

## N8. Segregation and Peer Group Effects

Environments where individuals care about neighbors

- Human capital spillovers (learn from neighbors). Classic peer group effect. So value having well educated neighbors.
- Scale economies and cultural differences leading to different tastes.

—When scale economies exist only certain kinds of goods are locally provided

—The goods that are offered are ones that appeal to the largest number of people

—So here have a benefit from neighbors with similar tastes

—Research by Waldfogel on radios, TV, and newspapers

—Networking benefits and immigrant ghettos

- There is an aspect of housing that has a *local public good* component.

—(*Public good*: means nonrivalrous and nonexcludable, *local* means this is true only nearby)

—Individuals get to look at neighbors houses all the time

—If one likes looking at big, well-cared for houses, then one values having affluent neighbors.

- Can model neighborhood effects by putting it directly into preferences.

—racial bias

## A Model of Segregation

- Start with monocentric model
- Two types of people, black and white,  $H_b$  and  $H_w$  are the numbers of each
- Both types have inelastic demand demand for one unit of land. Suppose for the purpose of the analysis that whites have a preference to live near whites but blacks are indifferent to the color of their neighbors.

- Formally, for a person living at location  $u$  define his or her neighborhood to be the locations in an interval  $[u - k, u + k]$ , where  $k$  is a constant that determines the size of a neighborhood. Let  $y(u)$  be the percent of individuals in the neighborhood of  $u$  that are white. For example, if blacks live on the interval  $[0, H_b]$  and whites live on the interval  $[H_b, H_b + H_w]$ , then

$$\begin{aligned}
 y(u) &= 0, \text{ if } u \leq H_b - k \\
 &= \frac{u - H_b + k}{2k}, \text{ if } u \in (H_b - k, H_b + k) \\
 &= 1, \text{ if } u \geq H_b + k
 \end{aligned}$$

- Suppose the utility functions for blacks and whites are

$$\begin{aligned}
 U_b(x, L) &= x, L \geq 1 \\
 &= -\infty, L < 1 \\
 U_w(x, y, L) &= x + \beta y, L \geq 1 \\
 &= -\infty, L < 1, L < 1
 \end{aligned}$$

- The parameter  $\beta$  is the extent of bias by whites.

### Integration Equilibrium

- Always exists.
- $\hat{u} = H_b + H_w$  given inelastic demand
- $y(u) = .5$  for all  $u \in [0, \hat{u}]$
- Bid rent curve is

$$R(u) = \bar{R} + t(H_b + H_w - u)$$

(Note it has slope  $t$  and  $R(\hat{u}) = \bar{R}$ )

Segregation Equilibrium with blacks close in and whites in suburbs

- $y(u)$  follows earlier formula
- Bid rent curve has three pieces

(1) Locations  $u \in [H_b + k, H_b + H_w]$  where  $y(u)$  (so neighborhood is all white). Here

$$R(u) = \bar{R} + t(H_b + H_w - u)$$

(2) Locations  $u \in [H_b, H_b + k]$  where whites live and neighborhood is mixed. Here

$$\begin{aligned} R(u) &= \bar{R} + t(H_b + H_w - u) - \beta(1 - y(u)) \\ &= \bar{R} + t(H_b + H_w - u) + \beta \left( \frac{u - H_b + k}{2k} \right) - \beta \end{aligned}$$

Note that if

$$t < \frac{\beta}{2k}$$

then the price rises as we move closer to the suburbs!

(3) Locations  $u \in [0, H_b]$ , where blacks live. Here

$$R(u) = R(H_b) + t(H_b - u)$$

Notice that land prices are lower in this degregation equilibrium

Segregation Equilibrium with blacks close in and whites in suburbs?

## Measures of Segregation

- Take a city with  $N$  locations. Let  $b_i$  and  $w_i$  be the number of blacks and whites at location  $i$ . Let  $b_{Total}$  and  $w_{total}$  be the total number of blacks and whites.

$$\text{Index of Dissimilarity} = \frac{1}{2} \sum_{i=1}^N \left| \frac{b_i}{b_{total}} - \frac{w_i}{w_{total}} \right|$$

- Answer to the question: What share of the black population would need to change locations for the races to be evenly distributed?