Cross-Country Income Differences

Harvard Economics 1011B
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Current framework

- **Labor income**, also known as ordinary income, taxed at progressive rate.
- **Labor income** also subject to payroll (social security, Medicare, UI) taxes.
- **Corporate income** taxed at corporate tax rate (less than ordinary income).
- **Capital gains** taxed at capital gains rate (less than ordinary income).
- **Qualified dividends** taxed at capital gains rate ("vanilla" stocks held for minimum period).
- **Ordinary dividends** taxed at ordinary income rate.
- Corporate taxes, capital gains taxes, and dividend taxes all apply to capital income, meaning income generated by wealth.

Wealth tax proposals

Warren: *Consider two people: an heir with $500 million in yachts, jewelry, and fine art, and a teacher with no savings in the bank. If both the heir and the teacher bring home $50,000 in labor income next year, they would pay the same amount in federal taxes, despite their vastly different circumstances. That's why we need a tax on wealth. Households would pay an annual 2% tax on every dollar of net worth above $50 million and a 6% tax on every dollar of net worth above $1 billion.*

Sanders: *In order to reduce the outrageous level of inequality that exists in America today and to rebuild the disappearing middle class, the time has come for the United States to establish an annual tax on the extreme wealth of the top 0.1 percent of U.S. households. It would start with a 1 percent tax on net worth above $32 million for a married couple. The tax rate would increase to 2 percent on net worth from $50 to $250 million, 3 percent from $250 to $500 million, 4 percent from $500 million to $1 billion, 5 percent from $1 to $2.5 billion, 6 percent from $2.5 to $5 billion, 7 percent from $5 to $10 billion, and 8 percent on wealth over $10 billion.*

Homework review: wealth tax

- In homework you assessed the incidence of a capital income tax.
- In similar setup, let's assess the incidence of a wealth tax.
- Workers consume their income each period.
- Capitalists flow budget constraint: $c_t + K_{t+1} = (1 + r_t^K - \delta - \tau)K_t$.
- Interpret: after production occurs, government seizes τK_t of capital stock and gives to workers to consume.

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- Capitalists' Lagrangian and first order conditions:

$$\mathscr{L} = \sum_{t=0}^{\infty} \beta^t \left(u(c_t) + \lambda_t \left[\left(1 + r_t^K - \delta - \tau \right) K_t - c_t - K_{t+1} \right] \right.$$

$$\text{FOC } c_0: \quad u'(c_0) = \lambda_0.$$

$$\text{FOC } c_1: \quad u'(c_1) = \lambda_1.$$

$$\text{FOC } K_1: \quad \lambda_0 = \beta \left(1 + r_1^K - \delta - \tau \right) \lambda_1.$$

$$\text{Euler:} \quad u'(c_0) = \beta \left(1 + r_1^K - \delta - \tau \right) u'(c_1).$$

Steady state/BGP

- Steady state $\Rightarrow c_0 = c_1 \Rightarrow 1 + r^K - \delta - \tau = \beta^{-1}$.
- Wealth tax acts like higher depreciation rate.
- Rental rate: $\alpha k^{\alpha-1} = \alpha(K/L)^{\alpha-1} = F_K = r^K = \beta^{-1} - 1 + \delta + \tau$.
- Capital-to-labor ratio: $k = \left(\frac{r^K}{\alpha}\right)^{\frac{1}{\alpha-1}} = \left(\frac{\beta^{-1}-1+\delta+\tau}{\alpha}\right)^{\frac{1}{\alpha-1}}$.
- Per-period revenue per worker: τk.
- Wage: $w = F_L = (1-\alpha)k^{\alpha}$.
- Worker consumption: $c^w = \tau k + (1-\alpha)k^{\alpha}$.

Incidence of tax and transfer on workers

- Worker consumption: $c^w = \tau k + w$.
- Taxes change capital stock:
$$\frac{dk}{d\tau} = \frac{1}{\alpha(\alpha-1)} k^{2-\alpha} = \frac{1}{\alpha(\alpha-1)} \frac{\alpha}{r^K} k = -\frac{k}{(1-\alpha) r^K}.$$
- Taxes change wages by changing capital-labor ratio:
$$\frac{dw}{d\tau} = \frac{\partial w}{\partial k} \frac{dk}{d\tau} = \alpha(1-\alpha) k^{\alpha-1} \frac{dk}{d\tau} = (1-\alpha) r^K \frac{dk}{d\tau} = -k.$$
- Full comparative static:
$$\begin{aligned} \frac{dc^w}{d\tau} &= k + \tau(dk/d\tau) + (\partial w/\partial k)(dk/d\tau) \\ \text{Evaluate } \partial w/\partial k: \quad &= k + \tau(dk/d\tau) - k \\ \text{Simplify:} \quad &= \tau(dk/d\tau) < 0. \end{aligned}$$

Questions

- A capital income tax (homework) or a wealth tax (previous slide) are counterproductive means to raise welfare of workers in this model. Why?
- How would you defend a wealth tax proposal?
- What other issues do capital income and wealth taxes raise?
- Which tax do you think is likely to work better in practice? Why?

Overview of growth and income differences

- Kaldor facts.
- Solow model.
  - Growth from capital accumulation and exogenous technology.
- Neoclassical growth model.
  - Growth from equilibrium capital accumulation and exogenous technology.
  - Efficiency result.
- Confronting neoclassical growth theory with evidence.
- **Other and deeper theories of cross-country growth differences.**
- Growth over time.
- Cross-country welfare differences beyond GDP.

Outline

Outline

Models

- Solow: exogenous long-run growth, endogenous long-run differences due to saving rate or level of A.
- Neoclassical growth model: endogenous saving rate, factor prices.
- Quantitative exploration: large differences in A required to rationalize cross-country differences in output per worker.

What is A?

1. Technology.
2. Total factor productivity: efficiency of combining K and L.
3. A "measure of our ignorance" (Abramovitz, 1956).
4. Evidence of mis-measurement of inputs or outputs.
5. Evidence of model mis-specification.

Why does A vary?

- Need to explain differences in A of order of $10\times$.
- Information flows (mostly) freely: firms in poor countries can copy firms in rich countries.
- Implication: different technology, management practices not a satisfying answer.
- Look for deeper answers, albeit perhaps not the deepest answers.

Today: a brief tour of the possibilities

- Other production functions.
- Mis-allocation.
- Geography.
- Institutions and legal origins.
- Culture.
- Evidence from "the field".

Outline

Neoclassical production function with CRS

$$Y = F(K, L) = K^{\alpha} L^{1-\alpha}$$

- Inada condition: as $K \to 0, F_K \to \infty$. Rules out "growth trap."
- Constant returns to scale: $F(\lambda K, \lambda L) = \lambda F(K, L)$.
- Note: ignoring A for simplicity. Think of A normalized to 1.

Increasing returns to scale

$$Y = F(K, L) = \left(K^{\alpha} L^{1-\alpha}\right)^{\gamma}.$$

- Increasing returns to scale: $F(\lambda K, \lambda L) = \lambda^{\gamma} F(K, L)$.
- If you did Hall and Jones (1999) exercise from previous lecture, you would attribute increasing returns to scale to A:

$$\left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}} \underbrace{Y^{\frac{\gamma-1}{(1-\alpha)\gamma}}}_{\text{"}A\text{"}} = \left(\frac{K}{\left(K^{\alpha} L^{1-\alpha}\right)^{\gamma}}\right)^{\frac{\alpha}{1-\alpha}} \left(K^{\alpha} L^{1-\alpha}\right)^{\frac{\gamma-1}{1-\alpha}}$$

$$= \frac{\left(K^{\alpha}\right)^{\left(\frac{1-\alpha\gamma}{1-\alpha} + \frac{\gamma-1}{1-\alpha}\right)} \left(L^{-\alpha\gamma+\gamma}\right)}{L} = \frac{\left(K^{\alpha} L^{1-\alpha}\right)^{\gamma}}{L} = \frac{Y}{L}.$$

- Within-country evidence: agglomeration externalities in cities.
- Policy implication if increasing returns external to investing firm.
- But not just that larger countries are richer... still need something to explain why U.S. economy is bigger than Brazil's.

