

The Von Thünen Model of Rural/Agricultural Land Use

Johann Heinrich Von Thünen (1783-1850) was a farmer, a German, a snazzy dresser, and an amateur economist who was interested in appropriation economics.

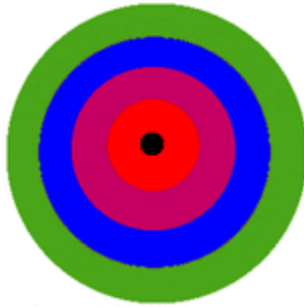


Inspired by Adam Smith and creating his model before industrialization, Von Thünen was interested in the natural laws that govern rural land use, that is, the best way for farmers of different goods to locate their farms within an **Isolated State** so that they maximized their profits.

As with any model, it has its assumptions. Here's a list of Von Thünen's:

- The central city (also market or CBD), where goods are sold and exchanged, is located centrally within an **Isolated State** which is self sufficient and has no external influences.
- The Isolated State is surrounded by unoccupied wilderness.
- The land in the aforementioned Isolated State is completely flat with no rivers, mountains, canyons, railroad tracks, golf courses, roadblocks, or anything else to interrupt the terrain. There aren't even any roads.
- The Isolated State obeys the laws of Euclidean Space, whereby the shortest distance between two points, called a geodesic, is a straight line.
- Farmers in the Isolated State transport their own goods to market via oxcart, across land, along the geodesic, directly to the central city, without passing go or collecting \$200.
- Farmers like to eat, so they will act to maximize profits.

One day, while playing darts and thinking about the Isolated State, Von Thünen hypothesized that, under the assumptions, a pattern of concentric rings around the market would develop. Heres' what he saw . . .



The different types of farms during Von Thünen's time were:

- **Ranching** (raising animals for slaughter)
- **Dairy and Intensive Farming** (produce & perishables)
- **Timber** (wood was in high demand pre-industrialization for heating and cooking)
- **Field Crops** (grains and other non-grain field crops)

All goods produced by the farmers had to be transported to the central city to be sold at market. Naturally, there are costs incurred with the transporting the product, which Von Thünen called **Luftlinie**, T , and additional costs of acquiring land, which Von Thünen called **Locational Rent**, L .

Land closer to the central city/market was more expensive, but transportation costs were lower.

Land further away from the central city/market was cheaper, but transportation costs were higher.

The obvious question for the farmer was “*Where to farm, where to farm, oh alas, poor me, where shall I farm?!?!*”

See if you would have made it as a pre-industrial farmer in the land of Von Thünen

Directions:

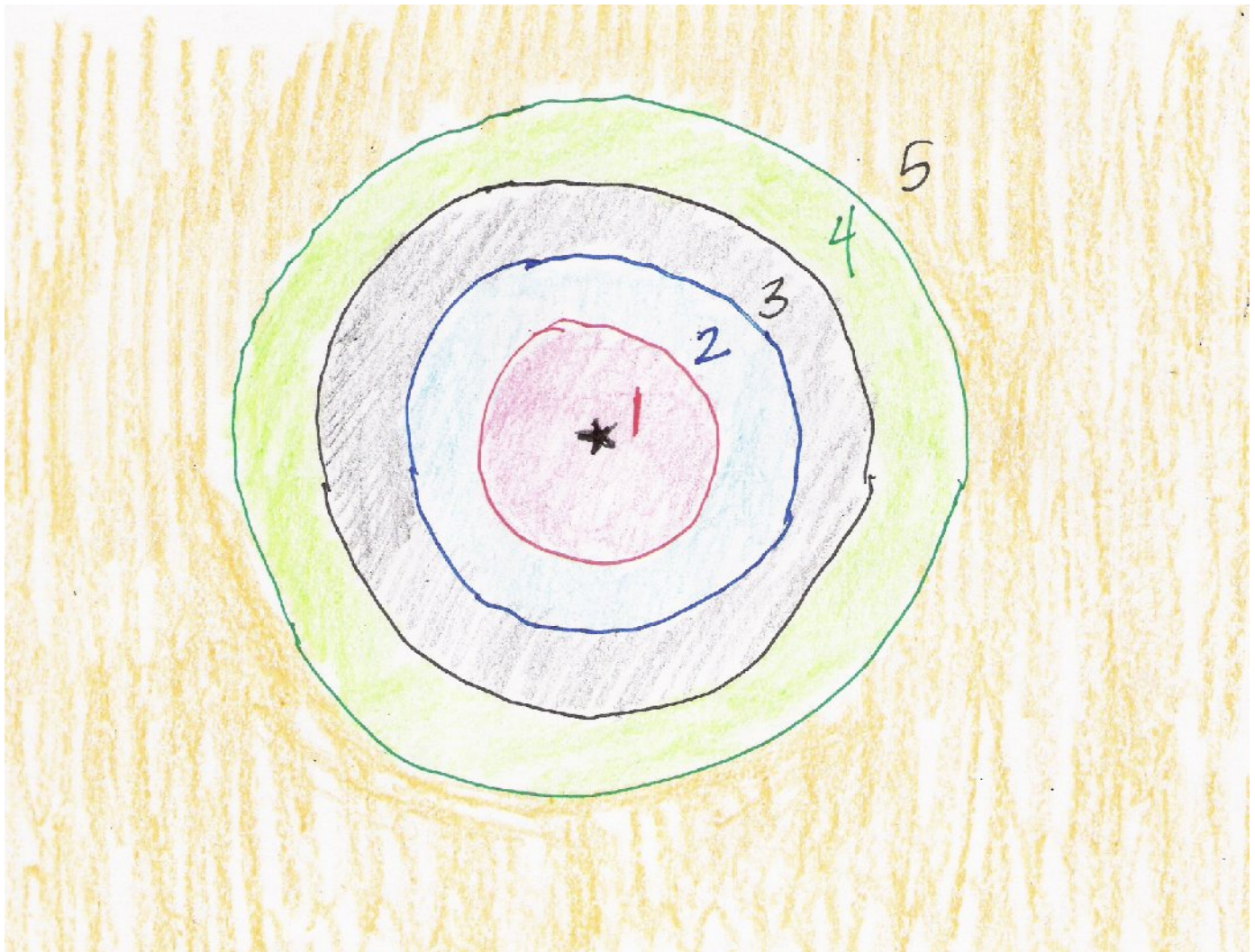
1. Place the following in the correct concentric ring.
2. Don't Mess Up, Lest ye go hungrig.

