Institutions, Technology and Prosperity

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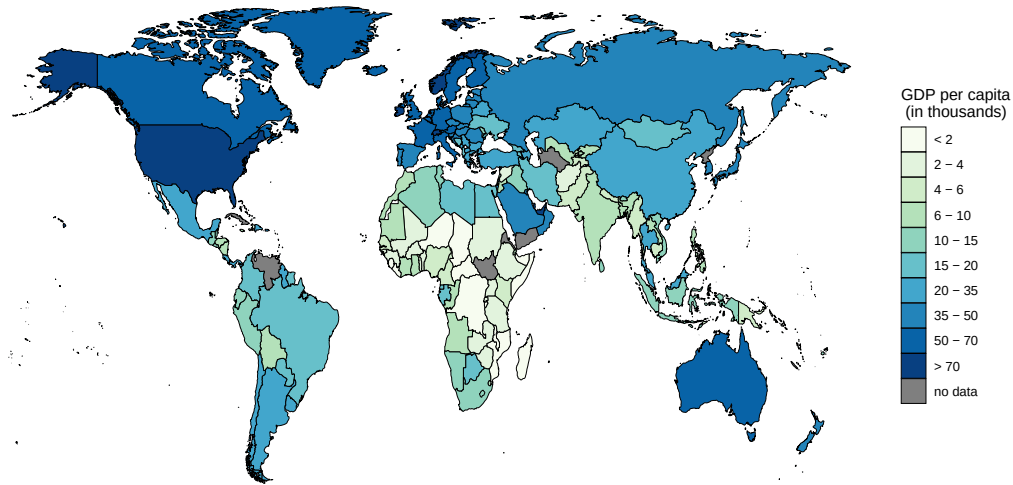
Nobel Lecture, Stockholm
December 8, 2024

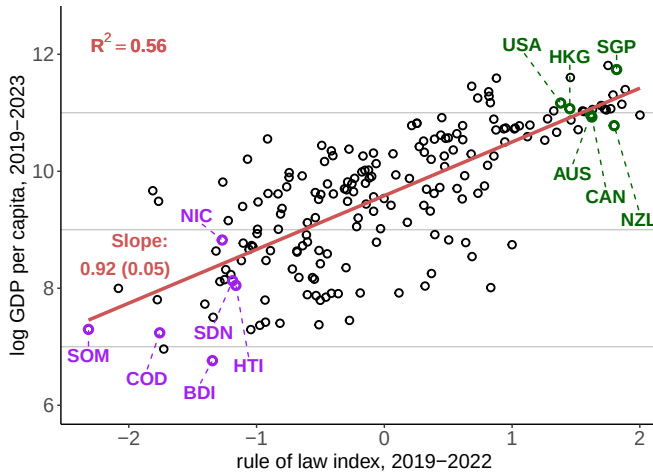
What Drew Me to Economics



The world distribution of income (GDP per capita, PPP, 2019-2023)

Institutions and Prosperity

- **Institutions**: property rights, laws, regulations, political arrangements that influence the distribution of political power and the constraints on that power, the distribution of economic resources.
- Institutions shape the **incentives and opportunities**.
- Polar opposites: **extractive** and **inclusive** institutions.
- Proxy these with a broad index: World Bank's **rule of law index**.



Correlation between institutions and GDP

Institutions Are Endogenous

- Correlation between institutions and prosperity does not imply a causal effect from institutions.
- Perhaps rich countries can "afford" better institutions, or their populations "demand" such institutions.
- Or omitted factors influence both institutions and prosperity.
- One such factor may be "geography" as long ago anticipated by Montesquieu:

