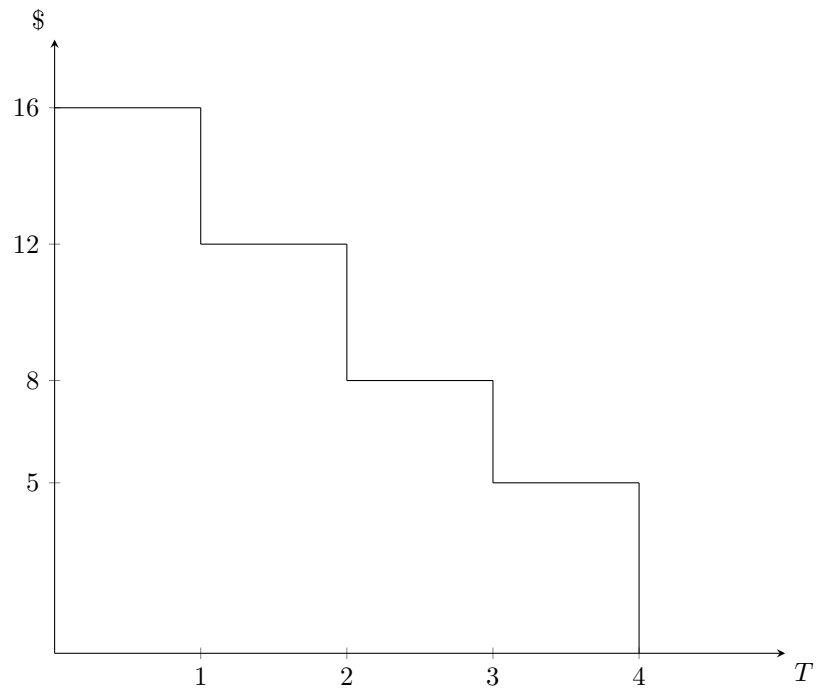# Urban Economics
31C02100, REC-E3500
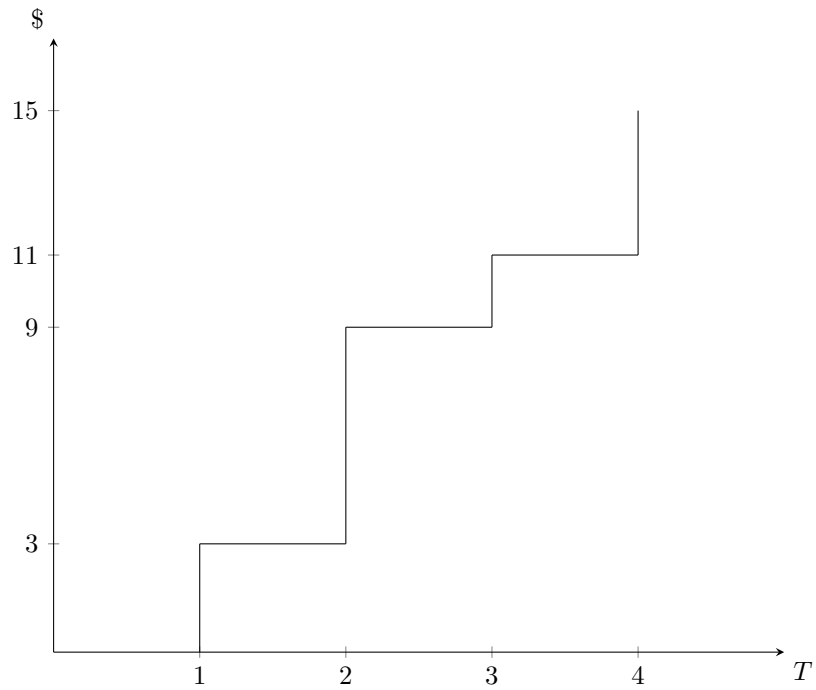# Spring 2023

Problem set 3

February 1, 2023

1 Congestion externality

a) The demand curve looks like this:

The average cost curve would look like this:

b) A and B on the freeway, C and D on alternate routes

On freeway	On alternate routes	Costs
No one	A, B, C, D	$16 + 12 + 8 + 5 = 41$
A, B	C, D	$9 + 9 + 8 + 5 = 31$
A	B, C, D	$3 + 12 + 8 + 5 = 28$
A, B, C, D	No one	$15 + 15 + 15 + 15 = 60$

c) The social optimal allocation is the one that minimizes costs. In this case, that would be the scenario where A only is on the freeway, and B, C, D on their alternate routes. The equilibrium allocation, where A and B are on the freeway and C and D are on their alternate routes is more costly (31 vs. 28).

