

The Global Economy

Sources of Growth

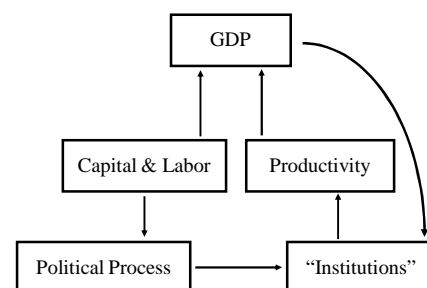
Roadmap

- In the news
- Reminders
- GDP per capita, GDP per worker, and data on both
- Level comparisons
- Growth rates and growth accounting

In the news

- “Reform in China,” *WSJ*, Feb 23, 2012, via Ming Dong:
 - “China 2030,” a report set to be released Monday by the World Bank and a Chinese government think tank, argues that **China should implement deep reforms**, including scaling back its vast state-owned enterprises and making them operate more like commercial firms. It also urges China to overhaul local government finances and promote competition and entrepreneurship.

Reminder: our plan



Reminder: production function

- Production function

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

[a formula in a spreadsheet]

- 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)

Reminder: productivity

- Production function in per worker form

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

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

- Productivity

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

- What is α ?

GDP per capita and per worker

- GDP per worker

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

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

- GDP per capita

$$\begin{aligned} Y/POP &= (Y/L) (L/POP) \\ &= A (K/L)^\alpha (L/POP) \end{aligned}$$

- Where do differences come from?

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Data

- Penn World Tables provides
 - Y: real GDP (2005 USD)
 - L: employment
 - Pop: population
 - I: investment
- We compute
 - K: capital stock
 - How? Perpetual inventory method using I
- Comparable across countries, 1950-2007

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Level comparisons

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 (2007)?

	Y/L	K/L	A
US	84.34	274.59	
Mexico	26.91	86.59	
Ratio			
"Contribution"			

Numbers in bold are data, what are the others?

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Level comparison: US & Mexico

- Why is Y/L larger in the US than Mexico (2007)?

	Y/L	K/L	A
US	84.34	274.59	12.98
Mexico	26.91	86.59	6.08
Ratio	3.13	3.17	2.13
"Contribution"	3.13	1.47	2.13

Numbers in bold are data, the others are computed

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Level comparison: China & India

- How do China and India compare?

	Y/L	K/L	A
China	13.20	30.98	
India	9.61	17.49	
Ratio			
"Contribution"			

Numbers in bold are data, what are the others?

13

Level comparison: China & India

- How do China and India compare?

	Y/L	K/L	A
China	13.20	30.98	4.20
India	9.61	17.49	3.70
Ratio	1.37	1.77	1.14
"Contribution"	1.37	1.21	1.14

Numbers in bold are data, the others are computed

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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

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

- See

– "Math review" and "Sources of growth"

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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**

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

[γ_X means "growth rate of X"]

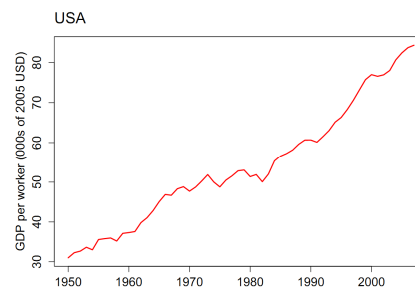
$\gamma_{K/L}$ is growth rate of K/L

$\alpha \gamma_{K/L}$ 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	30.99	82.83	
2007	84.34	274.59	
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	30.99	82.83	7.11
2007	84.34	274.59	12.98
Growth rate (annual %)	1.76	2.10	1.06
Contribution to growth	1.76	0.70	1.06

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

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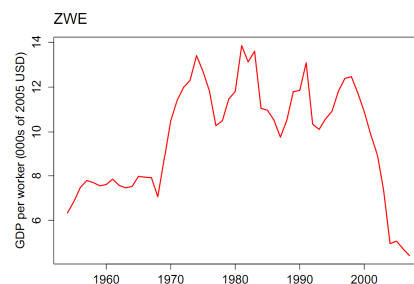
What happened in the US?

- 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, policymaking is felt by business to be 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 indebtedness.

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What happened in Zimbabwe?



22

What happened in Zimbabwe?

