

# **Community Development, Economic Development, or Community Economic Development?**

## **Concepts, Tools and Practices**

### **Location Theory: A Brief Overview Part I**

## **Location Theory: A Brief Overview**

**Location theory helps us one basic question: why does economic activity occur here rather than other there?**

**This can include questions about why a manufacturing firm selects one community over another or why certain types of retail and service business are located in some communities and not others.**

**Another way to think of this question focuses on how a system of cities (villages) is formed on the economic landscape.**

**This question is at the heart of the space element of the Shaffer Star.**

## Location Theory: A Brief Overview

There are a range of potential theoretical ways to think about these questions including:

- Neoclassical Firm Location Theory
  - Growth Pole/Center Theory
  - Central Place Theory
- Behavioral Approach
- Institutional Approach
- Agglomeration Theory (ala Michael Porter Cluster Theory)

Each of these will be outlined in turn with a discussion of the implication on community economic development policies.

# Location Theory: A Brief Overview

## Neoclassical Location Theory

There are four “traditions” in neoclassical location theory:

- ❑ Land use: (von Thünen and Alonso)
- ❑ Industrial Location: (Weber and Isard)
- ❑ Central Places: (Christaller and Lösch)
- ❑ Spatial Competition: (Hotelling)

Many of these “traditions” are over a hundred years old. For example, von Thünen (1783-1850), is considered one of the first to introduce the notion of space or geography into economic analysis with his study of land use patterns around villages in what is now Germany.

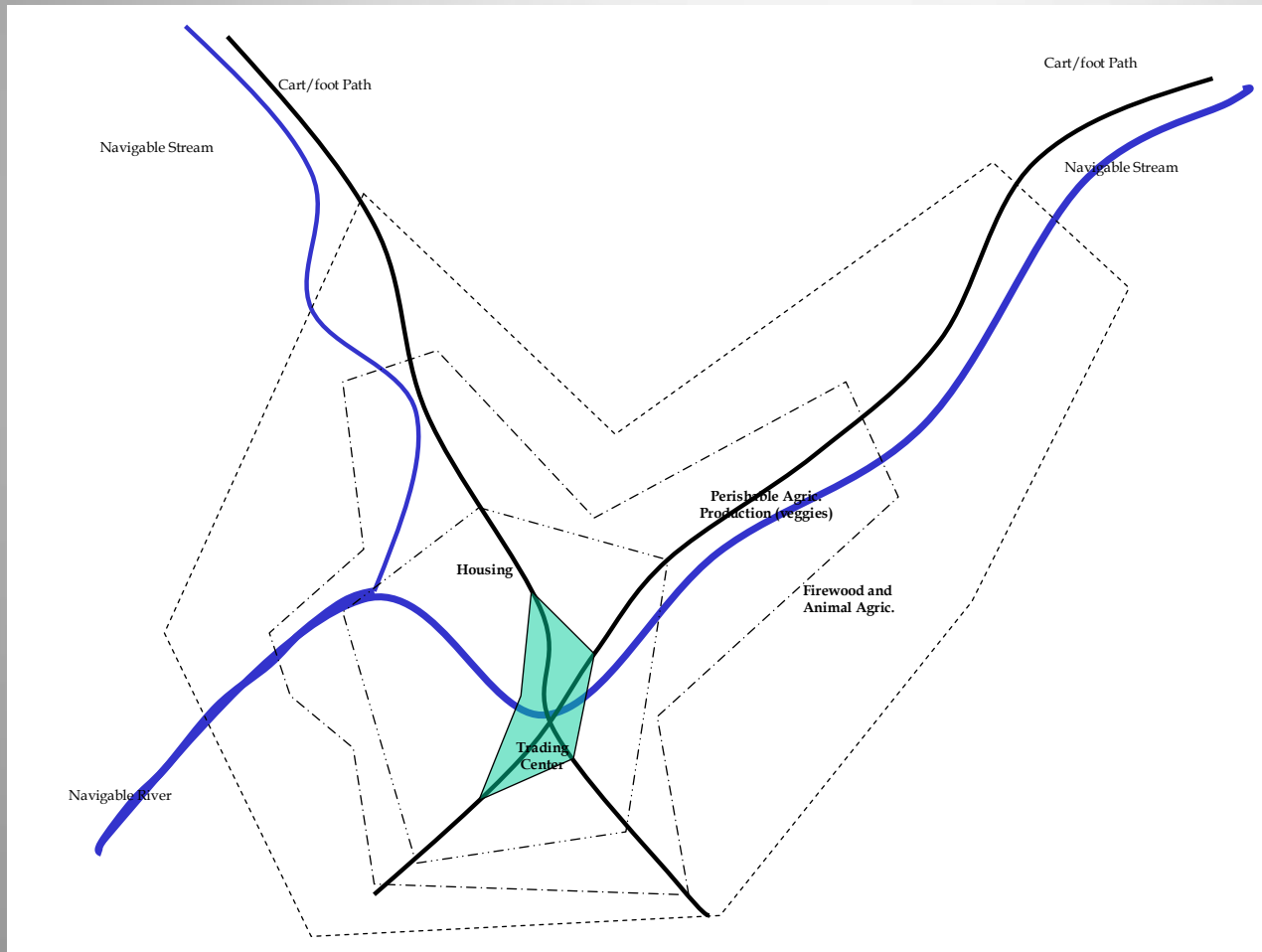


von Thünen

# Location Theory: A Brief Overview

## Neoclassical Location Theory

von Thünen found that land use patterns around German villages were remarkably similar.



- A market or trading area at the center of the village.
- Housing moving out from the central market.
- Then gardens (vegetables) and animal pens.
- Crops and grazing.

# Location Theory: A Brief Overview

## Neoclassical Location Theory

There are two factors at play in explaining this pattern:

- Weight of materials to be transported.
- Frequency of transport.

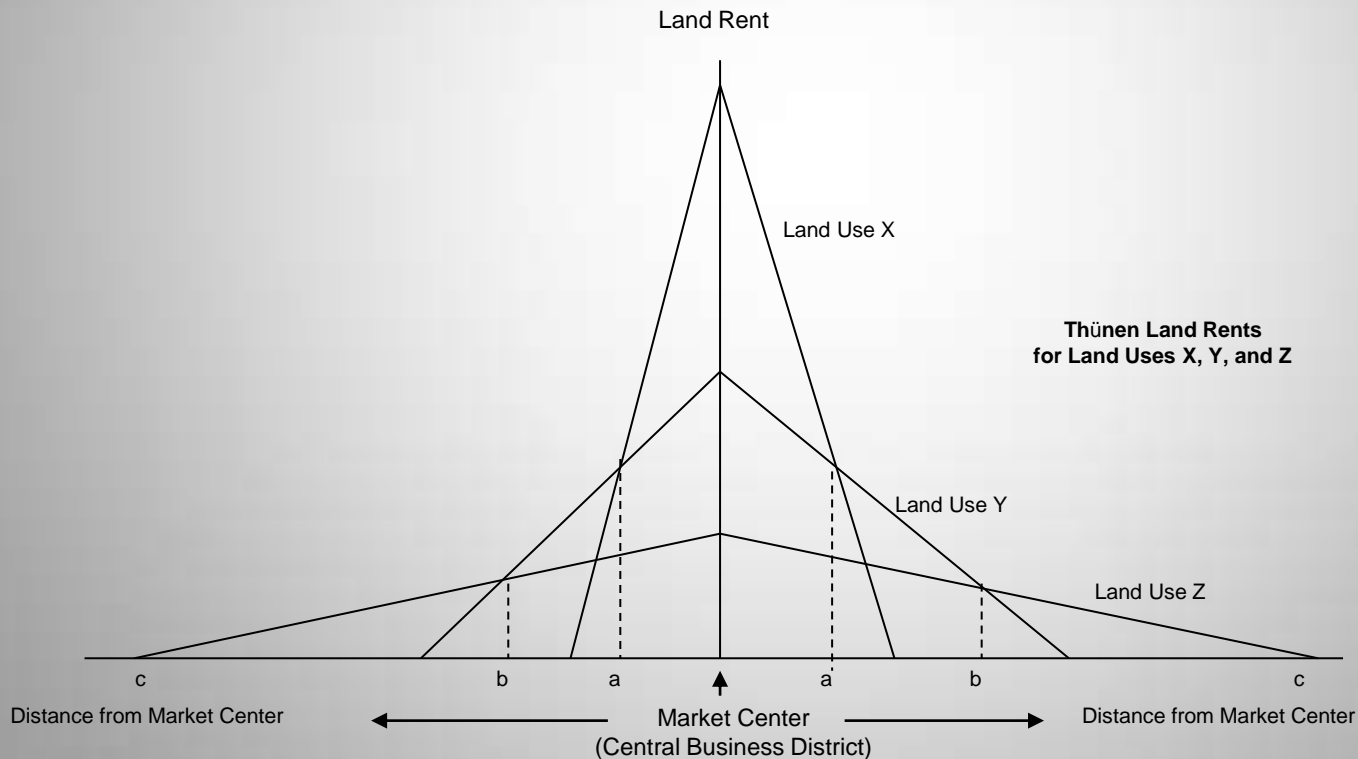
Heavier materials will tend to be located closer to the village center and items that are transported more frequently will also be located closer to the village center.

