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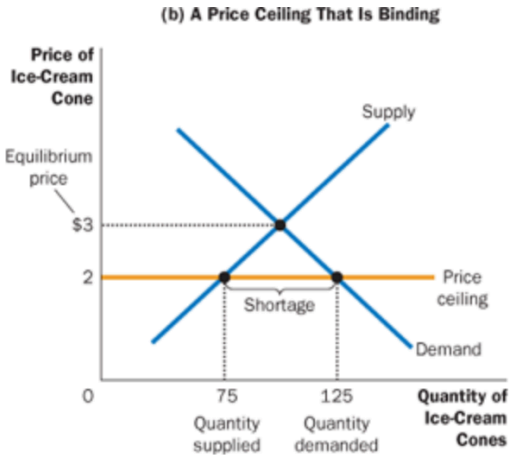
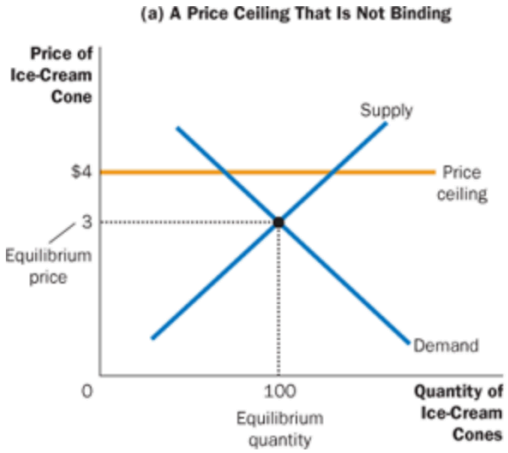
ECO 1104 - Midterm 2 (Chapters 6,7,8,11)

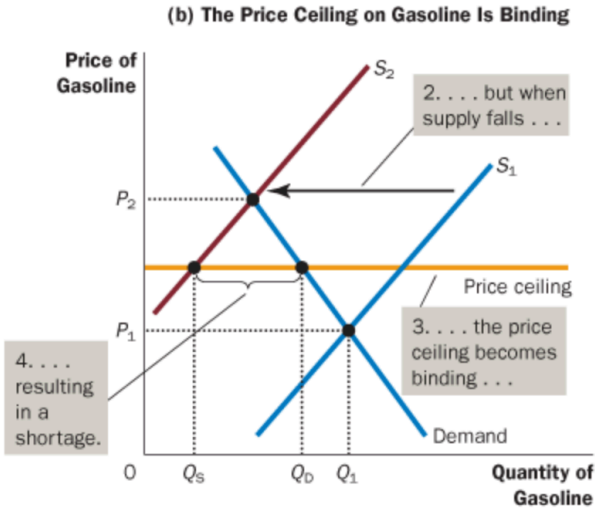
Chapter 6 - Supply, Demand, and Government Policies

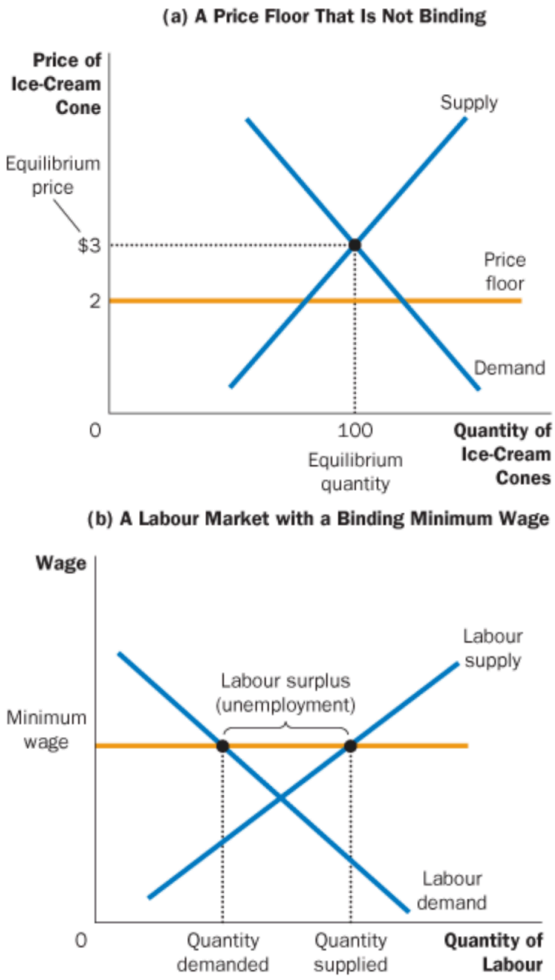
Controls on Prices

- **Price ceiling -** A legal maximum on the price at which a good can be sold
  - This is a regulated price designed to "protect" the interest of consumers
  - If the price ceiling lies below the equilibrium, a situation of excess Qd emerges (shortage), it becomes a **binding constraint**.
    - A price ceiling is ineffective unless it is below the equilibrium price (because the forces of supply and demand tend to move the price toward the equilibrium price, but when the market price hits the ceiling, it can rise no further)
  - If the price ceiling lies above the equilibrium price, the price ceiling is **not binding**. Markets forces move the economy to the equilibrium, and the price ceiling has no effect on the price or the quantity sold.
  - When the government imposes a **binding price** ceiling on a competitive market, a shortage of the good arises, and sellers must ration the scarce gods among the large number of potential buyers.
  - Ex: Rent control
    - If price ceiling is binding:
      - Price decreases, **quantity supplied decreases**. Thus developers stop building and landlord's cease to maintain units
      - Price decreases, **quantity demanded increases**. The shortage causes upward pressure on rents, and other perverse effects (landlords charge outrageous fees for parking and key charges to try acquiring a price that is closer to equilibrium)
- **Price ceiling always becomes binding when supply shifts to the left (see gasoline example)**