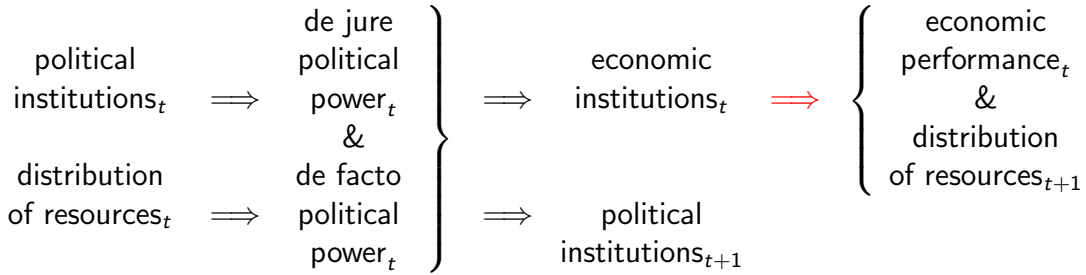
> **The heat of the climate may be so excessive as to deprive the body of all vigour and strength**. *Then the faintness is communicated to the mind; there is no curiosity, no enterprise, no generosity of sentiment; the inclinations are all passive; indolence constitutes the utmost happiness; scarcely any punishment is so severe as mental employment; and* **slavery is more supportable than the force and vigour of mind necessary for human conduct.** *(The Spirit of the Laws, 1748)*

- Then, how do we determine the effects of institutions?

European Colonial History

- Colonialism is one of the most formative institutional events of the millennium.
- It also provides a laboratory for understanding the effects of institutions.
- Europeans set up—and led to the development of—very different sets of institutions across the colonial empire.
- We see in the colonial world the whole range of institutions, from highly **extractive** to broadly **inclusive** ones. But why?
- We need a **theory**.
- A theory plus the right kind of data can also enable us to develop an **instrumental-variables (IV)** strategy—to exploit the exogenous source of variation in colonial history and estimate the effects of institutions.
- This is what we attempted to do in AJR (2001).

How Institutions Matter



- Political institutions and the distribution of resources (capital, land, human capital) as **state variables**.
- Economic institutions shape incentives for **investment, innovation** and **economic participation**.
- **Institutional persistence** and **institutional change** caused by the interplay of these dynamics.

Theory of Institutional Divergence among Colonies

(potential) settler mortality $\overset{(A)}{\Rightarrow}$ settlements $\overset{(B)}{\Rightarrow}$ early institutions

$\overset{(C)}{\Rightarrow}$ current institutions $\overset{(D)}{\Rightarrow}$ current performance

A Huge mortality rates discourage settlements.

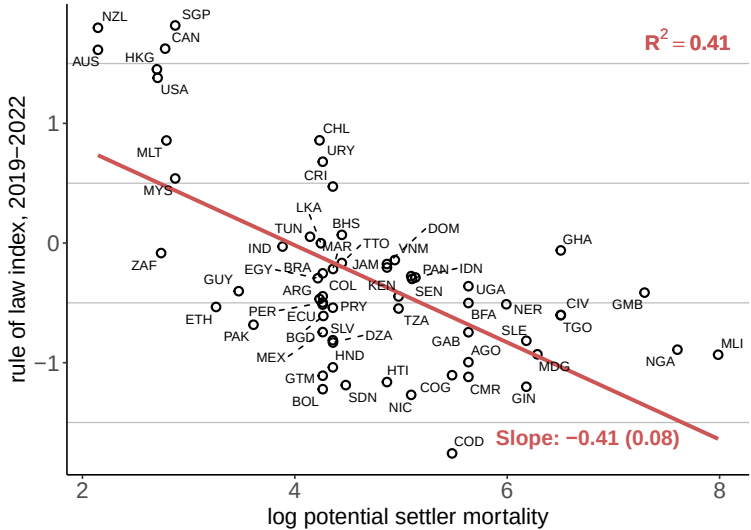
B European settlers **resisted** colonial designs for **extractive institutions**, making the emergence of inclusive institutions more likely.

C **Institutions persisted** through the channels highlighted above.

D Exploit this source of variation to estimate the causal effects of current institutions on development, under the **exclusion restriction** that potential settler mortality has no direct effect on current performance ("IV strategy").

