I. Competition

I. Technology
A. Why?
B. Who & Where?
C. How?
D. Which Way?
Competition

- Essential to capitalism
  - Key capitalist driver
- Weak competition
  - Keeping up with the herd
    - ‘Survival of the fittest’
- Strong competition
  - Getting ahead of others
  - ‘Competitive edge’, ‘competitive advantage’
Competitive Gain

- Profit
  - Goal of all capitalists
  - $= \text{Surplus}$
  - General rate of profit ($\pi$)
    - Baseline (non-zero)

- Higher profit
  - Share of $\pi$
    - Market share
  - Size of $\pi$
    - New markets, new labor
  - Thickness of $\pi$
    - Higher prices, lower cost (more surplus)
Competition

A. Why?
B. Who & Where?
C. How?
D. Which Way?
Firms (Capitals)

- Standard economics
  - Only firms compete

- Scales of capital
  - Intra-firm (profit centers)
  - Inter-industry (sectors)
Products & Industries

- Goods compete for total market share
  - Traded goods compete more broadly
    - Local goods & services more protected (often)

- Industries compete
  - Rising & declining sectors
    - Prices, quantity & profits
  - Competition for capital
    - Capital shifts
  - Competition for state aid
Places

- Places compete
  - As territorial sets of capital & labor

- At all scales!
  - Cities, regions, countries, blocs

- On basis of place difference
  Recall lecture 5
Gaining advantage

- ‘Comparative advantage’ (classic trade theory)
  - Relative cost
  - Specialization
    - in relatively better industries
  - Weak competition among firms (find niche)

- Competitive advantage
  - Getting ahead of other countries
  - Making industries better
    - In absolute terms (head to head competition)
  - Strong competition among firms
Workers

- Workers compete
  - Within labor markets
  - Across labor markets
    - (through their products)

- See lectures in Part V
Why?
Who & Where?
How?
Which Way?
Corporate Strategy

- **Strategy of firms**
  - Normal business practice
    - Always about getting ahead
  - Corporate theory
    - Business schools & modern management
    - Strategy & Structure, c. 1930
      - Edward Mason & students
      - Alfred Chandler

- **Elements of strategy**
  - Management & Expertise
  - Vision & Planning
  - Leadership & Power
  - Structure & restructuring
Industrial Policy

- Monopoly moves
  - Trusts & cartels
  - Oligopoly
- Trade Associations
  - Industrial strategy
- State aid
  - Infrastructure
  - Finance & subsidy
  - Protection
  - Guidance
  - Technology
National Policy

- National/State Strategy
  - For collective capital and national economy
    - v. Free Trade & Laisser Faire liberalism

- 19th century forms
  - Simple protectionism
  - National champions
  - University research

- Postwar forms
  - ISI
  - State ownership & investment
  - State-led development
  - Export-led development

- Neoliberal forms
  - Liberalization
  - Privatization
  - Technology policy
  - Industrial district policy

- ‘Competitive advantage’
  - New idea for era of global competition
    - Michael Porter, Competitive Advantage of Nations
    - Annalee Saxenian, Regional Advantage
Continental Policy

- EU initiatives
  - Airbus
  - Knowledge economy
  - Regional policy
  - Energy policy
  - Etc.
The A380: A PAN-EUROPEAN Plane

Airbus is building major components of the A380 in four countries—France, Germany, Britain, and Spain—then bringing them to Toulouse for assembly. It’s a gargantuan task:

FERRY Airbus had to build an ocean-going ferry to bring parts of the fuselage and wings to a port near Bordeaux.

BARGES Custom-built barges will carry the pieces up the Garonne River, passing beneath a bridge at Bordeaux that had to be reinforced.

HIGHWAY From the barges, the components will be loaded onto huge trucks. They will travel on a highway that Airbus had to widen to accommodate the oversize loads. The trucks will travel only at night when the road is closed to other traffic. The trip will take three days, so they’ve had to build big roadside “parking lots” where trucks will sit during the day.

