

EC2410-Spring 2020

Problem Set 3

(Updated 8 January 2020)

Matt Turner

When you write up your answers, your goals should be to (1) be correct, and (2) convince your reader that your answer is correct. It is always helpful if your work is legible and if all steps are presented, possibly with a line of explanation.

Answers which do not achieve these goals will not be awarded full credit.

Problems

1. Consider the monocentric city model with housing developed in Breuckner(2004) and discussed in class. Find the sign of $\frac{\partial r}{\partial t}$ and $\frac{\partial D}{\partial t}$. That is, the rate of change of the land rent gradient and the population density gradient as transportation costs change.
2. Consider a 'partially mixed' land use distribution in a linear city. Specifically, suppose that the central region of the city is mixed, i.e., occupied by firms and households. This central mixed region is surrounded by two symmetric business districts, occupied solely by firms. Finally, these business districts are surrounded by purely residential regions. Suppose that the details of this economy are as described in the Fujita and Ogawa we discussed in class. Can you construct land rent, agglomeration and wage gradients such that this spatial configuration is an equilibrium? Draw a graph to illustrate and explain briefly.
3. Derive the equation $p_s^* = l^c \frac{dr}{ds} + \frac{dw}{ds}$ from equation (5) of Roback (1982).