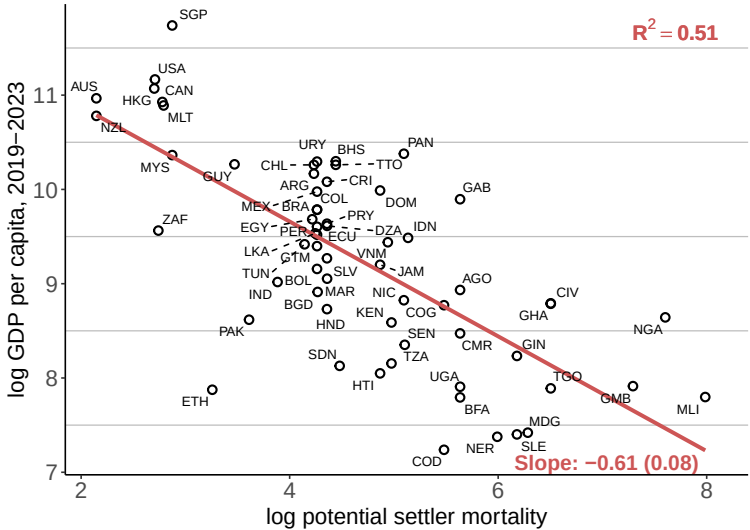
- Compile data on **potential settler mortality rates** from historical sources.
- Use potential settler mortality directly as an instrument for current institutions.

Settler Mortality and Institutions



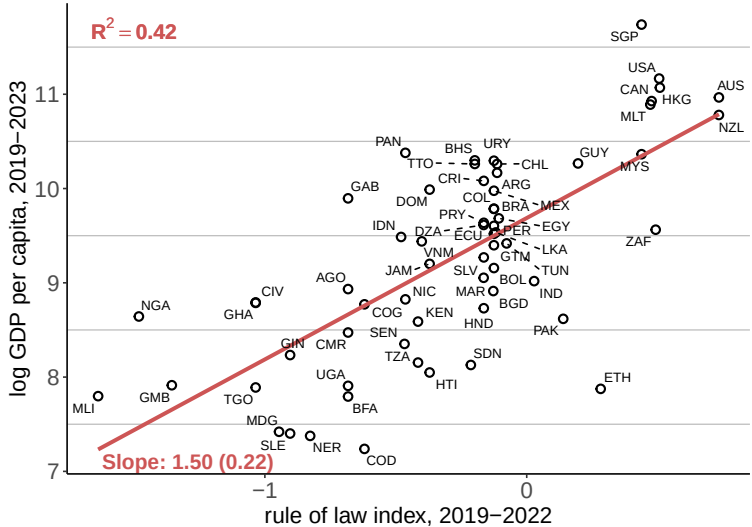
First stage: potential settler mortality and institutions today

The Reduced Form



Reduced form: potential settler mortality and GDP per capita today

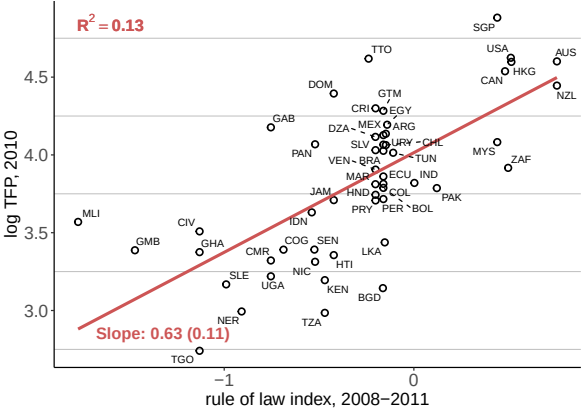
The Two-Stage Least Squares Estimates: GDP per capita



- This relationship is robust and quantitatively sizable.

Institutions and Technology: 2SLS Estimates

- Key channels: efficiency of economic arrangements and technology.
- Proxy: total factor productivity, **TFP** and **technology composition of exports**.



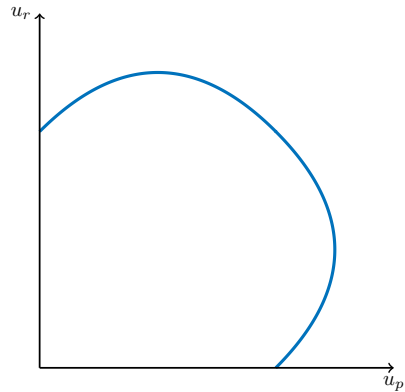
2SLS relationships between institutions and technology

A Framework

- Technological choices are both critical for prosperity and the distribution of that prosperity, and are intertwined with institutional trajectories.
- A new framework for a more holistic account of how institutions evolve and impact technology and prosperity.
- The centerpiece is the **utility-technology possibilities frontier—UTPF**, which informs us about the levels of utility/prosperity/welfare that different groups can achieve given institutions and technology choices.
- Given this framework, study:
  - factors that shift the frontier.
  - factors that induce moves along the frontier given technology.
  - role of technological choices.
  - causes of institutional persistence and change.