Villages that rely on a well for freshwater will tend to be built around the well, or the well in the center of the village. Why? Water is heavy and households potential need to make frequent trips.

# Location Theory: A Brief Overview

## Neoclassical Location Theory

But von Thünen's contribution as an economist was his observations on land values or rents. He observed the **land rents tended to be higher in the center of the village and progressively decline as you move way from the center.**



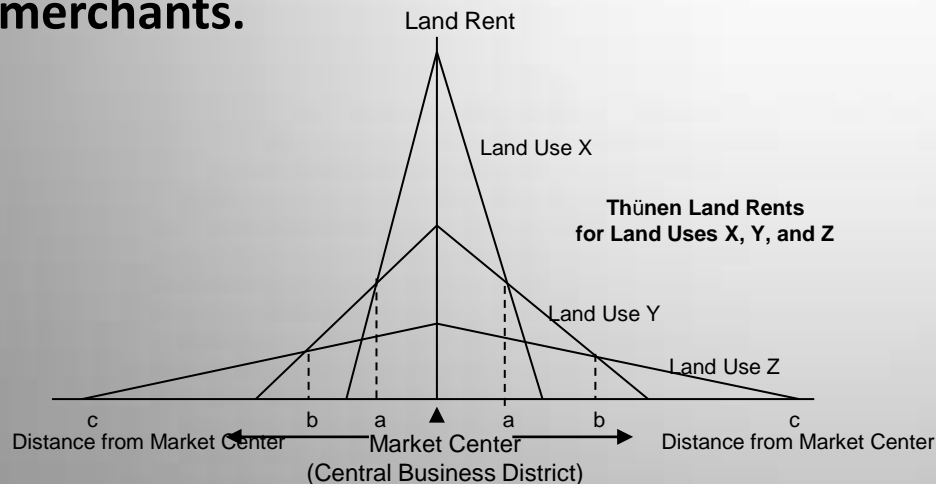
# Location Theory: A Brief Overview

## Neoclassical Location Theory

In this simple example, there are three land uses: “X” village shops or stores, “Y” housing, and “Z” agricultural.

For merchants (“X”) it is important to be close to the village center and will pay higher rents to be there. Merchants are less willing to pay for land farther than the village center.

Households (“Y”) would like to be near the village center but are not willing to pay the high rents offered by merchants. But as one moves slightly out of the village center, households are willing to pay more than merchants.



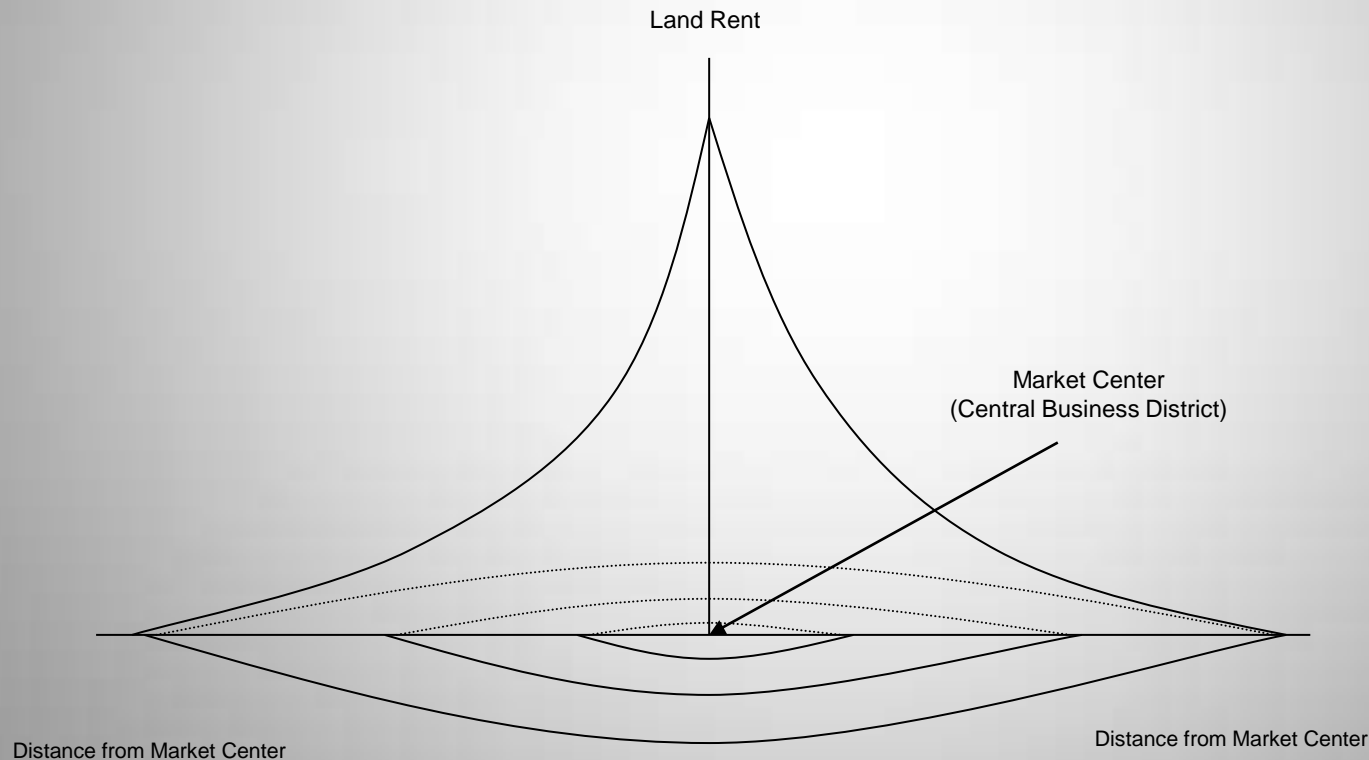
Farmers (“Z”) would like to be close to the village center, but are not willing to pay the same rents as merchants or household.



# Location Theory: A Brief Overview

## Neoclassical Location Theory

In this example we see three “rings” of land use in the village: merchants will be paying the highest rents at the center of the village, the next ring will be residential housing and the third outer ring will be farm land.



# Location Theory: A Brief Overview

## Neoclassical Location Theory

Alonso built on the work of von Thünen by thinking about how the land use model of German villages could be applied to modern cities. The overlap and insights gained is remarkable.

Assume that the center of the city is where all businesses are located, often called the “Central Business District” (CBD), and households live outside the CBD and commute into work in the CBD.