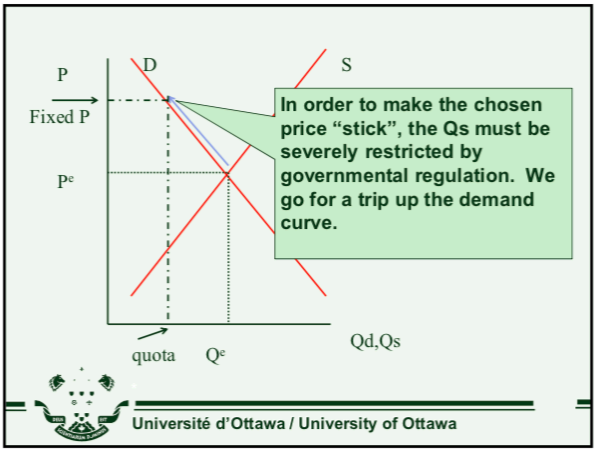




- **Price floor -** A legal minimum on the price at which a good or service can be sold
  - A price floor is ineffective **unless it is above** the equilibrium price (because the forces of supply and demand tend to move the price toward the equilibrium price, but when the market price hits the floor, it can't lower any further)
  - If the price floor lies above the equilibrium, a situation of excess supply emerges (surplus), it becomes a **binding constraint**.
  - If the price floor lies below the equilibrium price, the price floor is **not binding**. Because markets forces move the economy to the equilibrium, and the price floor has no effect on the price or the quantity sold.
  - Ex: Minimum Wage
    - If the price floor is binding (above the equilibrium price):
    - Price increase, **quantity supplied increases** (by prospective employees)
    - Price increase, **quantity demanded decreases** (by employers)
    - Big **surpluses** (**labour supplied**) emerge, placing a downward pressure on price. This situation is unsustainable unless the market surplus is removed from the market.
    - **Evidence indicates that both sides of the MW debate are full of shit:**
      - The MW does reduce employment, but only slightly. Workers do not get laid off, but job creation is less than what would otherwise be the case
      - Most MW earners do not live in poor families, and thus the program is poorly targeted
      - The **SOLUTION** is to give low income workers direct payments.

Supply Management

- An alternate policy instrument to the price floor
  - Designed to support super-competitive prices in the dairy and poultry industries
- The industry chooses the price level such that high profits are guaranteed



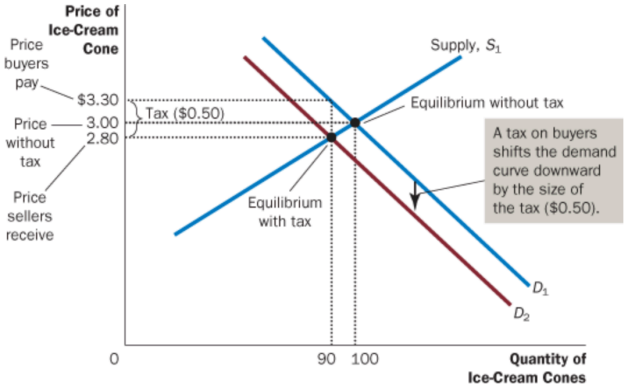
- This initially causes an increase in Qs and a decrease in Qd…causing a surplus (or excess Qs)
- The output level is thus restricted to the quantity that is consistent with charging that price according to the demand curve
- It is illegal for: Any new farmer to enter the market. Any incumbent farmer to raise output. To import these products from outside of Canada.

Taxes

- **Tax Incidence -** How the burden of a tax is distributed among the various people who make up the economy.
- To answer this question, we can follow the three steps for analyzing supply and demand:
  1. We decide whether the law affects the supply curve or demand curve
  2. We decide which way the curve shifts
  3. We examine how the shift affects the equilibrium

How Taxes on Buyers Affect Market Outcomes

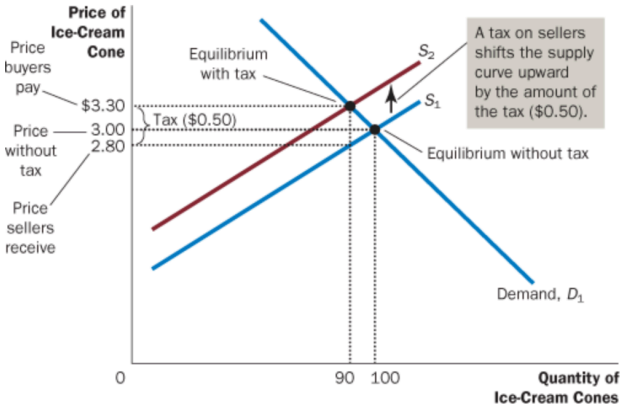
- When a tax of $0.50 is levied on buyers, the demand curve shifts down by $0.50 from D1 to D2. The equilibrium quantity falls from 100 to 90 cones. The price that sellers receive falls from $3.00 to $2.80. The price that buyers pay (including the tax) rises from $3.00 to $3.30. Even though the tax is levied on buyers, buyers and sellers share the burden of the tax.



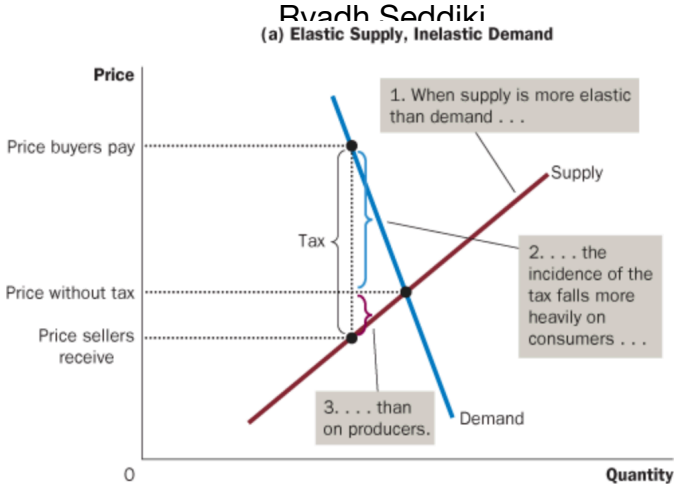
- **Implications:**
  - Taxes discourage market activity. When a good is taxes, the quantity of the good sold is smaller in the equilibrium.
  - Buyers and sellers share the burden of taxes. In the equilibrium, buyers pay more for the good, and sellers receive less.

How Taxes on Sellers Affect Market Outcomes

- When a tax of $0.50 is levied on sellers, the supply curve shifts up by $0.50 from S1 to S2. The equilibrium quantity falls from 100 to 90 cones. The price that buyers pay rises from $3.00 to $3.30. The price that sellers receive (after paying



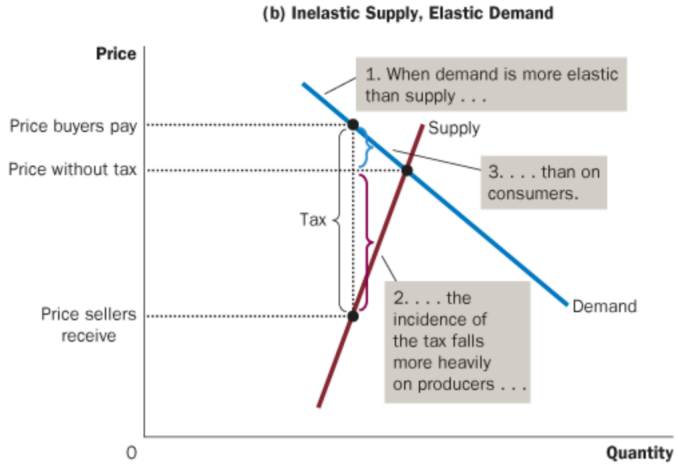
the tax) falls from $3.00 to $2.80. Even though the tax is levied on sellers, buyers and sellers share the burden of the tax.



