

## The Global Economy

### *Sources of Growth*

## Roadmap

- Rules of engagement
- What's happening?
- Reminders
- GDP per capita, GDP per worker, and data on both
- Level comparisons
- Growth rates and growth accounting

## Rules of engagement

- Please contribute your thoughts
- Even – especially! – if you disagree
- And if you have expertise about a country we're discussing

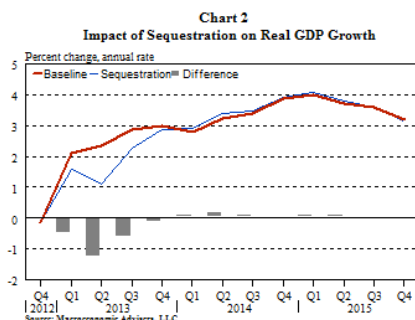
## What's happening?

- Sarah Palin on the sequester, Facebook, Feb 25, 2013:
  - If we are going to wet our proverbial pants over 0.3% in annual spending cuts when we're running up trillion dollar annual deficits, then we're done. Put a fork in us. We're finished. We're going to default eventually and that's why the feds are stockpiling bullets in case of civil unrest.
- Does this make sense to you? Which part?

## What's happening?

- Steven Avary sends this piece from Forbes:
  - President Barack Obama's first Chair of his Council of Economic Advisers (CEA) indicates the President's proposed tax increases would kill the economic recovery and throw nearly 1 million Americans out of work. Those are the extraordinary implications of academic research by Christina D. Romer.
- Does this make sense to you? Why or why not?

## What's happening?



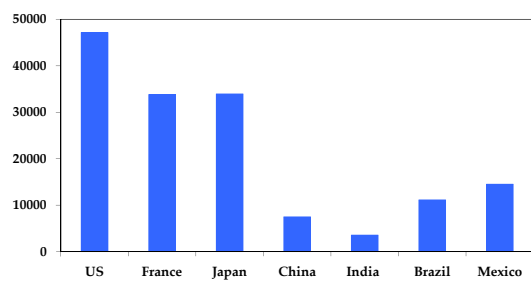
## What's happening?

- My take on Palin and the sequester
  - Modest short-term impact on the economy
  - Doesn't address long-term fiscal issues
  - In times of trouble, you need salt as well as bullets

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## Reminders

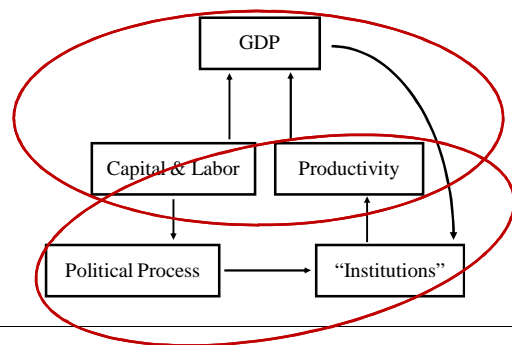
## Reminder: GDP per capita (USD, PPP adj)



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]

- Altogether now: what is  $\alpha$ ?
- 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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## Reminder: productivity

- Production function in per worker form

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

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

- Why use ratios?
- Productivity (TFP)

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

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## Level comparisons

## 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

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

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

- We'll focus on Y/L for now
- Where do differences come from?

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## Data

- Penn World Table provides
  - Y: real GDP (2005 USD)
  - L: employment
  - POP: population
  - I: investment
- We compute
  - K: capital stock
  - How? Perpetual inventory method using PWT investment
- Comparable across countries, 1950-2010
- 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	<b>27.62</b>	<b>73.47</b>	
US	<b>82.36</b>	<b>220.89</b>	
Ratio			
"Contribution"			

Numbers in bold are data, the others are computed

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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	<b>27.62</b>	<b>73.47</b>	6.59
US	<b>82.36</b>	<b>220.89</b>	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

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## Level comparison: China & India

- How do China and India compare?