O-RING PRODUCTION

$$Y_j = K_j^{\alpha} \left(\prod_{i=1}^{N_j} p_j N_j \right)^{1-\alpha},$$

$$y = \sum_j Y_j / \left(\sum_j N_j \right).$$

- Worker $i = 1, 2, \ldots, N_j$ at firm j performs a task that succeeds with probability p_j.
- Production fails if any task fails (google "Challenger O-ring").
- Suppose large number of identical firms: $A = p_j^{N_j}$.
- Small differences in p_j become large differences in A.

"Big push" production function

$$Y = F(K, L) = \begin{cases} L & \text{if } K < \bar{K}, \\ K^{\alpha} L^{1-\alpha} & \text{if } K \geq \bar{K}. \end{cases}$$

- Inada condition fails: for $K < \bar{K}, F_K = 0$.
- No rate-of-return puzzle.
- Example: without physical infrastructure capital (roads, railroads, etc.), can't get goods to market and everyone works his/her own farm.
- Clear policy implication. See e.g. Jeff Sachs and the Millenium Village Projects and the critique by Nina Munk.

Outline

Theory

- Actual economies consist of many firms.
- With CRS, number of firms is indeterminate.
  - One big firm the same as many small firms.
  - Or if firms differ in A, most productive firm employs all of the resources in the economy.
- Move to decreasing returns to scale. Simple example with one factor: $Y_i = F(K_i) = K_i^{\alpha},\ \alpha < 1$. Note: i indexes firms within a country.
- With common depreciation, efficient allocation requires $F_{K_i} = F_{K_j}\ \forall i, j$. (Why?)
- Efficient allocation achieved if efficient capital markets, since $r + \delta = r_i^K = F_{K_i}$.
- Misallocation occurs if marginal products are dispersed.

Explanations

- Inefficient capital markets.
- Political favoritism/capital subsidies.
- Difficulty in starting a business and competing away rents.
- Span of control.

HYPOTHESIS: MANAGEMENT QUALITY

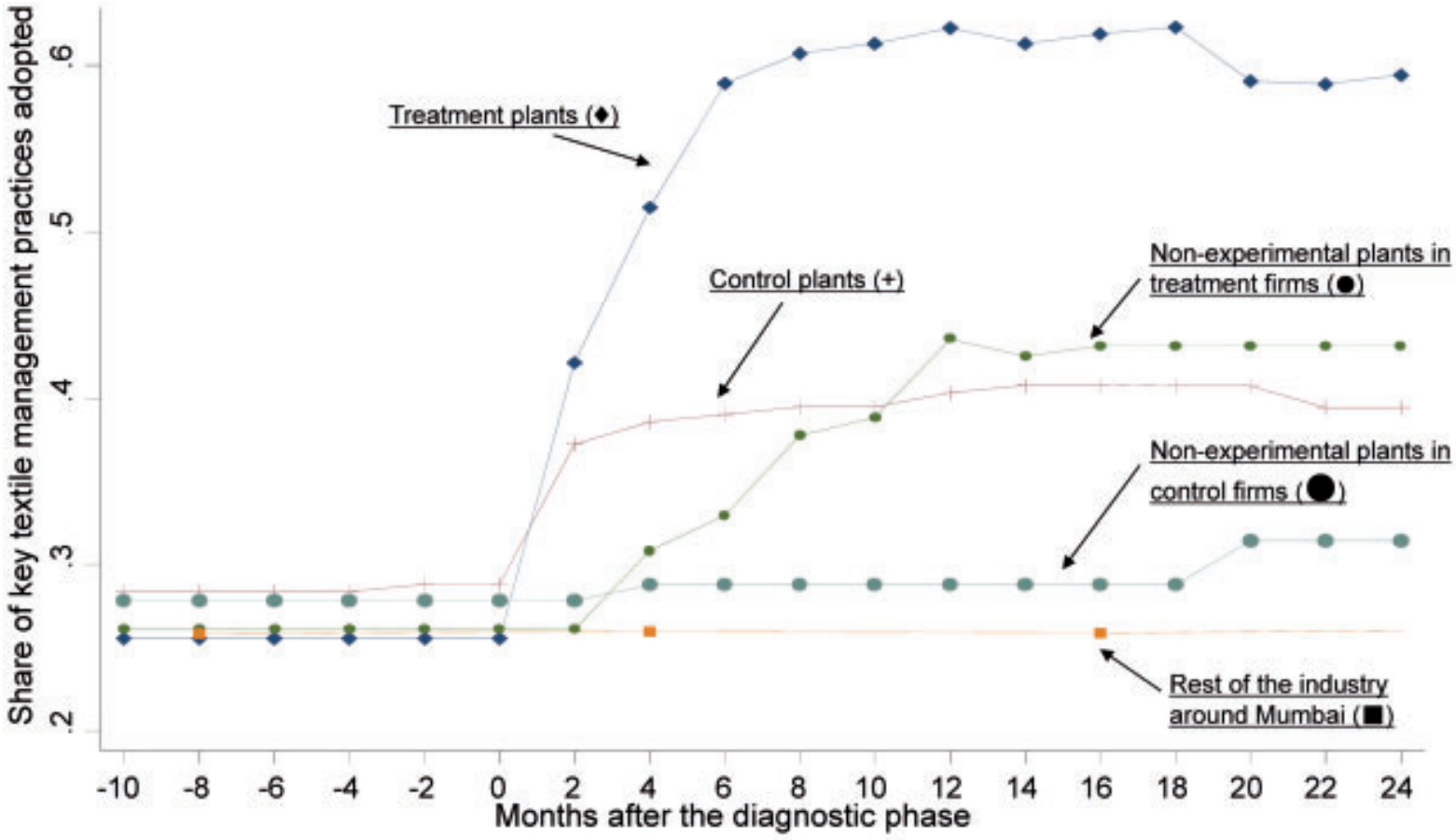
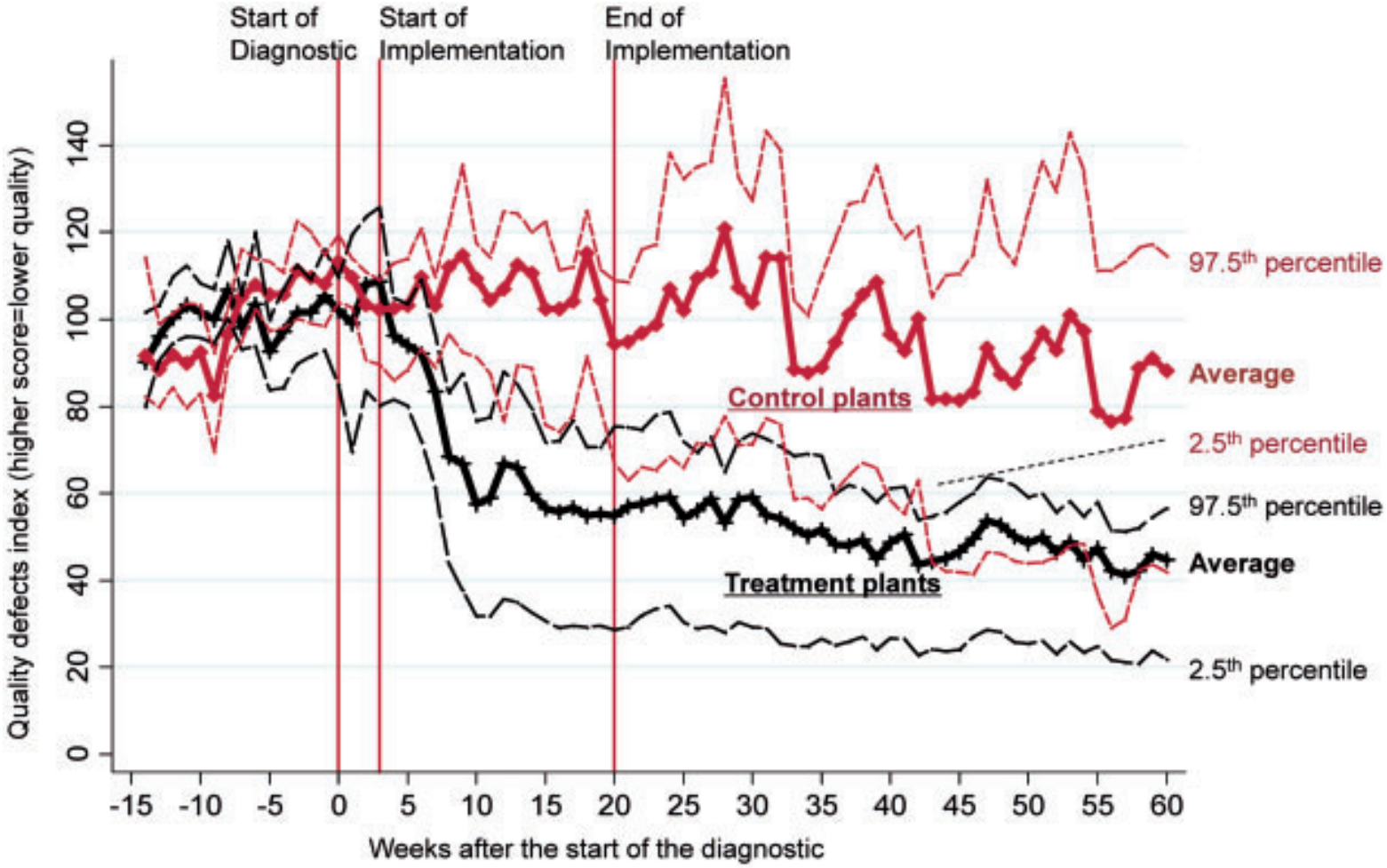


