Chapter 15

Geography, Climate, and Natural Resources
Question

• What role geography, climate, and natural resources play in the economic fate of single countries?
Location Matters

• On average, countries located further away from the equator, have higher standard of living. Why?
Figure 15.1 Relationship between Latitude and Income per Capita

GDP per capita, 2009 (2005 Dollars, ratio scale)
15.1 Geography
Proximity to sea

- Even today, ocean transport is the cheapest.
- The fastest growth in trade occurred in China’s coastal regions.
Figure 15.2
Regional Variation in Income and Access to the Sea

Geographic concentration and Spillovers

• Being close to a rich country is an advantage because of spillovers of technology.

• Bad news for sub-Saharan Africa.
Geography’s effect on government

- Europe – many countries
- China – Unified from 221 B.C.
- Why? Europe is separated by geographical barriers into several regions.
Figure 15.3
Core Areas in Preindustrial Europe

Source: Pounds and Ball (1964).
Figure 15.4
Core Areas in Preindustrial China

Large unified country vs. many independent states

• Advantages of large unified country
  – Large market and gains from specialization
  – Unity, fewer wars.

• Advantages of many independent states
  – Outside competition.
    • if taxes are high in one country, businesses move to the neighbor.
    • Harder to suppress innovation (Columbus vs. prohibition of sea exploration in 16th century China).
Guns, Germs and Geography (Jared Diamond 1997)

- Q. Why Eurasia was more advanced than Americas, Australia and Africa?
- (1) Eurasia had more animals and plants that can be domesticated:
  - Eurasia: cows, horses, pigs, sheep and goats.
  - Americas: llamas and alpacas.
Llama

Alpaca
• (2) Geographic location of Eurasia is **east-west**, which allows the spread of agricultural techniques and useful plant and animal species throughout a zone of relatively similar climates. For example, the chicken could spread from China to Europe. Geographic location of Americas is **north-south**.

• (3) Europeans were partially immune to some diseases: measles and smallpox (come from animals).
15.2 Climate
Climate and GDP per capita
<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Description</th>
<th>Representative Cities</th>
<th>Percentage of World Landmass</th>
<th>Percentage of World Population</th>
<th>GDP per Capita Relative to World Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Af</td>
<td>Tropical Rain Forest</td>
<td>Jakarta, Indonesia Manaus, Brazil Manila, Philippines</td>
<td>4.0</td>
<td>4.4</td>
<td>0.64</td>
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<td>Am</td>
<td>Tropical Rain Forest with Seasonal Monsoon</td>
<td>Cochin, India Belém, Brazil Dhaka, Bangladesh</td>
<td>0.8</td>
<td>2.4</td>
<td>0.41</td>
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<tr>
<td>Aw</td>
<td>Tropical Savannah</td>
<td>Kinshasa, Congo Havana, Cuba</td>
<td>10.8</td>
<td>17.5</td>
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<td>Cw</td>
<td>Subtropical: Mild Humid with Dry Winter</td>
<td>Hanoi, Vietnam Kanpur, India Lilongwe, Malawi New York, USA Paris, France</td>
<td>4.3</td>
<td>16.0</td>
<td>0.44</td>
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<tr>
<td>Cf</td>
<td>Mild Humid Climate with No Dry Season</td>
<td>Dhaka, Bangladesh</td>
<td>4.3</td>
<td>16.0</td>
<td>0.44</td>
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<tr>
<td>Cs</td>
<td>Mediterranean Climate: Mild, Humid with Dry Summer</td>
<td>San Francisco, USA Rome, Italy Santiago, Chile</td>
<td>2.2</td>
<td>4.3</td>
<td>2.10</td>
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<tr>
<td>Df</td>
<td>Snowy-Forest Climate with No Dry Season</td>
<td>Chicago, USA Moscow, Russia</td>
<td>23.0</td>
<td>5.8</td>
<td>1.90</td>
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<td>Dw</td>
<td>Snowy-Forest Climate with Dry Winter</td>
<td>Seoul, South Korea Vladivostok, Russia</td>
<td>6.2</td>
<td>5.3</td>
<td>0.64</td>
</tr>
<tr>
<td>BS</td>
<td>Semi-arid Steppe</td>
<td>San Diego, USA Odessa, Ukraine</td>
<td>12.3</td>
<td>11.8</td>
<td>0.55</td>
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<td>BW</td>
<td>Desert: Annual Precipitation Less than 15 in. (38 cm)</td>
<td>Cairo, Egypt Karachi, Pakistan</td>
<td>17.3</td>
<td>6.2</td>
<td>0.58</td>
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<tr>
<td>H</td>
<td>Highlands</td>
<td>Mexico City, Mexico</td>
<td>7.3</td>
<td>6.8</td>
<td>0.78</td>
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<td>E</td>
<td>Ice Climates: Average Temperature in Warmest Month Less Than 50°F (10°C)</td>
<td>Nuuk, Greenland</td>
<td>4.0</td>
<td>&lt;0.1</td>
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</tbody>
</table>

Source: Data on landmass, population, and GDP per capita are from Mellinger, Sachs, and Gallup (1999).
Climate and agricultural productivity

- Rain – in tropical areas very sporadic.
- Frost – slows the decay of organic material and keeps the land fertile. In tropical areas there is no frost and organic matter breaks down rapidly, which requires extensive use of fertilizer.
Climate and disease

- **Malaria** – in 2010, there were an estimated 216 million cases of malaria, resulting in 655,000 deaths. 80% of cases and 90% of deaths occurred in Africa.
Figure 15.6
Malaria Ecology Versus Incidence of Malaria

Percentage of the population at risk for malaria, 1994

Source: Kiszewski et al. (forthcoming).
Climate and human effort

• People in hot climate cannot work hard because of overheating.

• Air-conditioning, possible in some industries, problematic in agriculture.

• Labor force (world) - by occupation:
  – agriculture: 35.3%
  – industry: 22.7%
  – services: 42%
15.3 Natural Resources

• Having a lot of natural resources does not guarantee faster growth or higher GDP/capita.
<table>
<thead>
<tr>
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<th>Country</th>
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<tbody>
<tr>
<td>1</td>
<td>Algeria</td>
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<td>Indonesia</td>
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<td>3</td>
<td>Iran</td>
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<td>Iraq</td>
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<td>Qatar</td>
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<td>9</td>
<td>Saudi Arabia</td>
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<td>10</td>
<td>UAE</td>
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<td>11</td>
<td>Venezuela</td>
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</table>
“Resource curse”

1. Overconsumption: countries consume more than what can be sustained by their stock of resources.

2. Dutch disease – relying on natural resources can lead to underdevelopment of other sectors, if there are no linkages to industry.
   
   a) **Backward linkages** - locally produced goods are used in resource extraction.

   b) **Forward linkages** - the natural resources are used in local industries.

3. Politics: (1) big government sector, (2) civil wars.
Why did Industrial Revolution Happen in England and not in China?

1. Location of coal: in China coal is located far from centers of population and economic activity.

2. Different geology of coal mines: in Britain the mines were flooded and required pumping, which lead to improvements in steam engine. In China, the mines needed ventilation, and this technology was not used elsewhere.