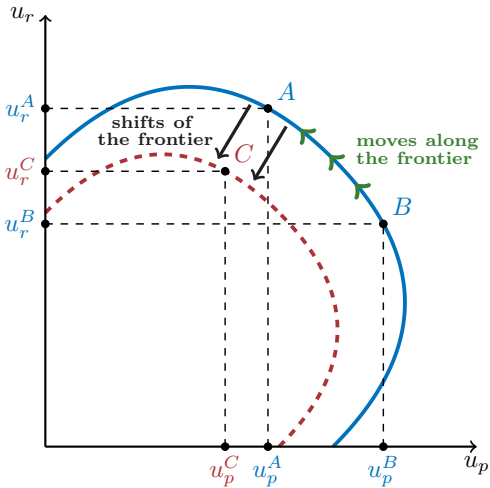
UTPF

- Focus on a world with just two groups, the rich and the poor, with the assumption that **the rich are initially politically more powerful/dominant**.



- Ex: rich=colonialists or landowners; and poor=indigenous population or peasants.

Moves and Shifts

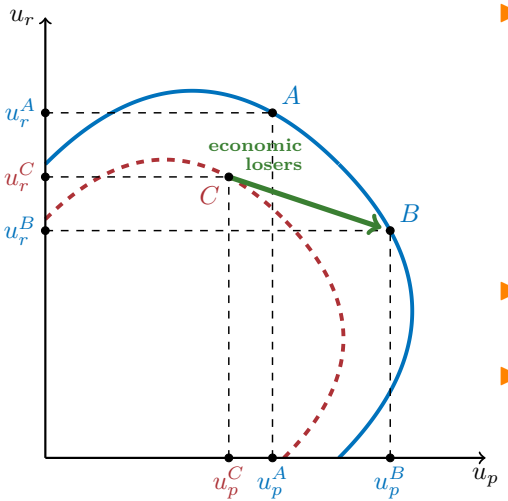


- Moves along the **blue frontier** driven by different balances of power.
- Such moves result when society can use "efficient" tools.
- Inefficient economic arrangements (e.g., monopoly power to extract rents) and technology distortions (including blocking of beneficial technologies) cause **shifts**—the move from **blue frontier** to the **red frontier**.

How Institutions Shift the Frontier

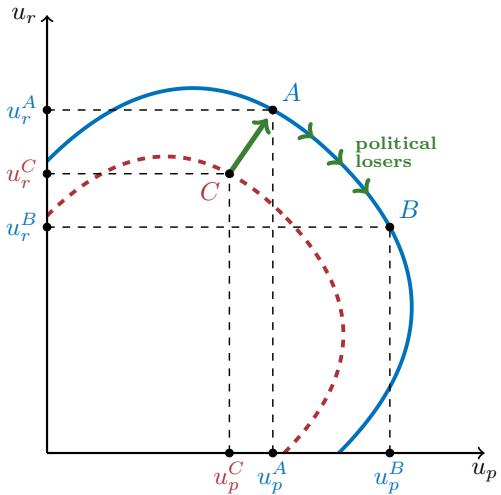
- **Holdup**: the politically powerful cannot refrain from using their power to extract income and resources, discouraging **investment, innovation** and **economic participation** by other groups.
- **Collapse of state capacity**: extractive institutions also intensify conflict (e.g. to take control of those institutions), potentially leading to the erosion of state capacity, and consequently to distorted economic incentives.
- **Discouraging experimentation and collective knowledge building**: even when the elites wish to encourage innovation, extractive institutions may discourage **experimentation** and thus **innovation**.
- **Economic losers**.
- **Political losers**.

