Industrial Revolution

- "industry" refers to the manufacturing of products
- Began in England in the late 1700s
- Diffused rest of Europe and North America during the "Industrial Revolution" of the nineteenth century (1800s)
- Replaced the previous method of production, known as the "cottage industry" system in which people made their own goods from home
Why Great Britain?

- Flow of capital
- Second agricultural revolution
- Mercantilism and cottage industries
- Resources: coal, iron ore, and water power
Some Early Effects of Industrial Revolution

Social, political, and economic effects

- **Economic:** large-scale production = more goods = lower prices
  - Created a global economic system

- **Social:**
  - People begin moving off of the farm (rural areas) and move to the cities (urbanization)
  - Unprecedented expansion in productivity resulted in higher standards of living
  - Principle cause of population growth in stage 2 of DTM

- **Political:** labor issues, policies,
  - Canals, Railroads built to link resources, factories and markets
  - ***Transportation was critical for diffusing the industrial revolution****
  - Creation of SEZ: A lot of Pacific Rim countries designate *Special Economic Zones* to lure in foreign investment and to encourage economic development.
  - :
Industrial Revolution

• Imperialism - colonies provided several resources including
  – raw materials such as sugar, cotton, umber
  – Markets to sell finished products
  – Ports
  – Profits

• Imperialism made wealthy countries even wealthier, leading to a great divide between the advanced industrialized states and the underdeveloped, nonindustrialized nations
Economic Sectors

- Primary
- Secondary
- Tertiary

- Outsourcing
  - BRICS
Sectors of the Economy

Primary Sector
Resource-based and Extractive Activities

Secondary Sector
Manufacturing-based Activities

Tertiary Sector
Service-based Activities

Quaternary Sector
Knowledge-based Activities

Quinary Sector
Intellectually-based macro-level Activities
### ECONOMIC SECTORS IN THE U.S.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Task</th>
<th>Examples</th>
<th>Economic Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Extracting natural resources</td>
<td>Farming, Mining, Fishing, Forestry</td>
<td>Dominated the economy until the Civil War</td>
</tr>
<tr>
<td>Secondary</td>
<td>Processing natural resources</td>
<td>Manufacturing, Building</td>
<td>Significant labor growth (1840s - 1860’s)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Providing services rather than working with natural resources</td>
<td>Marketing, Banking, Design</td>
<td>Most people in the U.S. labor force today</td>
</tr>
</tbody>
</table>

LDC = majority in Primary  
MDC = Majority Tertiary
### EMPLOYMENT CHANGES FOR U.S. MULTINATIONAL COMPANIES

<table>
<thead>
<tr>
<th>Industry</th>
<th>Change in Number of U.S.-Based Employees, 1999 to 2008</th>
<th>Change in Foreign-Based Employees of U.S.-Based Corporations, 1999 to 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>- 1,938,000</td>
<td>+ 243,000</td>
</tr>
<tr>
<td>Nonmanufacturing</td>
<td>+ 35,000</td>
<td>+ 2,115,000</td>
</tr>
<tr>
<td>All Industries</td>
<td>- 1,903,000</td>
<td>+ 2,358,000</td>
</tr>
</tbody>
</table>

Impact of outsourcing
Footloose Industries

• 1. Footloose industries are not restricted in where they can locate because of transportation costs.

• 2. These industries have spatially fixed costs, costs that remain the same no matter where they choose to locate.

• 3. These industries often produce lightweight products of extremely high value, like computer chips.
Flexible locations
Industrial Regions

Concentrated in 3 regions and responsible for about $\frac{1}{4}$ of total industrial output

- Europe
- North America
- East Asia

- Brazil and India account for most of industrial output outside of the aforementioned regions

- In recent years, geography of industrial production has shifted
  - Production of products began to move to LDCs
    - Cheaper labor
Europe’s Industrial Areas

You need to read and find out what each of these regions specializes in (read white book page 347)
Major Manufacturing Regions of Russia

- Many resources throughout the vast expanse of land: Oil, Natural Gas, Iron ore, and Steel

- Volga River provided an energy resource and transportation through canals
North America

- Industrialization began in Northeast
  - Megalopolis

- Coal: chief fuel source
  - Appalachian Pennsylvania- NW Great Plains
Northeastern U.S.

- New England: Textiles, cheap labor, textile mills (factory life)
- West Virginia: Coal Mining
- Middle Atlantic: Megalopolis
  - NYC, (NY), Philadelphia (Pennsylvania), Wilmington (Delaware), Baltimore (Maryland)
    - Contains largest percentage of population, large pool of available labor
    - Large market
    - Ports
North and Northeastern U.S.

