Chapter 12

Key Issue Two: Why are consumer services distributed in a regular pattern?
Distribution of Consumer Services

- Central place theory
  - Market area of a service
  - Size of market area

- Market area analysis
  - Profitability of a location
  - Optimal location within a market

- Hierarchy of services and settlements
  - Nesting of services and settlements
  - Rank-size distribution of settlements
Central Place Theory

Market areas are arranged into a regular pattern according to central place theory, with larger settlements fewer and further apart.
Hexagons are often used to delineate market areas because they are a compromise between circles, which have edges equidistant from the center but leave gaps, and squares, which don’t leave gaps but whose edges are not equidistant from the center.
Market Areas, ranges, and thresholds for department stores in the Dayton, Ohio, metropolitan area.
Range of a Service

- The range is the maximum distance people are willing to travel to use a service.
- The range is the radius of the circle drawn to delineate a service’s market area.
- If firms at other locations compete by providing the service, the range must be modified.
- The irregularly shaped circle takes in the territory for which the proposed site is closer than competitors.
- The range must be modified further because most people think of distance in terms of time, rather than a linear measure like kilometers or miles.
- The irregularly shaped circle must be drawn to acknowledge that travel time varies with road conditions.
Threshold of a Service

• The second piece of geographic information needed to compute a market area is the threshold, which is the minimum number of people needed to support the service.

• How potential consumers inside the range are counted depends on the product.

• Developers of shopping malls, department stores, and large supermarkets typically count only higher-income people.
Retailers and other service providers make use of market-area studies to determine whether locating in the market would be profitable and, if so, the best location within the market area.
The optimal location for a pizza delivery shop with seven potential customers in a linear settlement (top) and with 99 families in apartment buildings (bottom).
Market area, range, and threshold for Kroger supermarkets (left) and UDF convenience stores in Dayton, Ohio. Supermarkets have much larger areas and ranges than convenience stores.
Best Location in a Linear Settlement

- In a linear community like an Atlantic Ocean resort, the service should be located where half of the customers are to the north and half to the south.
- It corresponds to the median, which mathematically is the middle point in any series of observations.
- What if a different number of customers live in each block of the city?
- To compute the optimal location in these cases, geographers have adapted the gravity model from physics.
- The gravity model predicts that the optimal location of a service is directly related to the number of people in the area and inversely related to the distance people must travel to access it.
Best Location in a Nonlinear Settlement

- Most settlements are more complex than a single main street.
- Geographers still apply the gravity model to find the best location.
Hierarchy of Services and Settlements

- Small settlements are limited to services that have small thresholds, short ranges, and small market areas.
- Larger settlements provide services having larger thresholds, ranges, and market areas.
- However, neighborhoods within large settlements also provide services having small thresholds and ranges.
Nesting of Services and Settlements

- More developed countries have numerous small settlements with small thresholds and ranges, and far fewer large settlements with large thresholds and ranges.
- The nesting pattern can be illustrated with overlapping hexagons of different sizes (for) different levels of market area.
- In his original study, Walter Christaller showed that the distances between settlements in southern Germany followed a regular pattern.
- He identified seven sizes of settlements (market hamlet, township center, county seat, district city, small state capital, provincial head capital, and regional capital city).
- Brian Berry has documented a similar hierarchy of settlements in parts of the U.S. Midwest.
- The principle of nesting market areas also works at the scale of services within cities.
Rank-Size Distribution of Settlements

- In many MDCs the ranking of settlements from largest to smallest (population) produces a regular pattern or hierarchy.

- Rank-size rule: in which the country’s $n$th-largest settlement is $1/n$ the population of the largest settlement.

- Example: 2nd largest city is $\frac{1}{2}$ of the largest settlement, the 1/4th largest city is $\frac{1}{4}$th the size of the largest.

- Plotted logarithmically have a straight line. This is the rule in the US.

- Several European MDCs follow this rule at the smaller cities but follows the **primate city rule** with the largest settlements. According to the primate city rule, the largest settlement has more than twice as many people as the second-ranking city. (primate city). This common in LDCs.

- Impact—A regular hierarchy indicates that the society is sufficiently wealthy to justify the provisions of goods and services to consumers throughout the county.
Periodic Markets

• Services at the lower end of the central place hierarchy may be provided at a periodic market, which is a collection of individual vendors who come together to offer goods and services in a location specific days.

• Examples include, farmers markets for cities, health fairs for rural residence.

Periodic Market, Sierra Leone
Cities in the U.S. closely follow the rank-size distribution, as indicated by the almost straight line on this log scale. In Romania, there are few settlements in two size ranges.