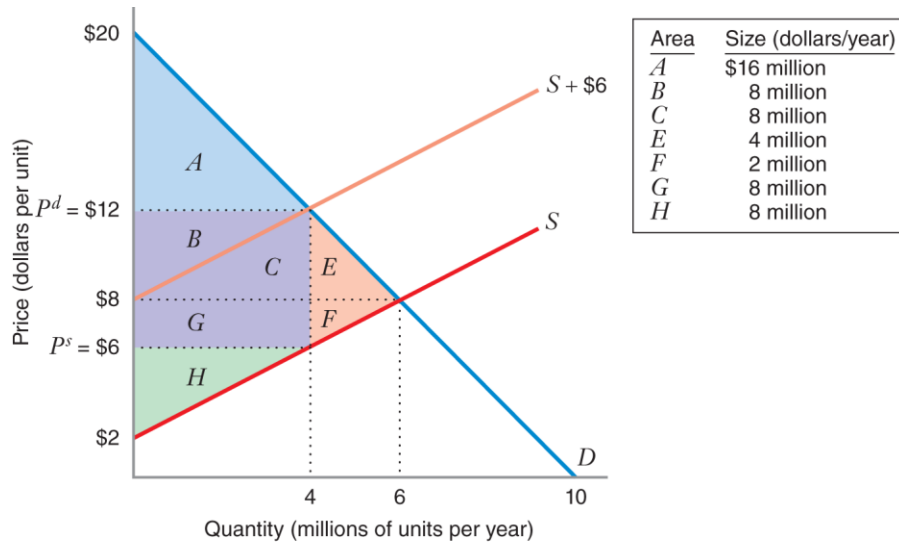


CHAPTER 10 LECTURE – COMPETITIVE MARKETS: APPLICATIONS

We all know about consumer surplus, producer surplus and deadweight loss from Principles of Microeconomics.

Effect of a Tax



	With No Tax	With Tax	Impact of Tax
Consumer surplus	$A + B + C + E$ (\$36 million)	A (\$16 million)	$-B - C - E$ (-\$20 million)
Producer surplus	$F + G + H$ (\$18 million)	H (\$8 million)	$-F - G$ (-\$10 million)
Government receipts from tax	zero	$B + C + G$ (\$24 million)	$B + C + G$ (\$24 million)
Net benefits (consumer surplus + producer surplus + government receipts)	$A + B + C + E + F + G + H$ (\$54 million)	$A + B + C + G + H$ (\$48 million)	$-E - F$ (-\$6 million)
Deadweight loss	zero	$E + F$ (\$6 million)	$E + F$ (\$6 million)

Mathematics

In this example you can show the inverse supply curve is $P = 2 + Q_S$ and the inverse demand curve is $P = 20 - Q_D$.

Equating Supply = Demand $2 + Q_S = 20 - Q_D$ $Q_D = Q_S$.

