

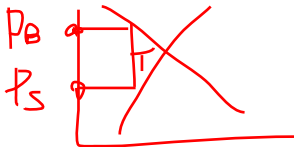
8. Application: The Costs of Taxation

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What this chapter is about

- ▶ How does a tax affect CS, PS, and TS?
 - ▶ What is the deadweight loss of a tax?
 - ▶ What factors determine the size of this deadweight loss?
 - ▶ How does tax revenue depend on the size of the tax?
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Review from Chapter 6

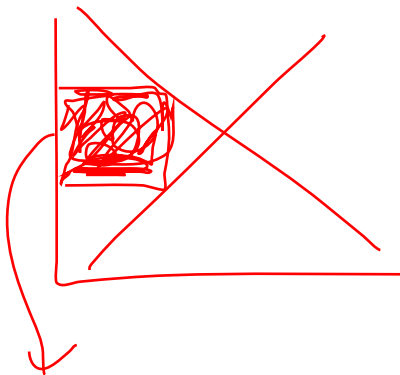


- ▶ A tax
 - ▶ drives a wedge between the price buyers pay and the price sellers receive.
 - ▶ raises the price buyers pay (P_B) and lowers the price sellers receive (P_S).
 - ▶ reduces the quantity bought & sold.
- ▶ Tax burden
 - ▶ Distributed between producers and consumers
 - ▶ Determined by elasticities of supply and demand
- ▶ These effects are the same whether the tax is imposed on buyers or sellers
 - ▶ We do not make this distinction in this chapter

Deadweight Loss of Taxation

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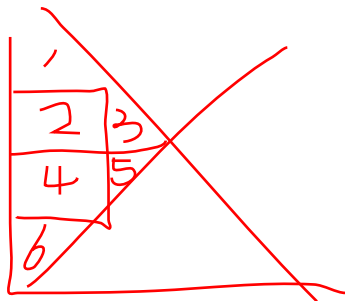
- ▶ Economic welfare
 - ▶ Buyers: consumer surplus
 - ▶ Sellers: producer surplus
 - ▶ Government: total tax revenue
 - ▶ Tax times quantity sold



$$\text{Tax Revenue} = T \times Q$$

- ▶ Public benefit from the tax (so we include it in TS)

Deadweight Loss of Taxation



- ▶ Welfare without a tax
 - ▶ Consumer surplus: same as before
 - ▶ Producer surplus: same as before
 - ▶ Total tax revenue = 0

- ▶ Welfare with tax
 - ▶ Smaller consumer surplus
 - ▶ Smaller producer surplus
 - ▶ Total tax revenue > 0
 - ▶ Smaller overall welfare

	No Tax	Tax
C	1 + 2 + 3	1
P	4 + 5 + 6	6
Tax	X	2+4
	1+2+3+4+5+6	1+2+4+6

Deadweight Loss of Taxation

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- ▶ Losses of surplus to buyers and sellers, from a tax
 - ▶ Exceed the revenue raised by the government
- ▶ **Deadweight loss (DWL)**
 - ▶ Fall in total surplus that results from a market distortion, such as a tax
- ▶ Taxes distort incentives
 - ▶ Markets allocate resources inefficiently

Deadweight Loss of Taxation

Deadweight losses and gains from trade

Let

Q_1 be a market equilibrium without tax and

Q_T be equilibrium quantities traded with tax.

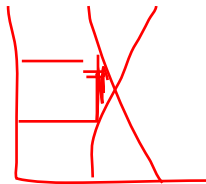
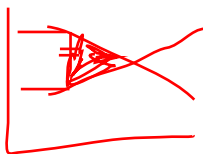
- ▶ Due to tax, the units between Q_T and Q_1 are not sold.
- ▶ The value of these units to buyers is greater than the cost of producing them.
 - ▶ so the tax prevents some mutually beneficial trades.
- ▶ Taxes cause deadweight losses
 - ▶ Prevent buyers and sellers from realizing some of the gains from trade

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 Q^D (or Q^S) changes when P changes.

가 DWL가

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DWL and the Elasticity of Supply

- ▶ Inelastic supply
 - ▶ it's harder for firms to leave the market when the tax reduces P_S .
 - ▶ So, the tax only reduces Q a little, and DWL is small.
- ▶ As supply gets more elastic
 - ▶ it's easier for firms to leave the market when the tax reduces P_S .
 - ▶ So, the tax reduces Q more, and DWL is bigger.