2

2 Value capture of public infrastructure projects

a) False. The subway line was extended in the Upper East Side.

b) False. Gupta mentions for example improved access to transportation, safer streets, less noise and less pollution and continues that such potential benefits should be reflected in changes of surrounding housing prices. This capitalization approach enables authors to assess the value of such benefits.

c) False, the authors use a difference-in-differences design where they compare treated properties closer to the new subway lines to similar properties farther away from the subway lines and served by other, existing subway lines.

d) True. The NY Second Avenue extension constituted a relatively small expansion to a large subway system. In LA, there was no subway system before 1990 and LA was a primarily car-rider-dominated city.

e) False. It is discussed that most don't seem to have a great idea on where their customers come from, and a local business owner who drives a car might mistakenly believe that their customers use the same type of commuting.

f) False. 30% does go to the city, but this is not enough to cover the cost of the construction.

3 Free market rentals vs subsidized rentals

Slope: -0.400
(0.038)
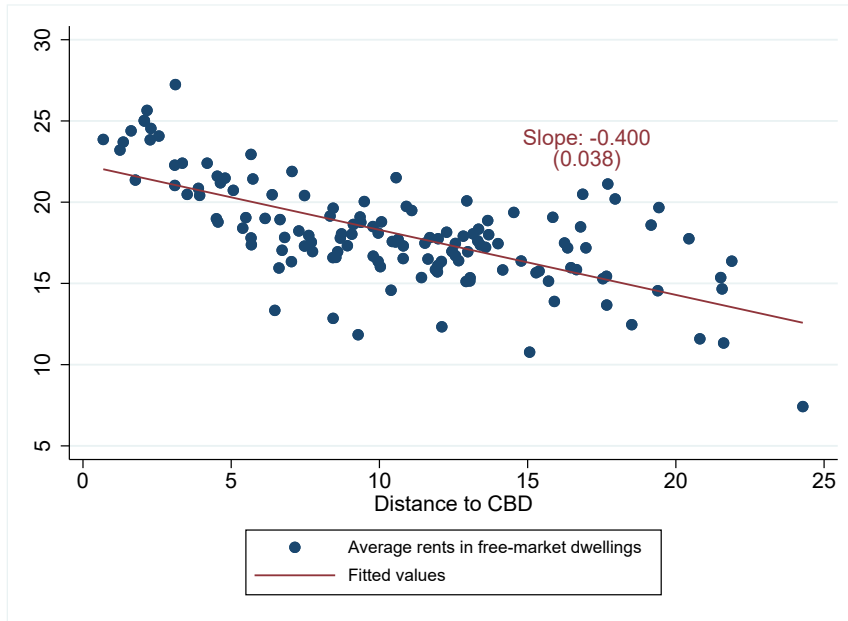
(a) Average rent in private dwellings

Slope: -0.248
(0.038)
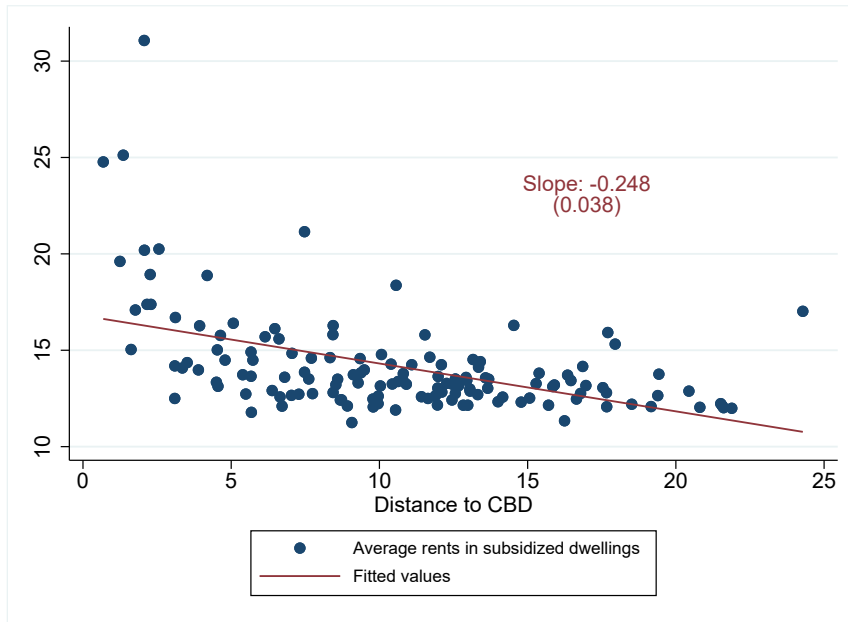
(b) Average rent in subsidized dwellings

4

a) From the graphs we see that in both cases, there is a negative correlation between rents and distance to the CBD. However, the relationship is stronger for free-market dwellings (slope is steeper in that case).

b) We notice that for a given distance to the CBD, there is variation in the rent amounts people in free-market dwellings pay. This is because rents are a function of many other variables, not just distance. However, here we plot only the correlation between rents and distance. Rents also reflect the demand for different housing characteristics or attributes and the demand for public services and neighborhood amenities.

