

ECN 370
Homework #4



Due: Thursday, Oct. 27 by the end of the day

Directions: Please complete this homework on a separate piece of paper and email your answers to me at ccdougla@umich.edu. A .pdf file is preferred, though any file works in practice.

1. Consider a proposed statewide law that would allow children to go to any public school in the state, regardless of what school district they live in. Think about the idea of house price capitalization when answering these questions:

- a. Why do you think homeowners in school districts with high home prices would oppose this? Why do you think that renters in school districts with high rent would support this?

The Funding For Public Schools in districts with high home prices is paid in large by taxes imposed on those high priced homes. Additionally by allowing anyone to go to any school, those districts may become then more crowded, lowering the value of the school & of local homes. Homeowners do not want to deal with lower prices, or more cluttered streets & schools, thus may oppose this.

Given falling home prices, rent shall fall in parallel. If the cost cut in rent is more valuable than the new town chaos, renters would support this.

- b. Why do you think that homeowners in school districts low home prices would support this? Why do you think renters in school districts with low rents would oppose this?

homeowners in school districts with low home prices may like this as they now have access to better public schools, despite longer drives. Additionally their local school may see a reduced student count with the same funding, thus a better quality

of schooling. In addition it may entice new residence thus prompting an increase in housing prices.
 Renters may oppose this as with new residents & increased home prices comes increased clutter to traffic & an increased rental payment...

2. Consider a town with two residents, Harry and Lloyd, who are determining how many miles of hiking trails to build in a public park in Aspen, Colorado. Hiking trails are a public good.

Harry's demand curve for hiking paths is $P = 10 - Q$. Lloyd's demand curve for hiking paths is $P = 8 - 2Q$. Suppose the social marginal cost is \$9 to produce each mile of the hiking path.

a. Who has the high willingness-to-pay for the hiking path? The low willingness-to-pay?

Harry has the high willingness-to-pay.

Lloyd has the low willingness-to-pay.

b. What is the social efficient quantity of hiking paths to produce? Recall from homework #3 that you vertically aggregate the individual demand curves to get a market demand curve and then set that equal to social marginal cost.

$$P^* = 10 - Q + 8 - 2Q = 18 - 3Q \quad ; \quad 18 - 3Q = 9 \quad ; \quad -3Q = -9$$

$Q = 9/3 = 3$, the social efficient quantity of miles of hiking path, at a cost of \$9 per mile, is 3 miles of path.

c. How much does each person pay in taxes towards the hiking paths?

$$P_H = 10 - 3 = 7 \quad ; \quad 7 \times 3 = 21$$

$$P_L = 8 - 2(3) = 8 - 6 = 2 \quad ; \quad 2 \times 3 = 6$$

Harry pays \$21 & Lloyd pays \$6, given taxes are proportionate to willingness-to-pay...

d. Suppose the high willingness-to-pay person pretends to be low willingness-to-pay in order to save on taxes. How many miles of hiking paths gets produced now? How much does each person now pay in taxes towards it?

$$\text{Assume } P_H = 8 - 2Q \Rightarrow P^* = 16 - 4Q \quad ; \quad 16 - 4Q = 9$$

$$-4Q = -7 \Rightarrow Q = 7/4 \Rightarrow \underline{1\frac{3}{4} \text{ miles}} \text{ of hiking paths get produced.}$$

$8 - 2\left(\frac{7}{4}\right) = \frac{16}{2} - \frac{7}{2} = \frac{9}{2}$; $\frac{9}{2} \times \frac{7}{4} = \frac{63}{8}$, Each person now pays \$7.875 in taxes for $1\frac{3}{4}$ miles of path...

e. How does the high willingness-to-pay person's tax bill change compared to how much of the public good he consumes from pretending to be low willingness-to-pay. What about for the original low willingness-to-pay person?

The tax bill of the high willingness-to-pay individual (Harry) decreases by $(21 - 7.875)$ \$13.125 , while the low willingness-to-pay individual (Lolyd) increases by $(7.875 - 6)$ \$1.875...