Data: Airbus
EU-US battles

EU takes tough line on GM food labelling

Trade war threat grows as lobbying by US firms fails

International News

By Andrew Osborn in Strasbourg and John Vidal

United States efforts to break down European resistance to genetically modified food products suffered a setback last week after the European Parliament voted for the toughest GM labeling and traceability rules in the world.

In a vote that drew massive lobbying from US biotechnology companies and consumer groups, the asssembly - which has real power to shape future legislation - took heed of consumer concerns and decided that all derivatives of GM food and animal feed products sold in the European Union should be subject to labeling. It also tightened the current 1% threshold for genetically modified organisms in foods, reducing it to 0.5%.

Effectively this means that lots of thousands of products such as SNAP, soft drinks, breads, cakes, chocolate and sweets could now be labelled GM. Consumer groups estimate that at least 30,000 food products contain derivatives of GM maize or soya.

However, the parliament stopped short by three votes of demanding GM labeling on products of animals reared on GM foods. Eggs, milk and meat will not be labelled even if the animals were reared on GM foods.

The vote is an embarrassment for the British government and its food standards agency, both of which said that the European Commission's proposals would be unworkable.

The vote will also infuriate US firms such as Monsanto, which believe that labeling GM food will stigmatize their products and confuse the consumer, and US industry bodies that believe the new labeling laws, if passed, could affect $4bn of trade a year.

In voting on the same day by the European Parliament's 这里的中文翻译有问题, 无法确定其含义。

U.S. slams EU over ‘Frankenfood’ ban

Trade chief says moratorium leads to starvation in poor nations

By Elizabeth Bacha

WASHINGTON — The Bush administration's top trade official announced Thursday that he wanted to file a case against the European Union for its ban on genetically modified food, calling the European position foolish and immoral for leading to starvation in the developing world.

US Trade Representative Robert Zoellick said he had not seen the 4-year-old old food safety of such modified food when African nations with starving populations refused last year to accept US food aid because the grain was genetically modified.

"The European antiscientific policies are spreading to other corners of the world," Zoellick told reporters at a news conference in the United States. "The amount of serious production in the United States that has been genetically modified has grown from 68 percent in 2000, while the percent of the EU's corn crop that is genetically modified is around 90 percent.

Footnotes of European consumers about possible health risks from the products.

Zoellick said the concerns had been raised by U.S. regulators who had found repeatedly that crops sold in the U.S. market represent no threat to health.

He said the Bush administration's four-year-old moratorium on imports of genetically modified crops was a clear violation of World Trade Organization rules, and that he had been asked to decide before the end of the month whether to challenge the ban before the Geneva-based WTO.

American farmers groups estimate the EU ban is costing them nearly $300 million a year in lost corn exports alone.

Hope to define a possible trade claim, Parcel Lacey, the European Commission’s chief trade negotiator, said on Thursday in a conference call with reporters that the new American position was neither helpful or productive.

Lacey said that bringing a case to the WTO would complicate the situation in Europe, where most trade rules have been adopted for genetically modified food in advance of a gradual lift of the ban in the spring.

A statement released earlier this month, the EU said that it had approved 16 genetically modified products and that while it was "aware of U.S. frustration," officials were not taking any action at the WTO.

The Cambodian government rejected shipments of genetically modified crops from the United States in August, despite several food shortages.

The United Nations has warned that the debate over genetically modified food would increase in the years ahead because of growing concerns about food security and nutrition.

Pedro Sanchez, the chairman of the U.S. Task Force on World Hunger, said in an interview that a general ban on genetically modified food was a luxury only wealthy nations could afford.

