Legacies of the Tokugawa Regime

• Establishment of the Tokugawa Bakufu
  – Tokugawa Ieyasu (1542-1616)

• Important Policies
  – Position of Emperor
  – Banning of Foreign Trade
  – Bakuhan system
  – The Rise of Cities

Japan Prior to 1600

• Japan had interacted heavily with China
  – Chinese Characters
  – Political Ideology was Confucian
  – Religion was a combination of native animism (Shinto) and Buddhism, which originated in India and entered via China

• Between 1500 and 1600 Japan was immersed in a long sequence of bloody civil wars
  – In 1600, Tokugawa Ieyasu emerged as victorious at the battle of Sekigahara
  – In 1603 the emperor named Tokugawa Ieyasu shogun
Political Issues

• Tokugawa government feared local rebellion
  – Prohibited local population from using guns
  – Wanted to make sure people would stay put and produce

• Divided the Daimyo into two types (approx)
  – 150 fudai daimyo - hereditary retainers - those that had allied themselves with Tokugawa
  – 100 tozama daimyo - outside lords- those that had opposed
  – Tozama han were placed between fudai han in outlying areas

Tokugawa Policy

• Shogun ruled in the name of the emperor
  – Emperor continued to remain as a figure head

• Banned all Foreign Contacts from 1639 to 1856
  – No Trade except with Dutch and Chinese

• Established the Bakuhan system
  – Bakufu had control over the daimyo (feudal lords)
    • Daimyo had control over their han (feudal domains)
  – Daimyo were basically administrators of regions that produced more than 10,000 koku (Japanese bushels)
  – Han were relatively small
    • In 1598 Japan produced about 18.5 million koku
    • Shogun controlled about 2 million koku
    • Only one had more than 1 million Koku
    • Only 22 had more than 200,000 koku
Social Structure

• Adopted a four class social structure based on Confucianism
  – Samurai, farmers, artisans and merchants
  – System similar to Physiocrats in France: “All value comes out of the ground”
• Peasants constituted 80% of the population and were heavily taxed to support Daimyo
  – Peasants were not permitted to leave farms but often did
  – Small Scale farms
  – Little capital
• Little use of machinery until end of nineteenth century
• Merchants were just “movers of goods” and therefore didn’t have real value

Development of Transportation Networks

• Established Sankin Kotai (alternate attendance) system
  – Required daimyo to spend every other year in capital Edo (Tokyo) and leave family behind
  – Caused roads, communication networks, towns to be built along the Tokaido road.
    • Five major roads left Edo
    • Dutch were very impressed, indicating relative development of Japan
    • Postal system became quite advanced
    • Greatly enhanced the wealth of Edo
    • Edo was probably Largest city in world by 18th century with a population of over 1 million
    • Population of Kyoto was over 500,000
    • Osaka had a population of 400,000
      – Relatively clean and well run
Urban Policy

• Bakufu issued decree requiring each daimyo to build a castle in his han
  – Samurai had to be kept in the castle town
  – Mechanism of monitoring weaponry
  – Prevented samurai from marauding and stealing from peasants
  – Broke connection between Samurai and land
  – Broke connection between Samurai and warrior past
  – Made Samurai dependent on Daimyo for stipends b/c couldn't collect them directly.

• Contrast with Europe
  – In Europe the aristocracy ruled from countryside as opposed to the urban based system in Japan
  – More urbanization than Europe
Legacy of the system today

- It is often argued that reaction of “castle towns” in Tokugawa period created agglomerations of people
  - These cities were more productive and created inward migration
  - Industries changed but the centers of production did not
  - Had the capital not moved to Edo, Tokyo would have remained a backwater.
Theory 1: Random Growth

- Random Growth
  - “History is one damn fact after another” – Henry Ford
  - Big cities form when the random events of history conspire to make them a location where many people end up
    - Immigrants arrived in New York and tended to stay here
    - People killed in catastrophic events result in permanent drops in population of the same magnitude.
- Not a Lot of Economics Underlying This
  - Oddly enough, this theory is successful at explaining the rank-size rule (Zipf’s law)
  - The rank-size rule is the fact that in virtually all countries the size of the \( n \)th largest city is \( 1/n \) times the size of the largest
  - Stunningly robust result in most countries.

Theory 2: Locational Fundamentals

- Locational fundamentals posits that there are unchanging characteristics of locations that determine the size of cities
  - For example, proximity to rivers, coasts, harbors, deserts, mountaintop, rainfall, flatland, latitude, etc
  - Each location is the sum of a long sequence of randomly distributed spatial qualities
  - Difference with RG is response to temporary shocks:
    - Random growth: shocks are permanent
    - Locational fundamentals temp shocks have no long run impact
Theory 3: Increasing Returns to Scale

- Productivity of firms is enhanced by surrounding economic activity
  - Achievement of Minimum Efficient Scale (MES)
    - Not enough local demand to achieve MES, so firms are less productive
  - Informational Exchange:
    - The more people one interacts with, the smarter one gets (and hopefully) the smarter they get!
    - But it is harder to interact with people who are farther away
  - Cost Linkage
    - The more varieties of inputs a firm has the better the output
    - But imported inputs are more expensive than local inputs
  - Cities arise because we are more productive when more concentrated

How to Measure Regional Dispersion?

- Concentration Ratio: Share of Population in Largest Regions

- Relative Variance
  - Ratio of Variance of Log Population Density in Year $t$ Relative to 1998

- Zipf Coefficient
  - Coefficient in Regression of Log of the Rank of a Region on the Log of Its Population Density
    - Note if region $n$ is $1/n$ times the size of region 1 then
      - $\text{Pop}(n) = 1/n \times \text{Pop}(1)$ or $\ln[\text{Pop}(n)] = \ln[\text{Pop}(1)] - \ln(n)$
Size Distribution of Feudal Domain Size in Japan (1597) Top 50 Daimyo

**Zipf's Law for Daimyo**

\[ y = -0.9326x + 14.224 \]
\[ R^2 = 0.9801 \]

\[ \ln(\text{Rank of Han}) \]
\[ \ln(\text{Rice Output of Han}) \]

**Zipf's Law and US Cities**

\[ y = -1.0012x + 10.547 \]
\[ R^2 = 0.9869 \]

\[ \ln(\text{rank}) \]
\[ \ln(\text{size}) \]
Zipf’s Law and Japanese Regions

Evaluating Theories: Historical Regional Population Data

- Data for the Years 725 –1150 Is Based on Censuses Done for Tax Purposes
  - Japanese Tax System Was Lump Sum and Therefore Required Detailed Censuses and Tax Districts Based on Population

- Data for 1600 Is Augmented With Major Land Survey

- From 1721 to 1998 We Do Not Need Tax Data As Actual Population Data Exists
What has happened to regional density? Look at Variation across 36 Regions

<table>
<thead>
<tr>
<th>Year</th>
<th>Population in Thousands</th>
<th>5 Largest Region Share</th>
<th>Relative Var of log Pop Den</th>
<th>Zipf Coefficient</th>
<th>Raw Correlation with 1998</th>
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Persistence of Density
What did we learn?

• High degrees of variation in population density has always been a feature of the world
  – Zipf’s law has always held, i.e. $n^{th}$ largest region is $1/n$ times the size of the largest region
    • Suggests the importance of either Random Growth model or Locational Fundamentals Model
  – High degree of persistence in the size of regions over time
    • Suggests that Locational Fundamentals are critical to understanding region size
  – There has been an increase in concentration in last century which coincides with industrialization
    • Increasing returns may play a role in the size of cities