CHAPTER 8

Application: The Costs of Taxation

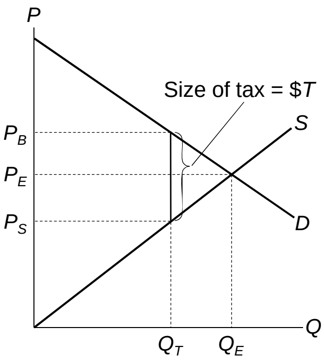
Review from Chapter 6

- A tax
  - drives a wedge between the price buyers pay and the price sellers receive.
  - raises the price buyers pay and lowers the price sellers receive.
  - reduces the quantity bought & sold.
- These effects are the same whether the tax is imposed on buyers or sellers, so we do not make this distinction in this chapter.

The Effects of a Tax

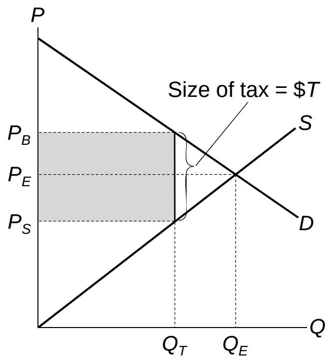
Eq'm with no tax:
Price = P_E
Quantity = Q_E

Eq'm with
tax = $T per unit:
Buyers pay P_B
Sellers receive P_S
Quantity = Q_T



The Effects of a Tax

Revenue from tax:
$T x Q_T

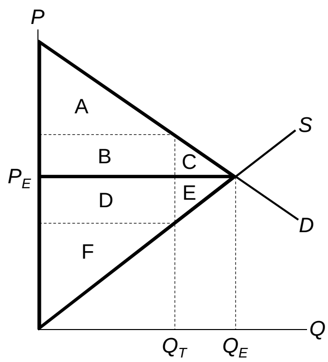


The Effects of a Tax

- Next, we apply welfare economics to measure the gains and losses from a tax.
- We determine consumer surplus (CS), producer surplus (PS), tax revenue, and total surplus with and without the tax.
- Tax revenue can fund beneficial services (e.g., education, roads, police), so we include it in total surplus.

The Effects of a Tax

Without a tax,
CS = A + B + C
PS = D + E + F
Tax revenue = 0
Total surplus
= CS + PS
= A + B + C
+ D + E + F



The Effects of a Tax

With the tax,

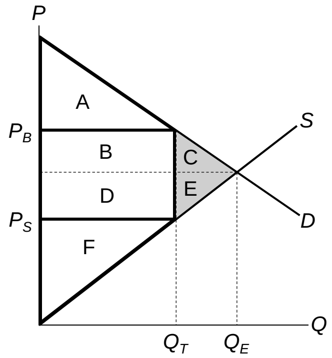
CS = A

PS = F

Tax revenue
= B + D

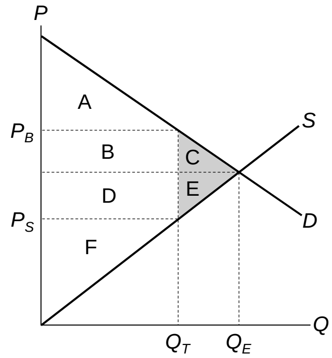
Total surplus
= A + B
+ D + F

The tax reduces total surplus by
C + E



The Effects of a Tax

C + E is called the
(   )
(DWL) of the tax,
the fall in total surplus that results from a market distortion, such as a tax.

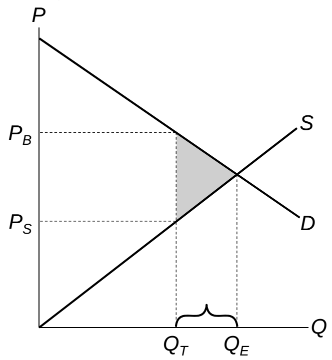


About the Deadweight Loss

Because of the tax, the units between Q_T and Q_E are not sold.

The value of these units to buyers is greater than the cost of producing them,

so the tax prevents some mutually beneficial trades.



What Determines the Size of the DWL?

- Which goods or services should govt tax to raise the revenue it needs?
- One answer: those with the smallest DWL.
- When is the DWL small vs. large?
  Turns out it depends on the price elasticities of supply and demand.
- Recall:
  The price elasticity of demand (or supply) measures how much $\boldsymbol{Q^D}$ (or $\boldsymbol{Q^S}$) changes when ***P*** changes.

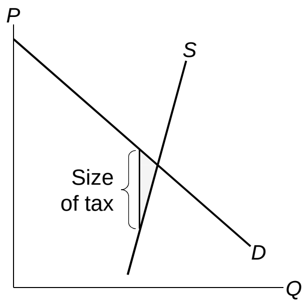
DWL and the Elasticity of Supply

When supply is inelastic,

it's harder for firms to leave the market when the tax reduces $\boldsymbol{P_S}$.

So, the tax only reduces ***Q*** a little,

and DWL is small.



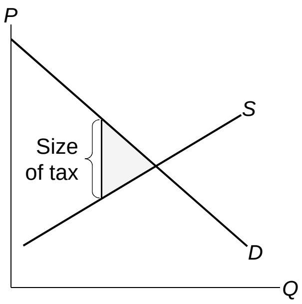
DWL and the Elasticity of Supply

The more elastic is supply,

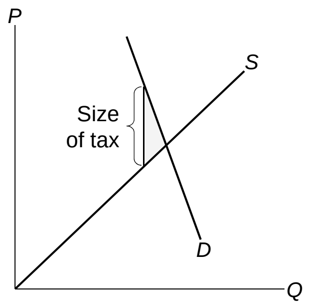
the easier for firms to leave the market when the tax reduces P_S,

the greater *Q* falls below the surplus-maximizing quantity,

the greater the DWL.