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

	Y/L	K/L	A
1998	12.47	34.17	
2007	4.42	26.51	
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 Zimbabwe?

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

	Y/L	K/L	A
1998	12.47	34.17	3.84
2007	4.42	26.51	1.48
Growth rate (annual %)	(11.52)	(2.83)	(10.58)
Contribution to growth	(11.52)	(0.94)	(10.58)

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 Zimbabwe?

- Fertile farm land with abundant resources
- History
 - European immigration in late 19th century
 - British colony 1888-1965
 - Independent 1980
 - Led by Robert Mugabe since then
 - 1997 “land reform” led to sharp drop in agricultural output, loss of tax revenue, hyperinflation, economic chaos

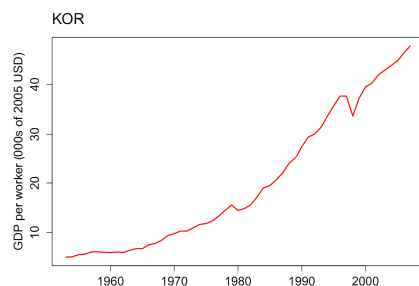
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What happened in Zimbabwe?

- World Economic Forum
 - Zimbabwe tentatively reverses its adverse trend. The assessment of public institutions, while still weak, has improved measurably, increasing from 125th two years ago to 107th. Specific areas of improvement are ethics and corruption and government inefficiency, although significant room for improvement remains. On the other hand, major concerns linger with regard to the protection of property rights, where Zimbabwe is second-to-last.

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What happened in Korea?



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What happened in Korea?

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

	Y/L	K/L	A
1953	5.03	7.68	2.55
2007	47.72	210.43	8.02
Growth rate (annual %)	4.25	6.05	2.16
Contribution to growth	4.25	2.08	2.16

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 Korea?

- Huge economic success
- Characteristics
 - Massive early investments from US
 - Strong government role in the economy early on
 - Encouraged large conglomerates (“chaebols”)
 - Greater role for investment than we see in US
- Which of these matters?

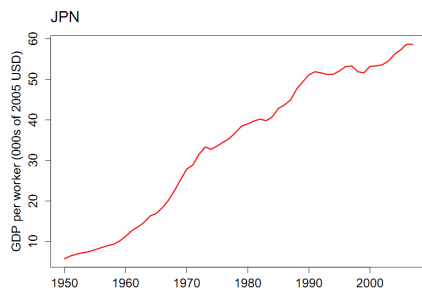
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What happened in Korea?

- World Economic Forum
 - Korea’s performance is very uneven. The country’s outstanding infrastructure (9th) and stable macroeconomic environment (6th) are among its key competitive strengths. Furthermore, education is accessible and of high quality. On the other hand, considerable room for improvement remains with respect to the quality of its institutions (65th) and its rigid labor market (76th), as well as its largely inefficient financial market (80th).

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What happened in Japan?



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What happened in Japan?

	Y/L	K/L	A
1950	5.82	7.67	2.95
1990	51.09	196.28	8.79
2007	58.60	273.71	9.03
Contribution, 1950-1990	5.43	2.70	2.73
Contribution, 1990-2007	0.81	0.28	0.15

Numbers in bold are data, the rest are computed

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What happened in Japan?

- Huge postwar 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 apparently failed
- Challenging demographics
- Lessons?

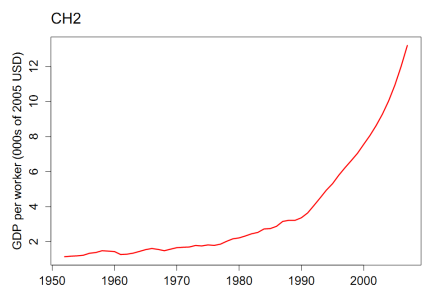
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What happened in Japan?

- 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.
 - Hmmmm....

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What happened in China?



35

What happened in China?

	Y/L	K/L	A
1952	1.14	1.95	0.91
1978	2.02	4.60	1.22
2007	13.20	30.98	4.20
Contribution, 1952-1978	2.20	1.10	1.10
Contribution, 1978-2007	6.47	2.45	4.28

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 support the Party or the business?

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What happened in China?

