
The Global Economy

Sources of Economic Growth



Natural resources

- Good or bad for economic performance?
- Examples?
- Why?

2

Natural resources

- From Ethan Mandelup (edited)
 - My first thought is oil and the Middle East, where you see great wealth and also great disparity. But Iceland has abundant thermal energy and a stable economy.
- Does this sound right? Other thoughts?

3

Natural resources

- What we know
 - Countries with lots of resources do worse – on average
 - “Dutch disease,” “resource curse”
 - Abundant resources: Nigeria, Liberia, Middle East, Venezuela
 - Scarce resources: Japan, Switzerland
- Suggestions why
 - Primary: corruption
 - Secondary: government programs, exchange rate

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Wages

- Would you like to work in a high- or low-wage country?
 - Why? Why not?
- Would you open an office or factory in a high- or low-wage country?
 - Why? Why not?

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Roadmap

- Resources, wages ✓
- What’s happening?
- Reminders
- GDP per capita & GDP per worker
- Level comparisons
- Growth rates and growth accounting

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What's happening?

- From Stacy Xie, Shanghai in 1990 and 2010

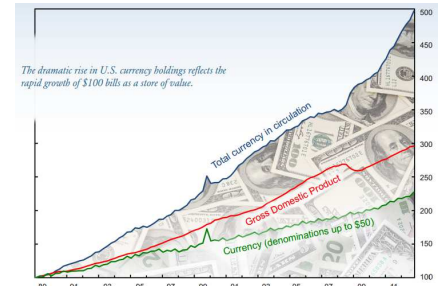


- Search "shanghai then now pictures"

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What's happening?

- From Lillian Pontius-Goldblatt



Source: SF Fed.

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What's happening?

- "The worst-managed economy?" *The Economist*, this week:
 - A big oil producer unable to pay its bills in an oil boom is a rare beast. Thanks to colossal mismanagement, that is exactly what Venezuela has become.
 - Unpaid bills and an over-valued exchange rate have produced shortages of food, medicine, and other basic supplies. Printing bolivares to pay bills has driven inflation over 60%. Even measuring inflation has become more difficult, as an estimated one-third of goods are not available.
- What's going on here? Why?

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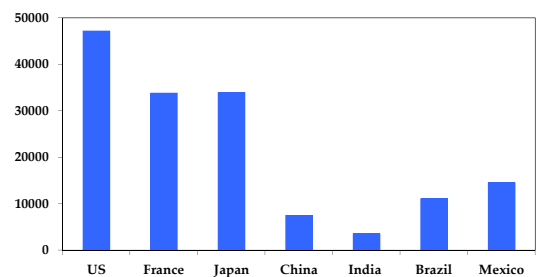
Reminders

Reminder: our perspective

- Last week
 - Output comes from inputs and productivity
 - Capital can't be the primary factor driving performance
- Today and next week
 - How is Country X doing? Why?
 - What's it like running a business there?

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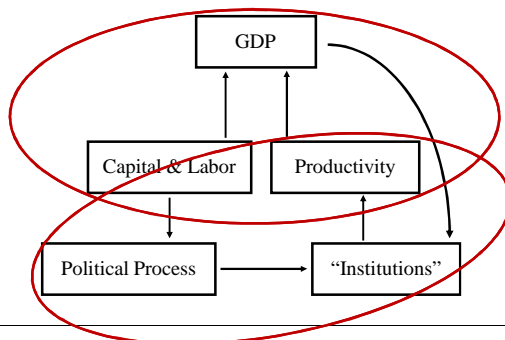
Reminder: GDP per capita (USD, PPP adj)



Source: World Bank, World Development Indicators

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Reminder: our plan



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Reminder: production function

- Production function

$$Y = A K^{\alpha} L^{1-\alpha}$$

[a formula in a spreadsheet]

- All together now: **what is α ?**

- Ingredients

- Y: real GDP (output)
- K: quantity of physical capital (plant and equipment)
- L: quantity of labor (number of workers)
- A: total factor productivity (TFP)
("productivity" for short)

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Level comparisons

GDP and GDP per worker

- Production function in per worker form

$$Y = A K^{\alpha} L^{1-\alpha}$$

$$Y/L = A (K/L)^{\alpha}$$

- Productivity (TFP) in per worker form

$$A = (Y/L)/(K/L)^{\alpha}$$

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GDP per capita and GDP per worker

- GDP per worker

$$Y = A K^{\alpha} L^{1-\alpha}$$

$$Y/L = A (K/L)^{\alpha}$$

- GDP per capita

$$Y/POP = (Y/L) (L/POP)$$

$$= A (K/L)^{\alpha} (L/POP)$$

- We'll focus on Y/L now, add L/POP next week
- Where do differences in Y/L come from?