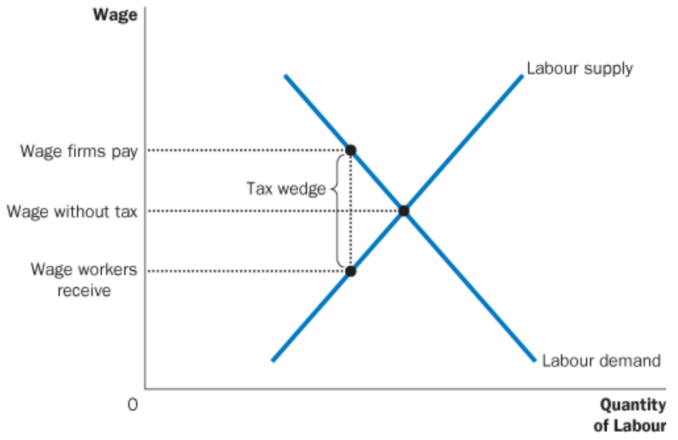
- **Implications:**
  - Taxes on buyers and taxes on sellers are equivalent. In both cases, the tax places a wedge between the price that buyers pay and the price that sellers receive.

Elasticity And Tax Incidence

- If supply is more price-elastic than demand, then supplies respond more to the "tax squeeze" than demanders, and thus demanders will pay most of the tax, as sellers succeed in passing most of the cost of the tax in the form of higher prices



- If demand is more price-elastic than supply, then demanders respond more to the "tax squeeze" than suppliers, and thus suppliers will pay most of the tax as they are unable to pass on the cost of the tax in the form of higher prices
- **A tax burden falls more heavily on the side of the market that is less elastic**
  - Why? Because the elasticity measures the willingness of buyers or sellers to leave the market when conditions become unfavourable.
  - A small elasticity of demand means that buyers do not have alternatives to consuming this particular good.
  - A small elasticity of supply means that sellers do not have good alternatives to producing this particular good.
- This logic can be applied to the payroll tax. Most labour economists believe that the supply of labour is much less elastic than the demand. This means that workers, rather than firms, bear most of the burden of the payroll tax. In other words, the distribution of the tax burden is not at all close to the 58-42 split that law makers intended.

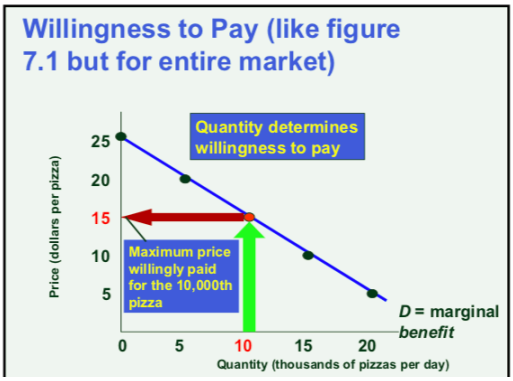


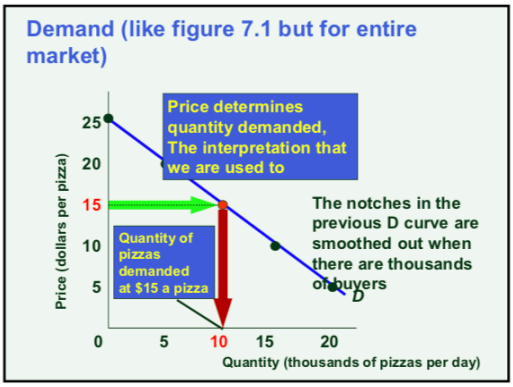
Chapter 7 - Consumers, Producers, and the Efficiency of Markets

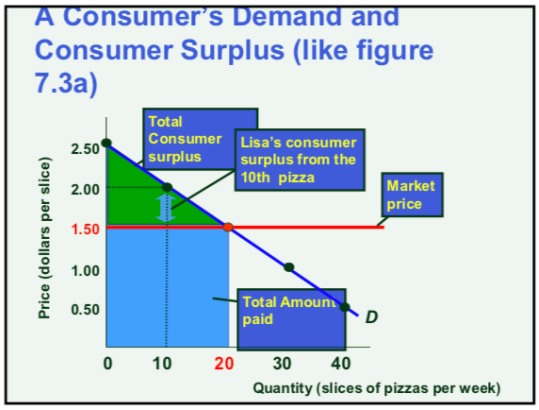
- **Welfare economics -** The study of how the allocation of resources affects economic well-being
  - By examining the benefits that buyers and sellers receive from taking part in a market
  - By examining how society can make these benefits as large as possible.
- The general idea behind this chapter is to demonstrate that the free market equilibrium generated in the supply and demand model is efficient
  - The quantity is said to be efficient if the welfare of producers on the supply side **PLUS** the welfare of the consumers on the demand side is higher than at any other output level.
  - To this end, we define three measures of: Consumer welfare called **consumer surplus**; producer welfare called **producer surplus**; global or total welfare called **total surplus**.

Consumer Surplus

- **Willingness to Pay -** The maximum amount that a buyer will pay for a good
  - How much is the consumption of that last unit worth to the consumer or to all consumers?
  - Each buyer would be eager to purchase the good at a price less than his willingness to pay. At a price equal to his willingness to pay, the buyer would be indifferent about buying the good: if the price is exactly the same as the value he places on it, he would be equally happy buying it or keeping his money.
  - The willingness to pay also tends to decline **within** an individual as their consumption level rises (I'm willing to pay less for my 8th slice of pizza vs my 1st slice of pizza)
- **Consumer Surplus -** A buyer's willingness to pay **MINUS** the amount the buyer actually pays

