MARKETS IN ACTION

LOS 15a: Explain market equilibrium, distinguish between long-term and short-term effects of outside shocks, and describe the effects of rent ceilings on the existence of black markets in the housing sector and on the market's efficiency. Vol 2, pg 66-72

Equilibrium occurs at the point where market demand equals market supply. Outside shocks may shift demand or supply, forcing the market towards a new equilibrium. In this reading our purpose is to analyze the effects of outside shocks on markets, and study whether the government's response to these shocks results in more desirable outcomes.

The Housing Market

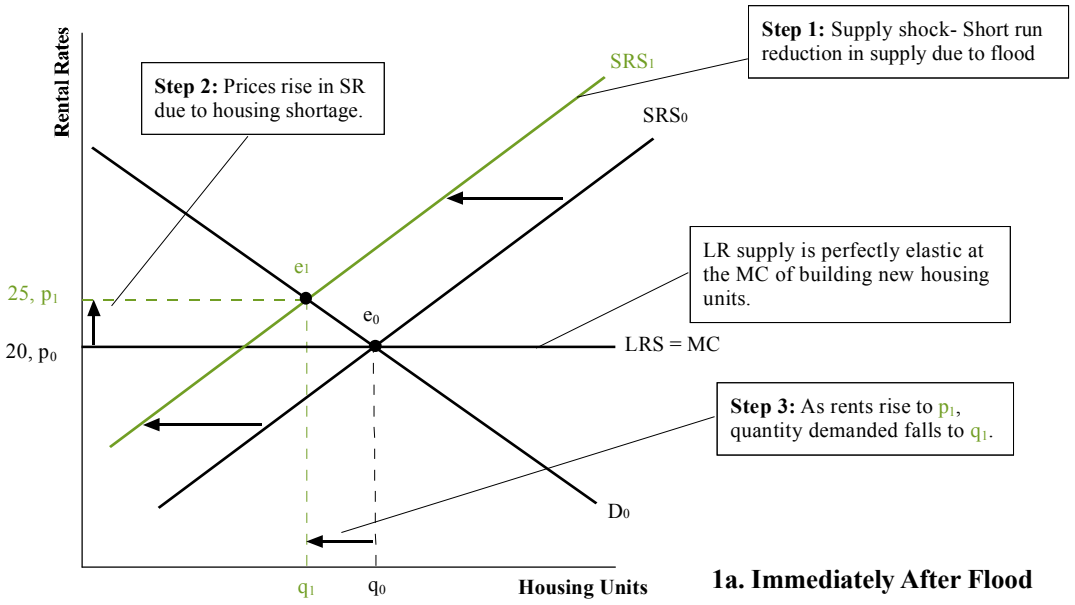
The short run supply curve (SRS) for housing shows the change in quantity of housing units available for rent as rental rates (prices) change, given that the total number of housing units remains constant.

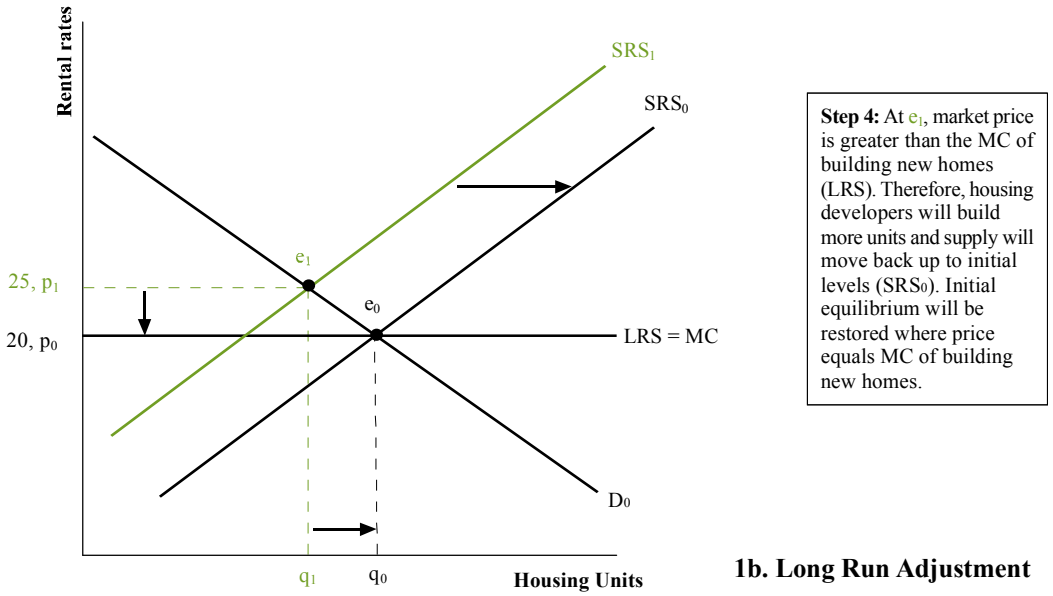
The long run supply curve (LRS) on the other hand, shows the change in quantity of housing units available for rent as rental rates change, given there is enough time for new units to be built or for existing ones to be brought down. The long run supply curve is *perfectly elastic* because the marginal cost of building new homes is relatively constant and does not vary with the number of homes already in existence. Housing developers will build more units as long as rental rates exceed the marginal cost of building houses. Therefore, long run supply is perfectly elastic at the rental rate that equals marginal cost.