The Associated Press contributed to this report.
Competition

A. Why?
B. Who & Where?
C. How?
D. Which Way?
Which Way to Go?

• On the Cheap
  − Downgrade
  − Low Road

• On the Move
  − Upgrade
  − High Road
Competition by cost

- Cost cutting
  - Simplest strategy

- Cheaper inputs
  - Labor, materials, land (rents)
  - Taxes

- Greater efficiency
  - This bleeds into upgrades
Geography of cheap

- Escaping high-cost centers
  - Developed = high cost
    - high rent, high wage, high tax
  - One driver of geographic expansion
    - Scale – suburban, regional, global

- Puzzles
  - Relocation v. in-situ cost cutting
  - Lack of convergence
    - *Is cost the key to development?*
Cheap labor

- Where is labor cheap?
  - In pre-industrial (agrarian) countries
  - In poor countries (low standard of living)
  - Where rights are suppressed
  - From such places (immigrants, rural migrants)

- Is cheap labor really cheaper?
  - cost of labor ≠ wages only
  - unit cost of labor = productivity + wages
    - Unit cost of low-wage labor > high-wage labor!
  - The importance of productivity
Maquiladoras

- US industry demand for cheap labor
  - Facing new global competition
  - Beyond US south
  - The Super-South

- Mexican development strategy
  - FTZ along the border
  - Set up 1965
  - Took off in 1980s
  - Doubled under NAFTA–1990s
Limits of cheap labor

- Rising skills + low wages
  - Perfect combo for K
- Lost decade
  - low wages > 1982
- Asian competition
  - Asian maquilas
  - Chinese competition

Factory jobs slipped from U.S. to Mexico, now to China

Global industry still hunting for cheapest wages

Globalization at work

A number of manufacturing firms in Mexico 1970 to March 2002

Global trade has created a new class of workers in China, Mexico, and other emerging markets. These workers are often paid less than their counterparts in developed countries, but they have access to better working conditions and higher wages. However, this trend has also led to job losses in developed countries, where many companies have moved their production facilities to lower-wage regions. This has raised concerns about the impact of globalization on the economy and the job market.
‘Cheapness’ is a dead end

- No industry or place ever developed by resting on cheapness
- Mythologies of cheapness
  - High wages, high taxes, etc are ‘ruining us’
Which Way to Go?

- On the Cheap
  - Downgrade
  - Low Road
- On the Move
  - Upgrade
  - High Road
Industrialization as strategy

- Productivity
- Products
  - the keys to modern industry
    - lecture 2
Productivity & Firms

- Rising efficiency
  - Lower unit costs

- Outflank rivals
  - Greater market share
  - More profit per unit
Productivity & Industries

- The double benefit of high tech

**Bar Chart:**
- Industries with highest labor productivity growth rates, 1990-2000

**Graph:**
- Labor Productivity, $k per worker
  - All Industry Groups
  - Materials Industries
Productivity & Place

- Productivity = riches
  - Rich countries/regions = higher productivity

- Fierce competition among the rich
  - R&D, Technology Policy, etc.
  - US v. EU v. Japan
    - ‘Europe is not only worse than America at making IT, but also much worse at using it -- US uses much more IT per worker & gets more productivity out of it’
      - *The Economist 5/19/07*
Playing catch-up

- Key strategy of late developers
  - Raise productivity

- Competitive edge
  - Productivity rises faster than wages
    - E.g. Japan in 1960s, Taiwan in 1980s, China today

- Shift to higher tech industries
  - ‘Moving up the value chain’
East Asian Upgrades

- All have gone through ‘cheap labor’ phase
  - Then move up to high tech industries
- Japan
  - Korea, Taiwan, HK
  - Malaysia, Thailand
  - Even China is worried!
New products

- Basic competitive strategy
  - New uses, designs, capacities
    - Ipod, Iphone etc.