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Data

- Penn World Table provides

- Y: real GDP (2009 USD)
- L: employment
- K: capital stock
- POP: population

- Comparable across countries, 1950-present
- Linked on course page

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Comparing output per worker

- Why do countries have different **output per worker**?
- GDP per worker

$$Y/L = A (K/L)^\alpha$$

- Comparison of countries 1 and 2

$$(Y/L)_1/(Y/L)_2 = (A_1/A_2) [(K/L)_1/(K/L)_2]^\alpha$$

- Bottom line: a clue to economic performance

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Level comparison: US & Mexico

- Why is Y/L larger in the US than Mexico (2010)?

	Y/L	K/L	A
Mexico	27.62	73.47	
US	82.36	220.89	
Ratio			
"Contribution"			

Numbers in bold are data, the others are computed
 "Contribution" means the K/L term has an exponent of 1/3

Mention "thousands" ²⁰

Level comparison: US & Mexico

- Why is Y/L larger in the US than Mexico (2010)?

	Y/L	K/L	A
Mexico	27.62	73.47	6.59
US	82.36	220.89	13.62
Ratio	0.34	0.33	0.48
"Contribution"	0.34	0.69	0.48

Numbers in bold are data, the others are computed
 "Contribution" means the K/L term has an exponent of 1/3

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Level comparison: China & India

- How do China and India compare (2010)?

	Y/L	K/L	A
China	11.93	28.61	3.90
India	9.01	18.18	3.43
Ratio	1.32	1.57	1.14
"Contribution"	1.32	1.16	1.14

Numbers in bold are data, the others are computed
 "Contribution" means the K/L term has an exponent of 1/3

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Growth rates & growth accounting

Growth rate review

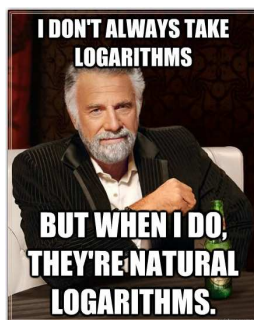
- Traditional growth rate g
 $(1+g)^n = x_{t+n}/x_t$
- Continuously-compounded growth rate γ
 $e^{n\gamma} = x_{t+n}/x_t$
- How to compute it (with "natural log" LN)

$$\gamma = [\ln(x_{t+n}) - \ln(x_t)]/n = \ln(x_{t+n}/x_t)/n$$

- See
 - "Math review"

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Natural logarithms



Source: John Cook's blog.

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Growth rate review

- Why are we inflicting this on you?
 - Builds character
 - Makes the calculations easier
 - Continuous compounding eliminates the dreaded cross terms we get with interest rates and growth rates: $(1+g)^2$ vs $\exp(2g)$
- Do I really need to do this?
 - Yes
 - Really

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Growth accounting

- Why differences in growth in output per worker?
- Production function

$$Y/L = A (K/L)^\alpha$$

- Additive in growth rates

$$\gamma_{Y/L} = \gamma_A + \alpha \gamma_{K/L}$$

$[\gamma_x$ means "growth rate of X"]

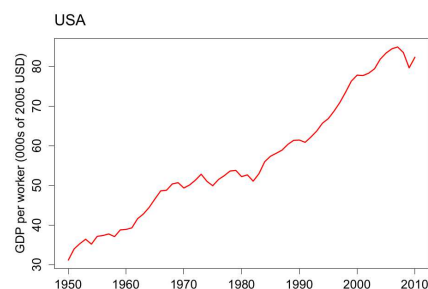
$\gamma_{K/L}$ is growth rate of K/L.

$\alpha \gamma_{K/L}$ is "contribution" to growth

- Bottom line: a clue to economic performance

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What happened in the US?