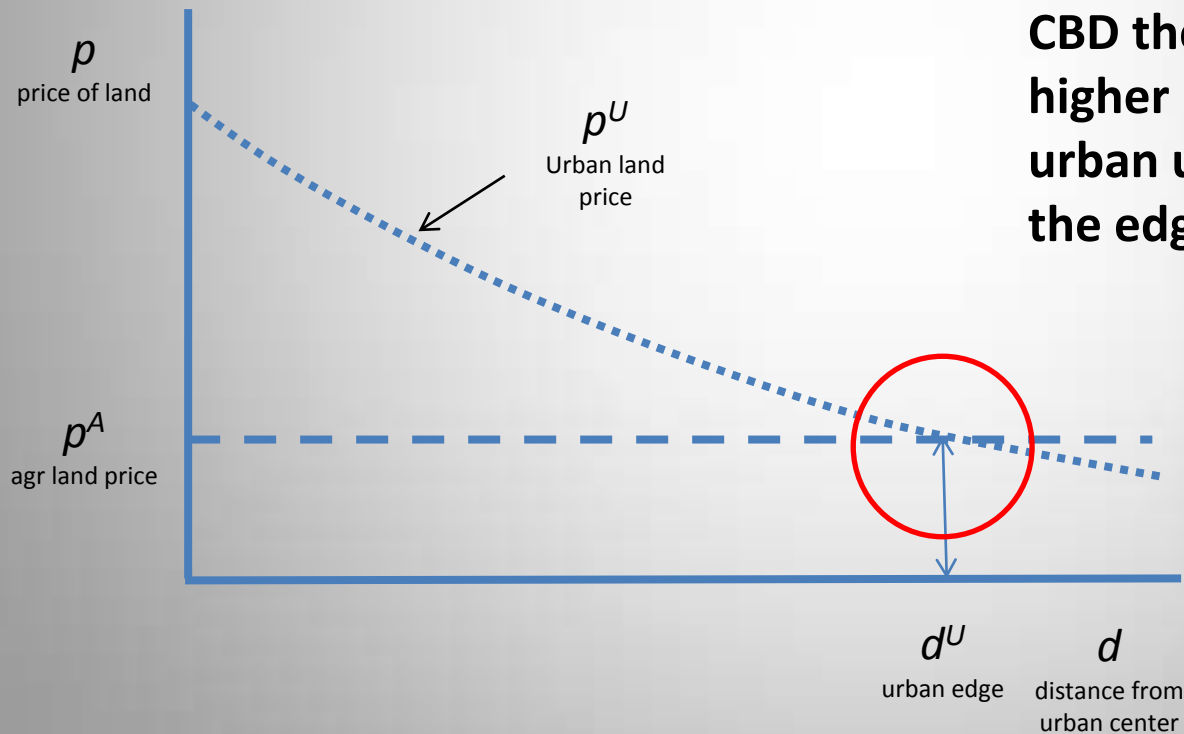


Alonso

# Location Theory: A Brief Overview

## Neoclassical Location Theory

Just as in the German villages we can see that land prices will be the highest at the center of the city. But as one moves away from the center of the city (or the central business district) land becomes less valuable and prices begin to drop.



At a certain distance from the CBD the value of the land is higher in agriculture than it is in urban use. This point defines the edge of the city.

# **Location Theory: A Brief Overview**

## **Neoclassical Location Theory**

**There is an interesting interplay of land and capital along the what is referred to as the “bid-rent function”. For a give size piece of land (say an acre) how much capital does one place on it? Here capital is the form of building density.**

**For the urban center land is expensive businesses will substitute capital for land. In essence, one will see larger (i.e., taller) building in the urban center where land is the most expensive.**

**Moving toward the urban fringe where land is relatively less expensive businesses will substitute land for capital. Here things like warehouses, shopping centers with large surface parking lots and golf courses are more likely to be present.**

**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

Labor (or households) also have a choice to make. Because the theory assumes that all jobs are within the central business district, workers must make the decision to live close to the CBD and commute a shorter distance or live further from the CBD and commute a longer distance.

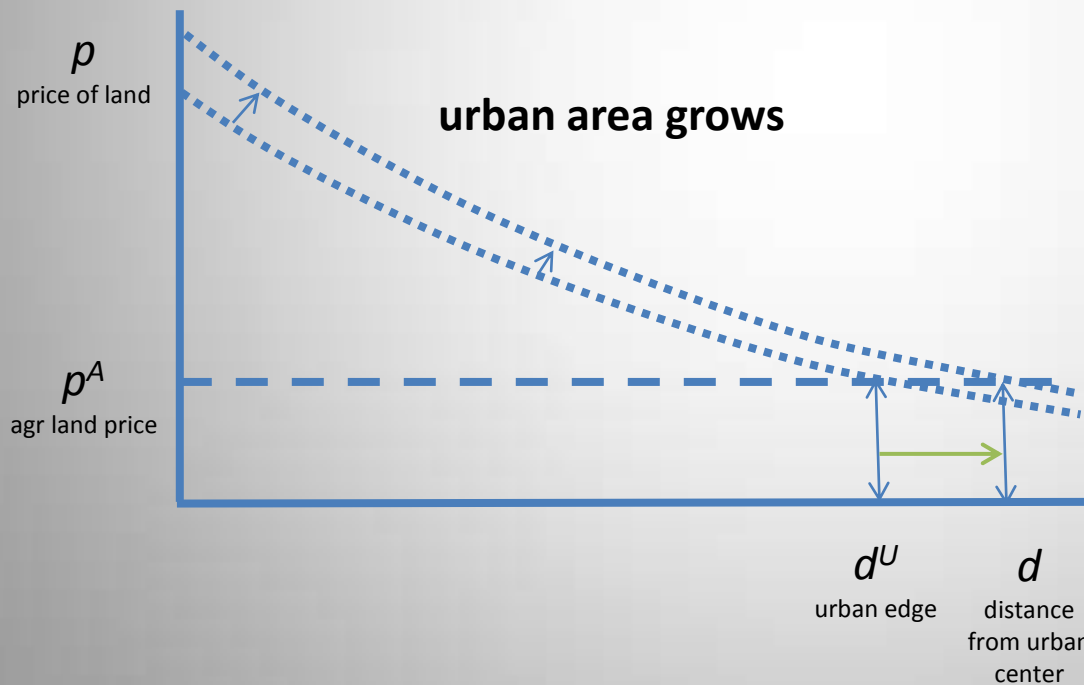
Generally, workers who commute greater distances must be “compensated” with larger homes. This is generally a pattern we see in urban areas: smaller more densely concentrated homes tend to be located closer to the CBD and larger homes on larger pieces of land tend to be closer to the urban fringe.

Much like businesses residential development must also make a decision on the trade-off between land and capital. Closer to the CBD capital will be substituted for land and one will see more apartment/condo type residents. But closer to the urban fringe one will see larger homes on larger lots.

# Location Theory: A Brief Overview

## Neoclassical Location Theory

One can also use this theoretical framework to thinking about the growth of cities is a spatial sense. If the city gains population or income, the bid-rent function will shift to the right in the same way that a demand curve would shift to the right.



As the value of land is bid up at the urban fringe agricultural land is converted into urban use.

Thus, is the “spreading” of a city a natural economic process or “sprawl”?

# **Location Theory: A Brief Overview**

## **Neoclassical Location Theory**

**Also notice that the theory predicts that as the city grows “back-fill” will tend to be more dense.**

**As the city grows the value of land that was suitable for less “intensive” or “dense” use (i.e., more capital on the land) is now becoming more expensive. There will be pressure to shift to more capital, or land redevelopment will be denser.**

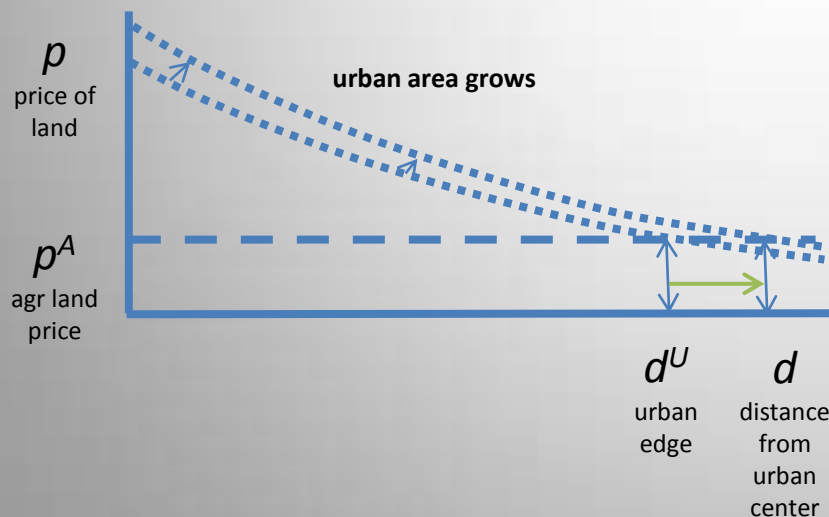
**Examples might include two acre residential lots redeveloped into four half acre lots, single story retail site redeveloped into two or three story mixed uses, “big box” stores with large surface parking lots rebuilt with the retail space above a parking ramp, or large single story warehouses redeveloped into more dense uses.**

# Location Theory: A Brief Overview

## Neoclassical Location Theory

The work of Alonso on city land structure sparked a parallel line of work looking at cities as **Growth Poles** or **Growth Centers**. Originally introduced by Francois Perroux in 1949 the ideas were widely studied in the 1960s.