- Eastern Great Lakes: Southeastern portions of Canada, Pittsburgh and upstate New York
  - Pittsburgh = Steel
  - Niagara Falls = Hydroelectric power
  - Southeastern Canada (Toronto, Montreal)
    - Contains most of Canada’s population
    - Large workforce, easy access to trade network via the St. Lawrence

- Western Great Lakes: Detroit (Mich), Chicago (Ill), Milwaukee (Wis)
  - Chicago: transpiration hub of the United States
  - Detroit: major automobile manufacturing
Other Regions

• South: Iron and steel, cotton, tobacco, furniture
  – Now some high-tech industries

• Southwestern (Gulf of Mexico area)
  – Metroplex: Dallas and Houston – New Orleans
  – Oil
Shift to Post-Industrial Economy

**Deindustrialization** Industries leave an area that was once heavily reliant and prosperous for other areas with cheaper labor
- Leaves workers unemployed
- Many lack skills needed for new jobs in different sectors of the economy

- **Substitution Principle** – use of mechanization and automation to replace workers to maximize profit

**Multiplier Effect** – potential of a job to produce additional jobs
- can have negative impact during deindustrialization

**Brownfields** – sites of abandoned factories that are boarded-up

**The Rust Belt** - Once a thriving region of industry, now many factories are abandoned – resulting in a crumbling infrastructure
Shifts in US

• The contemporary economic landscape has been transformed by the emergence of service sectors, high technology industries, and growth poles (e.g., Silicon Valley/Research Triangle in the U.S.).

• Emergence of sub-sections of the Tertiary Sector
  – **Quaternary sector** – research and development, business consulting, financial services, education, public administration, software development
  – **Quinary sector** – highest levels of decision making in government and business

• Have led to technopoles (agglomeration of high-tech manufacturing)
  – Silicon Valley (California)
  – Research Triangle (North Carolina)
Growth of high-tech industries in the USA as of 2012
Shifts in US Industry

• Today industry is moving South and West
• Tax incentives for businesses
• South - ‘right to work’ states - no unions - Texas
• West - Technology - computers - Silicon valley, L. A. San Francisco and San Diego
International Shifts in Industry

• Globally, industry has left North America and Europe for East Asia, South Asia, and Latin America; has created a “new international division of labor”

• *New international division of labor* refers to selective transfer of production operations requiring highly skilled workers to factories located in developed countries and those requiring little skill to factories located in developing countries.
  – Advances in technology has allowed for improved transportation
  – Workers in LDCs are willing to work for much less, and fewer laws limit businesses

• Many corporations take advantage of this through outsourcing, turning over production to independent, foreign suppliers
Many industries in China are clustered near the east coast (not all). In Japan, production is clustered along the southeast coast. Pacific Rim countries
Japan

- Imported raw materials from its colonial empire into Korea, Taiwan, and China
- Kanto Plain (1/3 of the population) includes Tokyo
- Highly skilled labor force
- Strong economy
China

• Major industrial expansion occurred during the Communist period
  – a vast country with a substantial resource base.
  – Coal: good quality, quantity, and easily extractable
  – Manchuria is China’s industrial heartland.
  – Other dominant industrial regions: Shanghai-Yangtze District and Guang Dong District.

– Created a major pollution issue – Some of the most polluted cities in the world today, are located in China, near their major industrial districts
– Many industries in China are clustered near the East coast (not all).
16 of the world’s 20 most polluted cities are in China
No regulations on dumping in waterways
Other Parts of the Pacific Rim

- A lot of Pacific Rim countries designate *Special Economic Zones* to lure in foreign investment and to encourage economic development.
• Secondary Industrial Regions are south of primary industrial regions
  – Thailand, Malaysia, Vietnam, Brazil, Mexico, parts of Africa.
  – EX: northern Mexico Maquiladoras have been created to produce cheap products for the US.

• Establishment of NAFTA in 1995 promoted further industrialization in North America.
Explaining and predicting where industries locate

• Weber’s Least Cost Theory
  – Early 20th century Alfred Weber (economist)
    • Where factories would locate in order to thrive and be at the lowest cost to them
  – Based on 3 factors
    • 1) transportation
    • 2) labor
    • 3) Agglomeration
• Geographers attempt to explain why one location may prove more profitable for a factory than others.

– Companies ordinarily face two geographic costs.

  1. **Situation factors** – costs associated with the established transportation networks accessible from a specific place and proximity to inputs

    1. The farther something is transported, the higher the costs, so a manufacturer tries to locate its factory as close as possible to its inputs and markets.

  2. **Site factors** – costs resulting from the unique characteristics of a location.

    1. Land
    2. Labor
    3. Capital
Transporting Material

- Truck: used for short distances
- Rail: used for multiple-day trips out of the range of trucks
- Shipping: used for long-distance trade; slow, but very cost-efficient
- Air: most expensive; used for low-bulk, high-value goods
- Many times, the method of transport is mixed, meaning more than one type is used
  - In this, goods are transferred at a “break-of-bulk-point” such as a seaport or airport
Break-of-Bulk Points
Site Factors for Industry: Land, Labor, Capital

1. **Labor** (most important at a global scale)
   - Labor-intensive industry – one in which labor is a high percentage of expense
     - Seek cheap labor sources (China, India, etc…)
     - Examples: Textile and clothing industries – require less skilled, low cost workers (highly clustered in LDCs
       - Textile and apparel spinning employ a high percentage of women
       - Textile and apparel weaving is more physically demanding and are traditionally men
       - Textile and apparel assembly takes place usually in MDCs because that is where most of the consumers of the assembled products are located
Fig. 11-17: Sewing cotton fabric into men’s and boys’ shirts is more likely to be located near customers in MDCs, but much production now occurs in LDCs.
Site Factors in Industry