	Y/L	K/L	A
China	<b>11.93</b>	<b>28.61</b>	3.90
India	<b>9.01</b>	<b>18.18</b>	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

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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  $\gamma$

$$e^{n\gamma} = x_{t+n}/x_t$$

- How to compute it (with "natural logs" LN)

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

- See

– "Math review" and "Sources of growth"

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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:  $(1+i)^2$

- 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  $x$ "]

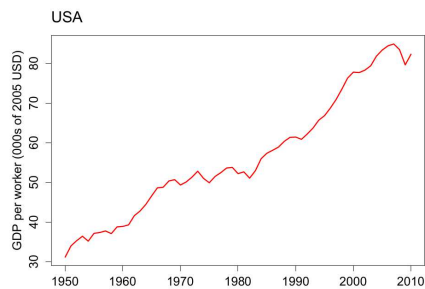
$\gamma_{K/L}$  is growth rate of  $K/L$

$\alpha \gamma_{K/L}$  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	<b>31.18</b>	<b>57.75</b>	8.07
2010	<b>82.36</b>	<b>220.89</b>	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

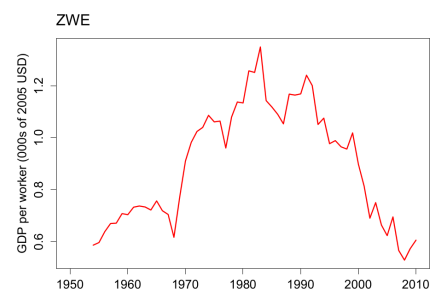
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## What happened in the US?

- 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?



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## What happened in Zimbabwe?

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

	Y/L	K/L	A
1990	<b>11.69</b>	<b>37.80</b>	3.48
2010	<b>6.06</b>	<b>37.78</b>	1.81
Growth rate (annual %)	(3.28)	(0.00)	(3.28)
Contribution to growth	(3.28)	(0.00)	(3.28)

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, abundant natural resources
- History
  - European immigration/colonization in late 19th century
  - British colony 1888-1965
  - Independent from 1980
  - Led by Robert Mugabe since then
  - 1997 "land reform" led to sharp drop in agricultural output, loss of tax revenue, hyperinflation, economic chaos
  - Now an opportunity?

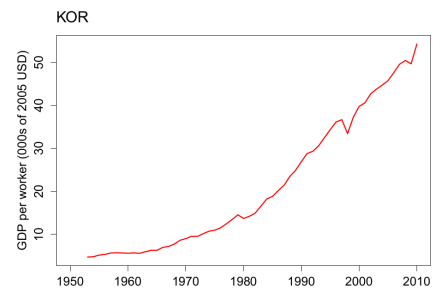
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## What happened in Zimbabwe?

- 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	<b>4.70</b>	<b>4.84</b>	2.78
2010	<b>54.32</b>	<b>189.64</b>	9.45
Growth rate (annual %)	4.29	6.44	2.15
Contribution to growth	4.29	2.15	2.15

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
  - Less advanced than the North prior to the Korean conflict
  - Massive 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?

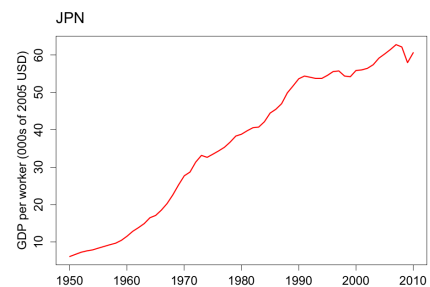
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## What happened in Korea?

- 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. 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	<b>6.14</b>	<b>8.11</b>	3.06
1990	<b>53.67</b>	<b>152.84</b>	10.04
2010	<b>60.64</b>	<b>244.34</b>	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?

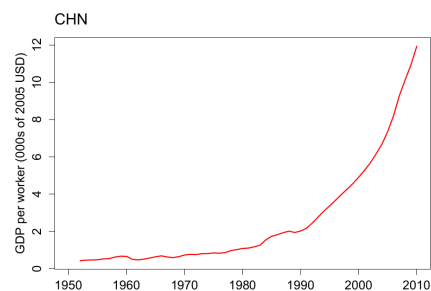
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## What happened in Japan?