While the theories have been generally dismissed as lacking rigor and testable hypothesis it did raise questions about how a city might grow over time. In the discussion of urban spatial growth we assumed that the bid-rent curve would shift to the right (and up).



But Growth Pole Theory suggests that there are multiple ways growth play out.



Perroux



# Location Theory: A Brief Overview

## Neoclassical Location Theory

Dave Barkley and Mark Henry of Clemson University conducted a series of studies looking at the behavior of eight “economic areas” of South Carolina a number of years ago to address a simple question: As an urban area (city) grows does the growth spillover (i.e., spread) into neighboring rural areas or did the growth “suck in” (i.e. backwash) the surrounding rural resources?

As part of the research to answer this question they described several ways that the urban centers (cities) and surrounding rural “hinterland” can interact, with both spread and backwash effects.

Barkley



Henry



**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

Now suppose the urban area grows, four possibilities:

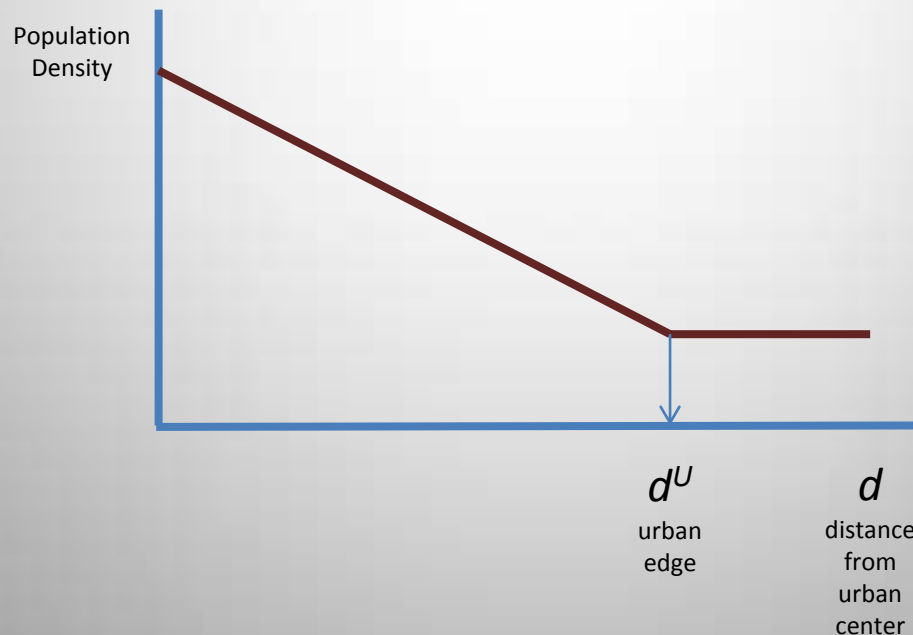
1. “Spread” through growth
2. Spread through decentralization
3. Urban growth – rural stagnation
4. “Backwash”

# Location Theory: A Brief Overview

## Neoclassical Location Theory

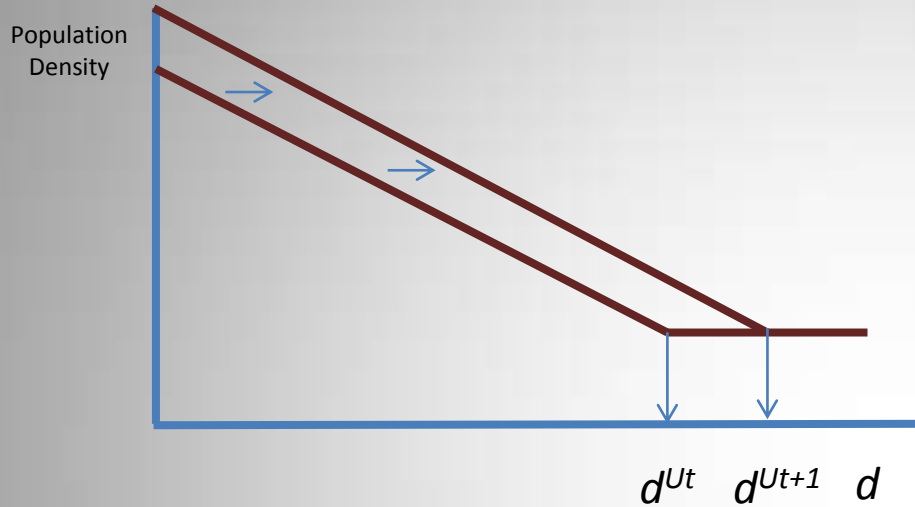
To address the basic question Barkley and Henry looked at the population density of the economic region over a ten year period. **Note that the population density follows a similar pattern to land rents (prices):**

Population density will be higher in the urban center and decline as one moves away from that center till one hits the edge of the city. The question is what happens to this pattern as the city grows?

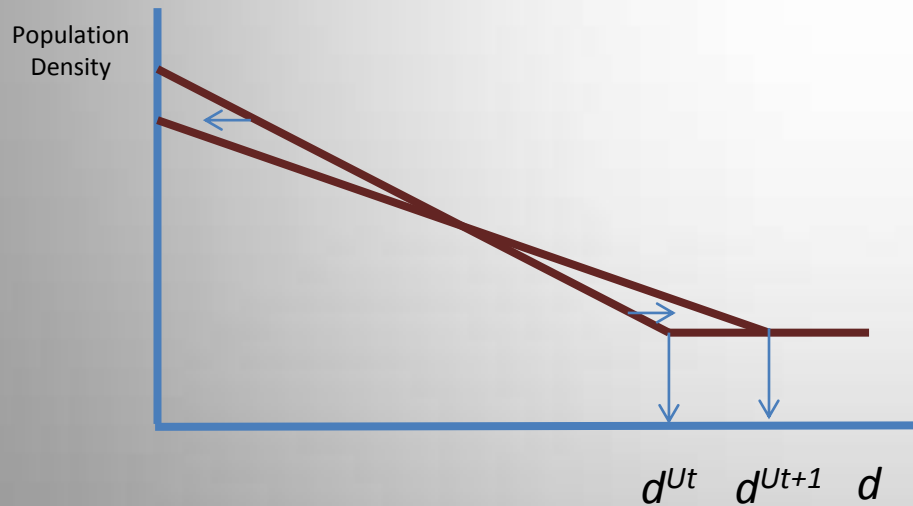


# Location Theory: A Brief Overview

## Neoclassical Location Theory



Spread through growth:  
(t to t+1)