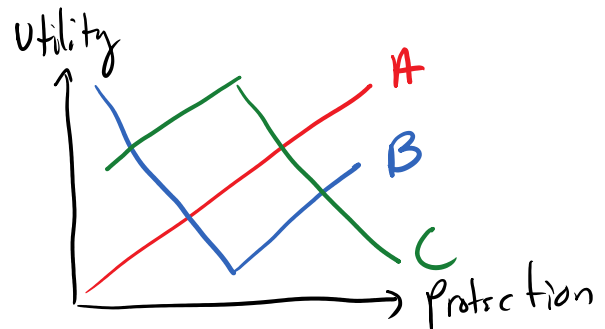
3. Suppose Flint has three equal sized groups of people: (1) Type A people who prefer more police protection to less; (2) Type B people who prefer low levels of police protection to high levels and they prefer high levels to medium levels; (3) Type C people who prefer medium levels to low levels, and prefer low levels to high levels.

a. Which types of people have single peaked preferences? Which have double-peaked preferences?

Type A : $P_{high} > P_{med} > P_{low}$

Type B : $P_{low} > P_{high} > P_{med}$

Type C : $P_{med} > P_{low} > P_{high}$



Type A & C have single-peaked preferences, while

Type B has double-peaked preferences

b. Will majority voting generate a consistent outcome in this case? Illustrate using a hypothetical election.

Assume Each Type has 1 vote, Thus type A votes for high protection, Type B votes for low protection, &

Type 'C' votes for medium protection...

Thus there is no consistent outcome generated.

Another way to look at this...

Say we vote high vs. medium, high wins 2 to 1,
 Say we vote medium vs. low, medium wins 2 to 1,
 Say we vote low vs. high, low wins 2 to 1...

4. Major League Baseball uses what is known as a "5-3-1 system" to vote for the Most Valuable Player (MVP) in each league. Each voter gets to vote for three different players they consider worthy of the award. The voting system is a Borda count. The voter's first place candidate gets 5 points, the voter's second place candidate gets 3 points, and the voter's third place candidate gets 1 point. Points are then added up across all voters and the player with the most total points becomes the MVP.

Suppose there are three votes: Mitch, Mike, and Drew, and five potential candidates for the award: Brandon, Magglio, Barry, Kenny, and Pudge (OK, yeah this is an old case, but Barry makes this a great example). The table below shows how each voter ranks the candidates.

Rank	Mitch	Mike	Drew
1 st	Magglio	Magglio	BarryX
2 nd	Brandon	Brandon	Brandon
3 rd	BarryX	BarryX	Kenny
4 th	Kenny	Kenny	Pudge
5 th	Pudge	Pudge	Magglio

Suppose Barry is embroiled in a substance abuse scandal. A "guilty" verdict will ban him from MVP voting, whereas an "innocent" verdict will allow him to remain eligible for being MVP. The verdict will come out the day before MVP voting.

a. Who will become MVP if Barry is found innocent?

Votes	Magglio	Brandon	Barry	Kenny
Mitch	5	3	1	0
Mike	5	3	1	0
Drew	0	3	5	1
Σ	10	9	7	1

if Barry is innocent,
 then Magglio is the
 MVP.

b. Who will become the MVP if Barry is guilty?

Votes | Magglio | Brandon | Kenny | Pudge

If Barry is found

Votes	Magglio	Brandon	Kenny	Pudge
mitch	5	3	1	0
mike	5	3	1	0
drew	0	5	3	1
Σ	10	11	5	1

If Barry is found Guilty, then Brandon is MVP...

c. What voting requirement is the Borda Count violating? Explain.

The Borda Count is violating the Independence of Irrelevant Alternatives (IIA) requirement.

By now adding a 4th choice, Pudge, to the system a vote otherwise for Magglio is removed. In this case Brandon & Magglio would have tied with 11 votes each...