FIGURE V

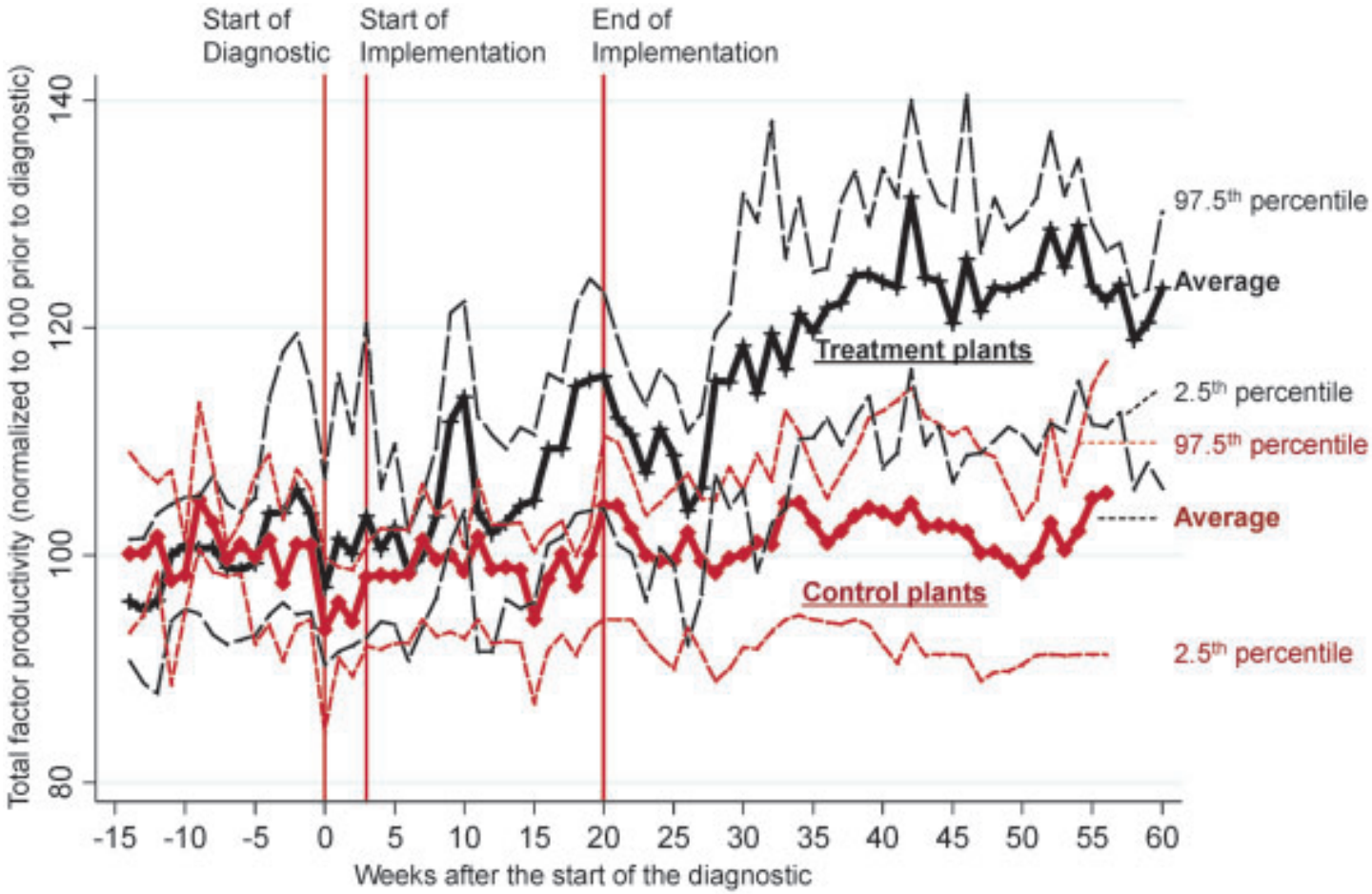
Source: Bloom,Eifert,Mahajan,McKenzie,Roberts (QJE 2013).

MANAGEMENT QUALITY MATTERS



Source: Bloom,Eifert,Mahajan,McKenzie,Roberts (QJE 2013).

Management quality matters



Source: Bloom,Eifert,Mahajan,McKenzie,Roberts (QJE 2013).

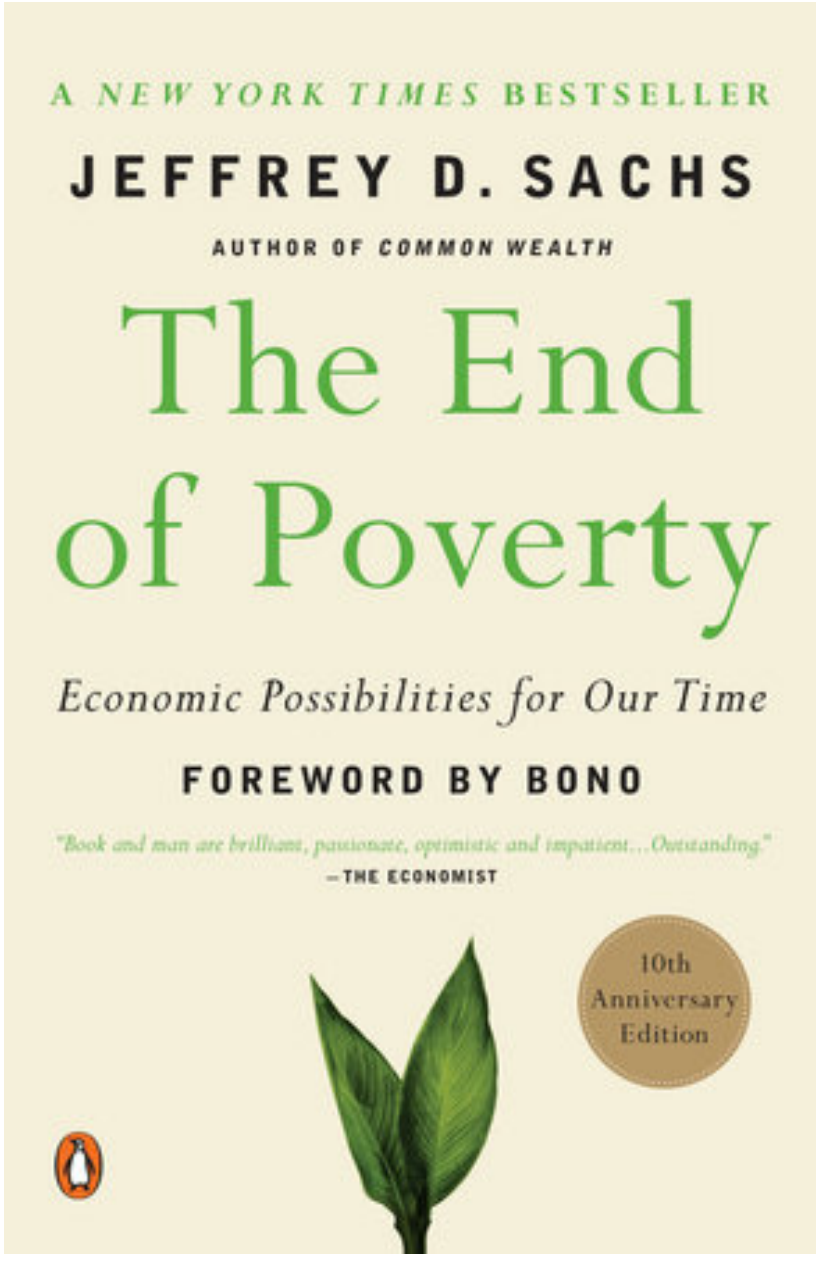
Why didn't firms already adopt these practices? Insufficient managerial time.