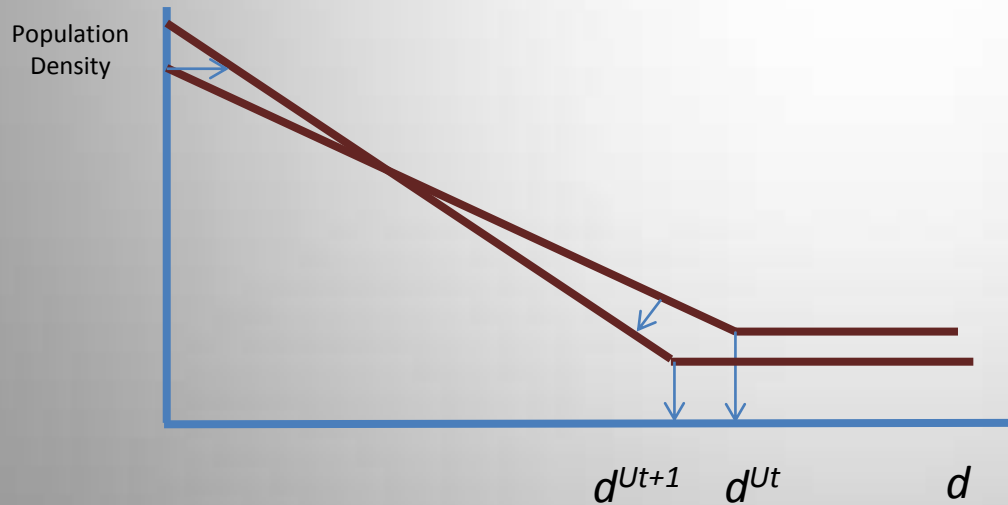
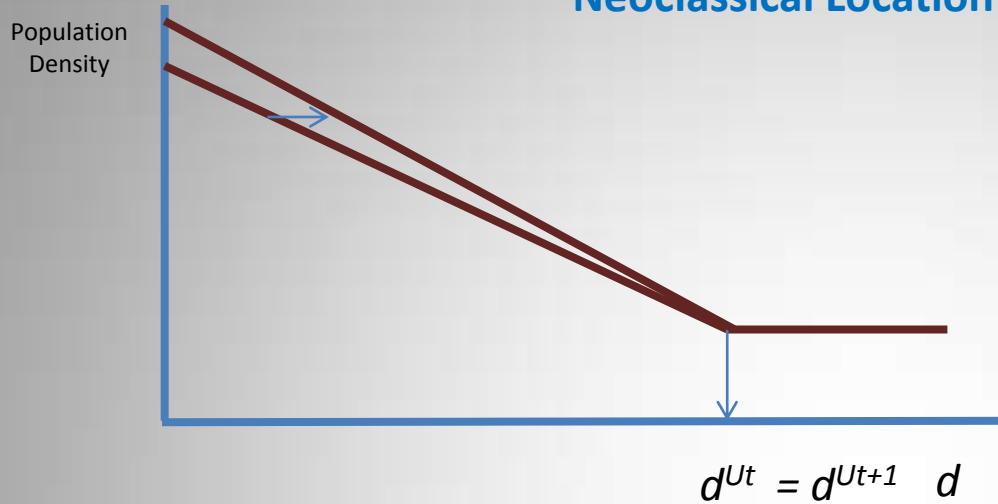


Spread through decentralization:  
(t to t+1)

(decline of the central city)

# Location Theory: A Brief Overview

## Neoclassical Location Theory



# Location Theory: A Brief Overview

## Neoclassical Location Theory

Barkley and Henry appealed to Growth Center/Pole Theory to think about how the urban and rural areas are interconnected and talk in terms of “flows” between urban and rural.

### Flows of Investment Funds

- Urban funds are invested in rural areas to take advantages of relatively low labor and land costs (**spread effects**).
- Rural funds are invested in urban areas to take advantage of relatively rapidly growing goods and services markets (**backwash effects**).

### Flows of Spending for Goods and Services

- Urban growth provides expanding markets for rural producers (**spread effects**).
- Spending in rural trade and service markets declines due to increased competition from more varied and efficient urban producers (**backwash effects**).

# Location Theory: A Brief Overview

## Neoclassical Location Theory

### Flows of People

- Rural labor commutes to urban area for employment (**spread effect**).
- Urban families relocate to rural areas because of lower real estate costs and perceived higher quality of life (**spread effect**).
- Rural residences migrate to urban areas for better access to employment opportunities and urban lifestyle (**backwash effect**).

### Flows of Firms/Employment

- Firms in the mature or declining stage of product life cycle locate in rural areas to take advantage of lower labor and land costs (**spread effects**).
- Firms in the innovative or growing stages of the product life cycle locate in urban areas to benefit from agglomeration economies, markets and specialized labor (**backwash effects**).

# Location Theory: A Brief Overview

## Neoclassical Location Theory

### Flow of Knowledge and Technology

- Urban centers are the generators and diffusers of information and innovation for rural areas (e.g., growth centers or growth poles) (**spread effects**).
- Social attitudes in rural areas are transformed by the “demonstration effects” of higher wages and expanding markets in the urban core (**spread effects**).
- Rural to urban migration is selective of the better educated and more highly skilled rural workers (**backwash effect**).

### Flows of Political Influence and Government Spending

- Urban growth increases socio-political conflict, contributing to a policy promoting decentralization (**spread effects**).
- Government expenditures enhances the infrastructure and public service delivery systems of the more heavily populated urban areas (**backwash effects**).

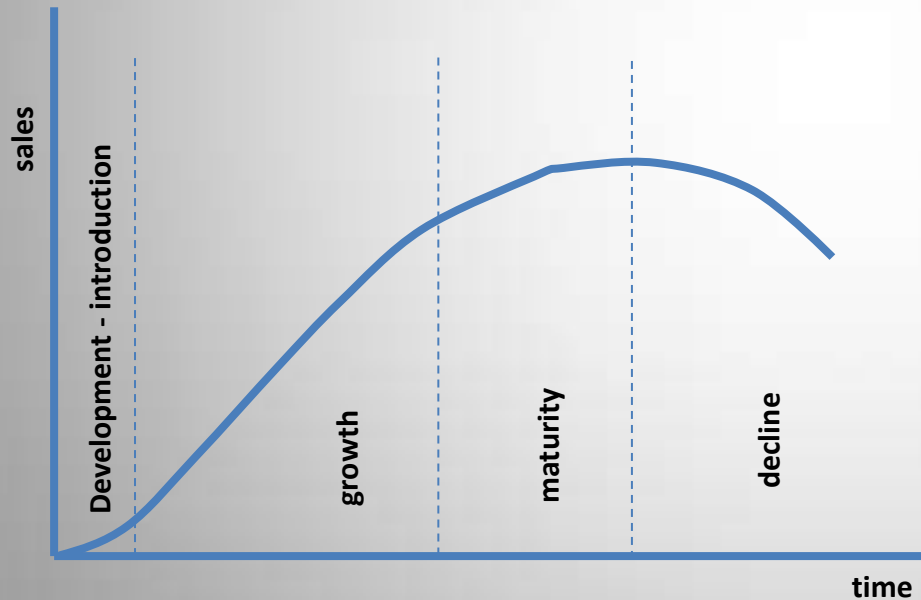
Clearly there are additional “flow” factors that can influence both spread and backwash effects. But this list provided by Barkley and Henry demonstrates that the relationship between the urban center (cities) and the surrounding rural hinterland can be complex and vary across places.



# Location Theory: A Brief Overview

## Neoclassical Location Theory

Before moving on, Barkley and Henry appeal to the notion of the “**product life cycle**” in helping think about spread and backwash effects. There are two ways this theory has been discussed: (1) industry sales over time, and (2) mobility of firms over time.



Over time, the industry goes through four stages:

- (1) Development and Introduction
- (2) Growth
- (3) Maturity
- (4) Decline

There is a predictable pattern to industry sale.