- World Economic Forum
 - China leads the BRICs by a significant margin. Challenges persist in the areas of corruption and judicial independence. Moreover, businesses feel that the country has become less safe, resulting in higher costs for protection. Finally, standards of business ethics and corporate accountability are below those found in a number of other economies. [There are also] poor results in financial market development.

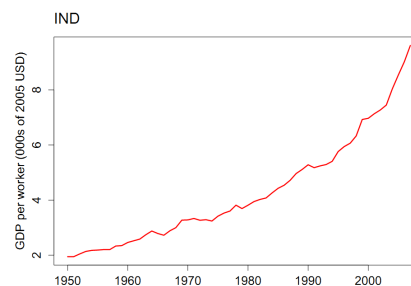
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What happened in China?

- 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.

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What happened in India?



40

What happened in India?

	Y/L	K/L	A
1950	1.95	1.70	1.63
1980	3.81	6.50	2.04
2007	9.61	17.49	3.70
Contribution, 1950-1980	2.58	1.72	0.86
Contribution, 1980-2007	3.19	1.14	2.05

Numbers in bold are data, the rest are computed

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What happened in India?

- British colony, independent 1947
- Active democracy
- British and successors built bureaucratic planned economy
- Modest liberalization under Rajiv Gandhi 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.

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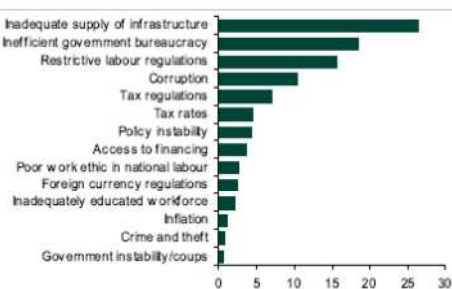
What happened in India?

- 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 relatively high and the tax system is complicated.

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What happened in India?

Figure 54. Main constraints on doing business in India*



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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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The Global Economy

Institutions

Roadmap

- Problem Set #1
- Productivity in nineteenth-century ocean shipping
- Institutions
- What is this?

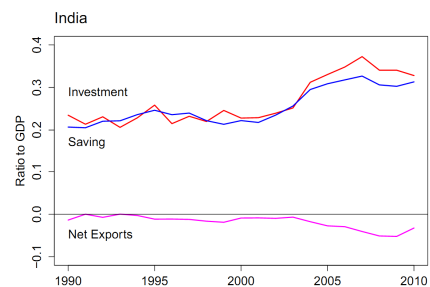
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Problem Set #1

- Answers will be posted Tuesday
- Figures from Question 3 follow
- Remaining question
 - Why are saving and investment rates so different?

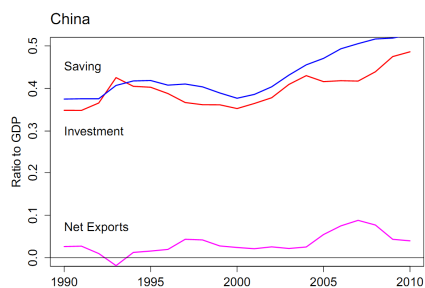
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Problem Set #1: India



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Problem Set #1: China



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Nineteenth-century ocean shipping

Ocean shipping

- Massive improvements in productivity
- Not due to technology
- Why?

53

Ocean shipping



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

54

Ocean shipping

- What's the takeaway?
- Productivity is in the environment, not the individual
- Steve Jobs? Immigration?

55

Institutions

What are "institutions"?

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

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Institutions

- **Governance**
- **Rule of law**
- Clearly defined **property rights**
- Open, honest, **competitive markets**

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Institutions

- **Governance**
 - Governments should be strong enough to deliver security and enforce rules
 - But not so strong that they can rob their own citizens
 - They should facilitate economic performance

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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, neither external nor internal controls on government would 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

63

Institutions

- Property rights
 - Should be clearly defined
 - And enforced

64

Institutions

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

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Measuring institutions

- Measures of institutional quality
 - Attempts to quantify inherently qualitative features of the economic and business environment
- Lord Kelvin
 - If you can't measure it, you can't improve it