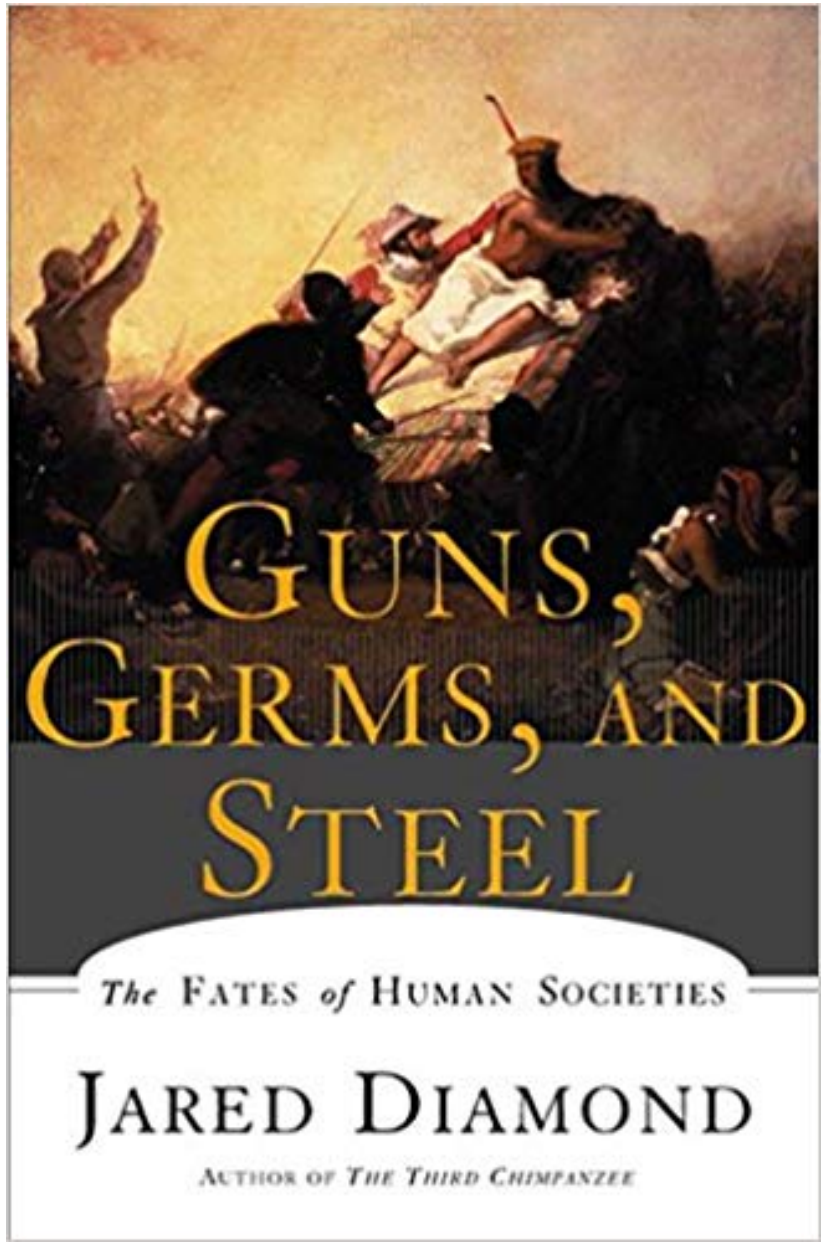
LIMITS ON FIRM SIZE IN INDIA

	(1)
Dependent variable	No. of plants
Sample	Industry
Time period	2011
Management$_{i,t}$	1.040*
	(0.563)
Male family members$_{i,t}$	0.210***
	(0.065)
Posttreatment$_{i,t}$	
Plant manager related$_i$	
Plant manager tenure$_i$	
Small sample robustness	
Permutation tests (p-value)	n/a
Time FEs	n/a
Plant/Firm FEs	n/a
Observations	107

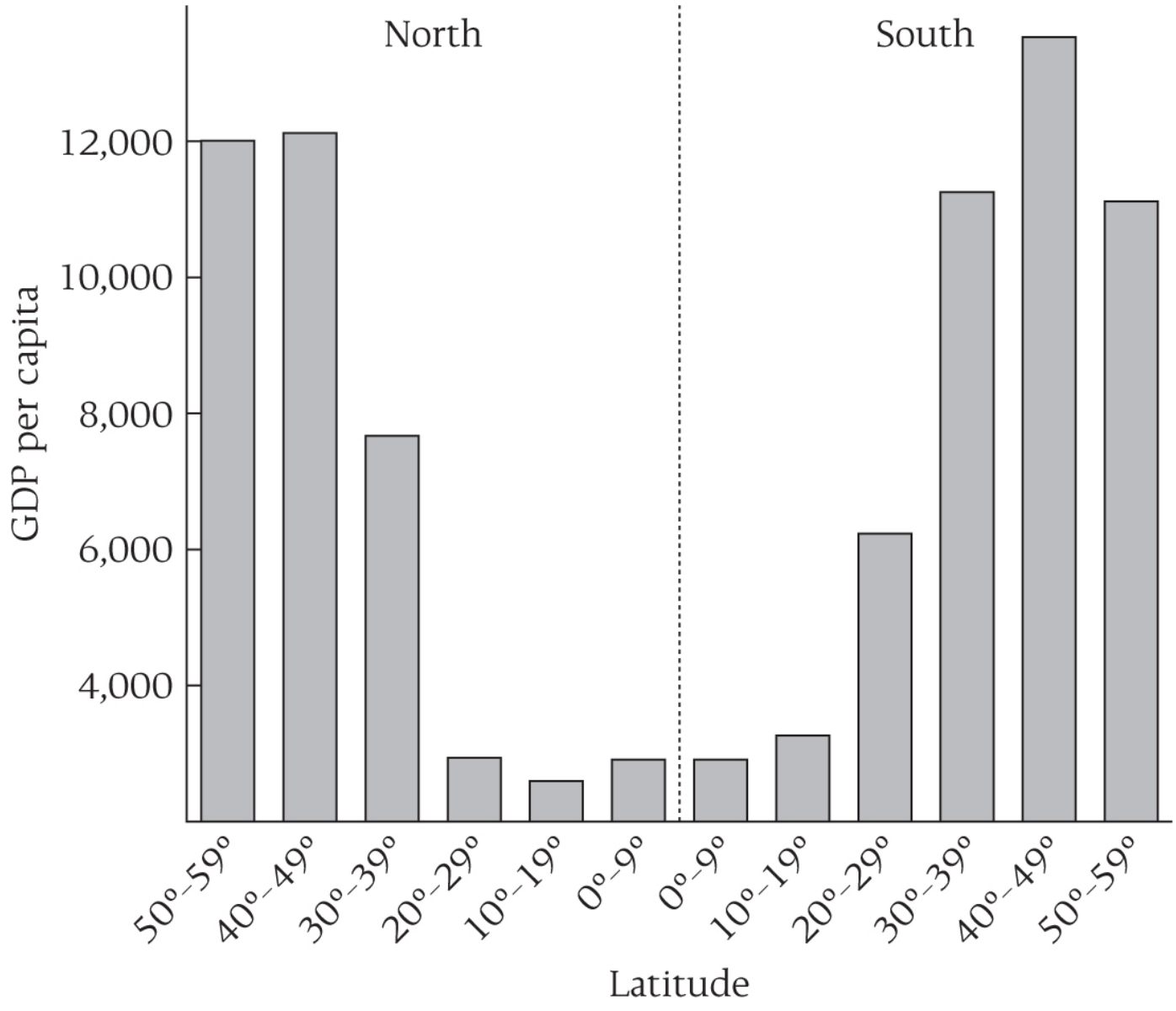
Source: Bloom,Eifert,Mahajan,McKenzie,Roberts (QJE 2013).