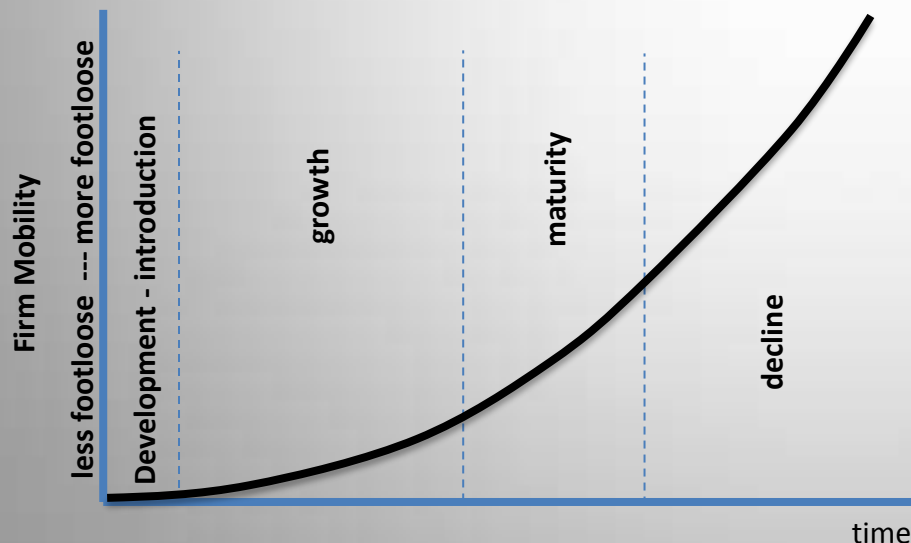
# Location Theory: A Brief Overview

## Neoclassical Location Theory

We can use this framework to think about **mobility of firms over time**.

Early in the industry's life it needs access to business services (e.g., financial, marketing, accounting, etc) which are commonly found in urban markets. Agglomeration economies come into play.

But as the industry matures the demand for these specialized services declines and the industry looks to boost profits by reducing costs. The urban center becomes too expensive to operate.



The firms in the industry become more “footloose” and relocate to rural areas to reduce costs. As production processes become “routine” firms may even move overseas.

# Location Theory: A Brief Overview

## Neoclassical Location Theory

In their work with South Carolina economic areas Barkley and Henry found evidence of all four possible combinations. But the more interesting question centered on if they could explain the patterns that they observed.

Their results, in hindsight, make perfect intuitive sense: quality of life matters!

People are drawn to places with perceived higher quality of life and repulsed from areas perceived to have low quality of life.

- Higher quality schools
- Lower crime rates
- Lower levels of poverty
- Higher local government spending on “cultural” services (e.g., parks, libraries)
- Natural amenities

Henry M.S., D.L. Barkley & S. Bau. 1997. The Hinterland's Stake in Metropolitan Growth: Evidence from Selected Southern Regions. *Journal of Regional Science* 37 (3): 479-501.



**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

**If the urban center is perceived to be a better place to live and conduct business relative to the surrounding area, backwash is likely to be present.**

**Conversely, if the urban center is perceived to be crime-ridden and run-down while the surrounding hinterland is blessed with high levels of natural amenities, strong spread effects are likely to occur.**

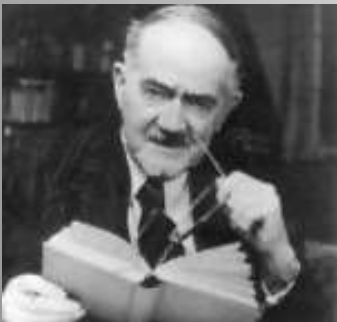
# Location Theory: A Brief Overview

## Neoclassical Location Theory

There are four “traditions” in neoclassical location theory:

- ❑ Land use: (von Thünen and Alonso)
- ❑ **Industrial Location: (Weber and Isard)**
- ❑ Central Places: (Christaller and Lösch)
- ❑ Spatial Competition: (Hotelling)

Weber



Isard



# Location Theory: A Brief Overview

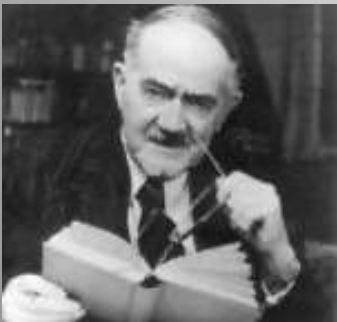
## Neoclassical Location Theory

The insights into land use and the urban-rural interface gained by von Thünen and Alonso, as well as Perroux's growth pole/center theory and the empirical work of Barkley and Henry is important but does not directly answer the question about **why firms locate in a particular locale.**

One of the first economists to rigorously address this question was Alfred Weber a German economist who was working in the spirit of von Thünen. From a purely historical perspective, location theory has its roots in the Germanic economists movement beginning with von Thünen.

Weber's approach is referred to as neoclassical because the theory assumes that the economy is characterized by perfect competition and constant returns to scale. In other words, firms cannot influence prices but are price takers.

Weber



# Location Theory: A Brief Overview

## Neoclassical Location Theory

The firm is faced with the locational choice that places the firm somewhere on the economic plane in a manner that maximizes profits.

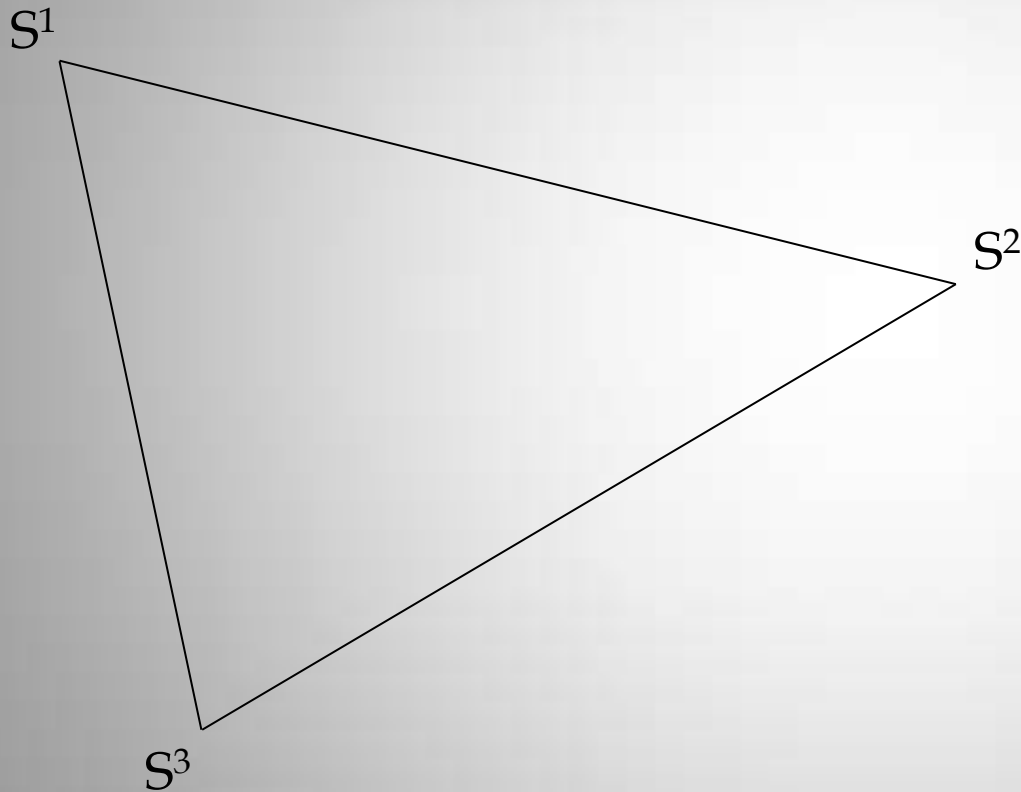
The firm does this by minimizing the transportation costs of shipping input supplies to the firm and maximizing the potential market demand for their good or service.

In other words, **profit maximization.....**

Economic plane: is a featureless surface that is not complicated by natural or institutional barriers such as mountains, rivers or valleys that create transportation bottlenecks, and political boundaries.

# Location Theory: A Brief Overview

## Neoclassical Location Theory



Lets say there are three market areas ( $S^1$ ,  $S^2$ ,  $S^3$ ) (could be Chicago-Milwaukee, the Twin Cities, and say St. Louis).

The firm's input suppliers are output markets are located at those three places. So the firm is buying from suppliers at all three locations, and selling its product to customers in all three markets.

**Where does the firm locate?**



# Location Theory: A Brief Overview

## Neoclassical Location Theory

The firm must pick a location ( $s^*$ ) that **minimizes the costs of shipping the inputs** from those three markets to the firm and **maximize the demand for its good/service** at those three markets.

