

Discussion Problem #3

I will post hints on the class web page, so check in there periodically. I will also post questions I receive from students and the answers that I send back.

Hand in your group's answer to this problem *at the start of our sixth class meeting*. You should turn in one hard copy per group. Make sure it has all group member names on it.

Vouchers

- (a) Suppose the demand curve for private elementary school education in a mid-sized metropolitan area is given by

$$Q = 15 - P,$$

where Q is the number of students enrolled in thousands and P is tuition in thousands of dollars.

Suppose there is a large number of small private elementary schools that supply education. However, expanding a school is costly. Even if a school decides to expand its capacity, it takes at least two years for the school to hire teachers and add classrooms. As a result, the short-run (that is, over the next two years) supply curve for private elementary school education is

$$Q = 12.$$

Given these demand and supply curves, compute the market equilibrium price and quantity.

- (b) Compute the dollar value of consumer surplus at this equilibrium price and quantity. (Note: Consumer surplus is defined as the difference between willingness-to-pay and price, summed over all consumers who purchase the product. It is the same as the area under the demand curve but above the price. Consumer surplus measures how much “value” consumers get from participating in the market.)
- (c) Now suppose the state legislature offers a voucher program that gives parents of every child a credit of \$3000 toward the purchase of a year of private elementary school education. Compute the equilibrium prices and quantity in this market in the first year after the voucher proposal passes. (Hint: It’s useful here to notice that now we essentially have *two* prices — the price that consumers pay and the price that schools receive. In the absence of the voucher program, the two are the same. But with vouchers, the price received is equal to the price paid plus \$3000. Market equilibrium is where the quantity supplied — which depends on the price *received* — is equal to the quantity demanded — which depends on the price *paid*. Use this insight to sort out the new equilibrium.)
- (d) Compute the dollar value of consumer surplus and the total cost to the state government of this program. How has consumer surplus changed as a result of the voucher program?
- (e) Now note that the supply of education is not likely to be fixed in the long run. Given time, schools can add classrooms and teachers. Suppose that the long-run market supply

curve is given by

$$Q = 11 + \frac{P}{3}.$$

Compute the market equilibrium price and quantity in the third year after the voucher proposal passes, as well as the new level of consumer surplus and government expenditure.

- (f) Suppose instead that the long-run education supply curve is given by

$$Q = 6 + 2P.$$

Compute the third-year-after market equilibrium price, consumer surplus and government expenditure. How and why are your answers different here compared to your answers in (e)? If the state government's goal is to use the voucher program to increase consumer surplus in the market for private education, what market conditions — those in part (e) or those in part (f) — are likely to make the program a success?

- (g) **Challenge Question** Do not hand in an answer to this question, but do think about how you'd answer it.

A group of public-school supporters plans a petition drive to put the voucher proposal to a referendum. Suppose that if they succeed and if the voters reject the proposal, then the \$3000 credit program will be canceled. If the public-school supporters fail this year, they vow to keep fighting until the voucher plan is canceled. How might this affect private schools' willingness to add capacity, and how might schools' capacity choices affect prices and consumer surplus in this market?