Economic Losers



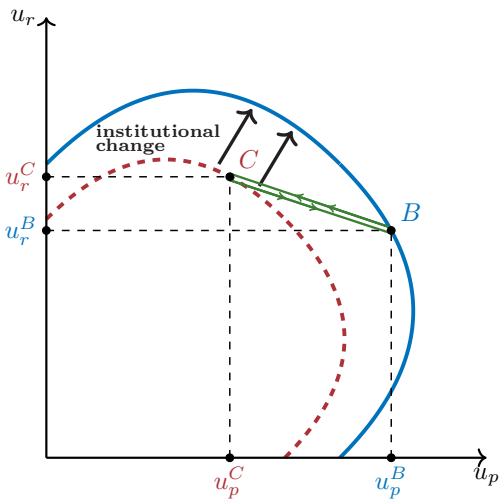
- Distribution and efficiency may be inseparable.
- Without tools to efficiently extract resources from the rest of the population, the elite may be faced with a choice between **point B** (better technology and better institutional arrangements, but low share for them) and **point C** (bigger share of a smaller pie due to worse technology and worse institutions).
- **Point C** on the red frontier is preferable to **point B** on the blue frontier for the elite.
- The choice of **point C** here signifies the **economic losers mechanism**: block beneficial institutional changes and adoption of superior technologies.

Political Losers and Institutional Persistence



- Even with tools to redistribute resources given technology and institutional arrangements, the rich elite may still stay away from the efficient arrangement.
- Suppose **point A** feasible when elite is in power.
- But better technology or institutional reform taking us to the higher frontier may destabilize their power—**political creative destruction**.
- Hence the effective choice may be between **C all the time** versus **A today** but **B from tomorrow onwards**.
- This **political losers mechanism** can keep society with **worse institutions/technology** and thus on the lower frontier.

Institutional Persistence and Institutional Change

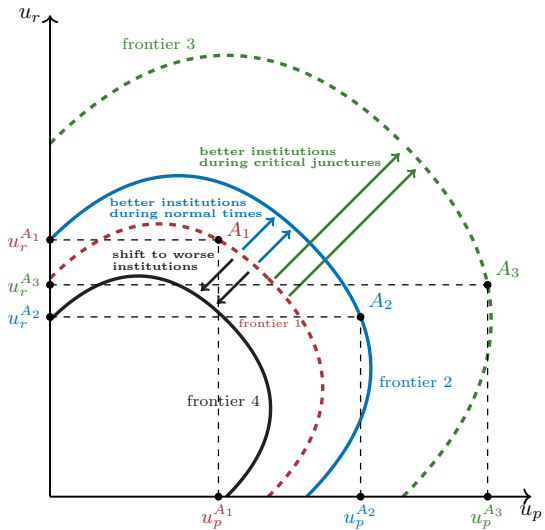


- Tensions for change as in *Economic Origins of Dictatorship and Democracy*.
- Suppose **B** is feasible, but the elite prefer **C**.
- Now the citizens gain temporary **de facto** power and demand concessions—"threat of revolution".
- Promises from the elite under the existing institutional arrangement are non-credible, because they prefer to revert to **C** when the temporary threat evaporates.
- Lord Grey in 1831: *"the principle of my reform is to prevent the necessity of revolution"*
- Demand for **institutional change**—to transfer power to citizens.

Applications of the Framework

- Understanding extractive colonial institutions:
  - **Huge power imbalance** between colonial authorities and native populations.
  - Limited fiscal tools, encouraging the use of monopoly, extraction and coercion.
  - **Political losers** mechanism is **critical** in encouraging choice of institutions for political control.
- Why different in settler colonies?
  - Colonial powers had **the same incentives**.
  - Yet, ideological factors and possible mobility of settlers created **a more balanced** distribution of political power between them and European settlers.
  - Attempts to impose extractive institutions similar to those in South America **failed** for this reason—e.g., Jamestown colony in Virginia or Pennsylvania.
  - This paved the way to economic institutions providing greater security to settlers as well as arrangements for self-governance (especially in Australia and North America).