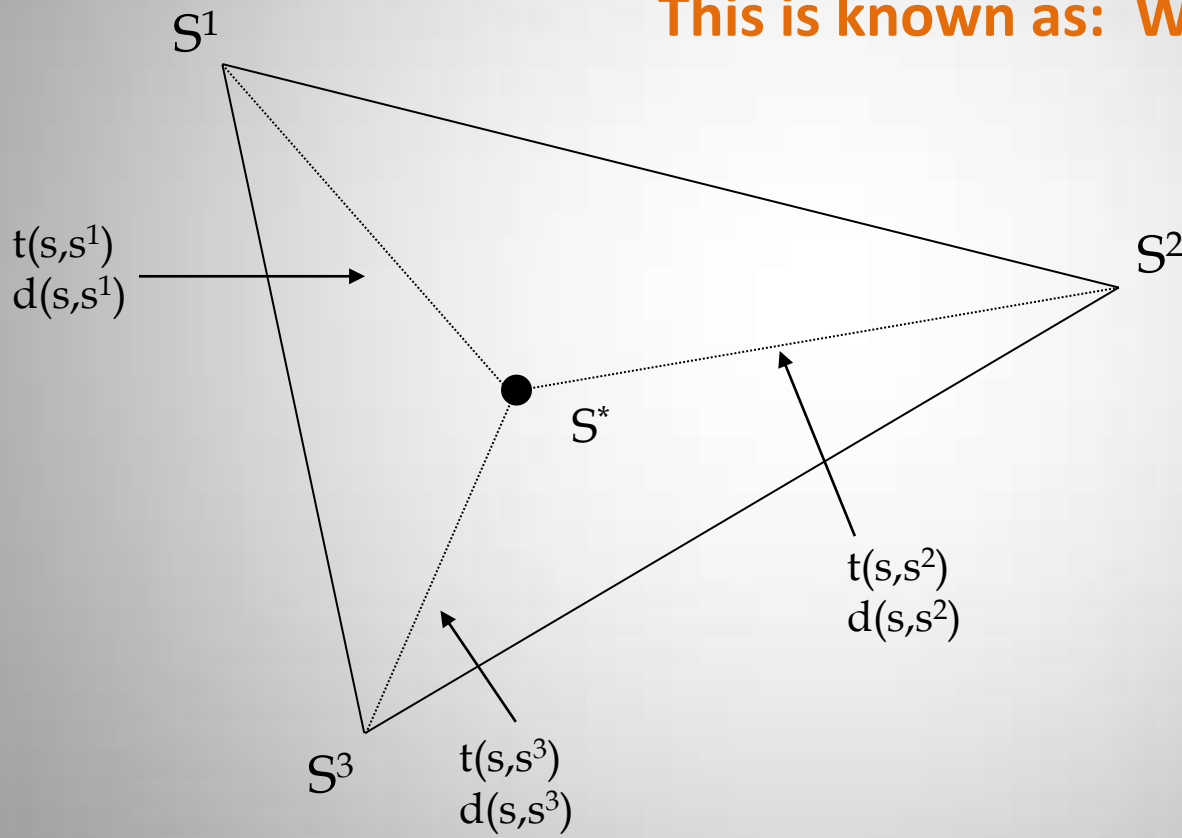
Let

$t(s, s_i)$  = cost of transporting one unit of the good from firm location  $s$  to market location  $s_i$

$d(s, s_i)$  = cost of transporting one unit of input  $x_i$  from market location  $s_i$  to firm location  $s$ .

**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

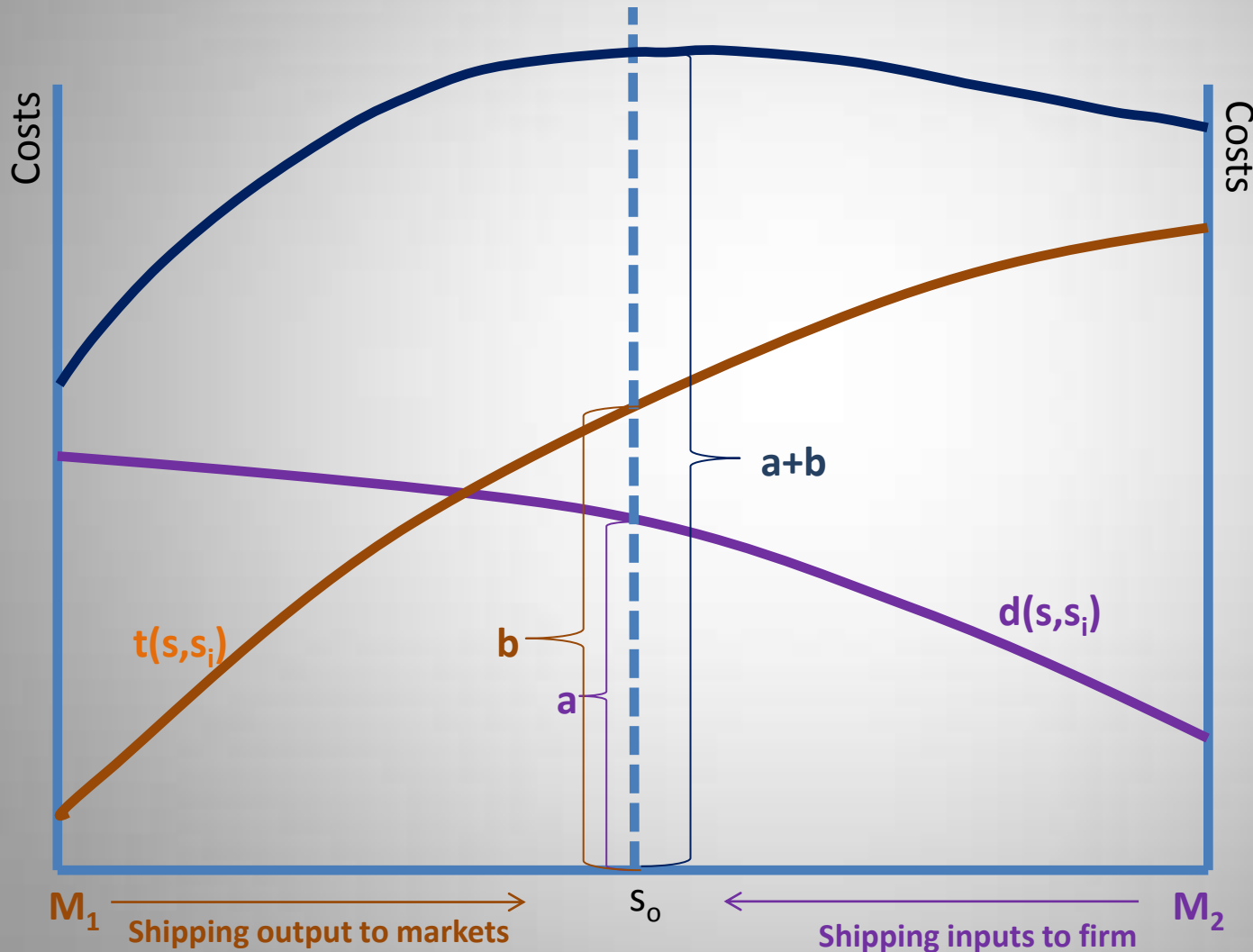
**This is known as: Weber's problem**



# Location Theory: A Brief Overview

## Neoclassical Location Theory

In this simple example the firm has one input market ( $M_2$ ) and one output market ( $M_1$ ). The question is where does the firm locate? At  $M_2$  or  $M_1$  or someplace in-between, say  $s_0$ ?



Depends on the total cost of shipping to the firm ( $d(s, s_i)$ ) and shipping from the firm ( $t(s, s_i)$ ).

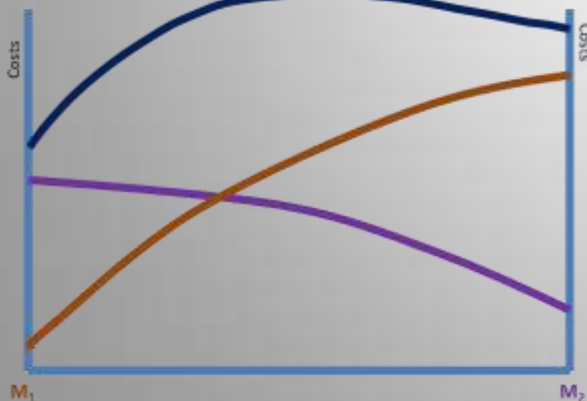
# Location Theory: A Brief Overview

## Neoclassical Location Theory

From this simple one dimensional (along a line or say a road) location problem a couple insights can be gained.