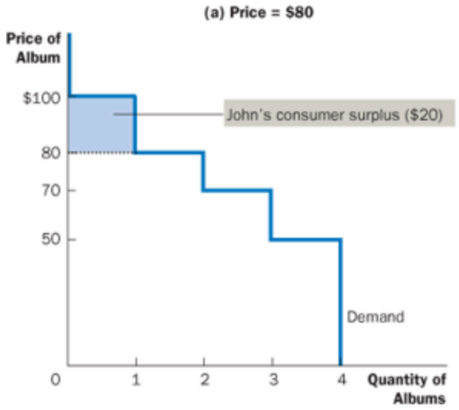


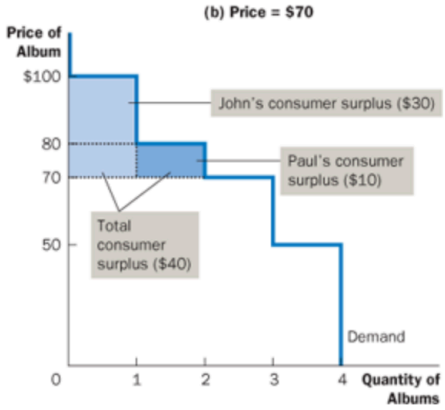


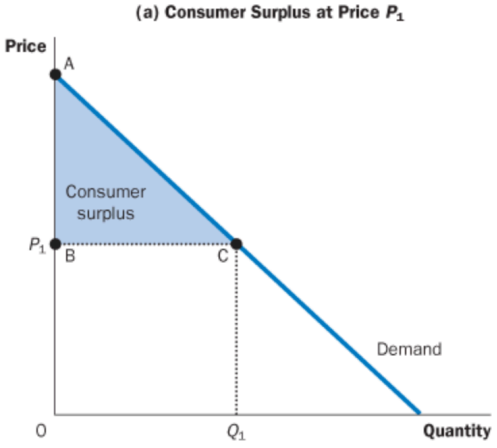


Using the Demand Curve to Measure Consumer Surplus

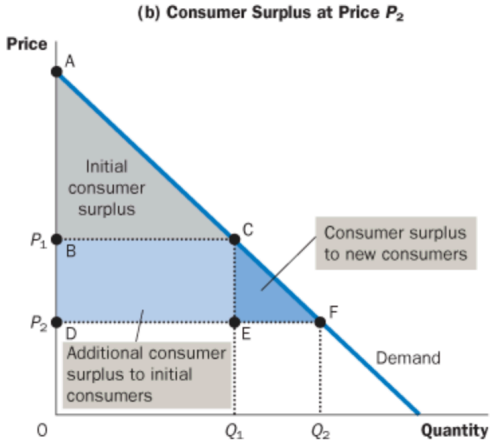
- The price given by the demand curve shows the willingness to pay of the **marginal buyer**, the buyer who would leave the market first if the price was any higher.
- The area below the demand curve and above the price measures the consumer surplus in a market







- As the level of consumption rises, the level of consumer surplus diminishes. Consumer surplus at the margin (the very last unit produced) is zero.



How a Lower Price Raises Consumer Surplus

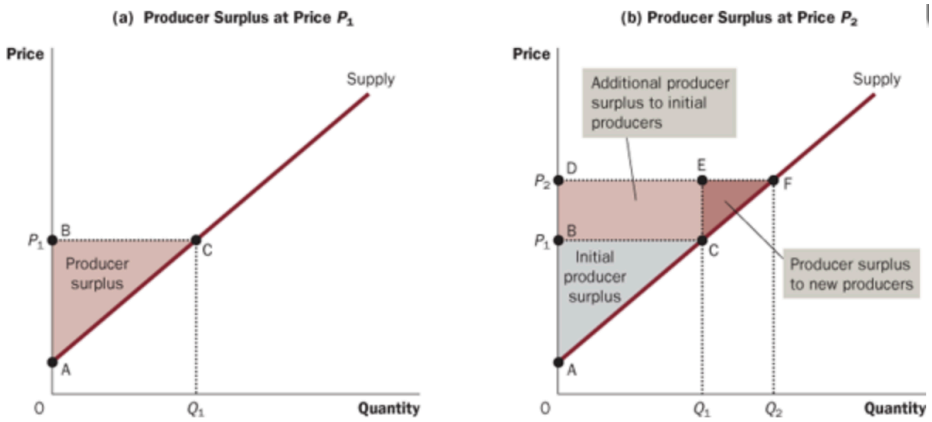
- A decrease in price will raise consumer surplus and thus make consumers better off
- An increase in price will have the opposite effect

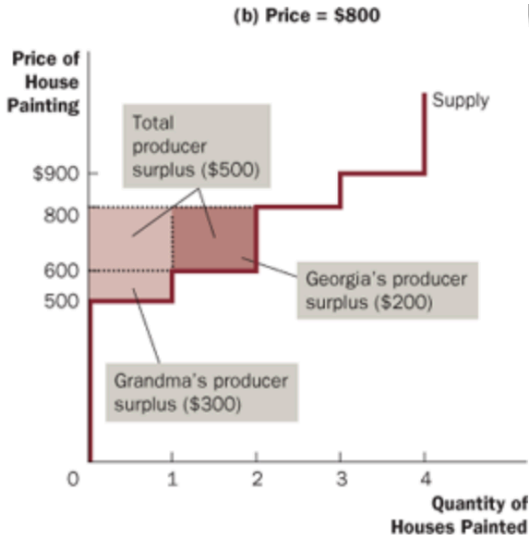
Producer Surplus

- **Producer surplus -** is the amount a seller is paid for a good minus the seller's cost
  - It is the counterpart for consumer surplus on the supply side
  - It is a measure of producer welfare: The benefit that firms receive from producing in the market
  - Think of the price variable on the supply curve as the **willingness to supply** a given quantity

- Essentially **producer surplus = the actual price received MINUS the willingness to produce (and sell)**
- An increase in price received raises the level of producer surplus, while a decrease lowers it.

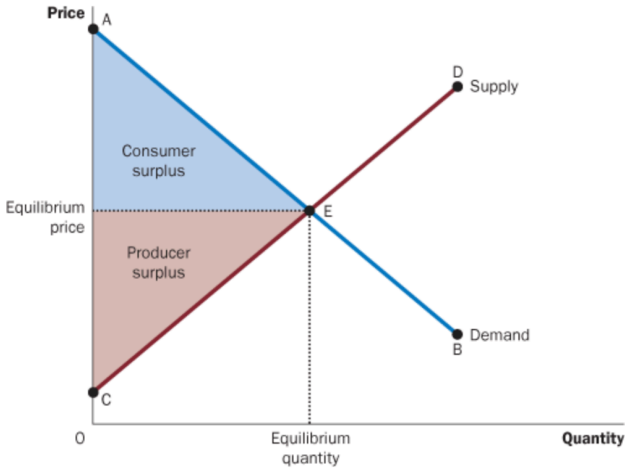
- **Cost -** The value of everything a seller must give up to produce a good.





