

Slightly More on Taxes

We've found out that the DWL comes about from restricting output below the efficient level, Q^* , where $MV = MC$. The more we restrict output, the larger the DWL. We decided that given we have to tax some goods, we ought to tax goods that are inelastically demanded or supplied, because these end up with relatively lower DWL and relatively lower restrictions of output.

It turns out in the extremes where either demand or supply is perfectly inelastic, you will get no DWL at all. If we could find some of these goods, these would be ideal goods to tax. So check them out. Might the estate tax apply? Maybe, kind of, sort of, but its in the news (or at least it was the last time I taught this class).

For fun, you should draw a picture of a per unit tax levied on suppliers when...

- a. demand is perfectly elastic
- b. demand is perfectly inelastic
- c. supply is perfectly inelastic
- d. supply is perfectly elastic

Three of these are easy, one of them is pretty tricky. If you get stuck, remember the rules....

As demand becomes more inelastic, consumers pay a larger fraction of the burden. As demand becomes perfectly inelastic, thus consumers would pay the entire burden of the tax.

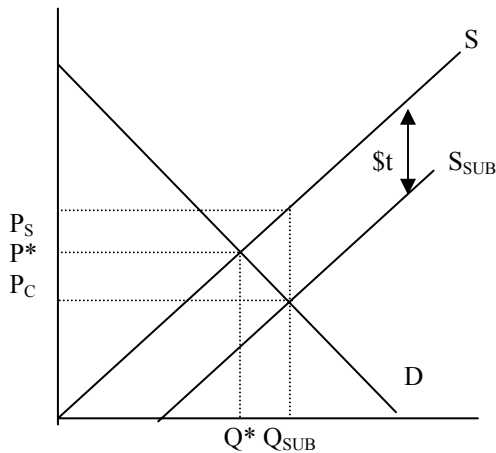
By similar reasoning, you'll get the answers to the other three cases. Or draw curves that are not quite perfectly elastic, just extremely flat or steep. You'll see...

Subsidies

A subsidy is a negative tax. If we were to have a per-unit subsidy for producers, what we'd do is give producers \$t for every unit they produced.

Thus, the suppliers will receive the price consumers pay + the amount of the subsidy. ($P_S = P_C + \$t$).

Let's think about the MC curve again, at a quantity q, where it just so happens that $MC = \$32$. Before the subsidy, to induce the firm to produce q, the price they receive from customers must be \$32 (to cover the firm's MC). Now, with the subsidy, they'll get \$1 from Uncle Sam, so the price they receive from consumers must only be \$31. Suppliers will *act as if* their MC curve has shifted down (vertically) by \$t.



The equilibrium quantity when the subsidy is imposed is found by the intersection of S_{SUB} and D, and is labeled Q_{SUB} .

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The demand curve has not been tinkered with, and thus still shows what consumers are willing to pay, P_C .

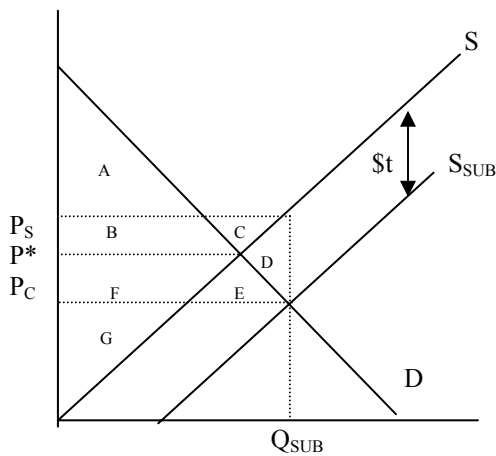
The price suppliers receive is equal to $P_C + \$t = P_S$. Recollect that we have shifted down the Supply curve (vertically) by the amount $\$t$.

Results

1. The price that consumers pay has fallen from P^* to P_C , but by less than the amount of the subsidy. (CS \uparrow)
2. The price that producers receive has increased from P^* to P_S , but by less than the amount of the subsidy (PS \uparrow).
3. The government has actually paid out subsidy dollars, in the amount of $\$t * Q_{SUB}$.
4. There is an increase in the equilibrium quantity, from Q^* to Q_{SUB} .
5. There is a DWL. Notice, that between Q^* and Q_{SUB} , the MC of producing any of these units is larger than the MV of consuming these units. ($MC > MV$). Society is producing **too much output**.