Outside shocks can temporarily interrupt the supply of goods and services, resulting in a decrease in supply. An example of an outside shock to the housing market is the occurrence of a devastating flood that destroys several thousands of homes in a city. People become homeless overnight and the short run supply of housing falls (shifts to the left from SRS_0 to SRS_1 in Figure 1a). The shift in supply breaks initial equilibrium of e_0 and brings the market to a new equilibrium of e_1 where prices are *higher,* p_1, and quantity *lower,* q_1.

At these higher prices there is an incentive for developers to erect more housing units because market price p_1 exceeds the marginal cost (MC) of building housing units. Therefore, developers construct more housing units, and over the long run, supply increases (shifts to the right) gradually back to SRS_0 (Figure 1b), restoring initial equilibrium (e_0).

Figure 1: SR and LR Effects of Outside Shocks on the Housing Market.





The key to the LR adjustment was the rise in prices (rents), which made it profitable for builders to construct more housing units, and brought about the increase in supply.

If the government were to enforce a maximum price, or a rent ceiling on housing, it would prevent the market's self-adjusting mechanism from functioning. Suppose the government were to cap rental rates at $20 per unit per month (Figure 2). In this situation, quantity supplied (60) will be lower than quantity demanded (70). Society will suffer a shortage of 10 units and the following undesirable developments might occur:

Search activity: People would spend a lot of time, energy, and fuel trying to be the first ones at the scene of any housing availability. These resources could have been put to some better, more productive use. Rent ceilings control the explicit rental portion of costs, but do not control the opportunity costs, which might be higher than the difference in rental rates were the market unregulated.

Black markets: Housing providers know that there are people willing to pay more than the ceiling price for a housing unit, but they cannot legally charge them a higher rent. Therefore, they look for other ways of indirectly increasing rents (e.g. by charging higher rates for other services, key money, etc.).

Were the rent ceiling of $20 not imposed, market prices would simply rise to $25 (as illustrated in Figure 1) and allocative efficiency would be reached because:

- The sum of consumer surplus (CS) and producer surplus (PS) would be maximized at e_0.
- Marginal cost (MC) to society would equal marginal benefit (MB) to society at e_0. (Demand = Supply)

With the rent ceiling in place however, there is no activity in the market beyond 60 units. Consumers are better off in the sense that they have to pay $20 instead of $25, but also lose out because they only get 60 housing units instead of 70. Producers are worse off because of lower realized prices and lower quantities sold. The loss to consumers and producers is the dead weight loss (DWL) borne by the society. Allocative efficiency is not reached because:

The rent ceiling only disrupts market equilibrium if set below equilibrium market prices. If the ceiling were set above equilibrium price it would have absolutely no effect on economic activity.