Market Efficiency

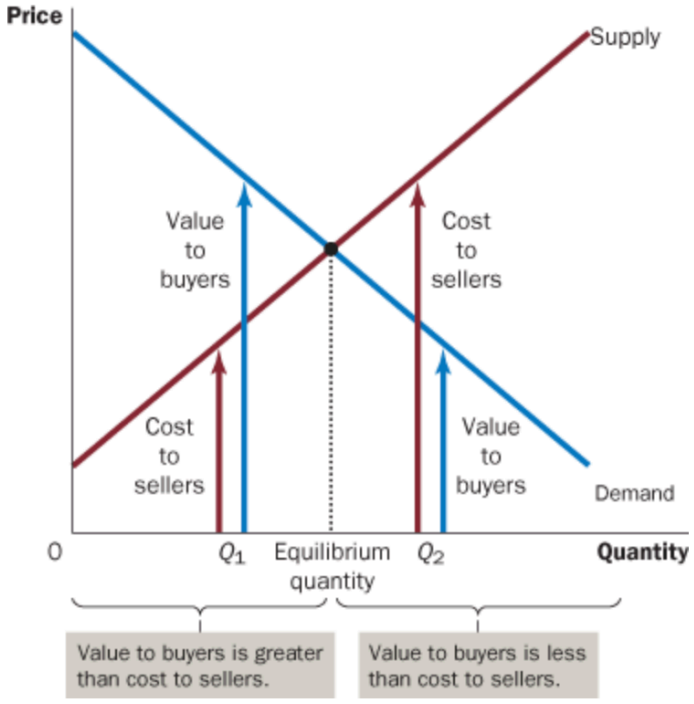
- Consumer and producer surplus are the basic tools that economists use to study the welfare of buyers. More specifically if the allocation of resources determined by free markets is in any way desirable.
- **Total Surplus = Willingness of demanders to pay (value to buyers) — cost incurred by sellers**
- **Efficiency -** The property of a resource allocation of maximizing the total surplus
  - If an allocation of resources maximizes total surplus, we say that the allocation exhibits **efficiency**.
  - If an allocation is not efficient, then some of the gains from trade among buyers and sellers are not being realized
  - Example: An allocation is inefficient if a good is not being produced by the sellers with lowest cost. In this case, moving production from a. High-cost producer to a low-cost producer will lower the total cost to sellers and raise total surplus.



- **Equity -** The fairness of the distribution of well-being among the various buyers and sellers
  - Efficiency deals with how big the pie is, equity deals with how equally the pie is divided amongst the economic players.

Evaluating the Market Equilibrium

- **3 points regarding market efficiency**
  - The S+D equilibrium allocated the supply of goods to the buyers who value them most highly, as measured by their willingness to pay as reflected in the demand curve
  - The S+D equilibrium allocates the demand for goods to the sellers who can produce them at the lowest cost, as reflected in the supply curve
  - The S+D equilibrium consists of the quantity of goods that maximizes the sum of consumer and producer surplus, and is therefore efficient
- As shown in the graph, at lower levels of output, value to demanders > cost to suppliers, so more should be produced.
- As shown in the graph, at higher levels of output, value to demanders is less than the cost to suppliers, so less should be produced.



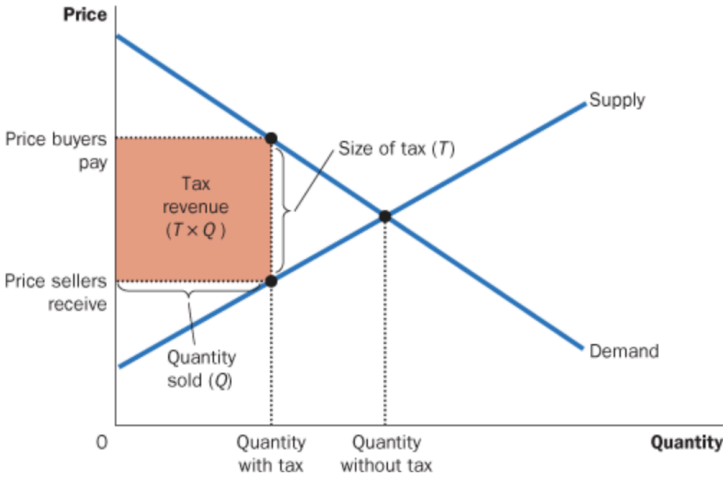
Laissez-faire outcomes

- "let people do as they will"
- According to free market economics, it is thought that in most cases, for most markets, the S+D equilibrium is efficient, or welfare maximizing
- Situations in which that condition does not apply are called **"market failure"** by free market economists
- **Market power -** Ability to influence prices. Can cause markets to be inefficient because it keeps the price and quantity away from the equilibrium of supply and demand.
- **Externalities -** When the decisions of economic player affect people who do not participate in the market at all. Example: Pollution

Chapter 8 - The Costs of Taxation

The Deadweight Loss of Taxation

- Recall that the impact of a tax on a market outcome is the same whether the tax is levied on buyers or sellers of a good.
  - When a tax is levied on buyers, the demand curve shifts downward by the size of the tax; when it is levied on sellers, the supply curve shifts upward by that amount.
  - In either case, when the tax is enacted, the price paid by buyers rises, and the price received by sellers falls. In the end, the elasticities of supply and demand determine how the tax burden is distributed between the producers and consumers.

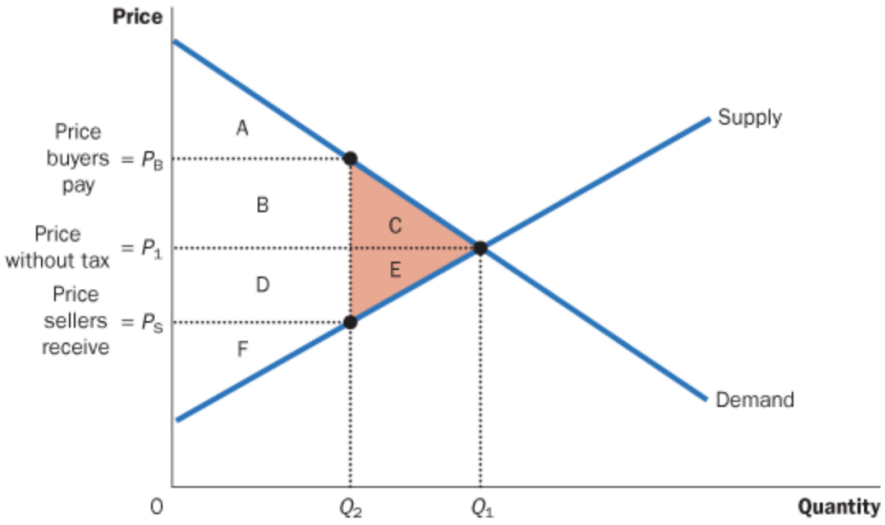


How a Tax Affects Market Participants

- If T is the size of the tax and Q is the quantity of the gold sold, then the government gets total tax revenue of T x Q
- See figure 8.2 above: The tax revenue equals the area of the rectangle between the supply and demand curves.