DWL and the Elasticity of Demand



When demand
is inelastic,

it's harder for consumers to leave the market when the tax raises P_B.

So, the tax only reduces Q a little,

and DWL is small.

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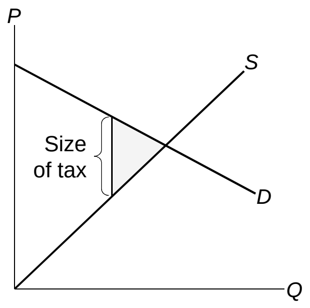
DWL and the Elasticity of Demand



The more elastic is demand,

the easier for buyers to leave the market when the tax increases P_B,

the more Q falls below the surplus-maximizing quantity,

and the greater the DWL.

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How Big Should the Government Be?

- A bigger government provides more services,
  but requires higher taxes, which cause DWLs.
- The larger the DWL from taxation,
  the greater the argument for smaller government.
- The tax on labor income is especially important;
  it's the biggest source of govt revenue.
- For the typical worker, the ***marginal tax rate***
  (the tax on the last dollar of earnings) is about 40%.
- How big is the DWL from this tax?
  It depends on elasticity….

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How Big Should the Government Be?

- If labor supply is inelastic, then this DWL is small.
- Some economists believe labor supply is inelastic, arguing that most workers work full-time regardless of the wage.

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How Big Should the Government Be?

Other economists believe labor taxes are highly distorting because some groups of workers have elastic supply and can respond to incentives:

- Many workers can adjust their hours,
  e.g., by working overtime.
- Many families have a 2nd earner with discretion over whether and how much to work.
- Many elderly choose when to retire based on the wage they earn.
- Some people work in the "underground economy" to evade high taxes.

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The Effects of Changing the Size of the Tax

- Policymakers often change taxes, raising some and lowering others.
- What happens to DWL and tax revenue when taxes change? We explore this next….

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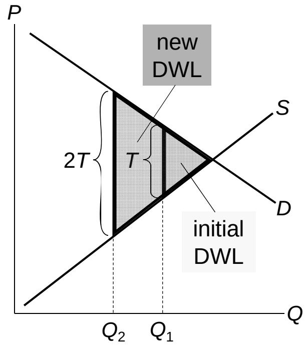
DWL and the Size of the Tax

Initially, the tax is *T* per unit.

Doubling the tax causes the DWL to more than double.



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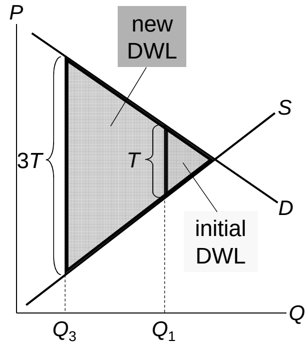
DWL and the Size of the Tax

Initially, the tax is *T* per unit.

Tripling the tax causes the DWL to more than triple.



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DWL and the Size of the Tax

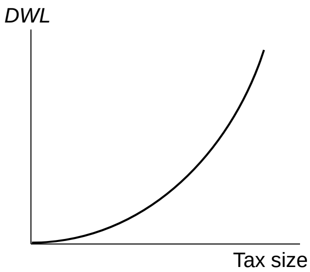
<u>*Implication*</u>

When tax rates are low, raising them doesn't cause much harm, and lowering them doesn't bring much benefit.

When tax rates are high, raising them is very harmful, and cutting them is very beneficial.

<u>*Summary*</u>

When a tax increases, DWL rises even more.



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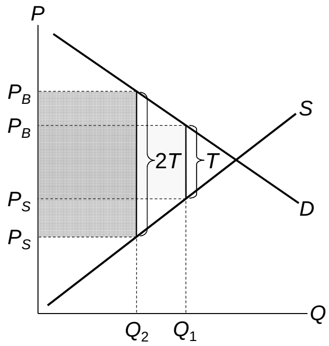
Revenue and the Size of the Tax

When the tax is small, increasing it causes tax revenue to rise.



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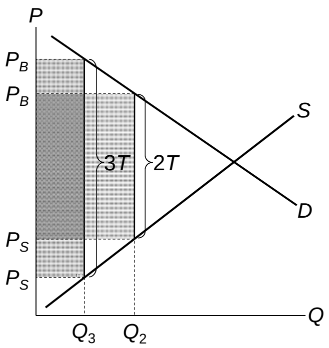
Revenue and the Size of the Tax

When the tax is larger, increasing it causes tax revenue to fall.



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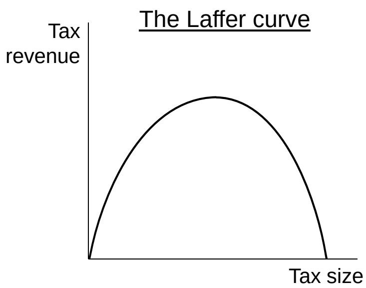
Revenue and the Size of the Tax

The **Laffer curve** shows the relationship between the size of the tax and tax revenue.



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