

Subsidies

Econ 1101

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ECON 1101 Lecture 4.3

1. Subsidies

2. Medicare and Social Security

ECON 1101 Lecture 4.2

1. Subsidies

Subsidies

- Intro: subsidy as an instrument to increase the quantity consumed
- How can the government raise the quantity to 9? Subsidy!!

Goal: $Q=9$

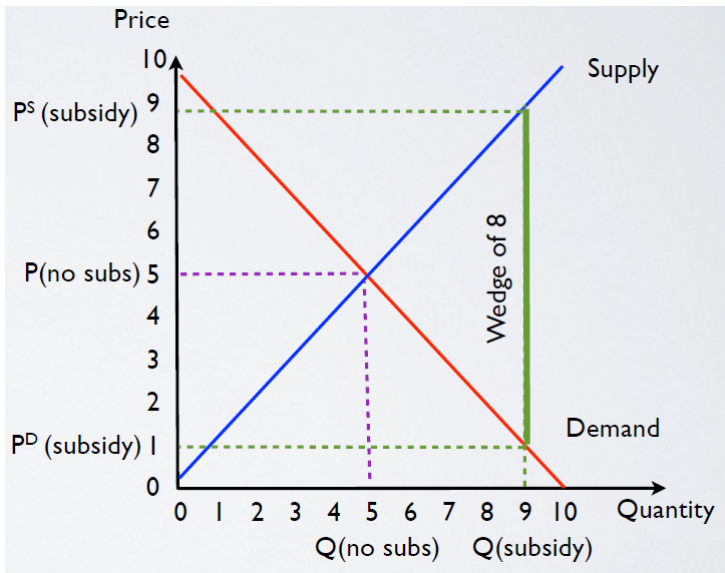
- For producers to supply 9 units they need a price of 9, but price must be 1 for consumers to demand 9 units
- The **wedge of 8** can be covered by a subsidy.
- Recall we just defined a subsidy as a wedge between producer and consumer prices ($P^s = sub + P^d$)

Subsidies

Calculating the equilibrium: -

- ① Test different quantities in the PHS of the market equilibrium to pick Q^* such that wedge fits
 - Note since we picked the wedge to get $Q^*=9$ we are just double checking subsidy is correct
- ② Recover $P(d)$ and $P(s)$ from D and S curves at Q^*

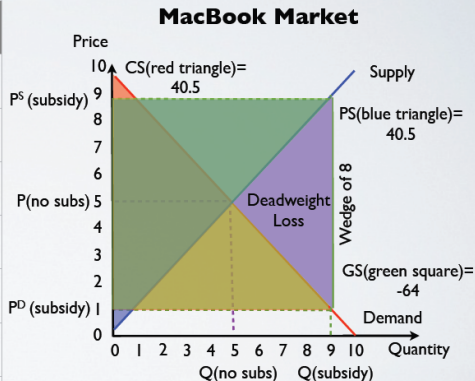
Subsidies



Welfare Analysis

- Without subsidy $Q=5$, $P(d)=P(s)=5$
- With \$8 subsidy $Q=9$, $P(s)=9$, $P(d)=1$

	No Tax	£8 Subsidy	Change
Q	5	9	+4
P^S	£5	£9	+£4
P^D	£5	£1	-£4
CS	12.5	40.5	+28
PS	12.5	40.5	+28
Government Surplus (here, loss)	0	-72	-72
TS	25	9	-16



ECON 1101 Lecture 4.3

2. Medicare and Social Security

Medicare and Social Security

New information about demographics of Econland

- D1, S1 are age 1
- D2, S2 are age 2, etc....
- Everyone dies at age 10, and every year one new D1 and S1 are born

New Government plan:

- Every citizen at least 10 years old get 2.25 to cover expenses
- Beneficiaries: S10, D10 with total cost=\$4.5