	Without Tax	With Tax	Change
Consumer Surplus	A + B + C	A	−(B + C)
Producer Surplus	D + E + F	F	−(D + E)
Tax Revenue	None	B + D	+(B + D)
Total Surplus	A + B + C + D + E + F	A + B + D + F	−(C + E)

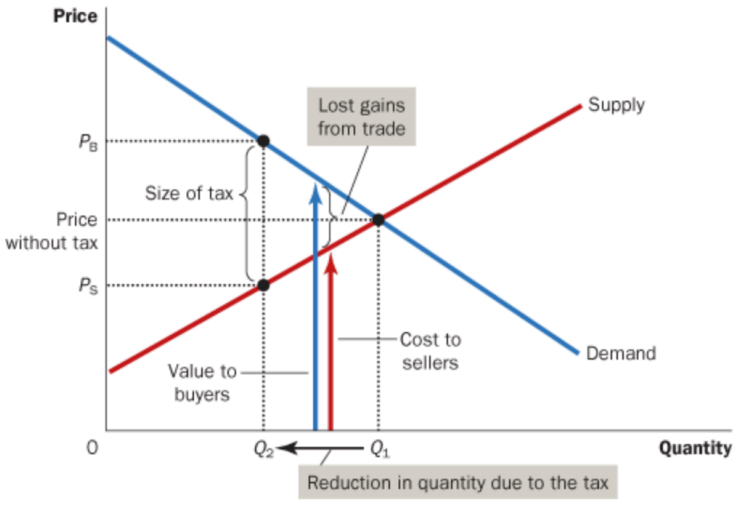
The area C + E shows the fall in total surplus and is the deadweight loss of the tax.



- A tax on a good reduces consumer surplus (**by the area B + C**) and producer surplus (**by the area D+E**). Because the fall in producer and consumer surplus exceeds tax revenue (**area B + D**), the tax is said to impose a deadweight loss (**area C + E**).
- **Deadweight Loss -** The fall in total surplus that results from a market distortion, such as a tax.
  - In other words, a NET LOSS in TOTAL surplus after the tax has been implemented
  - The NET effect on total surplus is always negative, as the gains realized by the government are outweighed by the losses of both demanders and suppliers.

Why is there a loss in welfare?

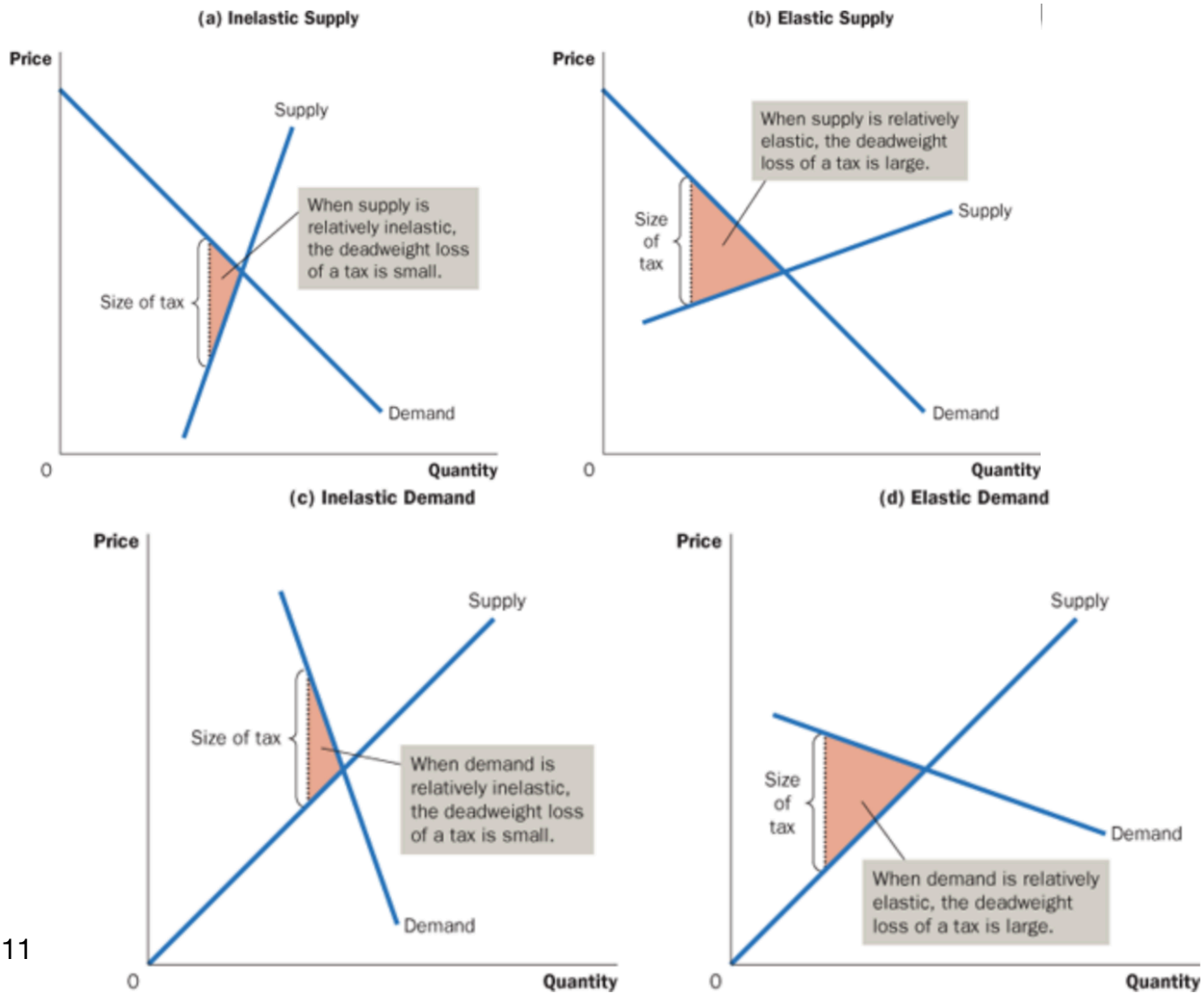
- The change in total welfare includes the change in consumer surplus (NEGATIVE), the change in producer surplus (NEGATIVE), and the change in tax revenue (POSITIVE).
- When we add these three pieces together, we find that total surplus in the market falls by the area C+E.
  - Thus the losses to buyers and sellers from a tax exceed the revenue raised by the government.
- When a tax raises the price to buyers and lowers it for sellers, it gives buyers an incentive to consume less and sellers an incentive to produce less than they otherwise would.
- As buyers and sellers respond to these incentives, the size of the of the market shrinks below its optimum. Thus, because taxes distort incentives, they cause markets to allocate resources inefficiently.