Outline


A NEW YORK TIMES BESTSELLER
JEFFREY D. SACHS
AUTHOR OF COMMON WEALTH
The End of Poverty
Economic Possibilities for Our Time
FOREWORD BY BONO
"Book and man are brilliant, passionate, optimistic and impatient...Outstanding."
—THE ECONOMIST
10th Anniversary Edition


GUNS, GERMS, AND STEEL
The FATES of HUMAN SOCIETIES
JARED DIAMOND
AUTHOR OF THE THIRD CHIMPANZEE

LATITUDE AND INCOME

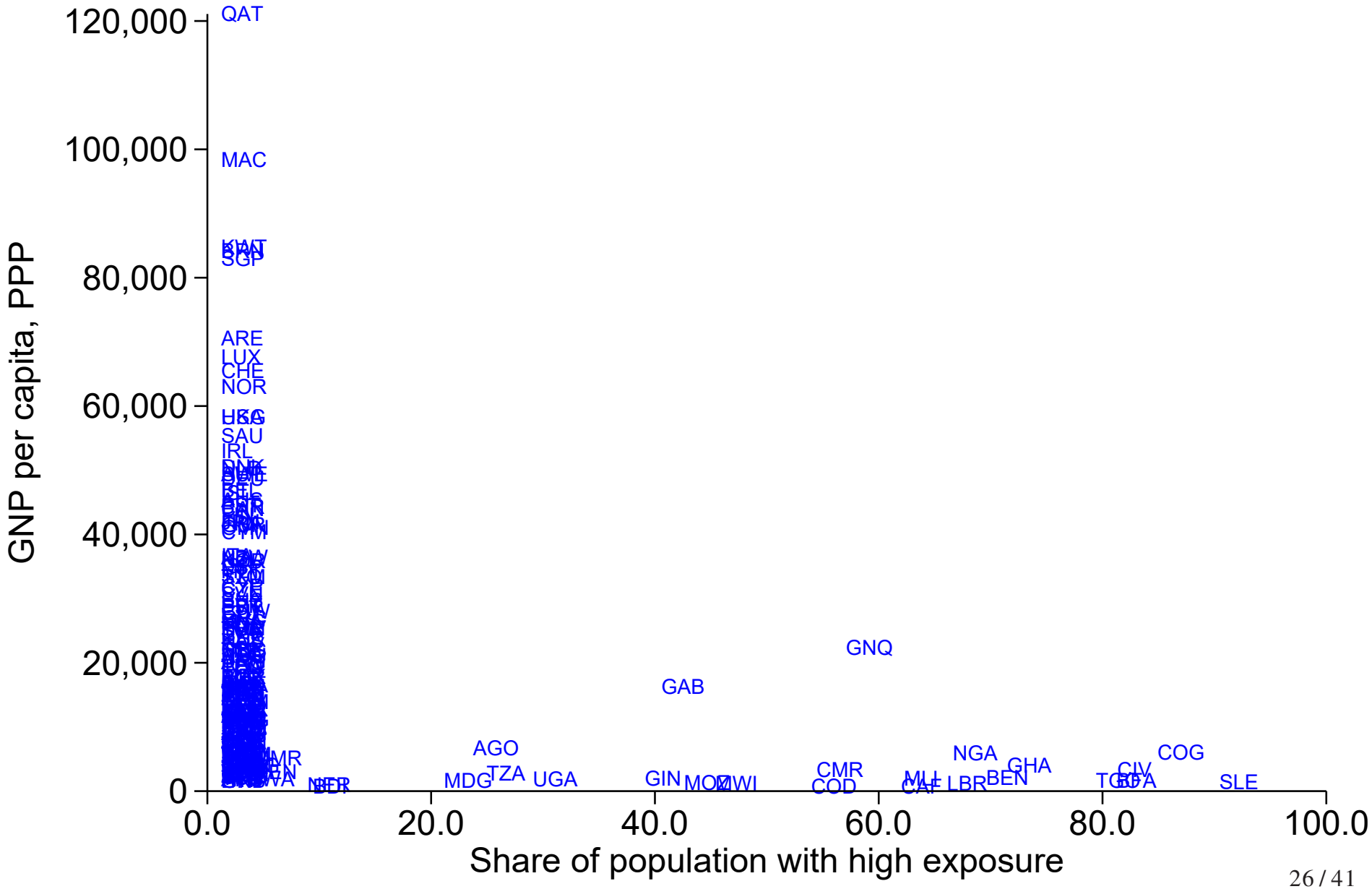


Direct channels

- Lower crop yields in the tropics.
- Different crops$\Rightarrow$harder to copy.
- Tropical diseases such as malaria.
- Land-locked countries$\Rightarrow$disadvantage in physical infrastructure.
- Small countries$\Rightarrow$small markets.

Note connection to big-push...