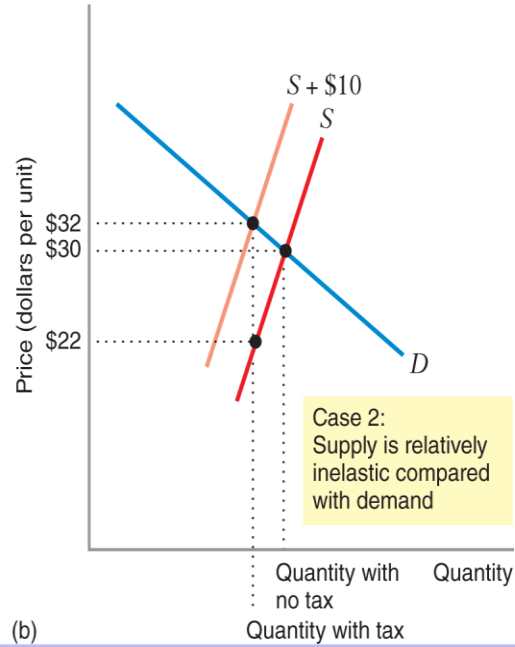
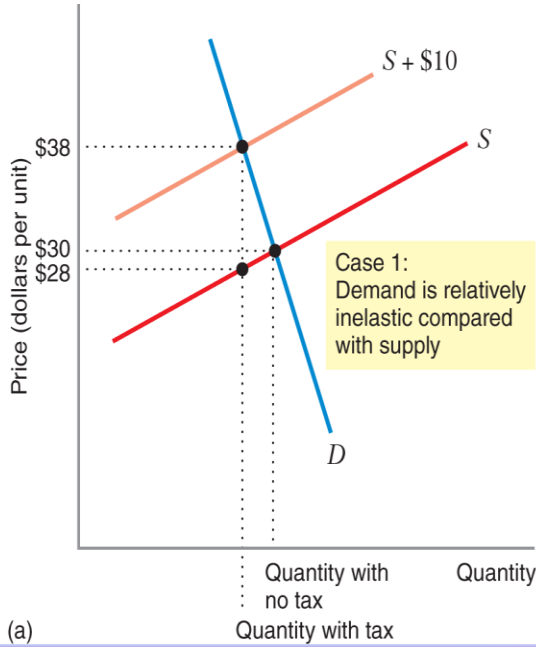
Thus, $3Q = 18$ or $Q = 6$ and $P = 8$

Now add a tax of 6. This new supply curve becomes $P = 2 + Q_S + T$ or $P = 8 + Q_S$

New Equilibrium P and Q with Tax becomes $8 + Q_S = 20 - 2Q_D$. or $Q = 4$ and $P = 12$

You can now show where all the values in the chart came from without referring to the diagram.

Incidence of a tax: A measure of the effect of a tax on the prices consumers pay and sellers receive in a market

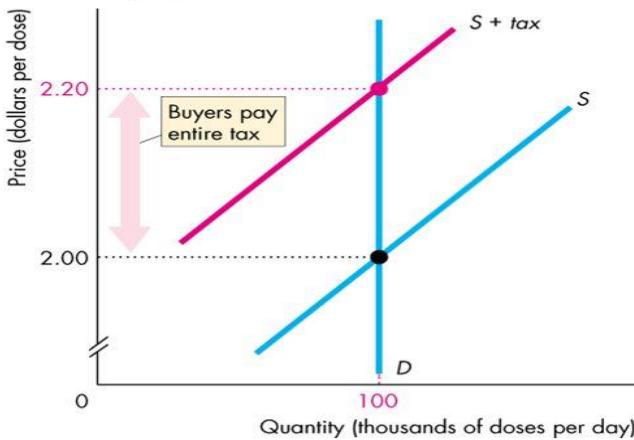


Taxes

Perfectly Inelastic Demand

Demand for this good is perfectly inelastic—the demand curve is vertical.

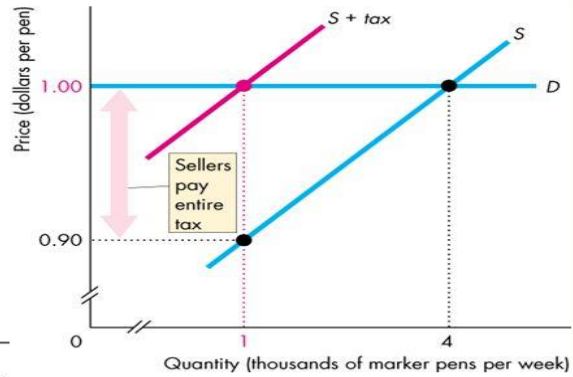
When a tax is imposed on this good, buyers pay the entire tax.



Perfectly Elastic Demand

The demand for this good is perfectly elastic—the demand curve is horizontal.

When a tax is imposed on this good, sellers pay the entire tax.