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What happened in the US?

$$\gamma_{Y/L} = \gamma_A + \alpha \gamma_{K/L}$$

	Y/L	K/L	A
1950	31.18	57.75	
2010	82.36	220.89	
Growth rate (annual %)			
Contribution to growth			

Numbers in bold are data, the rest are computed
 "Contribution" means we multiply $\gamma_{K/L}$ by 1/3

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What happened in the US?

$$\gamma_{Y/L} = \gamma_A + \alpha \gamma_{K/L}$$

	Y/L	K/L	A
1950	31.18	57.75	8.07
2010	82.36	220.89	13.62
Growth rate (annual %)	1.62	2.24	0.87
Contribution to growth	1.62	0.75	0.87

Numbers in bold are data, the rest are computed
 "Contribution" means we multiply $\gamma_{K/L}$ by 1/3

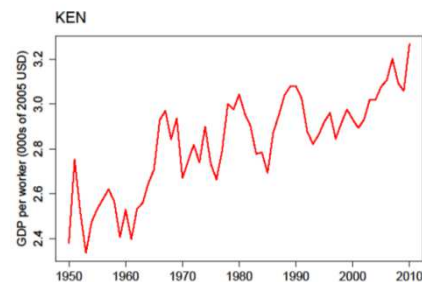
30

What happened in the US?

- World Economic Forum
 - While many structural features continue to make its economy extremely productive, a number of escalating weaknesses have lowered the US ranking. Compared to last year, **polymaking is less transparent** (ranked 50th of 141 countries) and **regulation more burdensome** (58th). Lack of macroeconomic stability continues to be the greatest area of weakness (90th), particularly repeated **fiscal deficits** and burgeoning levels of **public debt**.
- Does this sound right to you?

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What happened in Kenya?



32

What happened in Kenya?

$$\gamma_{Y/L} = \gamma_A + \alpha \gamma_{K/L}$$

	Y/L	K/L	A
1990	2.38	5.02	1.39
2010	3.27	4.98	1.91
Growth rate (annual %)	0.53	(0.02)	0.54
Contribution to growth	0.53	(0.01)	0.54

Numbers in bold are data, the rest are computed
 "Contribution" means we multiply $\gamma_{K/L}$ by 1/3

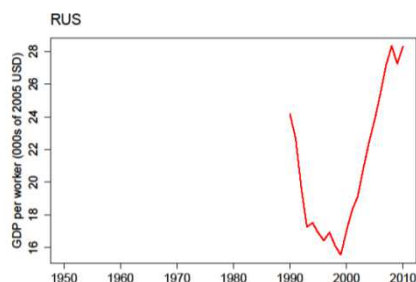
33

What happened in Kenya?

- World Economic Forum
 - Kenya moves up six places to 90th, including improvement in **market efficiency**. Its economy is supported by **financial markets** that are well developed (up by seven places to 24th position), an **efficient labor market** (25th), and an increasingly **efficient goods market** (62nd).
 - With a new constitution in 2010, Kenya has registered improvements in "institutions" and is now 78th, up from 123rd five years ago. This is largely **more efficient government and reduced corruption**. The country's **education** system gets relatively good marks.
- Does this sound right to you?

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What happened in Russia?



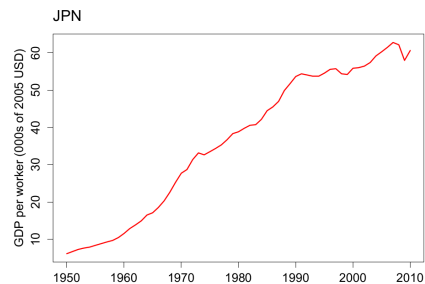
35

What happened in Russia?

- World Economic Forum
 - The Russian economy continues to face challenges. Russia's weak and inefficient institutional framework (97th) remains its Achilles heel and will require a major overhaul in order to eradicate **corruption and favoritism** (92nd) and re-establish trust in the independence of the judiciary (109th). Strengths include an **educated population**.
- Does this sound right to you?

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What happened in Japan?



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What happened in Japan?

	Y/L	K/L	A
1950	6.14	8.11	3.06
1990	53.67	152.84	10.04
2010	60.64	244.34	9.70
Contribution, 1950-1990	5.42	2.45	2.97
Contribution, 1990-2010	0.61	0.78	(0.17)

Numbers in bold are data, the rest are computed

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What happened in Japan?

- Huge success story
- Capital played larger role than in US
- 1990s malaise
 - Widespread financial crisis
 - Many banks insolvent but allowed to linger ("Zombies")
 - Massive stimulus program to little evident effect
- Challenging demographics
- Lessons?

