

Urban Economics: Economics 4621 (Holmes)

Dept. of Economics, University of Minnesota

Homework 2

(Due Thus. March 11)

1. Use the data for Minneapolis available at the course web site to calculate the Dissimilarity index in the residential living patterns for Blacks and Whites. Calculate the index twice, once with data at the Census tract level, then with data at the Census block level (a much finer level of detail). Please just report the number, I don't want to see an Excel spreadsheet printout. What do you think is a good explanation for why one is larger than the other?

2. Recall the model of segregation in the monocentric city discussed in class (see Notes N9). Suppose in the model that $H_b = 8$, $H_w = 12$, and $t = 1/2$. Suppose $k = 4$, so whites define their neighborhood as comprising four land units in either direction. Finally, suppose $\beta = 8$, so that the utility function of whites consuming one unit of land is $U_w(x, y) = x + 8y$, where y is the percentage of the neighborhood that is white. (Recall the assumption of inelastic demand for one unit of land by all individuals, so utility is not written as a function of land consumption L .) The utility function of a black individual consuming one unit of land is $U_b(x) = x$. The price of farm land is $\bar{R} = 5$.

(a) As discussed in class, there exists an integration equilibrium. Describe the equilibrium. Use graph paper to illustrate the bid rent curve. What is the equilibrium utility of blacks? What is the equilibrium utility of whites? (Hint. $\hat{u} = 20$, also $R(\hat{u}) = \bar{R} = 5$. Blacks must be indifferent to living at \hat{u} and every other point $u \in [0, \hat{u}]$. If a black individual lives at \hat{u} , he or she incurs a transportation cost of $t\hat{u} = 10$ plus the individual pays a rent of 5 for a total cost of $10 + 5 = 15$. So the

individual's equilibrium utility is $U_b = x = -15$. Black individuals are indifferent where they live, so all black individuals have utility -15 ...)

(b) Note the utility function of each type is specified as linear in money so the units have an interpretation in dollars. Define the total surplus in the economy to be the sum of the utilities of blacks and whites plus the sum of landowner surplus, where landowner surplus is the difference between the total equilibrium rent paid and what the total would be at the farm price \bar{R} . Calculate total surplus in the segregation equilibrium.

(c) Construct a segregation equilibrium where blacks live closest to the CBD and whites live far out. Graph the neighborhood function y . Graph the equilibrium bid rent function. What are the equilibrium utility levels of blacks and whites. What is landowner surplus? Calculate total surplus.

(d) Construct a segregation equilibrium where whites live closest to the CBD and blacks live far out. Graph the neighborhood function. Graph the equilibrium bid rent function. What are the equilibrium utility levels of blacks and whites. What is landowner surplus? Calculate total surplus.

(e) Compare the utilities of blacks, whites, landowners, and compare total surplus across the three allocations. Explain the economic reasoning for the differences.

(f) You should have found that total surplus is actually higher in the segregation equilibria than it is in the integration equilibrium. What important features of the real world does this model leave out that would tend to reverse this conclusion.

(g) The segregation equilibrium discussed above is an example of "Decentralized Racism" in the language of Cutler, Glaeser, and Vigdor. Create an of "Collective Action Racism" in this model and show how equilibrium black utility falls compared with utility in the integration equilibrium.