2. Land

- Traditional industry located near cities for markets and labor
- Modern industry is done in rural areas in MDCs
  - Land is cheaper
  - Transportation is easier, labor will travel

- Environmental Factors – access to low-cost energy sources

3. Capital

- Industry also seeks money for investment
- Will locate near areas offering capital from banks or other financial groups
  - Example: Silicon Valley, California – agglomeration of technology companies – needed bank loans more than it needed skilled labor!
Agglomeration

1. Agglomeration occurs when industries clump together in the same geographic space.
   - Alfred Marshall first identified the benefits of agglomeration in industrializing England in the late nineteenth century.

2. Factories that are in the same area can share costs associated with resources such as electrical lines, roads, pollution control, etc.

3. Agglomeration economies occur when the positive effects of agglomeration (such as lower costs for industries) result in lower prices for consumers.
   - i. Localization economies are a category of agglomeration economies that occur when many firms in the same industry benefit from clustering close together—for example, these firms get to share skilled labor talents living in the same region.
   - ii. Urbanization economies are another category of agglomeration economies that occur when large populations in urban areas benefit from clustering together because they get to share infrastructural elements, such as power lines and transport systems.
New International Division of Labor

Source: IDC Manufacturing Insights

Courtesy VentureOutsource.com
MANUFACTURING WAGES

The chart shows average hourly wages for workers in manufacturing in the 14 countries with the largest industrial production in 2010.
Hotelling’s Model

• Locational Interdependence Theory
  – Agglomerations – groupings of specific industries in certain areas due to specificity, resources needed, and labor force
    • Silicon Valley
    • Rust belt
    • Coal mining

• Companies will naturally form agglomerations and seek locations close to their competitors (think Best Buy and Circuit City) or gas stations on adjacent corners

• People will go to one or the other and this could maximize their market share

• Compete by service and product, NOT PRICE
Other Location Models

Losch’s Model
Manufacturing plants choose locations where they can maximize profit.

Theory:
Zone of Profitability
Other businesses can come in and change the configuration of that zone
Agglomeration can give the entire area competitive advantage
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<table>
<thead>
<tr>
<th>Country</th>
<th>Average wage (annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myanmar</td>
<td>US$ 2,062</td>
</tr>
<tr>
<td>Cambodia</td>
<td>US$ 1,887</td>
</tr>
<tr>
<td>Vietnam</td>
<td>US$ 2,989</td>
</tr>
<tr>
<td>Indonesia</td>
<td>US$ 4,481</td>
</tr>
<tr>
<td>Thailand</td>
<td>US$ 7,120</td>
</tr>
<tr>
<td>Philippines</td>
<td>US$ 4,012</td>
</tr>
<tr>
<td>China</td>
<td>US$ 8,204</td>
</tr>
</tbody>
</table>

Source: FY2014 Survey of Japanese-Affiliated Firms in Asia and Oceania, JETRO
MANUFACTURING WAGES

The chart shows average hourly wages for workers in manufacturing in the 14 countries with the largest industrial production in 2010.
Highlights the Core-Periphery Model

• The “new international division of labor” highlights the “core-periphery” system

• This system states that there are three world systems:
  – The Core: Serviced (tertiary) based economies, Highly skilled workers, high wages, High direct foreign investment: Outsource jobs to the semi-peripheral countries, involved in the sale of products
  – Semi-Periphery: Secondary economies, Assemble many products to sell to the Core countries that come from the Peripheral countries. Shares qualities of both the Core and Peripheral countries
  – The Periphery: Large primary sector economy, low wages for workers, dependent on foreign investments from the Core countries

• Ultimately, this system benefits the MDCs as the LDCs never develop as more than supplier nations
How has industry changed?

**Fordist** – Assembly line production – worker performs same task repeatedly
standardized production
Less-skilled labor needed
lack of variety

**Substitution Principle** – businesses try to increase their profits by substituting
one factor or production for another (automation/robots)

**Post-Fordist** – current mode of production with a more flexible set of
production practices in which goods are not mass produced. Production is
accelerated and dispersed around the globe by multinational companies that
shift production, outsourcing it around the world.
Time-Space Compression

Through improvements in transportation and communications technologies, many places in the world are more connected than ever before.
Time-Space Compression

• **Just-in-time delivery**

rather than keeping a large inventory of components or products, companies keep just what they need for short-term production and new parts are shipped quickly when needed.
Newly Industrialized Countries (NICs)

“Four Tigers”
South Korea
Hong Kong
Taiwan
Singapore

A map showing the Four Asian Tigers
Consequences of Industrialization

- Pollution
- Contamination via industrial waste
- Climate change
- Resource depletion

- Sustainable development – achieving social and economic goals without comprising natural resources or the environment for future generations