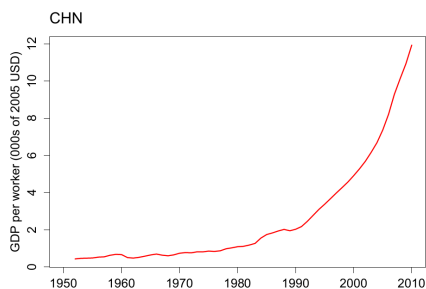
39

What happened in Japan?

- World Economic Forum
 - Japan continues to enjoy a major competitive edge in **business sophistication** and innovation. Overall competitive performance, however, continues to be dragged down by severe macroeconomic weaknesses, with high **budget deficits** and the highest **public debt** levels in the entire sample.
- Does this sound right to you?

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What happened in China?



41

What happened in China?

	Y/L	K/L	A
1952	0.44	1.64	0.37
1978	0.98	3.04	0.68
2010	11.93	28.61	3.90
Contribution, 1952-1978	3.08	0.79	2.29
Contribution, 1978-2010	7.79	2.34	5.45

Numbers in bold are data, the rest are computed

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What happened in China?

- Modest reforms in late 1970s led to huge gains
- Ongoing development of market economy
- Economic structure remains unusual
 - “Socialism with Chinese characteristics”
 - Central role for Communist Party
 - Do banks lend to Party friends or good business?

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What happened in China?

- World Economic Forum
 - **China continues to lead the BRICs** by a wide margin. The ecosystem for entrepreneurship and innovation has improved, led by higher education and training.
 - The financial sector is fragile. **Access to loans** remains very difficult for a large number of firms. **Barriers to entry**, along with investment rules, greatly limit competition.
 - **Corruption** and low levels of **accountability** and transparency continue to weaken the institutional framework.
- Does this sound right to you?

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What happened in China?

- EIU Country Finance Report:
 - **China’s financial sector is large but immature**, with significant structural weaknesses. Risk-management techniques and the quality of bank lending have improved. However, the dominance of state-owned banks (the five large banks dominate the sector) suggests that savings are not used efficiently. Pressure from local governments means that lending decisions are still occasionally driven by **political factors**.
- Does this sound right to you?

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What have we learned?

- Production function is a clue about performance
 - Why output per worker differs across countries
 - Why countries grow
 - [Also a good source of exam questions]
- Productivity invariably central to good performance
- Up next: the foundations of high productivity

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After the break

	Y/L	K/L	A
1950	1.44	2.00	
1980	2.76	5.13	
2010	9.01	18.18	
Contribution, 1950-1980			
Contribution, 1980-2010			

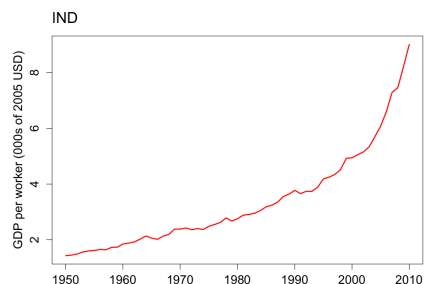
Fill in the blanks for India

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The Global Economy

Institutions

What happened in India?



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What happened in India?

	Y/L	K/L	A
1950	1.44	2.00	1.14
1980	2.76	5.13	1.60
2010	9.01	18.18	
Contribution, 1950-1980	2.18	1.05	1.13
Contribution, 1980-2010			

Why did India grow? Fill in the blanks.

50

What happened in India?

	Y/L	K/L	A
1950	1.44	2.00	1.14
1980	2.76	5.13	1.60
2010	9.01	18.18	3.43
Contribution, 1950-1980	2.18	1.05	1.13
Contribution, 1980-2010	3.94	1.41	2.53

Numbers in bold are data, the rest are computed

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What happened in India?

- British colony, independent 1947
- Slow growth before and after independence
- Active democracy
- British and successors built bureaucratic planned economy
- Modest liberalization under Rajiv Ghandi in 1980s
- More liberalization during 1990 crisis
- Dramatic improvement in economic performance

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What happened in India?