- 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.

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## What happened in China?



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## What happened in China?

	Y/L	K/L	A
1952	<b>0.44</b>	<b>1.64</b>	0.37
1978	<b>0.98</b>	<b>3.04</b>	0.68
2010	<b>11.93</b>	<b>28.61</b>	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 support the Party or their business?

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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 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			

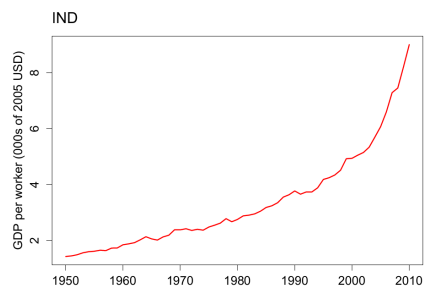
Fill in the blanks for India

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## The Global Economy *Institutions*

NYU STERN

## What happened in India?



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## What happened in India?

	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			

Why did India grow?

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## What happened in India?

	Y/L	K/L	A
1950	<b>1.44</b>	<b>2.00</b>	1.14
1980	<b>2.76</b>	<b>5.13</b>	1.60
2010	<b>9.01</b>	<b>18.18</b>	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
- 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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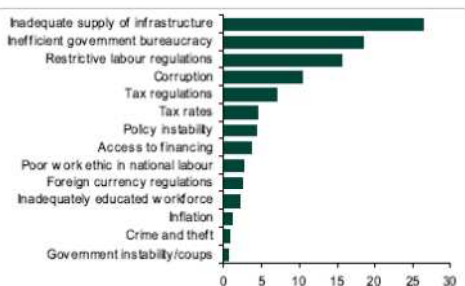
## What happened in India?

- 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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## Roadmap

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

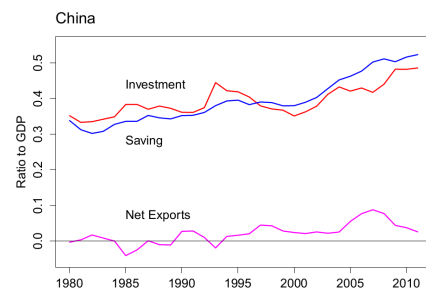
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## Problem Set #1

- Answers will be posted Tuesday
- When you look at the figure for Question 3 (over)
  - Which way is “capital” flowing – in or out of China?
  - How important are international capital flows to China?

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## Problem Set #1: China



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## Nineteenth-century ocean shipping

## Ocean shipping

- Massive improvements in productivity
- Why?

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## Ocean shipping



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

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## Ocean shipping

- What's the takeaway?
- Productivity is in the environment, not the individual
- Steve Jobs?
- Immigration?
- Who are the pirates of the modern world?

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## 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 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, ... 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

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- 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

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

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## Institutions

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- Property rights
  - Should be clearly defined
  - And enforced

---

69

## Institutions

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

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**What is this?**

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## Two questions

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- What institution is this?
- Who are the pirates?

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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. 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?

- From a student who 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.
  - All of 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?

- Car loans in Brazil
  - In 2000, the car loan market was dead: bad loans couldn't be enforced, courts wouldn't give lender title, so lenders simply didn't lend
  - Then: Brazil allowed lenders to give loans in exchange for title
  - Car loans boomed
  - Delinquencies, too

75

## 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?

- 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)

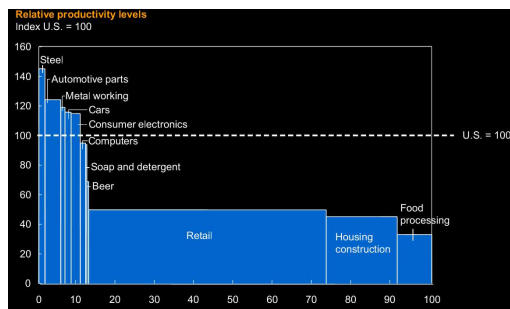
77

## 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?



79

## 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.

80

## What is this?

- Carlos Slim in Mexico
  - Many reports see him as using influence with the Mexican government to eliminate competition in his businesses, including telecoms.