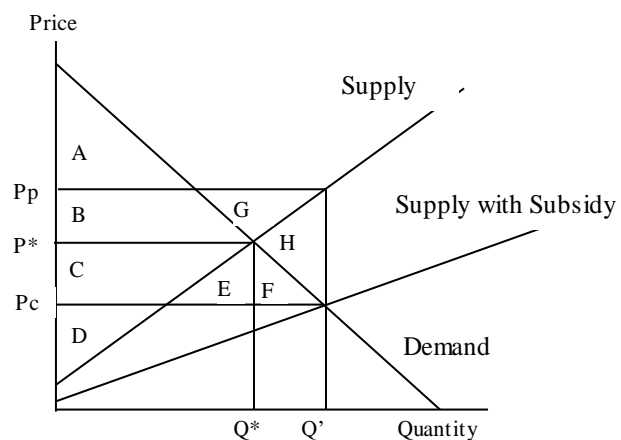
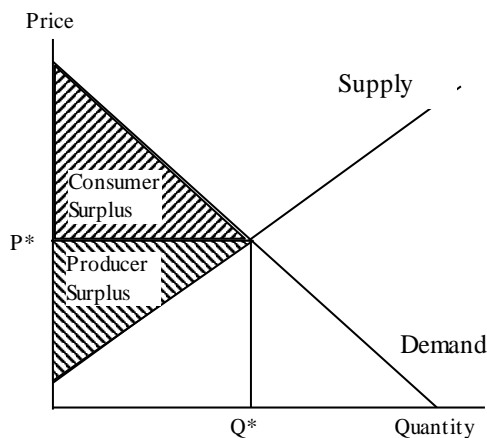
Subsidies and Price Ceilings

We can use the idea of consumer and producer surplus to examine the welfare impacts of subsidies and price ceilings to lower prices and encourage consumption. As shown below, a subsidy will increase the supply curve, or shift the supply curve to the right (alternatively, the same analysis could be conducted shifting the demand curve to the right). This will increase the price producers receive (P_p) and encourage them to expand output (Q'). At the same time, the subsidy reduces the price consumers pay (P_c) and encourages them to consume more (Q'). As a result, consumption and production both increase, increasing equilibrium output (Q').

As illustrated in the table and figures below, the subsidy increases both consumer and producer surplus. Both consumers and producers would tend to support this measure. However, tax payers are the losers. The tax revenue required to finance the subsidy exceeds the total gain to consumers and producers. This represents the cost associated with producing units of output for which the cost to producers exceeds the value to consumers. This cost is the area between the demand and supply curves for the extra units encouraged by the subsidy (area H), as indicated in the table and illustrated in the figure below.

Effect of a Subsidy on Consumer and Producer Surplus

	Before Subsidy	After Subsidy	
Consumer Surplus	A + B	A + B + C + E + F	
Producer Surplus	C + D	C + D + B + G	
	Consumer	Producer	Total
Net Surplus Gain	C + E + F	B + G	B + C + E + F + G
Tax Expenditure			B + C + E + F + G + H
Net Gain (Loss)			-H