- World Economic Forum
 - The country's supply of **infrastructure** remains largely insufficient. In **health and education**, quality remains a concern. Discontent in the business community about the inability of the government to provide a more conducive environment for business has been growing. **Corruption** (99th) and **burdensome regulation** (96th) fuel this discontent. Despite these considerable challenges, India has a well-developed and **sophisticated financial market**.
- Does this sound right to you?

53

What happened in India?

- EIU, Country Finance Report:
 - **India is a difficult operating environment** for foreign companies. Most economic activities are girded with restrictions, public services and infrastructure are poor, and the government continues to impede the free flow of capital across its borders. **Tax rates are high** and the tax system is complicated.
- Does this sound right to you?

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Roadmap

- What happened in India? ✓
- Problem Set #1
- Nineteenth-century ocean shipping
- Institutions
- Measuring institutional quality
- What is this?

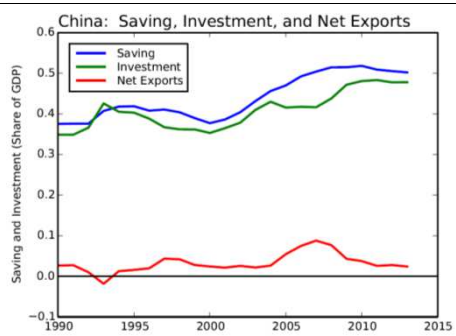
55

Problem Set #1

- Answers will be posted after Saturday's class
- When you look at the figure for Question 3
 - Which way is “capital” flowing – in or out of China?
 - What does this mean?

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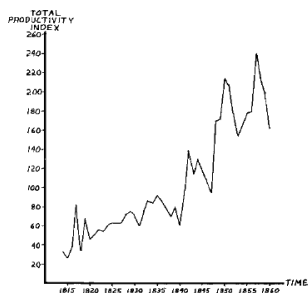
Problem Set #1



57

Nineteenth-century ocean shipping

Ocean shipping



Source: Douglas North, Journal of Political Economy, 1968.

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Ocean shipping

- Massive improvements in productivity
- Why?

60

Ocean shipping

- What's the takeaway?
- Productivity is in the environment, not the individual
- Steve Jobs?
- Immigration?
- Who are the pirates today?
In the US? In Mexico? In India? Elsewhere?

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Institutions

What are "institutions"?

- Social mechanisms that facilitate economic performance
- Good institutions favor production over piracy
- Like what?
- What's important in your business or industry?

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Institutions: categories

- **Governance**
- **Rule of law**
- Clearly defined **property rights**
- Open, honest, **competitive markets**
- Overall: **consistency** over time

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Institutions

- **Governance**
 - Governments should be strong enough to deliver security and enforce rules
 - But not so strong that they rob their own citizens
 - They should facilitate economic performance, not hinder it [corruption and red tape are the opposite of this]

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Institutions

- James Madison, *Federalist Papers* 51 (1788):
 - If men were angels, no government would be necessary. If angels were to govern men, ... controls on government would [not] be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: **you must first enable the government to control the governed; and in the next place oblige it to control itself.**

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Institutions

- Old Soviet joke:
 - Here's how things work under Communism. We pretend to work, and they pretend to pay us.

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Institutions

- Old Czech joke (circa 1968):
 - The difference between capitalism and socialism? Under capitalism, Man oppresses Man. Under socialism it's exactly the opposite.

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Institutions

- Rule of law
 - Legal system must enforce the law
 - Honest police and judiciary

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Institutions

- Property rights
 - Should be clearly defined
 - And enforced

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Institutions

- Kenneth Arrow, "Gifts and exchange"
 - [A market] system must involve the concept of property. [But] property systems are not self-enforcing. The judges and police may indeed be paid, but the system itself would disappear if they were to sell their services and decisions. Thus the definition of property rights depends precisely on the lack of universality of private property.
- My take: without rule of law, property rights are meaningless

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Institutions

- Open, honest, competitive markets
 - Not "free" markets
 - Competitive, not monopolies
 - Free entry

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What is this?

Two questions

- Here's how the game works
- For each example, ask yourself
 - What institution is this?
 - Who are the pirates?
- Categories
 - Governance
 - Rule of law
 - Property rights
 - Competitive markets

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What is this?