Notice that the transportation cost curves have a positive intercept, or there are “fixed” costs to transportation. The firm incurs some costs before the first unit is shipped. This could be a trucking or rail terminal.

Trucking → Lower fixed costs, but higher “marginal” costs.  
Rail → Higher fixed costs, but lower “marginal” costs.



In this example, the **orange** cost line could be shipping by truck, and the **purple** line is shipping by rail.

In this example it is “cheaper” or lower transportation costs to ship outputs to consumers than to ship inputs to the firm.

**Locate at the source of inputs!**

**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

In the cost minimization approach the firm has not necessarily made its final decision when it identifies the transportation cost minimizing location  $s^*$ .

If we lift the strict assumption of a homogenous economic plane and allow for some economic variations across locations the cost minimizing firm is said to go through a two step process.

Here the first step centers on the general location based on transportation costs.

# Location Theory: A Brief Overview

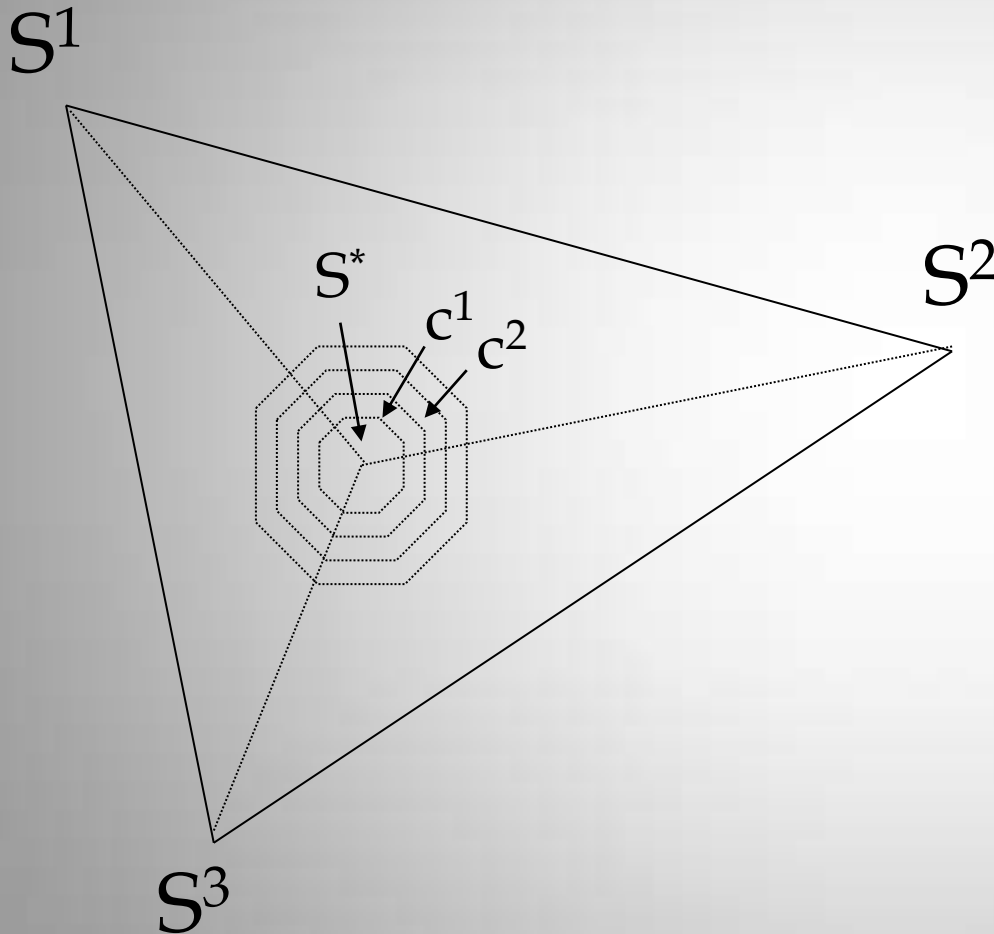
## Neoclassical Location Theory

The important thing to remember is that once transportation costs are minimized **the firm's attempts to minimize factor of production costs may change the location from the minimum transportation costs site.**

Suppose that the firm makes the decision that it wants to be closer to its input markets than its output markets. Once this decision is made, it must pick a specific location. This is the second step of the two-step process.

# Location Theory: A Brief Overview

## Neoclassical Location Theory



In this example the transportation cost minimizing location is  $S^*$ .

But there are what can be called “isocosts” encircling location  $S^*$ . These isocosts reflect differences in things like land prices, labor costs, taxes, among others.

Could it be that cheaper labor costs at  $c^2$  is more than sufficient to move the firm from  $S^*$ ?

**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

It is in this second stage of the location decision-making process that communities often have some influence on firm location decisions.

In a “cost minimization” (in order to maximize profits) world, what are the policy options? Think in terms of “business climate”.

- Cheap labor
- Low taxes
- Limited regulation



**Business  
Climate?**



**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

**Communities can offer**

- high quality infrastructure,
- skilled labor,
- building locations and
- generally high quality of life characteristics

and not only offer low cost alternatives for the firm but, more importantly, offer a viable comparative advantage over other locations.

Return to the spread-backwash study of Barkley and Henry.....

**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

- **What complicates the problem is that firms in different industries look at different factors.**
- **No two industries are exactly alike and as such they look at different factors in the second stage.**
- **For example, firms that are seeking high skilled professionals (e.g., engineers, computer scientists, etc.) will look at things like quality of life while other firms, such as food processors, are more concerned with access to input supplies and labor costs.**

**One must avoid blanket generalizations!**

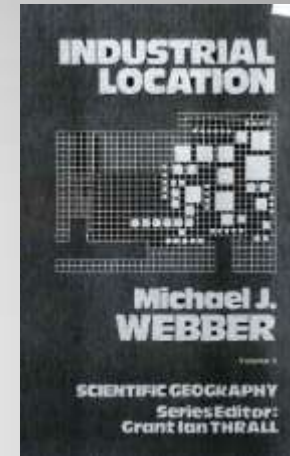
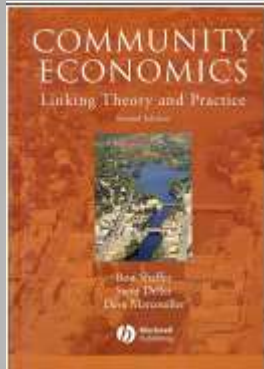
**Location Theory:  
A Brief Overview**  
Neoclassical Location Theory

The least cost approach to location selects the site by assuming that the firm sells its total output to a given point market (i.e., effectively eliminating demand from the location decision).

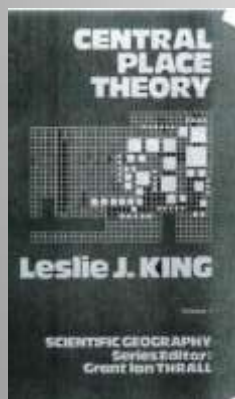
The **demand maximization approach**, however, reaches the location decision by explicitly incorporating demand into the decision. **THIS WILL BE DISCUSSED IN PART II**

# Recommended Readings

Shaffer, R., S.C. Deller and D.W. Marcouiller.  
(2004). Community Economics: Linking Theory  
and Practice. Blackwell: Oxford England.



[http://rri.wvu.edu/wp-content/uploads/2011/05/3\\_IndustrialLocation.pdf](http://rri.wvu.edu/wp-content/uploads/2011/05/3_IndustrialLocation.pdf)



[http://rri.wvu.edu/wp-content/uploads/2011/05/1\\_CentralPlaceTheory.pdf](http://rri.wvu.edu/wp-content/uploads/2011/05/1_CentralPlaceTheory.pdf)



Prepared by Steven Deller, Department of  
Agricultural and Applied Economics,  
University of Wisconsin-Madison/Extension