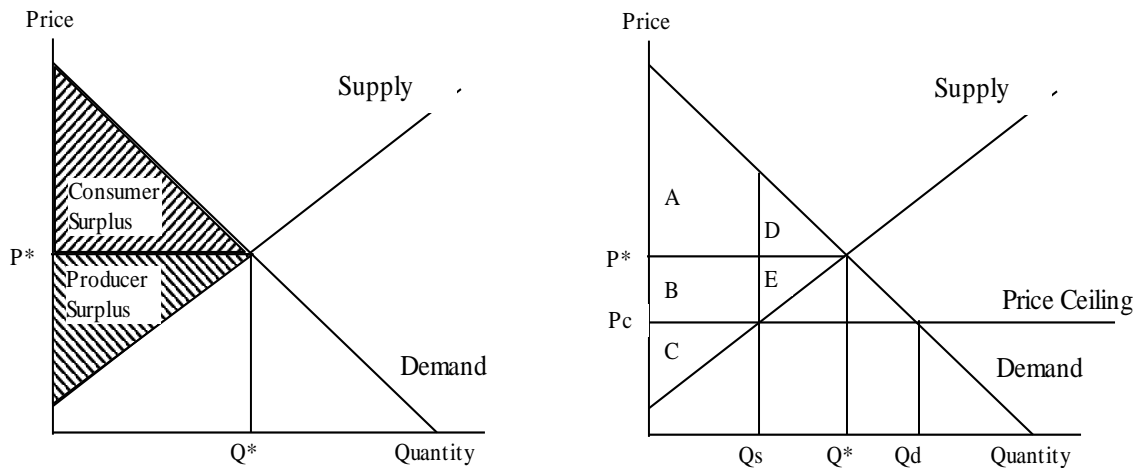


Price ceilings can be analyzed in a similar fashion. A price ceiling reduces market price by administrative order. This increases the quantity demanded but reduces the quantity supplied, as illustrated below. The price ceiling's welfare implications can be analyzed by examining consumer and producer surplus. This is described in the table below and illustrated in the corresponding figure.

As illustrated in the table and figure, the price ceiling increases consumer surplus at the expense of producer surplus. In particular, area B represents an income transfer from producers to consumers. This represents the impact of reducing price from its equilibrium value to the ceiling price on the items exchanged under the price ceiling. In addition, there is a net welfare loss. Areas D and E represent consumer and producer surplus lost as a result of the price ceiling. This is the surplus value associated with the units that are no longer exchanged after imposing the price ceiling. This area is frequently referred to as the dead weight loss associated with a price ceiling (you should be able to identify a similar dead weight loss associated with taxes). Consumers that receive the item after the price ceiling would support this measure; consumers not receiving the item and producers would oppose it.

Effect of a Price Ceiling on Consumer and Producer Surplus

	Before Ceiling		After Ceiling
Consumer Surplus	A + D		A + B
Producer Surplus	B + C + E		C
	Consumer	Producer	Total
Net Surplus Gain	B - D	- B - E	- D - E



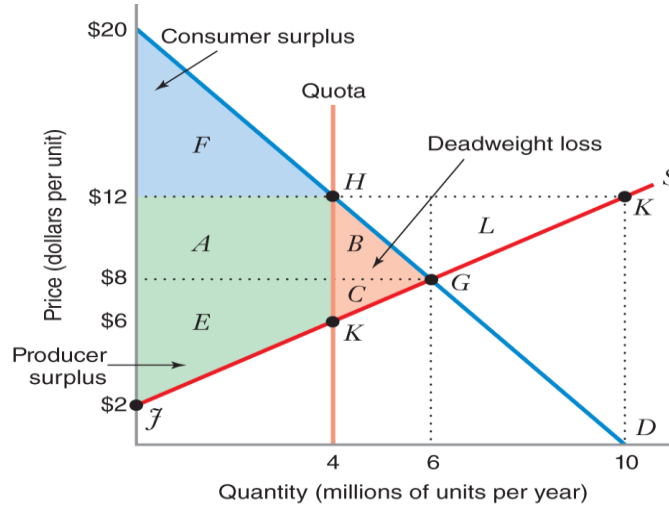
Definition: **Economic Efficiency** means that the total surplus is maximized.

"Every consumer who is willing to pay more than the opportunity cost of the resources needed to produce extra output is able to buy; every consumer who is not willing to pay the opportunity cost of the extra output does not buy."

The perfectly competitive equilibrium attains economic efficiency.

Policy: Production Quotas

Definition: A **production quota** is a limit on either the number of producers in the market or on the amount that each producer can sell. The quota usually has a goal of placing a limit on the total quantity that producers can supply to the market.