- Sandeep Kohli, "Long live license Raj," *WSJ*, Feb 13 09:
 - When I set up restaurants in Dehli, I found the License Raj was alive and well. First, you need a "No Objection" certificate from the Fire Department. Then a Health license from the Municipal Corporation of Delhi. Then three different police clearances – one from the police station in the area where the restaurant is located, the next from the police station in the area where the restaurant manager lives, and then another one from the police licensing department. Next, you apply for Tourism & Excise licenses. Inspectors check out the premises and paste a notice at the restaurant inviting objections from the neighborhood regarding the sale of alcohol.

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What is this?

- From a student working for a NYC hospital:
 - All building projects must get the approval of three city agencies.
 - Almost everyone hires an expeditor, typically someone who used to work for the city and now helps you navigate the system.
 - The Buildings Department, in particular, has long history of corruption.
 - This adds an estimated 30-40% to construction costs from the permitting process alone, more if you count the extra time, effort, and delay to go through all this.

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What is this?

- Andrew Kramer, *New York Times*, May 16, 2006:
 - Mike Matthews, a sound-effects designer and one-time promoter of Jimi Hendrix, bought a moribund Russian factory and converted it to making vacuum tubes for high-end guitar amplifiers. Now he's facing a hostile takeover. A company called Russian Business Estates offered \$400k for his firm, which has a monthly turnover of \$600k. When Mr Matthews refused, **the electricity went off. Then he was accused of "security violations."**

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What is this?

- Argentina in 2008 (*WSJ*, Oct 28 08)
 - Argentina's government pressed forward with its controversial plan to **nationalize private pension plans**. President Fernandez de Kirchner said her move is designed to protect private pension funds from mismanagement amid the global financial crisis.

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What is this?

- Hernando de Soto, *The Other Path*
- Researchers tried to set up a factory in Lima – legally
 - Steps required: 11
 - Time: 289 days
 - Bribes requested: 10 (2 paid)
 - Cost: \$1,231 (32 times the monthly min wage)

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What is this?

- Tesla Motors
 - Tesla Motors sells high-end electric cars direct to the consumer. But North Carolina's car dealers have proposed a law prohibiting sales except through car dealers. Robert Glaser, president of the N.C. Automobile Dealers Association, comments: "The whole point of the system is to protect the consumer."

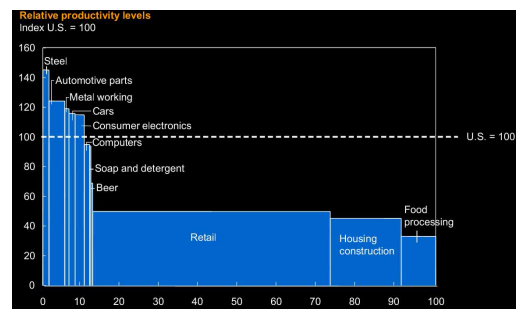
80

What is this?

- Bill Lewis, McKinsey, *The Power of Productivity*
 - The Japan we see the small farmer, the small shopkeeper, and the small milk plant. But small isn't beautiful, it's inefficient and unproductive. A string of land restrictions, tax policies, loan subsidies, and regulations prop up the small while stifling the enterprising and efficient. As a result, **Japan is 40% more productive than the US in autos but 50% less productive in retail.**

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What happened in Japan?



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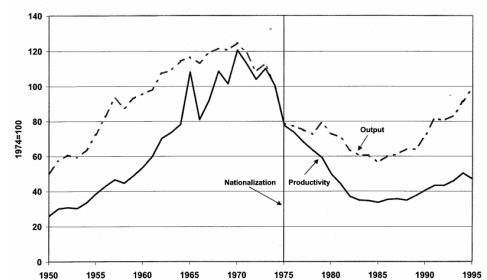
What is this?

- World Economic Forum on Mexico
 - There is a **lack of competition in some key strategic sectors**, which spills over into most sectors of the economy.

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What is this?

Figure 11. Output and Labor Productivity of the Petroleum Industry in Venezuela (1950-1997)

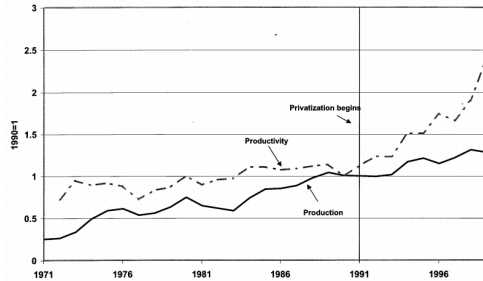


Source: Cole, Ohanian, Rascos, and Schmitz, "Latin America in the rearview mirror."

