

14.41 Fall 2004 Mock Final

I. True, False or Uncertain

(30 minutes, 5 minutes each; 95% of credit is based on your explanation)

- 1) Recall, from the midterm, Funkytown, which, after its members split into 3 cities based on their income levels, provided music education efficiently (if not optimally from a utilitarian perspective). A new technology (MP3's) emerges in Funkytown that allows all students to costlessly share their music with all families in all towns—so now families get utility out of every student's education, not just their own.
The Tiebout requirements for the efficient local provision of the public good (music education) still hold.
- 2) Research shows that children do better when their mothers stay home than when they work. The government should therefore eliminate child care subsidies.
- 3) The 2003 tax cuts reduced taxes on high-income families by much larger amounts than for low-income families. This provides a good opportunity for a difference-in-difference estimate of the effect of tax cuts on labor supply, using high-income families as the treatment group and low-income families as the control group.
- 4) Requiring employers to provide dental insurance will distort employment.
- 5) Child health insurance is valued at \$500 by parents. A new, free government child insurance program is joined by 10 million children. Social surplus has increased by \$5 billion.
- 6) Research shows that penicillin is the most inelastically demanded good in society. The government should tax penicillin at a higher rate than any other good.

II. Short Essays

(30 minutes, 15 minutes each)

- 1) Evaluate the possible effects on private and national saving of the following policy: decreasing the tax on interest income while increasing the tax on labor income enough to maintain budget neutrality. Would you predict that the static estimate of how much labor income tax must rise to offset the loss in interest tax revenue to be higher or lower than most dynamic estimates? Explain.
- 2) For each of the following drug coverage proposals, discuss the likely effects on quantity of drugs purchased (relative to the current system), health care

outcomes (again, relative to the current system), the cost-effectiveness of the coverage, and how different parts of the population would be affected.

- a) Senator Kennedy proposes full federal coverage for all “medically necessary” prescriptions for those whose health care plans do not cover drugs.
- b) Senator McCain would have the government contribute a fixed amount, in the form of a refundable tax credit, towards the purchase of a special “supplemental drug insurance” plan for those whose health care plans do not cover drugs.

III. Long Problems

(120 minutes, 40 minutes each)

1) The city of Boston is considering a 10% tax on the revenues of all hotels/motels inside the city limits. While not completely different from hotels and motels in the nearby suburbs, the ones in Boston have a distinct advantage in their proximity to the interesting sights and convention centers. That is, individuals will pay some premium in order to stay in Boston rather than nearby.

Furthermore, all land is used equally well by hotels/motels and other forms of business; any Boston land not taken by a hotel/motel is readily absorbed by other forms of business.

Mayor Menino calls you in to advise him on the efficacy of such a tax. He is particularly concerned with who will bear this tax in the short run (ie. one month) and the long run (ie. five years).

- a) What is the incidence of the tax in the short run? Answer intuitively, and use a diagram if possible.
- b) What is the long run incidence? Once again, use a diagram if possible.
- c) How would your analysis in (b) change if hotels/motels in the suburbs were perfect substitutes for those in Boston? What would happen to tax revenues?
- d) How would your answer to (b) change if land were somewhat specialized to hotels, that is if business could not readily use land vacated by hotels? How would the equilibrium number of hotels compare to (b)? What if land were completely specialized to hotels?

2) There are two towns—let’s call them Cambridge and Somerville--which each provide street cleaning, S , for their own residents. There are two types of residents in Cambridge and Somerville, professors and students. Professors have an income of $Y=200$; students have an income of $Y=100$. Professors value street cleaning more than students because they have nicer cars. In fact, the value of street cleaning to each individual takes the form: $((Y*S)/10) - (S^2/2)$. The *per-resident* cost of street cleaning is $5S$.

- a) What is the marginal value of street cleaning for each type of individual? What is the marginal cost to each type of individual?
- b) How much do professors want to spend on street cleaning? How much do students want to spend?
- c) Assume that residents are distributed as follows:

	Cambridge	Somerville
Professors	50	25
Students	25	50

If each town uses majority voting to determine how much street cleaning to provide, how much will each town provide? Are any residents unsatisfied with the amount of street cleaning?

- d) Now assume that professors and students are able to migrate between Cambridge and Somerville. Which residents will choose to move? What will the equilibrium distribution of residents be? Are any residents unsatisfied with the amount of street cleaning now? Is the provision of street cleaning efficient? Why or why not?
- e) Consider again the pre-migration equilibrium. The state of Massachusetts decides to pass a law about street cleaning. It requires that professors in the state must contribute 75 towards street cleaning in the town where they live; students must contribute 25 towards street cleaning in the town where they live. How much street cleaning will there be in each town under the new regime? Will any residents want to move and, if so, where and why?

3) Consider a welfare program to ensure that needy people get adequate food. Food stamps are distributed according to the following schedule. For example, people with incomes of \$100 get \$264 in food stamps. Standard assumptions include the nontransferability of the food stamps.

Income	Food Stamps Received
100	264
200	234
300	204
400	174
500	144
600	114
700	84
800	54
900	24
980	0

People have utility functions:

$$\ln(u_i) = 1/3\ln(F_i) + 2/3\ln(X_i).$$

Where F is food and X is other goods. The price of food and other goods are both normalized to 1; therefore, the budget constraint is:

$$F + X = Y.$$

- a) Consider first the no food stamp world; determine the demands for food and other goods for someone with an income of \$300.
- b) Consider the consumption of food and other goods with the food stamp program in place. Determine the optimal level of consumption of food and other goods, also for someone with an income of \$300.
- c) Show these outcomes with a standard budget constraint/indifference curve graph.
- d) Does the food stamp program entail a loss or gain in efficiency? If so, then both calculate the value and describe the nature of the loss/gain.
- e) Repeat a - d for an income of \$900, providing intuition for any differences in the outcomes.
- f) Make a rational economic argument in favor of the food stamp program in place of a cash transfer system.