Problem: how to raise \$4.50 in econland

- Alternative: using a wigdet tax to raise \$4.50

Raising \$4.50 with a tax

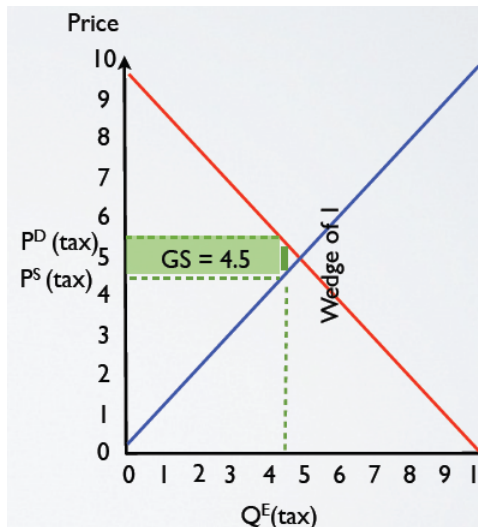
Need a tax to raise \$4.50

We can put a tax of \$1 so

- $P(d)=5.50$, $P(s) = 4.50$ and
- $Q=4.50$

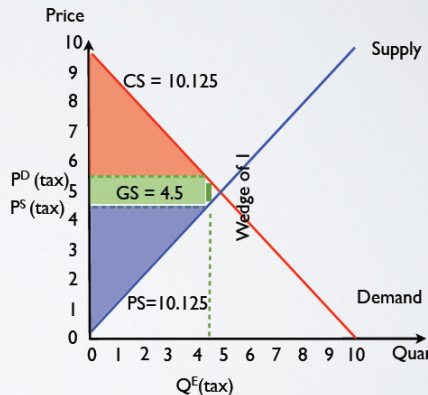
Then government revenue = $\text{tax} * Q$

- $GS=4.50$



What are the welfare effects?

	No Tax	£1 Tax	Change
Q	5	5	0
p^S	£5	£4.5	-£0.5
p^D	£5	£5.5	+£0.5
CS	12.5	10.125	-2.375
PS	12.5	10.125	-2.375
Government Surplus	0	4.5	+4.5
TS	25	24.75	-0.25



Welfare Effects

Compared to free market:

$$\Delta CS = 10.125 - 12.5 = -2.375$$

$$\Delta PS = 10.125 - 12.5 = -2.375$$

$$\Delta \text{Gov't} = +4.5$$

$$\Delta TS = -.25$$

Deadweight loss per dollar collected is $.25/4.5 = .056$

All this for **year 1**

- Net effect on total surplus with social security is $-.25$ or 0.056 per dollar is this OK?
- From an economist's perspective, it is not efficient, but maybe taking care of elderly is more important

New development (\uparrow cost)

New Development! (Year 2)

- New medical treatments prolong life to 11 Econland years!
- Treatment is more costly than before.
- Will cost \$3.00 per person per year

Program cost this year = \$6 (cost for D10 and S10)

How can we raise \$6?

New development (\uparrow cost)

How can we raise \$6

- We could implement a tax of \$2
(double check this is more than enough it will raise too much)
- Or alternatively, we can keep the old taxes and finance the rest from abroad
- \$4.50 raised from the \$1 tax and \$1.5 borrowed from china

Is there an extra cost here?

(Hypothetical program YEAR 3)

- Health benefits kick in, and we have our first 11-year olds D11, S11
- We also have \$1.50 in debt to China

What is the cost of the program now?

- At a cost of \$3.00 / person, cost is now \$12.00 (beneficiaries D10, D11, S10, S11)

What can be done to raise the money?

- EconLand Congress decides election year is too important to raise taxes so borrows new amount $\$12.00 - \$4.50 \text{ (in taxes)} = \7.50 NEW borrowing
- New debt is AT LEAST (not including interest) $\$7.50 + \$1.50 = \$9.00$

(Hypothetical program YEAR 4)

Runaway debt unsustainable in the long run and this is the year that the poop hits the fan.

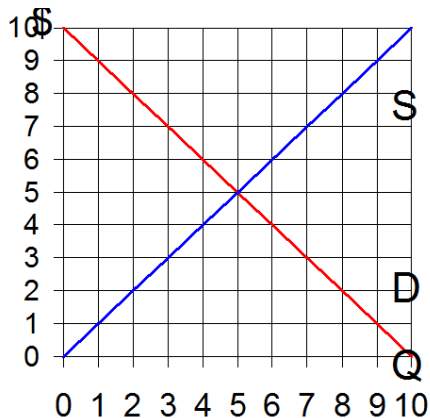
- Suppose China asked its money back!
- EconLand tries to payoff the entire debt with no change in the program

Needed: \$12 to fund program \$9 to pay debt = total of \$21 in revenues.