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## What is this?

- "Oil reform in Mexico," FT, Feb 26, 2013
  - Legislators are expected to pass President Ernesto Pena Nieto's landmark energy reform, which would allow foreign investment in the state oil company Pemex. Analysts expect this to lead to foreign investment in the tens of billions of USD.

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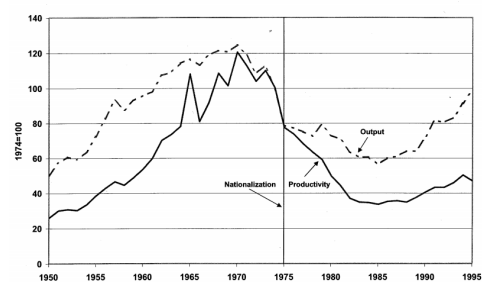
## What is this?



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## What is this?

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

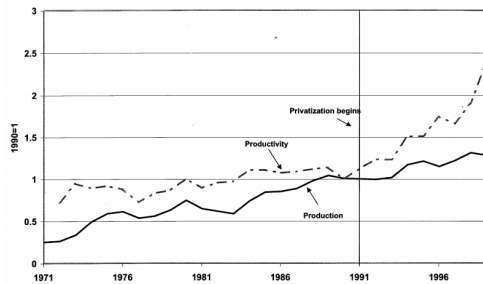


Source: Cole, Ohanian, Rascos, and Schmitz, "Latin America in the rearview mirror."

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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."

85

## 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.**

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## What is this?

- "Africa's Singapore?" *The Economist*, Feb 25 2012:
  - 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?

- 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?

- Argentina
  - 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.

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## 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.

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## What is this?

- The Economist, Nov 9 2012:
  - Michael Woodford was sacked as president of Japan's Olympus after he revealed a \$1.7b accounting cover-up. The company's board lied about the mystery. When the truth came out, the board kept their jobs and the boss lost his. Over the summer, a government advisory committee quietly squelched proposed reforms to corporate governance.

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## What's this?

- "Fiscal footnote," NYT, Jan 19, 2013:
  - Amgen scored a largely unnoticed coup: Lawmakers inserted a paragraph into the "fiscal cliff" bill that strongly favored one of its drugs. The language delays a set of Medicare price restraints on a class of drugs that includes [Amgen drug] Sensipar. It is projected to cost Medicare up to \$500 million.
  - Amgen has a small army of 74 lobbyists in the capital.

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## What is this?

- What examples come to mind?

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## Measuring institutional quality

## Measuring institutional quality

- Lord Kelvin
  - If you can't measure it, you can't improve it
- Lots of measures now available
  - Attempts to quantify inherently qualitative features of the economic and business environment
  - See links on resource page

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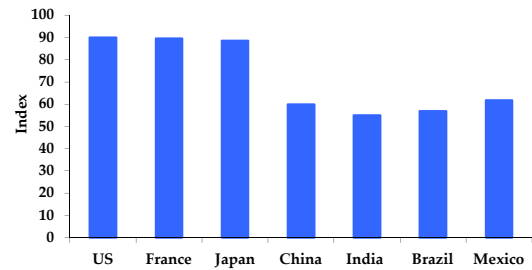


## Measures of institutional quality

- 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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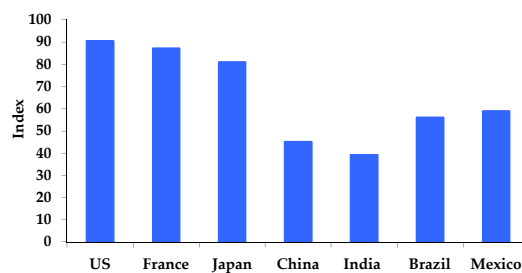
## Government effectiveness



Source: World Bank, Governance Indicators.