c) Calculate the subsidy as the difference between the private rents and the subsidized rents. On average, the subsidy is around 4 euros per square meter. The rents in subsidized housing are based on maintenance and capital costs (see slide 35, Lecture notes 7), so it can be that in certain areas, these costs make it so that rents in public housing are higher than market rents.

| Mean	Min	Max
3.90	-9.60	10.54
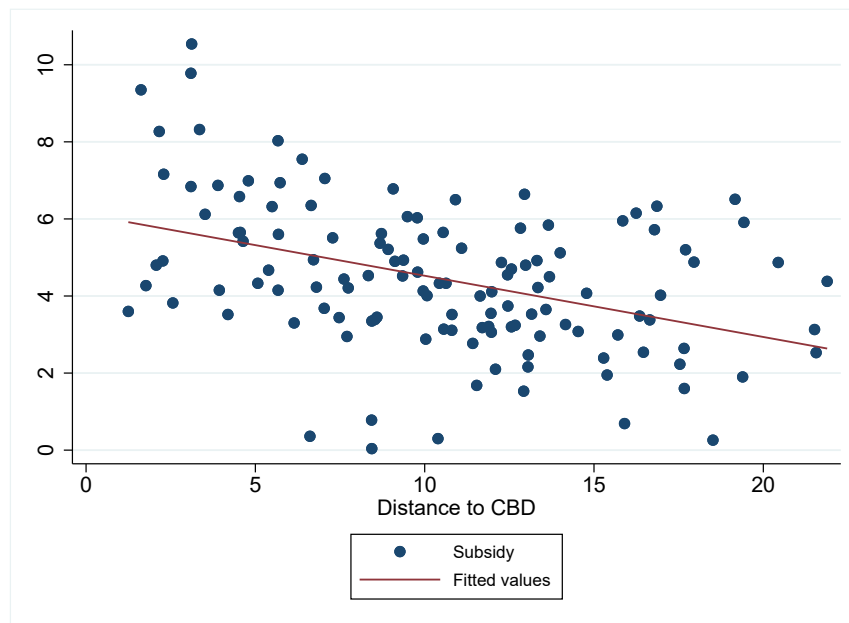
d) We see a negative correlation between the size of the subsidy and the distance to the CBD: the closer the zip code area is to the CBD, the

higher the subsidy.

e) To get the share, we need to divide the number of individuals who have a higher level university degree by the total number of individuals above 18. In doing so, we get a variable with the following summary statistics:

Mean	Min	Max
.22	.06	.44

On average, around 22% of residents who are above the age of 18 have a high level of education. There is significant variation, as there are also areas where only 6% have a high level of education, as well as areas with as much as 44%.
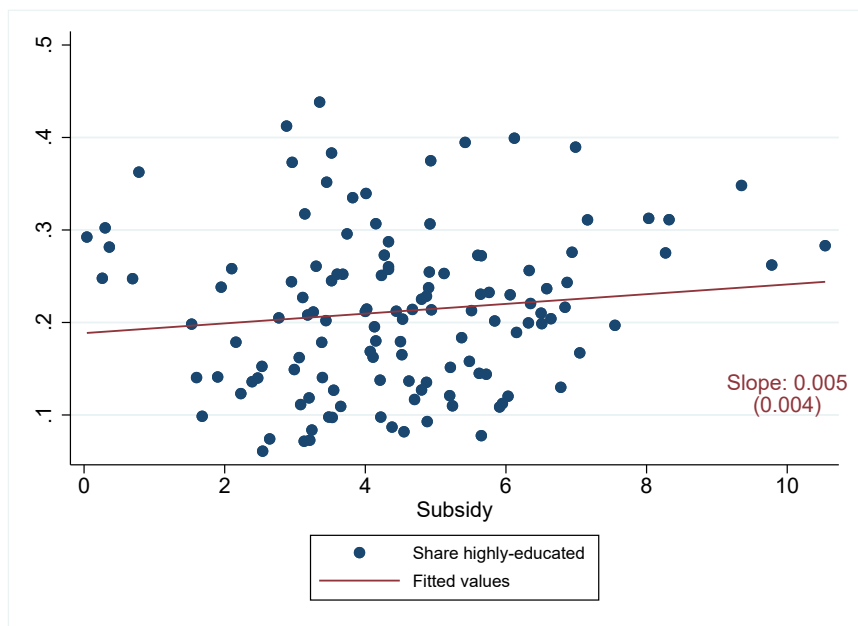
f) We see that while overall, the relationship between a high level of education among residents and the subsidy rate is positive, this relationship is quite weak. We might be tempted to say that because there is a high share of educated people in areas with high subsidies, it is the subsidies that cause the high education level. However, these simple correlations do not allow us to say anything about causal relationships. Moreover, this is data at the zip-code level, so it is likely that what we observe is the fact that highly-educated people sort into areas closer to the CBD - which are also the areas where the subsidies are higher.