• When the government imposes a tax on a good, the quantity sold falls from Q1 to Q2. As a result, some of the potential gains from trade among buyers and sellers do not get realized. These lost gains from trade create the deadweight loss.

The Determinants of the Deadweight Loss

- In panels A and B, the demand curve and the size of the tax are the same, but the PED of supply is different. The more elastic the supply curve, the larger the deadweight loss of the tax.
- In panels C and D, the supply curve and the size of the tax are the same, but the PED of demand is different. The more elastic the demand curve, the larger the deadweight loss of the tax.
- A tax has a deadweight loss because It induces buyers and sellers to change their behaviour. The tax raises the price paid by buyers, so they consume less. At the same time, the tax lowers the price received by sellers, so they produce less.
- Because of these changes in behaviour, the EQ quantity in the market shrinks below the optimal quantity.
- The more responsive buyers and sellers are to changes in the price, the more the equilibrium quantity shrinks, hence, the **greater the elasticity of supply and demand**, the **greater the deadweight loss** of a tax.



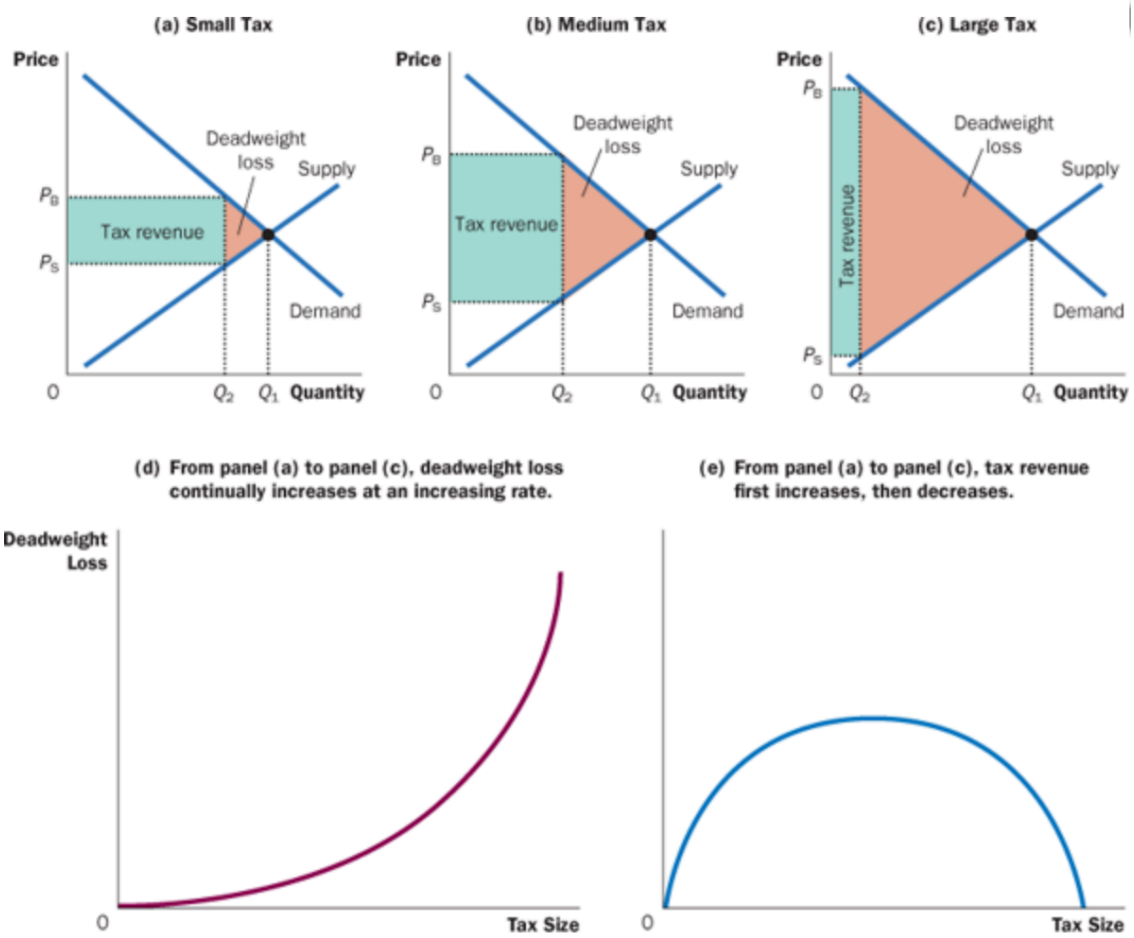
- Essentially, the **greater the elasticities of demand or supply** the **larger the decline will be in the equilibrium quantity** in response to the tax, and **thus the greater the deadweight loss of a tax**.
- Consumption taxes should be applied on goods having inelastic demand. Thus, "sin" taxes don't make economic sense if they apply to luxuries.

Political Economy Of Taxation

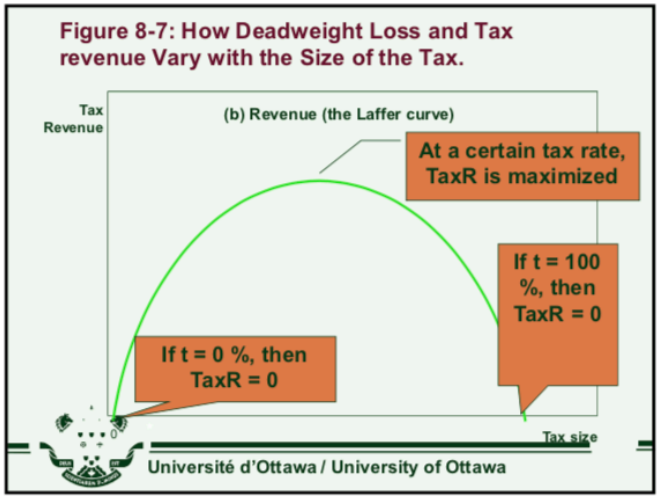
- Right wingers dislike taxes, claiming that they choke off economic activity
  - They argue that the demand and especially supply elasticities are high, and thus contribute to a higher deadweight loss.
- Left wingers do not dislike taxes (because they love government spending), claiming that they do not choke off economic activity
  - They are essentially arguing that demand and especially supply elasticities are low, and thus deadweight losses are low.
  - **Workers will keep on working, and investors will keep on investing despite of high taxes**

