

CE H0200
Spring 2006
Homework 2
Due February 27, 2006

1. Suppose that a gravity model of trip distribution has been estimated as

$$T_{ij} = \frac{O_i^{0.5} D_j^{0.2}}{(d_{ij})^2}$$

- (a) What is T_{ij} if $O_i = 100$, $D_j = 200$, and $d_{ij} = 5$ miles? What if the distance is 10 miles instead of 5 miles?
- (b) What happens to T_{ij} if both O_i and D_j double in size?

2. A model of mode split (with two modes) has been estimated as

$$\ln \left(\frac{P_{ija}}{1 - P_{ija}} \right) = -8(t_a - t_b) - 2(m_a - m_b)$$

where mode a is auto and mode b is public transit, t (travel time) is measured in minutes, and m (money cost) is measured in cents.

- (a) At what values of $(t_a - t_b)$ and $(m_a - m_b)$ is the probability of using the auto equal to 0.5?
- (b) What is the value of reductions in commuting time implied by the estimated mode split function? What unit of measurement did you use to express the value of time?