

N5: Monocentric Model Part 3

Addendum for "Effect of a Decrease in t "

- Simple case where inelastic demand for one unit of land

$$U(x, L) = -\infty, L \neq 1$$

$$U(x, L) = x, L = 1$$

So $L = 1$ always

- So

$$px + R(u) = w - tu$$
$$R'(u) = \frac{-t}{L} = -t$$

Since x must not vary with u to keep $U^*(u)$ constant

- Graph. Now change from t_1 to $t_2 < t_1$.

Closing the Model

- Up to this point have assumed H and w are exogenous.

- Let $\tilde{U}(H, w)$ be equilibrium utility given H and w .

— \tilde{U} decreases in H and increases in w

- As stated, incentive to make cities very small....

- Add *agglomeration economies*. Suppose $w = f(H)$, $f' > 0$,
 $f'' < 0$.

- Equilibrium city size H^e solves

$$\max \tilde{U}(H, f(H))$$

$$FONC : \frac{\partial \tilde{U}}{\partial H} + \frac{\partial \tilde{U}}{\partial w} \frac{df}{dw} = 0$$

- Tradeoff between congestion costs (transportation costs) and agglomeration economies
- Can decentralize with model of land developers and free entry of cities...