Deadweight losses and tax revenue as the tax rate increases

- With each increase in the tax rate the deadweight loss of the tax rises even more rapidly than the size of the tax
  - Thus higher taxes cause rapidly rising losses in efficiency



- The laffer curve is the hallmark of the supply side economics and current US policy
  - Because tax cuts were intended to encourage people to increase the quantity of labour they supplied, the views of Laffer and Reagan became known as “supply-side economics”
- A lower (higher) tax rate can bring about higher (lower) total tax revenues
  - Workers and investors respond to lower tax rates by increasing the quantity supplied of labour or capital
- As the size of a tax increases, its deadweight loss quickly gets larger
- By contrast, tax revenue first rises with the size of a tax, but then, as the tax gets larger, the market shrinks so much that tax revenue starts to fall



Chapter 11 - Public Goods and Common Resources

The Different Kinds of Goods

- There are 4 types of goods in an economy: **Private goods, Club goods, Common Resources, Public goods.** They are classified according to two characteristics:

1. Is the good **excludable**? Can people be prevented from using the good?
2. Is the good **rival in consumption**? Does one person’s use of the good diminish another person’s ability to use it?

Excludable? \ Rival in Consumption?	Yes	No
Yes	Private Goods • Ice-cream cones • Clothing • Congested toll roads	Club Goods • Fire protection • Cable TV • Uncongested toll roads
No	Common Resources • Fish in the ocean • The environment • Congested nontoll roads	Public Goods • Tornado siren • National defence • Uncongested nontoll roads

- **Excludability -** The property of a good whereby a person can be prevented from using it
- **Rival in consumption -** The property of a good whereby one person’s use diminishes other people’s use

- **Common resources -** are characterized as being rivalrous but non-excludable
  - Best example is fish in the ocean. No one is excluded from fishing in the ocean, but it is rivalrous, because every fish I receive is one less fish for someone else
- **Public goods -** are characterized by being non-rivalry in consumption
  - Society consumes public goods jointly. Beautiful views, clean environment, highway before the saturation point
- **Public goods -** are also characterized by non-excludability in consumption
  - We cannot exclude people from benefiting from skating on the canal, national defence, public security
- Public goods are **NOT FREE GOODS —** they are still economic goods that **incur an opportunity cost!**
  - They are financed from **tax revenue** (NO FREE LUNCH REMEMBER)
- Many goods are considered **mixed goods**
  - **Public transportation -** excludes riders who do not pay their fares, but cannot exclude them from benefiting from the lower congestion so there is not TOTAL excludability
  - **Public health (immunization) -** Could charge for flu shorts and thus exclude certain poor people, but all benefit from greater levels of public health (herd immunity), so there is not TOTAL excludability

<u>The Free-Rider Problem</u>

- **Free-rider -** A person who receives the benefit of a good but avoids paying for it
  - Free rider problem causes market failure. It causes public goods to be under-produced by the private sector.
  - See fireworks example on page 223-224. Fireworks would be confer an external benefit on those who see the display w/o paying for it. The show is socially desirable, but it not privately profitable for Ellen. Thus, the private sector will not produce it.
- With **private goods**, we can measure people's preferences according to their buying habits (BECAUSE IT IS AN EXCLUDABLE GOOD). **People have to put their money where their mouth is if they want to consume.**

- **Free riding -** is essentially **lying —** not contributing to the provision of the public good according to one's true preferences.
  - People cannot be excluded from consuming, so in many cases they tend to underpay for public services
- There are two forms:
  - **Heavy users -** of the service tend to overstate their preference for it (knowing that others are paying for most of the cost). (consume more than they pay)
  - **Light users -** downplay their preference (want to pay less)
  - Both groups are tempted to avoid paying their share of the tax burden (relative to how much they actually use)
- The practical **solution to free riding** is government provision of the G/S financed by **COMPULSORY taxation.**
  - This will increase the production level closer to the socially optimal level.
- Just about any time you hear an interest group saying that **more tax money** should be allocated to such and such purpose, they are making a "**public good**" argument
  - Students ask "why should we pay anything towards out university educations? It is society who benefits, not us!" —> **In economic terms: This is a fully NON-EXCLUDABLE public good**
- Just about any time you hear an interest group saying that **fewer tax money** should be allocated to such and such purpose, they are saying that it's essentially a "**private good**"
  - Childless people will say "why should we be compelled to pay for schools? We do not benefit, so why should we contribute?" —> **In economic terms: This is an EXCLUDABLE private good**

<u>Optimal Provision of a Public Good</u>

- We have seen that the government provides public goods because the private market on its own **will not produce** an **efficient quantity**.
- For private goods, it is the free market equilibrium that determines the optimal provision of the good

- For public goods, the government must determine what kinds of public goods to provide and in what quantities, to determine this we must apply the **cost-benefit analysis**
- **Cost-benefit analysis -** A study that compares the costs and benefits to society of providing a public good
  - The production costs are the same as with private goods
  - The benefit side is problematic due to free riding. We do not really know how much value people place on the provision of a given level of output.
  - **Optimal provision** for the community occurs at the output level where **marginal benefit = marginal cost**.
- In practice, many mixed goods and public goods may be overpriced (**MC > MB**)
  - At least 40% of all economic activity in Canada is accounted for by the 3 levels of government

<u>Common Resources and the Tragedy of the Commons</u>

- **Tragedy of the commons -** A parable that illustrates why common resources get used more than is desirable from the standpoint of society as a whole
  - This is the case due to common resources being **non-excludable** and **rivalry** in consumption
  - Any user imposes a **negative externality** on other users because she has a strong incentive to over-exploit and little incentive to invest
  - Collective ownership of public resources leads to **over-utilization** and **under-maintenance**
- **SOLUTION:** Divide the land into parcels and either sell them or give them away such that they become private property that is excludable (it's already rivalrous). That will give strong incentives for sustainable exploitation and for maintenance.
  - In other words, assign **property rights**. That confers to the owner the ability to use it as he/she sees fit.
  - **It is the lack of assigned property rights that is the heart of the externality and public good problem.**