RANCHING
FIELD CROPS

DAIRY

LIONS & TIGERS & BEARS

TIMBER



Zum beispiel:

Suppose Milk can earn \$200 per month at the Market, so

$$M = 200 \text{ (market price)}$$

Assume the following rates for Land Rent, L , and Transport Costs, T , for milk.

Region (miles from Central City)	1	2	3	4	BEARS
L = Land Rent, \$/ <i>month</i>	100	80	25	10	free
T = Transport Cost, \$/ <i>mile</i>	5	20	100	200	Arm+Leg

Let's calculate profits for milk in each Region

$$P = \underset{\substack{\text{market} \\ \text{price or} \\ \text{revenue}}}{M} - \left(\underset{\substack{\text{transport} \\ \text{cost}}}{T} + \underset{\substack{\text{land} \\ \text{rent}}}{L} \right)$$

Region

$$1: \quad P = 200 - \left(\quad + \quad \right) =$$

$$2: \quad P = 200 - \left(\quad + \quad \right) =$$

$$3: \quad P = 200 - \left(\quad + \quad \right) =$$

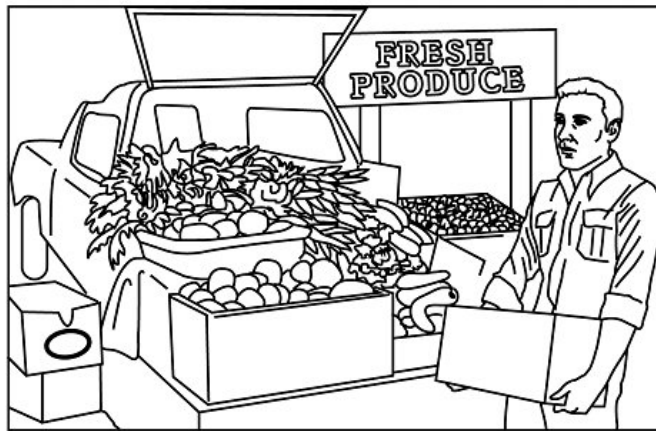
$$4: \quad P = 200 - \left(\quad + \quad \right) =$$

$$5: \quad P = 200 - \left(\quad + \quad \right) =$$

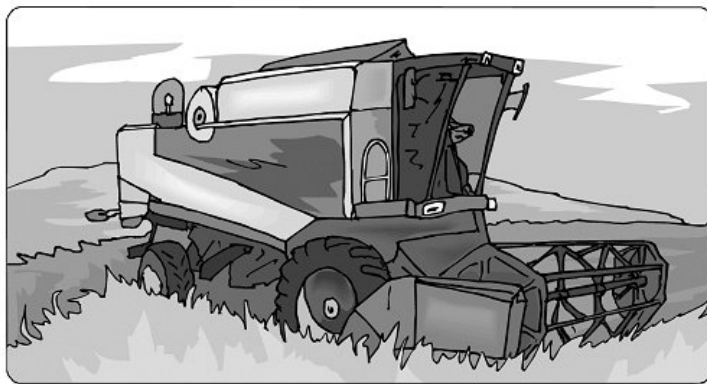
Final notes:

1. Even though Von Thünen's model was created in a time before factories, highways, railroads, UPS, and i-phones, it is still an important model in geography, demonstrating the balance between land cost and transportation cost in producing a cost-effective product.
2. William Alonso built up Von Thünen's idea and modified it for urban use. Known as the "Bid-Rent Function Theory," it takes into account things like population density, employment, etc. It also makes no mention of oxcarts.

2007 AP® HUMAN GEOGRAPHY FREE-RESPONSE QUESTIONS



X



Y

1. The drawings above reflect agricultural activities in the hinterland of a large urban area.
 - A. Apply the underlying principles of von Thünen's agricultural land-use model to predict the locations of the activities shown in X and Y relative to a large urban area.
 - B. Choose either activity X or activity Y and apply the underlying principles of von Thünen's agricultural land-use model to explain the location of the activity.
 - C. Discuss two factors that explain why agricultural land-use patterns today differ from those developed by von Thünen's model in 1826.