MALARIA EXPOSURE AND GDP



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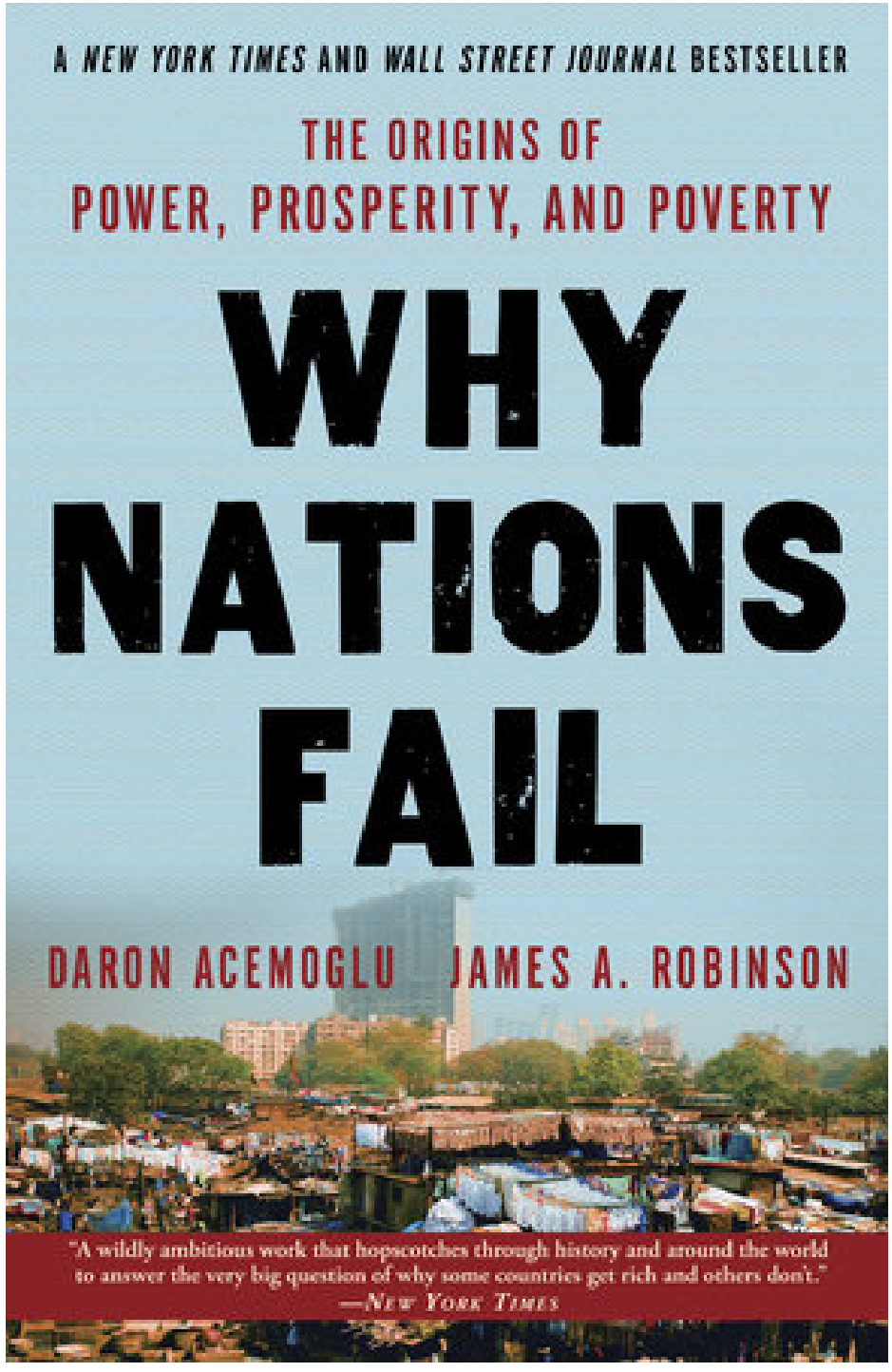
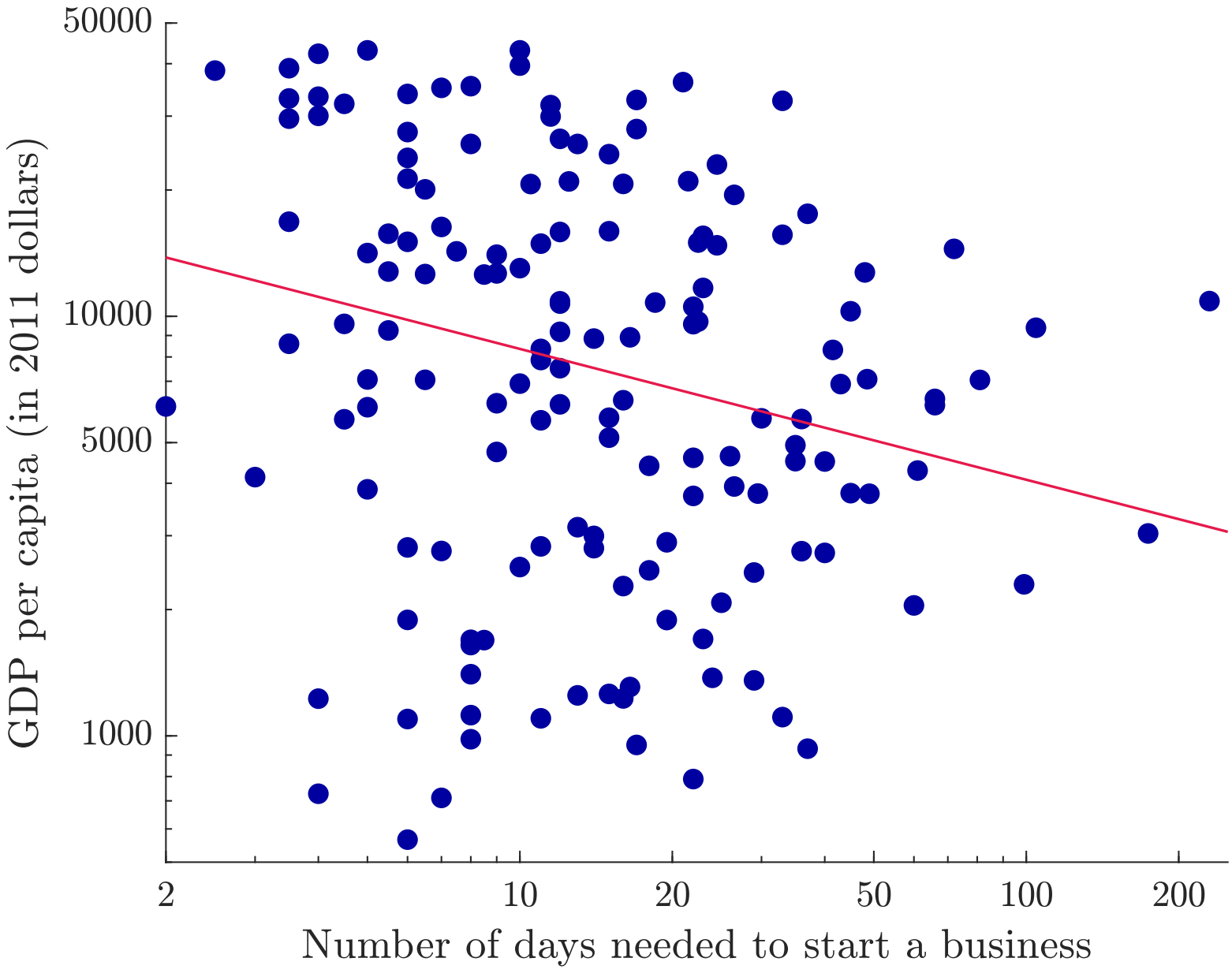

A NEW YORK TIMES AND WALL STREET JOURNAL BESTSELLER
THE ORIGINS OF
POWER, PROSPERITY, AND POVERTY
WHY
NATIONS
FAIL
DARON ACEMOGLU JAMES A. ROBINSON
"A wildly ambitious work that hopscotches through history and around the world to answer the very big question of why some countries get rich and others don't."
—NEW YORK TIMES

What are institutions?

Formal rules, laws, and regulations that determine economic incentives.

1. Inclusive institutions promote growing of pie:
   - Secure private property rights.
   - Markets for exchange of goods and services.
   - Free career choice.
   - Ability of entrepreneurs to disrupt existing firms.
2. Extractive institutions allow government/elites to capture disproportionate share of pie:
   - Weak private property rights, ability for government to expropriate wealth.
   - Restrictions on entry of new business.
   - Limits on personal freedom.