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What is this?

Figure 16. Production and Productivity Brazilian Iron-Ore Industry, 1971-97



Source: Cole, Ohanian, Rascos, and Schmitz, "Latin America in the rearview mirror."

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What is this?

- What examples come to mind?
- Any specifically relevant to your business?

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Measuring institutional quality

Measuring institutional quality

- Bill Gates
 - I have been struck by how important measurement is to improving the human condition. You can achieve incredible progress if you set a clear goal and find a measure that will drive progress toward that goal.
- Lots of measures now available
 - Attempts to quantify institutional features of the economic and business environment
 - See links on resource page

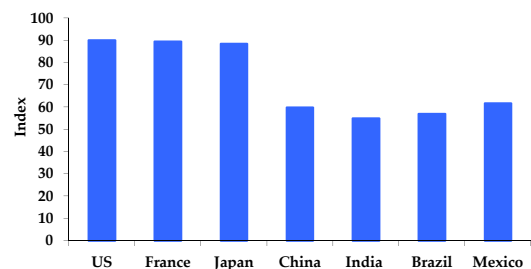
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Measures of institutional quality

- Good sources
 - World Bank, *World Governance Indicators*
 - World Bank, *Doing Business*
 - Transparency International, corruption indexes
- Useful aggregators
 - Economist Intelligence Unit, various reports
 - World Economic Forum, *Global Competitiveness Report*
- Links to these and more on the "resources" page

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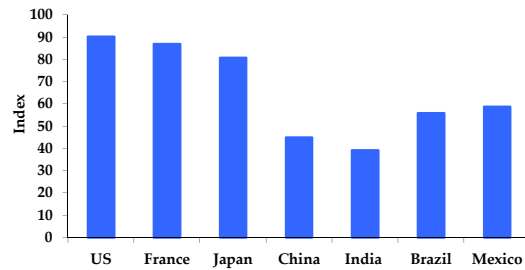
Government effectiveness



Source: World Bank, Governance Indicators.

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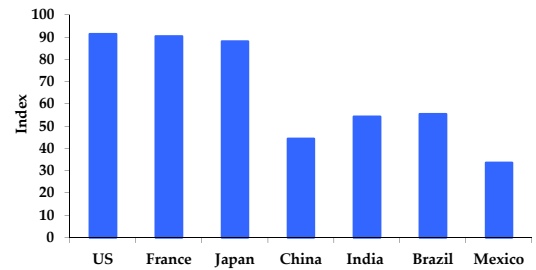
Regulatory quality



Source: World Bank, Governance Indicators.

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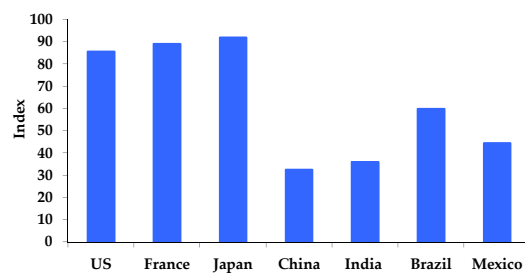
Rule of law



Source: World Bank, Governance Indicators.

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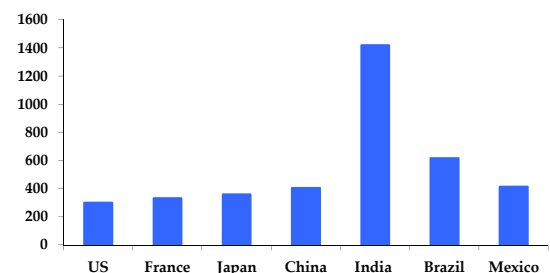
Control of corruption



Source: World Bank, Governance Indicators.

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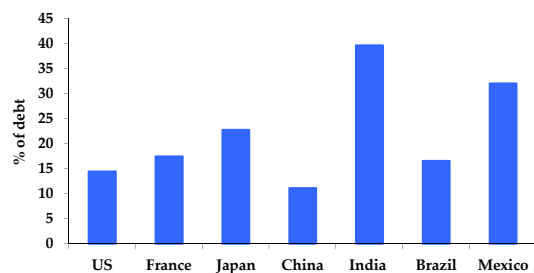
Days to enforce a contract



Source: World Bank, Doing Business.