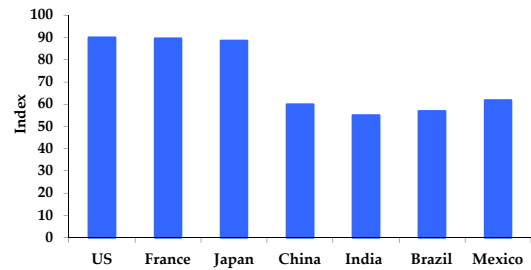
66

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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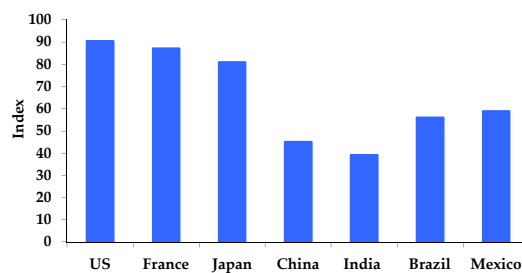
Government effectiveness



Source: World Bank, Governance Indicators.

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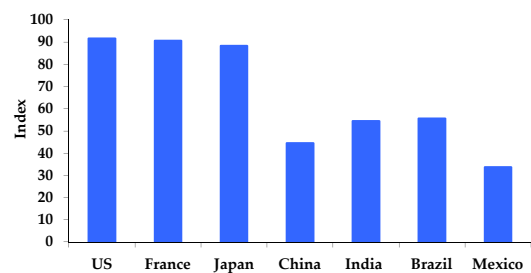
Regulatory quality



Source: World Bank, Governance Indicators.

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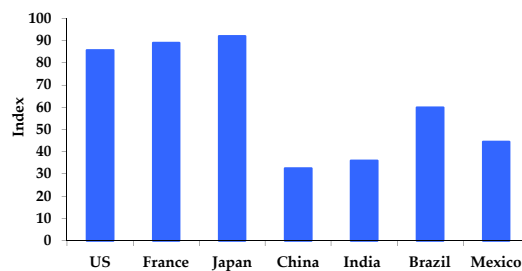
Rule of law



Source: World Bank, Governance Indicators.

70

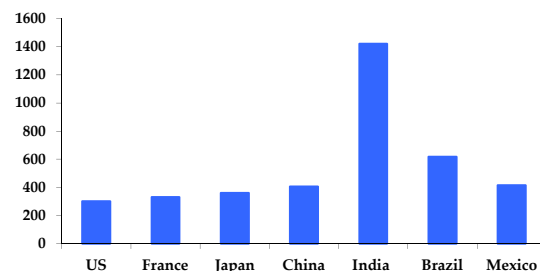
Control of corruption



Source: World Bank, Governance Indicators.

71

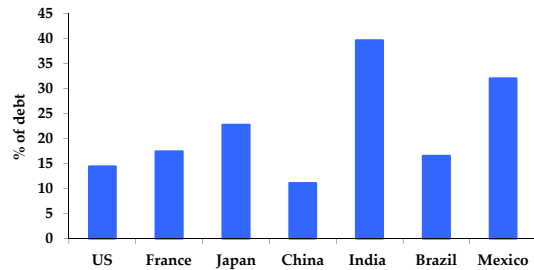
Days to enforce a contract



Source: World Bank, Doing Business.

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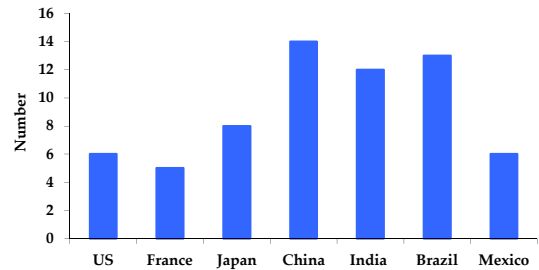
Cost of enforcing a contract



Source: World Bank, Doing Business.

73

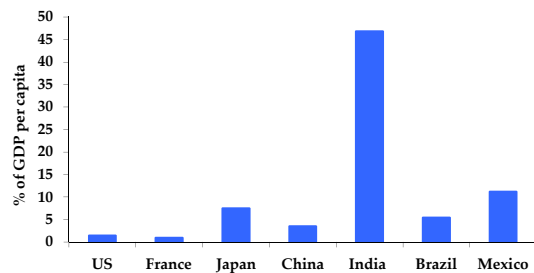
Procedures required to start a business



Source: World Bank, Doing Business.

74

Cost of starting a business



Source: World Bank, Doing Business.

75

What is this?

What is this?