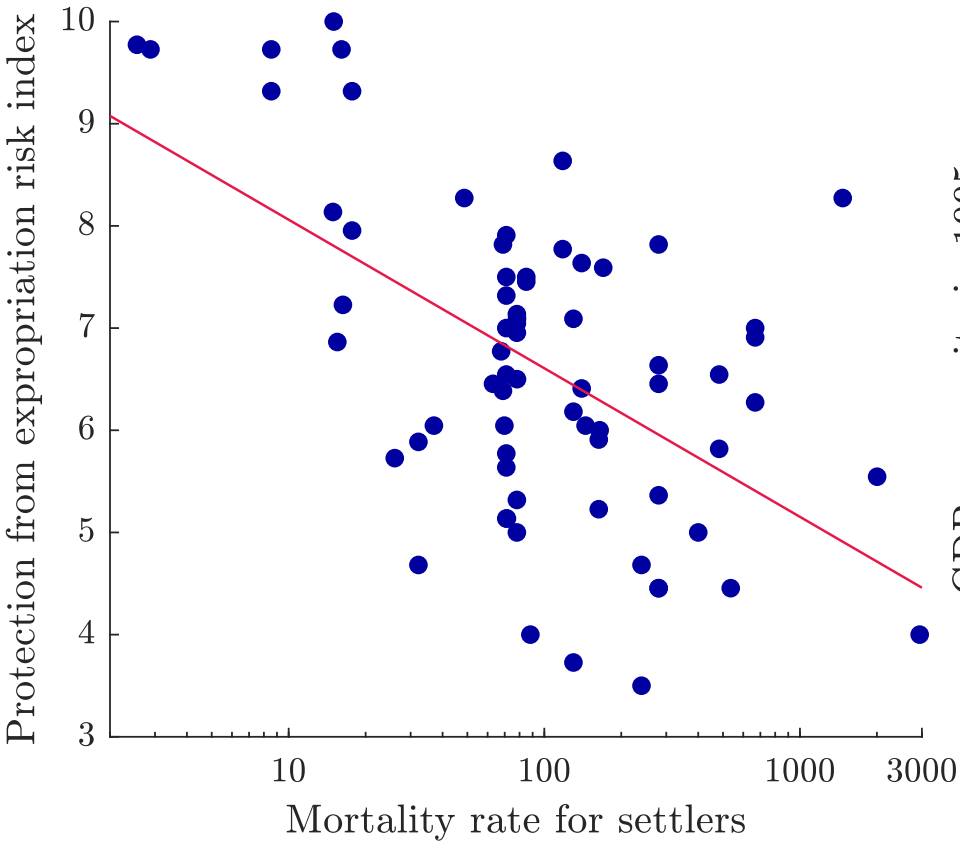
Correlation

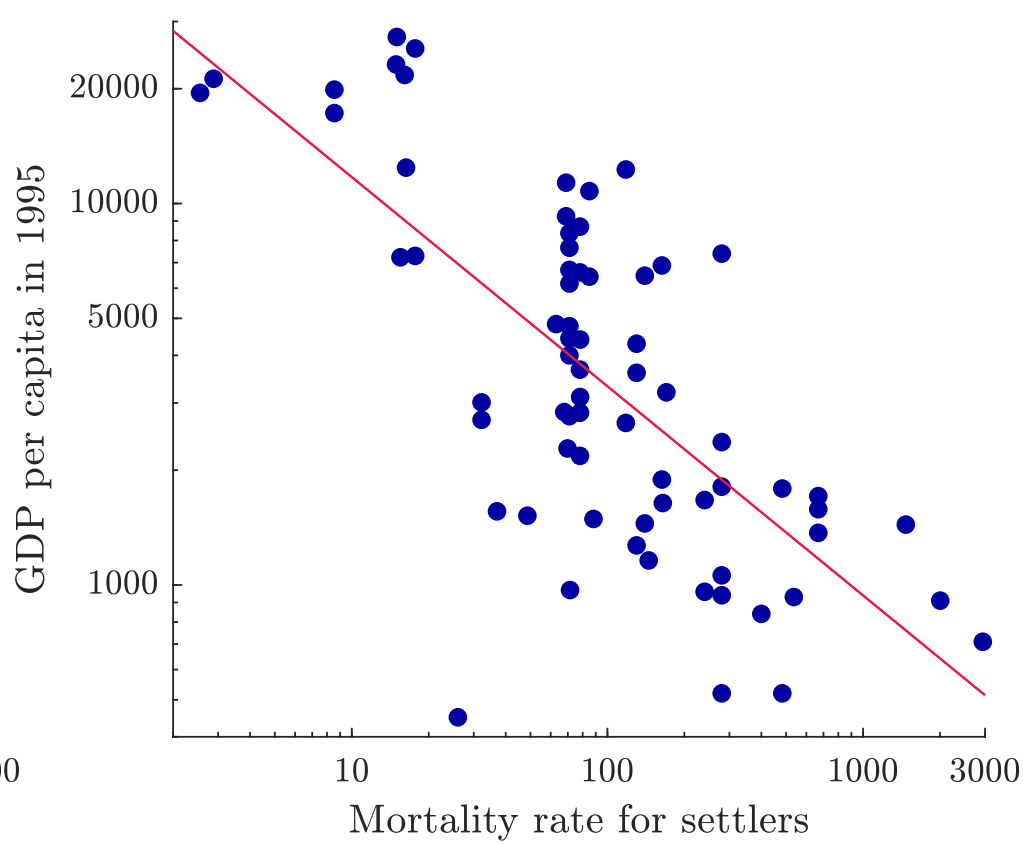


Causality?

- Good institutions cause growth or growth causes good institutions?
- Acemoglu, Johnson, and Robinson (AER 2001) argued they could use the "long hand of history" to sort this out.
- Idea: European colonists set up two very different regimes:
  1. "Extractive states": take natural resources and run (e.g. Congo).
  2. "Neo-Europes": replicate European institutions to produce permanent settlements (e.g. U.S., Australia, New Zealand, Canada).
- Key determinant was feasibility: where diseases such as malaria killed settlers, extractive states emerged.
- Key assumptions:
  1. Relevance: institutions persist.
  2. Exclusion: mortality risk at time of colonization related to income today only through the impact on institutions.

Evidence


Protection from expropriation risk index
10
9
8
7
6
5
4
3
10
100
1000
3000
Mortality rate for settlers


GDP per capita in 1995
20000
10000
5000
1000
10
100
1000
3000
Mortality rate for settlers