- Gaining extra surplus
  - Short-term monopoly
  - Consumers pay extra
    - ‘Consumer surplus’
Product niches

- Moving upmarket
  - Mass markets
    - Highly competitive, low profit margins
  - Rich niches
    - Less competitive, more consumer surplus (rich pay extra for status)

- Capturing the local edge
  - National markets
    - State protection
  - Taking the local global
    - Italian coffee, pasta, shoes
    - French perfume, wine, fashion
Product Quality

- What is quality?
  - Beauty
  - Reliability
  - Durability

- Quality benefits
  - Lower costs
    - Fewer rejects
  - Higher revenues
    - Quality as a niche

"Our study shows that substance can matter more than image. Throughout, we found that objective quality drives customer perceptions of quality."
German upgrading

- Competing by product excellence
  - Better technical solutions
  - More reliable goods
  - Problem solving for customers

- Mostly machinery
  - German machines in East Asia
  - Speciality consumer goods
    - Neumann microphones, Bechstein pianos, etc.

- Still subject to new global competition
  - Import share of products is rising
  - More production is being offshored
Investment & Upgrading

- Upgrading takes money
  - Investment of capital

- Investment in...
  - New products, quality, productivity, etc.

- Investment by...
  - firms, industries, countries (places), etc

- Investment from...
  - Savings & credit
East Asian Investment Model

- Cheap labor = surplus
- Surplus = savings
  - Capital controls
- Savings = investment
  - Capital incentives
- Investment = K formation
  - 20–30%
- Japan » Korea » Malaysia » China
Other tools of competition

- Design & Marketing
  - See lecture 17

- Business Organization
  - See lecture 16
I. Competition

II. Technology
Technology

A. Technical Change
B. High & Higher Tech
C. Harnessing Science
D. Learning & Labor
E. States & Technology
Technical Change

- Key to competition
  - Improvement in production

- Source of
  - lower costs
  - higher productivity
  - new products

- Beware the *Deus ex Machina*?
What is ‘technology’?

- Products
  - Things we use
- Production methods
  - Things we work with
- Labor process
  - Ways of working
- Materials
  - Things we work on

*Behind the scenes*

- Knowledge
  - ‘Know-how’ in use
- Practice
  - Experience with all three
Technical improvement

- Product improvement
  - Things that work better
  - Things that do more
  - New things, new uses

- Process improvement
  - Better machinery
  - Better layout & flow
  - Automation & computers
  - Better chemical & biological processes

- Labor improvement
  - More skilled workers
  - New division of labor
  - More rationalized & standardized tasks

- Materials improvement
  - Better metallurgy
  - Finer chemicals
  - Hybrids, GMOs

- Behind the scenes
  - Improved knowledge & practice
The Whole Banana

- E.g. Ford’s Assembly Line
  - Solid, reliable product
    - With easy repair (parts)
  - Standardized parts
    - Because of better machines & materials
  - Rationalized work
    - Careful division of labor
  - Assembly line
    - Better flow of materials & work
Technology

A. Technical Change
B. • High & Higher Tech
C. Harnessing Science
D. Learning & Labor
E. States & Technology
Technology today

- Prodigious production
  - Computer automation
  - Electronics & optics
  - Chemistry & Biology

- Virtual products
  - Less bulk, more beat
  - What you see is not what you get
High & Higher

- Rising arc of technology
  - More & more sophisticated industry
    - Accumulated knowledge & know-how
  - Greater capabilities of social labor
    - General rise of education

- What is ‘high tech’?
  - Moving front of industrial technology
  - Today’s high tech is tomorrow’s smokestacks
    - E.g., Kodak ravaged by digital photography; has shrunk by 10s of thousands of workers since 2004.
The Holy Grail

- ‘Technical innovation’
  - Every firm & country wants it

- How to get it?
  - Industrial practice & experience
  - Education & training
  - R&D – applied science
  - Basic science
Technology

A. Technical Change
B. High & Higher Tech
C. Harnessing Science
D. Learning & Labor
E. States & Technology
Science & technology

- Science ≠ technology
  - Basic knowledge about nature
  - ≠ knowledge in general

- Technology as applied science
  - Advances trickle out
  - How to promote?
Modern myths