DWL and the Elasticity of Demand

- ▶ Inelastic demand
 - ▶ 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.
- ▶ As demand gets more elastic
 - ▶ it's easier for consumers to leave the market when the tax raises P_B .
 - ▶ So, the tax reduces Q more, and DWL is bigger.
- ▶ Summary: *The greater the elasticities of supply and demand, the greater the DWL of a tax*

How big should the government be?

- ▶ A bigger government provides more services
 - ▶ But requires higher taxes, which cause DWL.
- ▶ The larger the DWL from taxation, the greater the argument for smaller government.
 - ▶ Government programs are more costly.
- ▶ If taxes impose small deadweight losses
 - ▶ Government programs are less costly

How big should the government be?

- ▶ The tax on labor income is especially important
- ▶ 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? Is 40% too large?
 - ▶ Small or large DWL?
 - ▶ It depends on elasticity. . . .

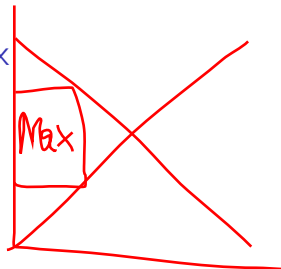
How big should the government be?

- ▶ Some believe labor supply is fairly inelastic
- ▶ Almost vertical
 - ▶ Most people would work full-time regardless of wage
- ▶ Tax on labor: small DWL

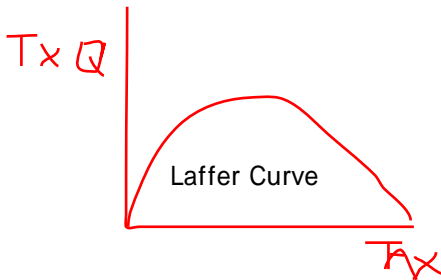
How big should the government be?

- ▶ Others: labor supply is more elastic
 - ▶ Many workers can adjust the number of hours they work (overtime)
 - ▶ Some families have second earners
 - ▶ Some discretion over whether to do unpaid work at home or paid work in the marketplace
 - ▶ Many of the elderly can choose when to retire
 - ▶ Some people consider working in the “underground economy” to evade high taxes.
- ▶ Tax on labor: greater DWL
가)
()
2nd worker(가 ?)

The Effects of Changing the Size of the Tax



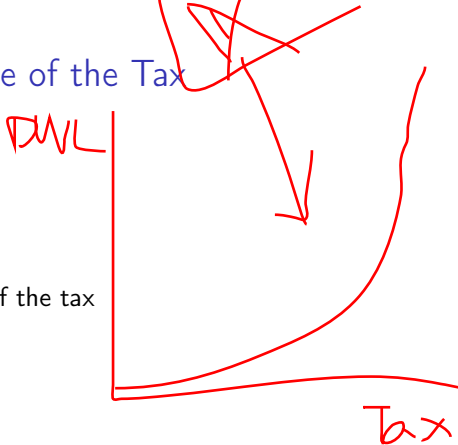
- ▶ Policymakers often change taxes, raising some and lowering others.
- ▶ What happens to DWL and tax revenue when taxes change?
- ▶ We explore this next. . . .



The Effects of Changing the Size of the Tax

As the tax increases

- ▶ Deadweight loss increases
 - ▶ Even more rapidly than the size of the tax
- ▶ Tax revenue
 - ▶ Increases initially
 - ▶ Then decreases
 - ▶ Higher tax: drastically reduces the size of the market
- ▶ The **Laffer curve** shows the relationship between the size of the tax and tax revenue.



The Laffer curve and supply-side economics

- ▶ 1974, economist Arthur Laffer
 - ▶ Laffer curve
 - ▶ Supply-side economics
 - ▶ Tax rates were so high, that reducing them would actually raise tax revenue
- ▶ Ronald Reagan's experience in film industry
 - ▶ High tax rates caused less work
 - ▶ Low tax rates caused more work

The Laffer curve and supply-side economics

- ▶ Ronald Reagan ran for president in 1980
 - ▶ Platform: cutting taxes
 - ▶ Argument
 - ▶ Taxes were so high that they were discouraging hard work
 - ▶ Lower taxes would give people the proper incentive to work
 - ▶ Raise economic well-being
 - ▶ Perhaps increase tax revenue

The Laffer curve and supply-side economics

- ▶ Continue to debate Laffer's argument
- ▶ No consensus about the size of the relevant elasticities
 - ▶ ... and where the peak is.
- ▶ General lesson:
 - ▶ Change in tax revenue from a tax change depends on how the tax change affects people's behavior
 - ▶ Recall Ten Principles: **People Respond to Incentives!**