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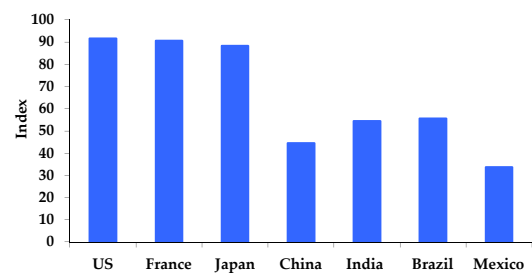
## Regulatory quality



Source: World Bank, Governance Indicators.

99

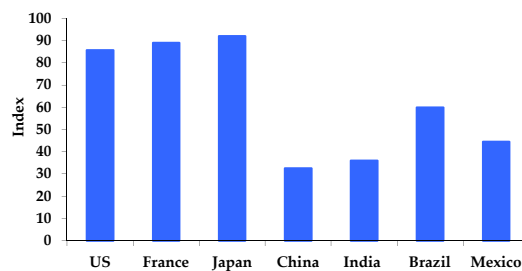
## Rule of law



Source: World Bank, Governance Indicators.

100

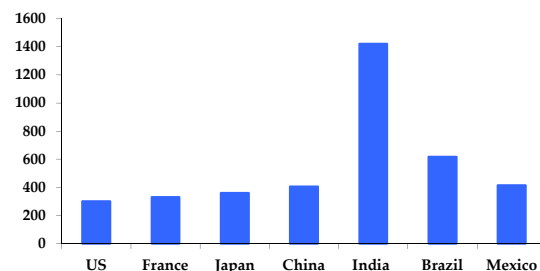
## Control of corruption



Source: World Bank, Governance Indicators.

101

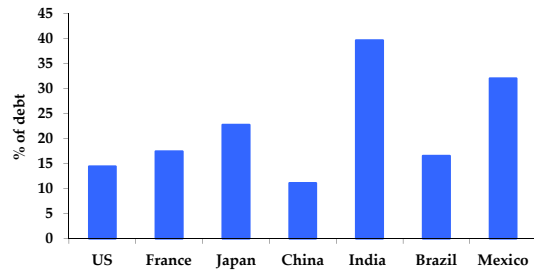
## Days to enforce a contract



Source: World Bank, Doing Business.

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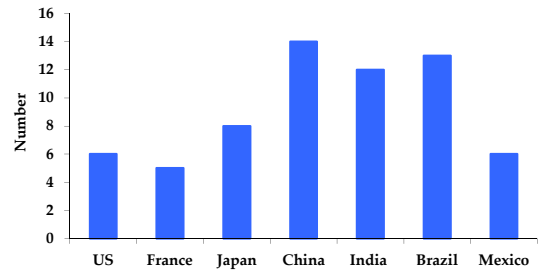
### Cost of enforcing a contract



Source: World Bank, Doing Business.

103

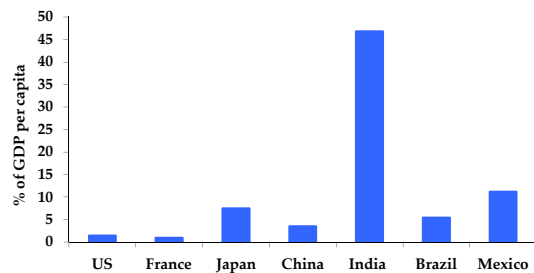
### Procedures required to start a business



Source: World Bank, Doing Business.

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### Cost of starting a business



Source: World Bank, Doing Business.

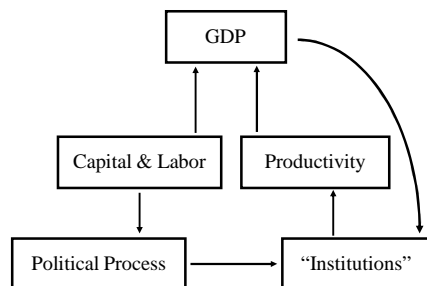
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### Summing up

- 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 all of these things
- Macroeconomic policies matter, too [later]

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## Problems

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

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## Something for the ride home

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- 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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