Critical Junctures and Institutional Change

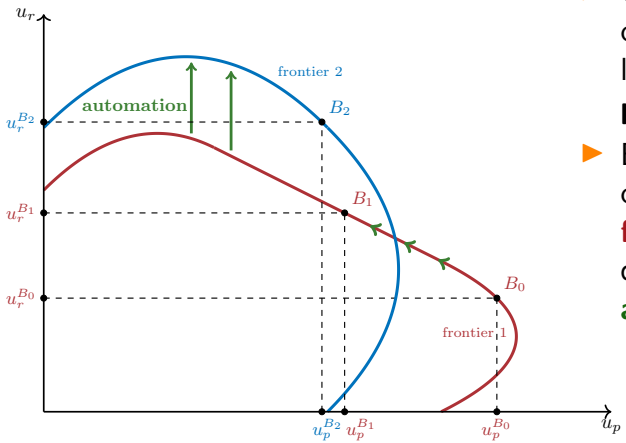


- During **critical junctures**, the effects of institutional changes are amplified.
- Instead of a shift from the **red** to the **blue**, we get a shift to the **green** frontier.
- Or, remaining on **red frontier** becomes more costly to some groups, who may mobilize and **force institutional change**.
- But if elite increase repression in response to the critical juncture and succeed in staying in power, **then worse institutions**.
- **Path-dependent** change: even if a society does not stay on the **red frontier** after a critical juncture, its path of change is influenced by initial conditions.

Colonialism and Industrialization as Critical Junctures

- Reinterpreting the colonial divergence.
  - **Small differences now matter more**.
    - Ex: disease environments that mattered little before Europeans arrived became more consequential once European colonialists arrived.
    - Ex: Costa Rica vs. Guatemala—differences in indigenous population and labor relations.
- Reinterpreting the spread of industrialization.
  - Institutional differences that did not cause big divergence before (e.g., between Mexico and the United States or between France and the Habsburg Empire) start mattering more in the context of whether to encourage industrial technology and relevant investments (such as in railways).
  - von Gentz: "*We do not desire at all that the great masses shall become well-off and independent. . . How could we otherwise rule over them?*"
- Institutional responses during critical junctures.
  - The progressive era as a response to rising inequality and concentration of power during the critical juncture created by the rapid adoption of new technologies in many industries.

The Age of Digital Technologies and AI



- Change in balance of power between capital-labor (and professional-manual labor) moving society from **point** B_0 to **point** B_0 due to how rents are shared.
- Equilibrium effects through technology choices, causing a tilt from the **red frontier** to the **blue frontier** via the development and adoption of **automation technologies**.

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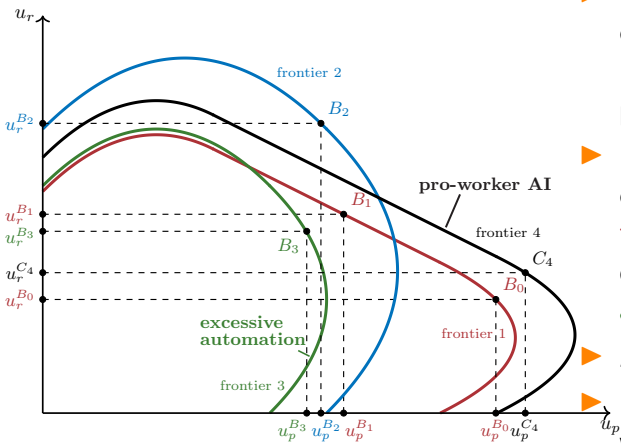

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- Equilibrium effects through technology choices, causing a tilt from the **red frontier** to the **blue frontier** via the development and adoption of **automation technologies**.
- **AI intensifying these trends**.
- If AI can be developed in a pro-worker way, then shift to the **black frontier**.
- If excessive automation using AI, then perhaps shift to **green frontier**.

Concluding Thoughts and Areas for Future Research

- Political economy and institutional economics are very active areas of research, with exciting contributions from many scholars, including many PhD students.
- The intersection of these issues with technology choices can help us:
  - unify questions of between-country inequality with those of within-country inequality;
  - understand how institutions influence technology and its direction;
  - uncover **new commonalities** between disparate episodes such as colonialism, industrialization and the age of AI.
- Several areas for exciting future research:
  - How monopoly power is exercised and determined with institutions in the age of AI.
  - **Path dependence**.
  - How **culture**, **norms** and **ideology** are co-determined with institutions and technology.
  - Understanding **agency** in technology and institutions.
  - More on AI as a critical juncture.