Can we shade in PS and CS, and the DWL?

It's a bit tricky here. All of the other items we looked that interfered with markets (price floors, price ceilings, taxes) all restricted output below the efficient level where $MV = MC$. Here, we have a policy that results in an output level that is beyond the efficient level. It makes it tougher to shade, but we can still figure out what is happening. Below is an identical picture to the previous one, only without Q^* labeled. The notation here (the letters in the boxes are slightly different from those you have in class, but the story is the same).



$$CS_0 = A + B$$

$$CS_1 = A + B + E + F$$

$$PS_0 = F + G$$

$$PS_1 = F + G + B + C$$

$$\text{Subsidy payments} = B + C + D + E + F$$

Consumers gain $E + F$, producers gain $B + C$, but we must pay out subsidy payment of $B + C + D + E + F$ which is bad. (The government must tax someone to come up with this money).

Thus, on net, society is worse off by area D. Area D represents the dead weight loss. This is where $MC > MV$. We are adding up the negative gains from trade between Q^* and Q_{SUB} . Society is losing gains from trade when these units are produced.

The whole point of the subsidy is to make certain that more of the good is produced (and to transfer wealth from taxpayers to consumers and especially producers of the subsidized product).

Where do we see subsidies? Agriculture is a big one. (For whatever reason, the US government sure loves those farmers. Why?) We have already seen subsidies for water in Chapter 6 in Miller, Benjamin, and North. (Did I make you read Chapter 6 in MBN? If not, take a lookie, it's only a few pages). The federal governments subsidizes student loans for us, this is a program I am in favor off, as I am a consumer of subsidized loans. I am less in favor of subsidized housing for low-income

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individuals. I don't get to purchase subsidized housing. Sometimes my professors subsidize my beer consumption. I love that. Have I given you a lesson about subsidized beer this semester?

You're a consumer, right? Why shouldn't you be in favor of subsidizing every good? Keep in the back of your mind that the subsidy payments come from taxes collected by the government. If the federal government decides it wants to subsidize more stuff someone has to pay the bill. Is that someone you?

It can get pretty complicated – for instance, what portion of the subsidy payments do you have to pay? That is, what portion of the tax revenue the government collects comes from your pocket. In the US, it depends on your income. As a consumer, you need to compare your gain in CS, to the amount of the subsidy payment you'll end up paying in taxes. This is getting to the edge and beyond of Econ 211 material. Right now, I make little money, and pay little money in income taxes. I am in favor of subsidizing more stuff than I will be in favor of when I am filthy rich (after winning the lottery?).

The same sort of stuff applies to subsidies as it does to taxes, though you shouldn't worry too much about it, i.e. not going to be on the test

The more inelastic demand and supply, the lower the DWL from a subsidy.

Both consumers and producers share the gains from a subsidy, as long as the elasticity is not 0 or infinity (the extreme cases of perfectly inelastic or perfect elastic supply and demand curves).

The effects do not matter in regard to whether the subsidies are given to the suppliers or the demanders. None of the results change.

We won't worry too much about the extra stuff involved with subsidies. We know that we have to have some taxes, because we need to pay for the goods that we want the government to buy for us (roads, police, public education?). So, we can worry about how we can minimize the DWL from all these taxes that we need to have.

On the other hand, there is not real direct reason why we should have subsidies for subsidies sake, so it doesn't make as much sense to worry about who gets the gains, and how big the DWL is, etc. It's just not as interesting or pertinent. (We will talk about one notable exception in two days – the case of external benefits.) We can't talk about this very often without putting our normative values about what types of things we should subsidize – student loans, low-income housing, rock-concerts, etc... Should we make life better for college students, low-income individuals, rock-concert fans?

What should I be reading?

Hmmm, let's see, your book devotes a total of 0 pages to subsidies. Take the day off and go and have some fun.

Did you know that peanut farmers are subsidized? Dairy farmers? Flu shots?