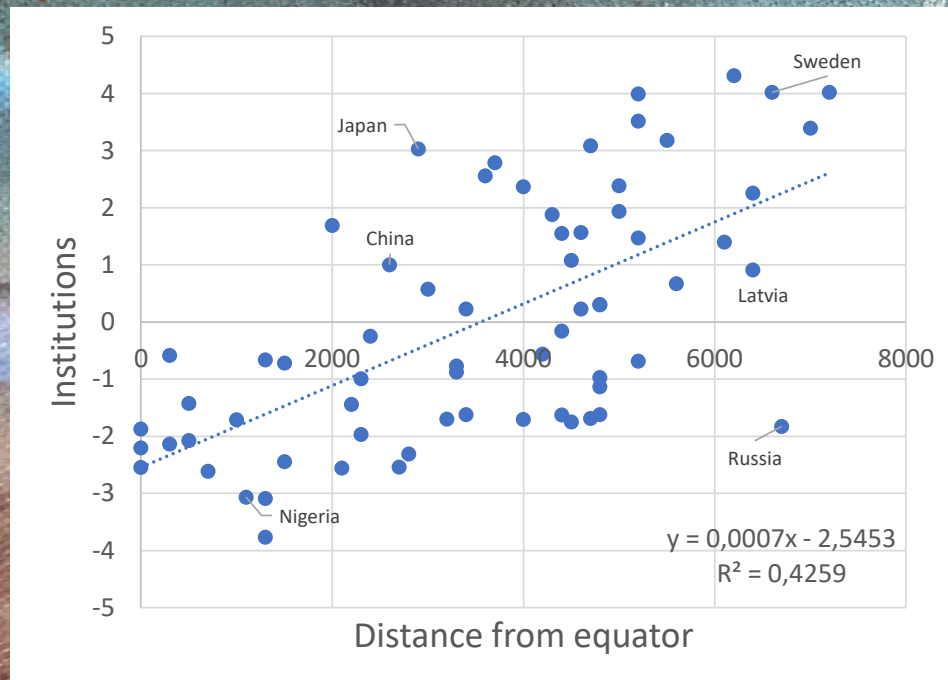


HDI and institutions

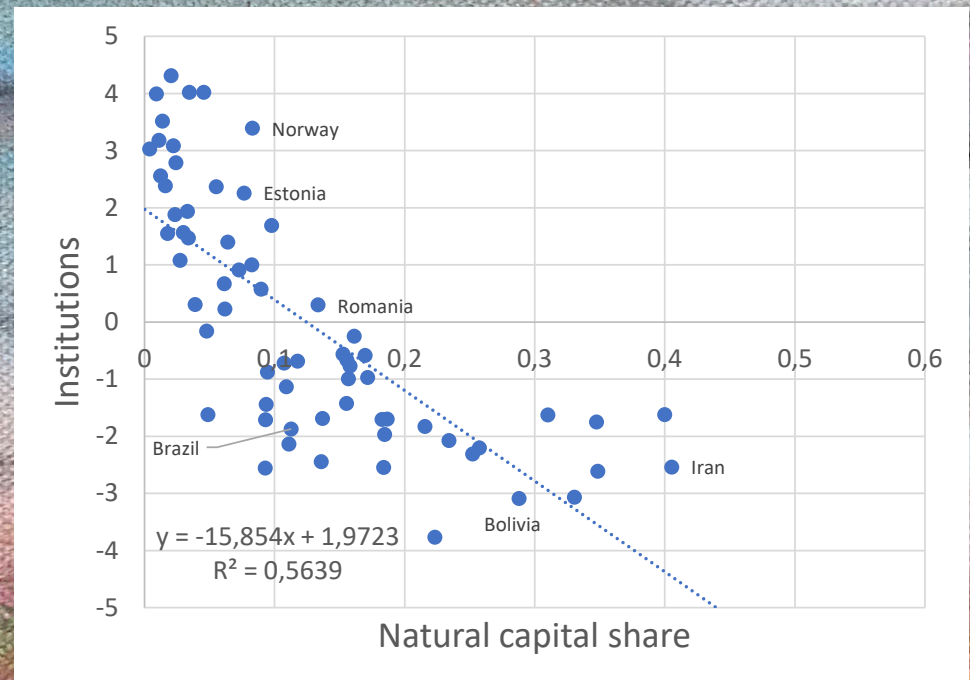


# Natural capital, geography, and institutions

Institutional quality and distance from equator



Institutional quality and natural capital



# Conclusion

Many resource-rich countries have fared rather poorly

- Our new data show, once again, inverse cross-country relationship between natural resource intensity and economic outcomes and institutions
  - Few resource-rich countries have performed well
- In our data, failures dominate successes
  - Extreme case: Libya

Among 179 countries ranked by V-Dem Institute

- Iran ranks 152<sup>nd</sup>, Russia 159<sup>th</sup>, Saudi Arabia 169<sup>th</sup>
- Effects of natural resources managed by theocrats and oligarchs can manifest themselves through lack of diversification and democracy as well as inadequate institutions, including inequality

The End