- Rules of the game
 - Assess problem
 - Decide which institutions are involved
 - Bonus points: Who's the pirate?

77

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. That's followed by a Health license from the Municipal Corporation of Delhi. Then you need 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?

- 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?

- Bill Lewis, McKinsey, *The Power of Productivity*
 - The Japan we don't see is the small farmer, the small shopkeeper, and the small milk plant. 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.**

80

What is this?

- “Africa’s Singapore?” *The Economist*, Feb 25 2012, via Aaron Butler:
 - Rwanda is best known for the genocide of 1994. It has been peaceful since then, but lacks nearly all of Singapore’s advantages. Yet Rwanda has one huge advantage: the rule of law. No African country has done more to curb corruption. Transparency International reckons Rwanda is less graft-ridden than Greece or Italy. The country is blessedly free of red tape, too. Property rights are strengthening, as well—the government is giving peasants formal title to their land.

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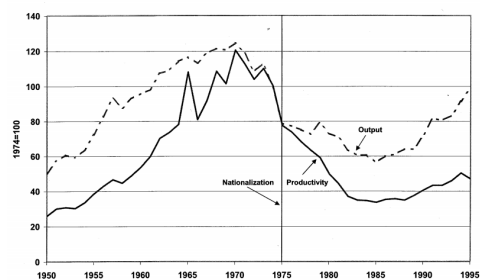
What is this?

- 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.”**

82

What is this?

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

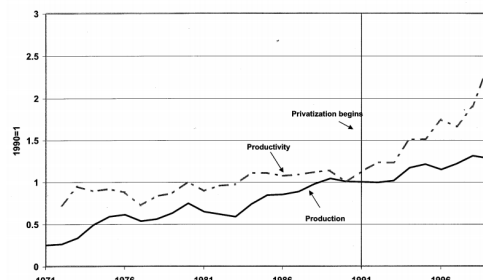


Source: Cole, Ohanian, Rascos, and Schmitz, “Latin America in the rearview mirror.”

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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?

- Cole et al, "Latin America in the rearview mirror":
 - In 1977, Brazil embarked on a zero-quota policy that meant that only PCs and minicomputers produced by Brazilian-owned firms could be sold in Brazil. Moreover, the black market was not a practical choice for large firms. The policy insulated Brazilian computer producers from foreign competition and featured entry barriers to new Brazilian producers through a maze of bureaucratic requirements. As a result, **computer prices were 70-100 percent above international prices.**

85

What is this?

- Carlos Slim in Mexico
 - Most reports see him as using influence with the Mexican government to eliminate competition in his businesses, including telecoms.
- Is this "capitalism"?

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What is this?

- Argentina in 2002
 - Facing inflation over 1000%, the government announced in 1991 that citizens could use dollars and pegged the peso to the dollar. A decade later, they forcibly converted dollar deposits to pesos ("pesification") and devalued 75%.

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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 Kirchner said her move is designed to protect private pension funds from mismanagement amid the global financial crisis.

88

What is this?

- Joe Nocera, NY Times, Aug 22 11:
 - In April, the National Labor Relations Board filed a complaint against Boeing, accusing it of opening its new non-union South Carolina plant to retaliate against the union, which has a history of striking at contract time. The NLRB's proposed solution is to move all its Dreamliner production back to Puget Sound.

89

What is this?

- David Leonhardt, NY Times, Nov 8 09:
 - When Intermountain standardized lung care for premature babies, it not only cut the number who went on a ventilator by more than 75 percent; it also reduced costs by hundreds of thousands of dollars a year. Perversely, Intermountain's revenues were reduced by even more. Thanks to the fee-for-service system, the hospital had been making money off substandard care. **By improving care it lost money.**

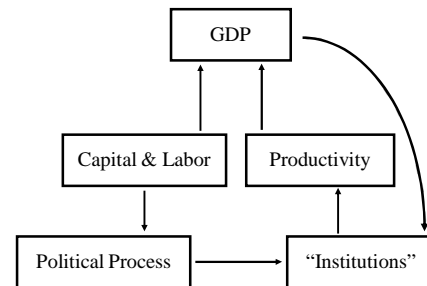
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What is this?

- What examples come to mind?

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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
- Macroeconomic policies matter, too [later]

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Something 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.
- Do you agree? Disagree? Both?
- Come to class next week with examples for discussion

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