	With No Quota	With Quota	Impact of Quota
Consumer surplus	$A + B + F$ (\$36 million)	F (\$16 million)	$-A - B$ (-\$20 million)
Producer surplus	$C + E$ (\$18 million)	$A + E$ (\$32 million)	$A - C$ (\$14 million)
Net benefits (consumer surplus + producer surplus)	$A + B + C + E + F$ (\$54 million)	$A + E + F$ (\$48 million)	$-B - C$ (-\$6 million)
Deadweight loss	zero	$B + C$ (\$6 million)	$B + C$ (\$6 million)

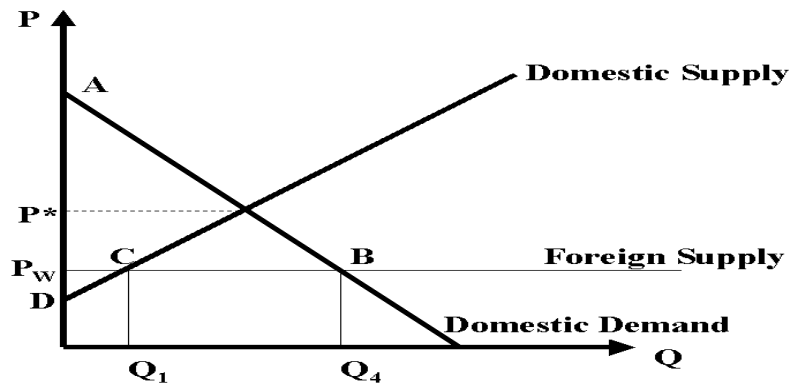
Example: Consider a quota program those results in the same market price as a price support program. How does the output levels and surpluses (CS,PS,TS) generated by the programs compare?

Policy: Import Tariffs and Quotas

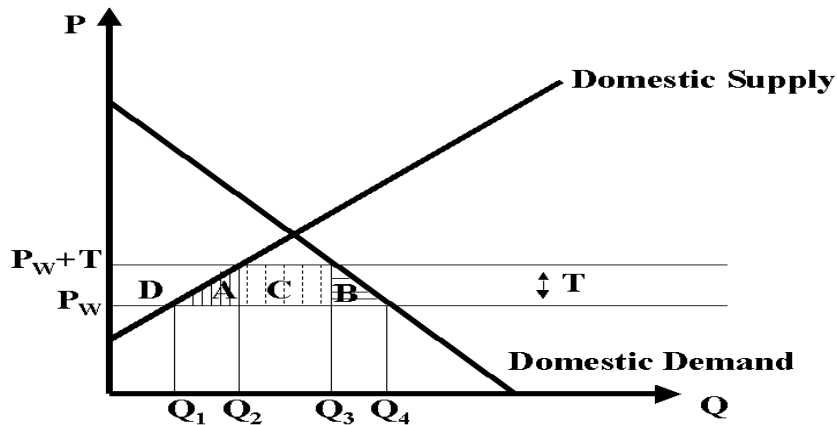
Definition: **Tariffs** are taxes levied by a government on goods imported into the government's own country. Tariffs sometimes are called **duties**.

Definition: An **import quota** is a limit on the total number of units of a good that can be imported into the country.

We assume country can import all it wants at the world price.



Now, add an import tariff.



Comparing a tariff to a quota...

Let quota limit imports to $Q_3 - Q_2$...the equilibrium price would be the same as for the tariff...and the (world) deadweight loss would be the same as well.

Is there a difference? The quota generates no government revenue. Hence, while the total supply and total price for the domestic market remains the same under the two policies, *domestic* deadweight loss is larger under the quota.

Government Intervention: Who Wins and Who Loses?

Intervention Type	Effect on (domestic) Quantity Trade	Effect on (domestic) Consumer Surplus	Effect on (domestic) Producer Surplus	Effect on (domestic) Government Budget	Is a (domestic) Deadweight loss created?
Excise Tax	Falls	Falls	Falls	Positive	Yes
Subsidies to Producers	Rises	Rises	Rises	Negative	Yes
Maximum Price Ceilings for Producers	Falls; Excess Demand	Rise or Fall	Falls	Zero	Yes
Minimum Price Floors for Producers	Falls; Excess Supply	Falls	Rise or Fall	Zero	Yes
Production Quotas	Falls; Excess Supply	Falls	Rise or Fall	Zero	Yes
Import Tariffs	Falls	Falls	Rises	Positive	Yes
Import Quotas	Falls	Falls	Rises	Zero	Yes