- How are we going to get that?
- How much tax do we need to raise \$21 in revenue?

How much tax to raise \$21?

Tax	Q	Revenue	DWL	DWL / £ revenue
£1	4.5	£4.50	0.25	0.056
£2	4	£8.00	1	0.125
£4	3	£12.00	4	0.333
£5	2.5	£12.50	6.25	0.50
£6	2	£12.00	9	0.75



How much tax to raise \$21? No way!

Its impossible to raise \$21

- The most we can possible raise is \$12.50 with a \$5.00 tax
- \$12.5 is maximum!
- Attained at tax of \$5, which does a tremendous amount of damage
- For every dollar taken in, 50 cents of dead weight loss.

Tax	Q	Revenue	Dead-wgt Loss	Dead-wgt loss per \$ rev
1	4.5	4.5	.25	.056
2	4	8	1	.125
4	3	12	4	.333
5	2.5	12.50	6.25	.50
6	2	12	9	.75

What will happen? PLAN A

- Not going to raise \$21
- Even if we set the tax high, still going to have to cut back on the program somehow

Example (Plan A)

The Balanced Plan

- In year 4, set tax = \$4, raise \$12.
- Lower the cost program from \$3 to \$2 per person (reduce the amount of assistance)
- Total program costs \$8 (4 people, \$2 each).
- From tax, the government is bringing in \$12, so have \$4 this year to start paying down debt. . . .

Plan A - Criticisms

Discussion of this outcome

1. High taxes in year 4 are very **damaging** to the widget economy. (33 cents lost per dollar in government revenue)
recall if $\text{tax}=4$, $\text{DWL}=.33$
2. **Equity** issue. Intergenerational transfer
 - Go back to year 3 when D10 and D11 were getting \$3.
 - They paid into a system earlier in their lives where the widget tax was only \$1
 - Current young people are paying \$4 in tax. But they will only get \$2 in benefits.
 - The younger generations pay the costs of borrowing from the later generations
3. Costs of kicking can down the road.

Plan A - Criticisms

3. Costs of kicking can down the road

- Social security is a recurring cost and delaying payment caused accumulation of cost and thus required a higher, more distorting tax (in the sense of high DWL)

Using debt to pay for expenses makes sense for one-shot expenses

- The US amassed huge debt during WWII but only for four years
- Could spread debt out over many periods (can also work for home purchase)

Paying for senior citizens' healthcare is different.

- It isn't "one shot." It will always be there.
- If you get behind on your payments, tomorrow you have to pay not only for today's cost, but tomorrow's as well.

Delaying social security payments forces us to pay debt back for previous periods AND today, etc.

Plan B

Policy Alternatives Plan B. (after the increase of age)

Year 2:

- **freeze benefits at \$2.25**
- **Raise retirement age to 11 starting year 3** (so only “11 year olds” get to get Econlandcare)
Recall at year 3 we have our first 11-year old population

Effects (compared to Plan A)

- 1) Taxes stay low so not much damage to the economy.
- 2) Effects on beneficiaries: older generations now bear a much higher nancial cost
 - D10 and S10 in year 2 get \$2.25 instead of \$3.00, so need to come up with \$.75 on their own. (And in year 3)
 - For year 3, the current D10 and S10 get nothing. So need to come up with \$3 on own. D11 and S11 need to come up with \$.75

Plan B

What do we think of this?

- On one hand: these people should be happy compared to the old days (year 1) when people died at age 10.
- On the other hand, there may be a concern that old people would suffer too much financial hardship.
- Or maybe Plan B is irrelevant because old people have enough political clout to keep Plan B off the table.

Plan C

- Perhaps **some coverage starting age 10**. (Maybe targeted based on need? But be wary that targeting to poor creates own-incentive problems as the old may spend down assets to qualify for benefits.)
- But unlike plan A, start cutting the benefits sooner, and start raising taxes earlier, so as to not kick the can down the road.