- Garages & labs
  - Everyone an Edison
- Science parks
  - Industry by osmosis
- Tech entrepreneurs
  - Picking fruit from the tree of technology
- High tech without industry
  - Is mastery of production still key to mastery of technology?
Making the Link

- 19th C practice & tinkering
  - Gentleman scientists
  - Science followed industry

- 20th C corporate labs
  - Chemistry, agriculture
  - Geography of labs

- Postwar university labs
  - Huge government investment
  - Centers of basic science
  - Breakthroughs move into industry
No simple solution

- No end of ‘tinkering’
  - aircraft design, plant genetics, software, SV garages

- Continuing corporate R&D
  - Applied science & engineering
  - Blend with manufacturing & marketing

- University–corporate liaisons
  - Contracts, consulting, start-ups
  - Can the university be milked?
Patents & Progress

• Patents & copyrights
  ✷ Logic of incentives
    ▪ But for how long?
  ✷ Patent thicket
    ▪ Patents interfering with research
      • 2005 SupCt ruling that medical researchers could use patented stuff in making their own products

• ‘Intellectual property rights’
  ✷ Social technology & private gain
    ▪ Inherent tension
Technology

A. Technical Change
B. High & Higher Tech
C. Harnessing Science
D. •Learning & Labor
E. States & Technology
Technology by hand

- ‘Big bang’ model
  - Major scientific breakthroughs
  - Favored in U.S.

- Incremental model
  - Steady improvements
  - Favored in Germany, Japan, etc.

- No simple divide
  - Advances come in increments & leaps
Korean learning

- Japan’s subcontractors
  - Learning by doing

- Reverse engineering
  - Taking apart products

- Upgrading
  - now Korea is far advanced...
German system

- High-quality products
  - Mittelstand companies

- Focus on labor skill
  - Upgrading skills
  - Apprentice training
  - Technical High-Schools
German exports

- Still world leader in exports
  - E.g., Whirlpool—Germany leading exporter of washing machines to US
  - E.g., SAP, Europe’s rival to Oracle, follows the same model of high-grade programming and continual upgrades, rather than buying startups and other firms

- Use low-cost sites selectively
  - Spain & ‘white goods’ in 1980s
  - Puma & Adidas shoes » China 1990s
Old Italian company in Anzola (Emilia)
- ice-cream machinery

Share of world output fell
- From 25% in 1980 to 15% in 1990
- Back to 50% in 2007

New management & strategy
- Cut workforce & outsourced parts (cheapening)
- Quality control (better product)
- R&D/technical dept. (improved materials)
- Gelato University (teach labor skills)

Factory locations: Italy, Spain, US
- New one in China for Chinese market (not labor)
Technology

A. Technical Change
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C. Harnessing Science
D. Learning & Labor
E. •States & Technology
Funding Research

US University–government research alliance
  ✦ invented in WW2 under Vannevar Bush

• Military tech
  ✦ Electronics, Computers, Communications

• Biomedical tech
  ✦ Biotech, Pharma, Instruments
The future is South Korea
Tech firms try out latest in world's most wired society

Birgitta Forsberg, Chronicle Staff Writer
Sunday, March 13, 2005

Pick up your mobile phone and watch your favorite TV show. At home, on your computer, download a feature-length movie in no time at all.

If you live in South Korea, it is an everyday reality to have always-on superfast Internet -- broadband -- both in your cell phone and in your home.

South Korea is the most wired country on the planet. Some South Koreans can get up to 20 megabits of data per second -- breakneck speed by today's standards. Americans are lucky if they get 4 Mbps.

While South Korea leads in the rollout of broadband, the United States --

...supposedly the world's technology leader -- comes in no better than No. 13, according to experts. About 76 percent of households have broadband in South Korea. The figure is 30 percent in the United States.
Techno Districts

- Science Parks
- Technopolis
  - Science Cities