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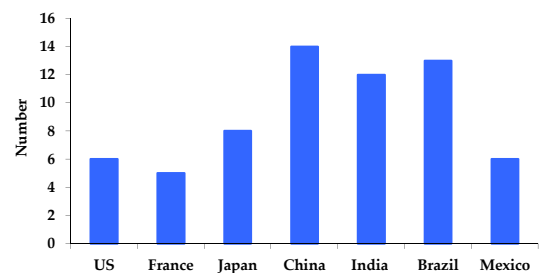
Cost of enforcing a contract



Source: World Bank, Doing Business.

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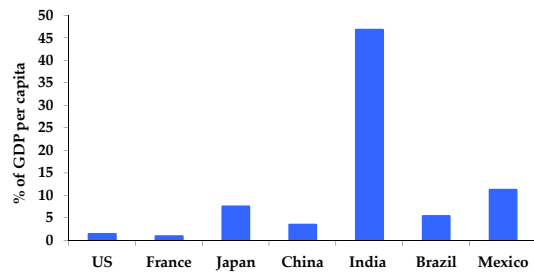
Procedures required to start a business



Source: World Bank, Doing Business.

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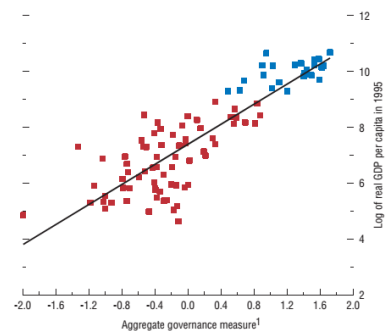
Cost of starting a business



Source: World Bank, Doing Business.

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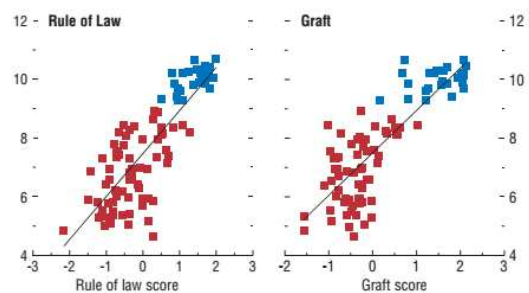
Institutions and performance



Source: IMF, WEO, 2003.

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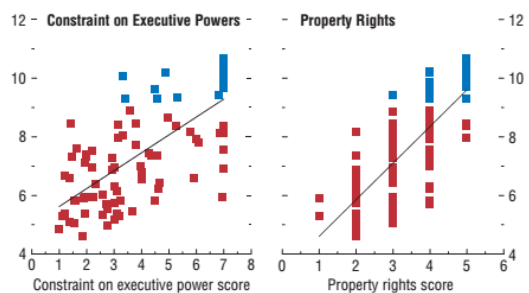
Institutions and performance



Source: IMF, WEO, 2003.

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Institutions and performance



Source: IMF, WEO, 2003.

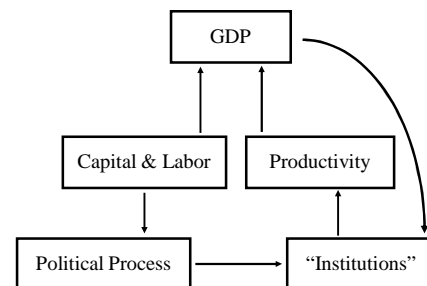
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Summing up

- Why is China growing so rapidly?
- India? Mexico? Others?
- Answer so far
 - Productivity
 - Good institutions
- Translation
 - Bad institutions raise cost of doing business, lower productivity

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Summary



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What have we learned?

- Good institutions support productivity and economic performance
- A short list includes
 - Governance
 - Rule of law
 - Property rights
 - Competitive markets
- We have measures of most of these things
- Macroeconomic policies matter, too [later]

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Problems

- Problem Set A
 - Will not be collected, but good practice
- Problem Set #2
 - Due in two weeks, mostly doable now

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For the ride home

- James Surowiecki, *New Yorker*, June 10, 2010
 - Regulation isn't an obstacle to thriving markets, it's a vital part of them.
- Tim Harford, *Undercover Economist*, September 2014
 - Just because a problem exists does not mean a new regulation will solve it. Policymaking is flawed and crude while the world is subtle and unpredictable. That is why regulations have a tendency to backfire.
- Do you agree or disagree? Which one? Bring examples to class

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