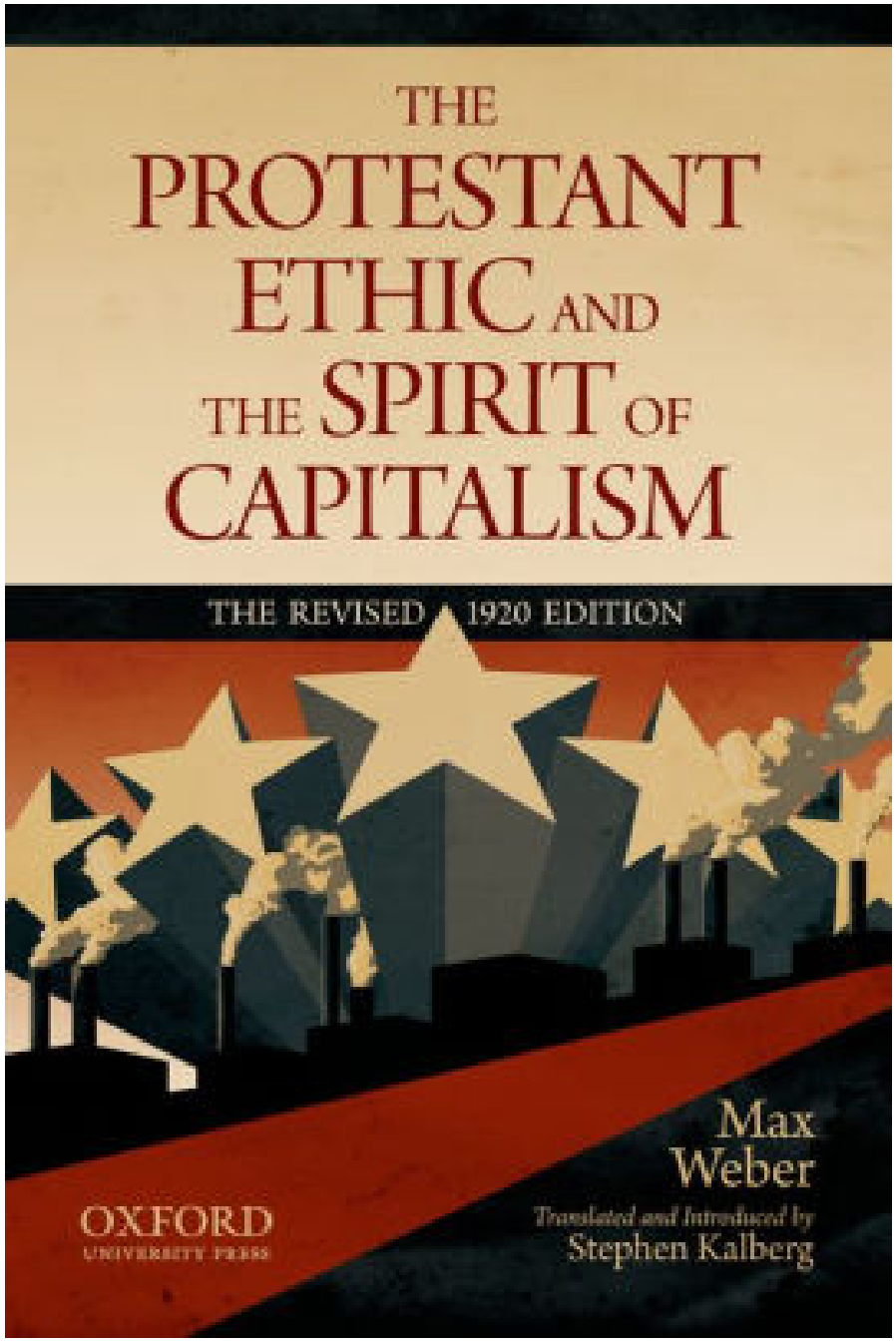
Evaluation

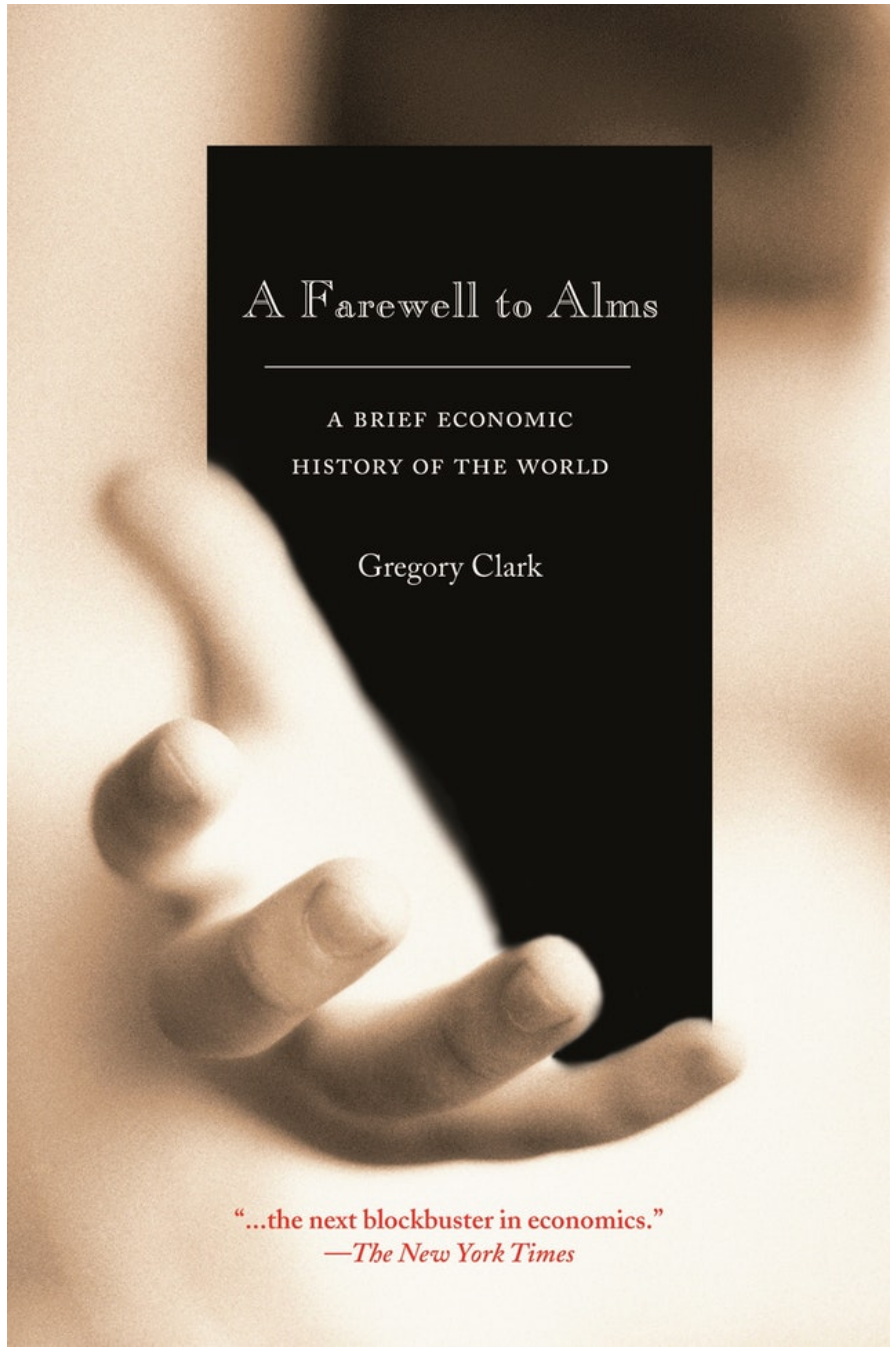
- Extremely influential theory and evidence.
- "Explains" geography: AJR find that geography no longer a significant determinant of income once institutions are accounted for.
- Pushback: Albouy (AER 2012) questions settler mortality data in AJR.
- Pushback: other reasons diseased areas in 1800s correlated with income today?
- Establishing causality is hard!

Legal origins: La Porta, Lopez-de-Silanes, Shleifer, Vishny (JPE 1998)

This paper examines legal rules covering protection of corporate shareholders and creditors, the origin of these rules, and the quality of their enforcement in 49 countries. The results show that common-law countries generally have the strongest, and french civil law countries the weakest, legal protections of investors, with German and Scandinavin civil law countries located in the middle. We also find that concentration of ownership of shares in the largest public companies is negatively related to investor protections, consistent with the hypothesis that small, diversified share-holders are unlikely to be important in countries that fail to protect their rights.

Outline


THE
PROTESTANT
ETHIC AND
THE SPIRIT OF
CAPITALISM
THE REVISED 1920 EDITION
Max
Weber
Translated and Introduced by
Stephen Kalberg
OXFORD
UNIVERSITY PRESS


A Farewell to Alms
A BRIEF ECONOMIC
HISTORY OF THE WORLD
Gregory Clark
"...the next blockbuster in economics."
—The New York Times

Gregory Clark (author "Farewell to Alms")

Most economists think English political institutions ensuring free markets and individual incentives caused the Industrial Revolution. Consequently efforts to aid areas like sub-Saharan Africa, with living standards now BELOW those of the Stone Age, have focused on getting them "good" institutions...
England in 1800 had economic incentives. But medieval England in 1300 was even more incentivized. Ancient Babylon in 2,000 BC likely had all the incentives economists think guarantee growth. None of these earlier societies had an Industrial Revolution. Between 1857 and 1947 the British provided India with economic institutions Margaret Thatcher would have been proud of. The result? India de-industrialized under the Raj.

What does culture mean?

- Value of work.
- Value of education.
- Gender equality.
- Causality especially difficult, since culture especially mutable.

Outline

Overview

- Dismal interpretation of the preceding: economists have little idea what actually makes countries rich.
- It's a hard problem!
  - Rich and poor countries different along many dimensions.
  - Can't do randomized control trials (RCTs) of national policies.
- Alternative approach: focus on improving peoples' lives (welfare) directly, rather than increasing incomes.
- Can do RCTs of these policies since they affect people directly.
- 2019 Nobel Prize awarded to Abhijit Banerjee, Esther Duflo, and Michael Kremer for bringing RCTs to development.
- Note: even if you accept dismal interpretation, still important to teach and research sources of income differences because potential gains from knowledge so large.

Example: malaria bed nets

- Malaria is mosquito-borne disease.
- Prevent mosquito bites $\Rightarrow$ prevent malaria.
- Mosquito bites preventable by sleeping under insecticide-treated bed net.
- Nets cost about \$6 to produce.
- Policy question: give nets away for free or charge small user cost?
- Advocates of small user cost ($< \$1$) argued would allocate nets to people who will actually use them and can fund further programs.

FREE DISTRIBUTION OR COST-SHARING? EVIDENCE FROM A RANDOMIZED MALARIA PREVENTION EXPERIMENT*

JESSICA COHEN AND PASCALINE DUPAS

It is often argued that cost-sharing—charging a subsidized, positive price—for a health product is necessary to avoid wasting resources on those who will not use or do not need the product. We explore this argument through a field experiment in Kenya, in which we randomized the price at which prenatal clinics could sell long-lasting antimalarial insecticide-treated bed nets (ITNs) to pregnant women. We find no evidence that cost-sharing reduces wastage on those who will not use the product: women who received free ITNs are not less likely to use them than those who paid subsidized positive prices. We also find no evidence that cost-sharing induces selection of women who need the net more: those who pay higher prices appear no sicker than the average prenatal client in the area in terms of measured anemia (an important indicator of malaria). Cost-sharing does, however, considerably dampen demand. We find that uptake drops by sixty percentage points when the price of ITNs increases from zero to \$0.60 (i.e., from 100% to 90% subsidy), a price still \$0.15 below the price at which ITNs are currently sold to pregnant women in Kenya. We combine our estimates in a cost-effectiveness analysis of the impact of ITN prices on child mortality that incorporates both private and social returns to ITN usage. Overall, our results suggest that free distribution of ITNs could save many more lives than cost-sharing programs have achieved so far, and, given the large positive externality associated with widespread usage of ITNs, would likely do so at a lesser cost per life saved.

malaria_poster.png