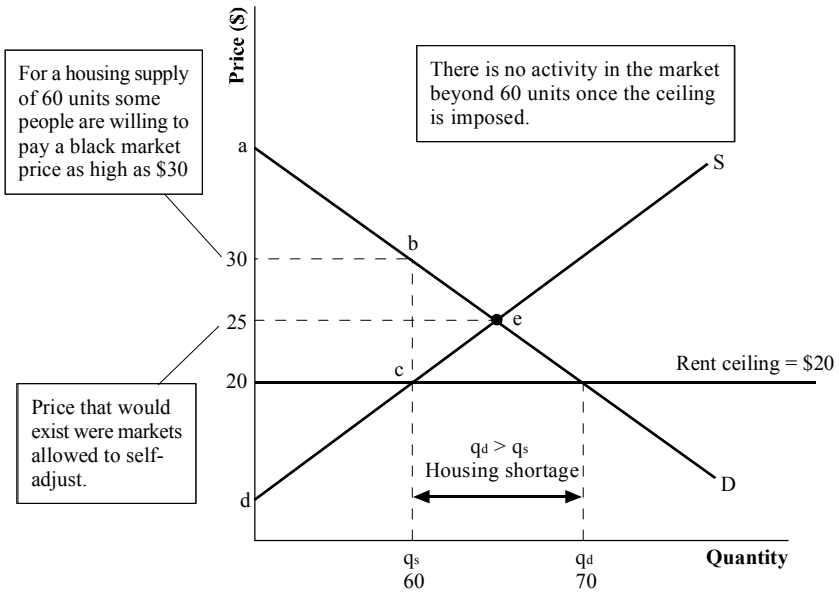
- The sum of CS and PS is not maximized
- MC does not equal MB. At the ceiling price of $20, MB (demand) exceeds MC (supply).

Okay, so ceilings are allocatively inefficient. But, are they fair?

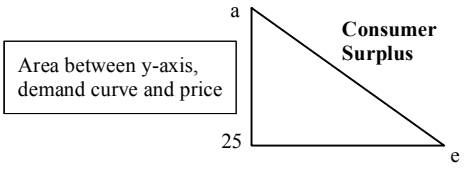
According to the fair *rules* view (symmetry principle) anything that hinders voluntary exchange in unfair, so rent ceilings are unfair. According to the fair *results* view (utilitarian principle) fairness would be achieved were housing units allocated to the poorest members of society. In practice, we cannot be sure that this will be the case. Most probably, the available units will be allocated on either first-come, first-served basis, through a lottery, or on the basis of one's contacts.

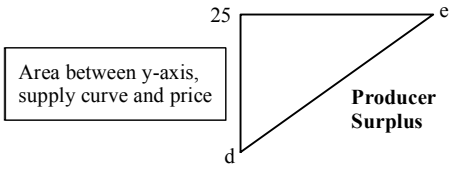
The bottom line is that although it sounds like capping rents on housing is a noble idea, it fails to achieve fairness and efficiency, and prevents the housing market from operating in social interest.

Figure 2: Effects of a Rent Ceiling



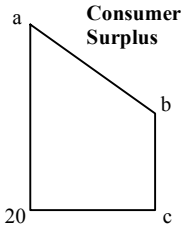
If Rents were Allowed to Rise to $25



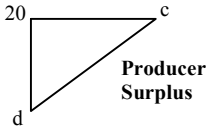


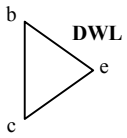
If the market were left on its own to self-adjust, an allocatively efficient outcome would be reached:
1. MB=MC at Point 'e'.
2. Sum of CS and PS is maximized.

With Rents Capped at $20



Consumers now pay a lower price of $20, but suffer because of a lower equilibrium quantity. Consumer surplus does not extend beyond 60 units.





With a rent ceiling in place below equilibrium price, society suffers a dead weight loss from underproduction.

LOS 15b: Describe labor market equilibrium and explain the effects and inefficiencies of a minimum wage above the equilibrium wage. Vol 2, pg 72-77

The Labor Market

The short run supply (SRS) curve for unskilled labor shows the change in labor quantity supplied as the wage rate changes. In order to increase the supply of unskilled labor, a higher wage must be offered.

In the long run, people can leave the unskilled labor market, go back to school or acquire new skills that will enable them to enter a higher wage bracket. If unskilled labor wages are high enough, others will join the unskilled labor force. The long run supply of labor is the

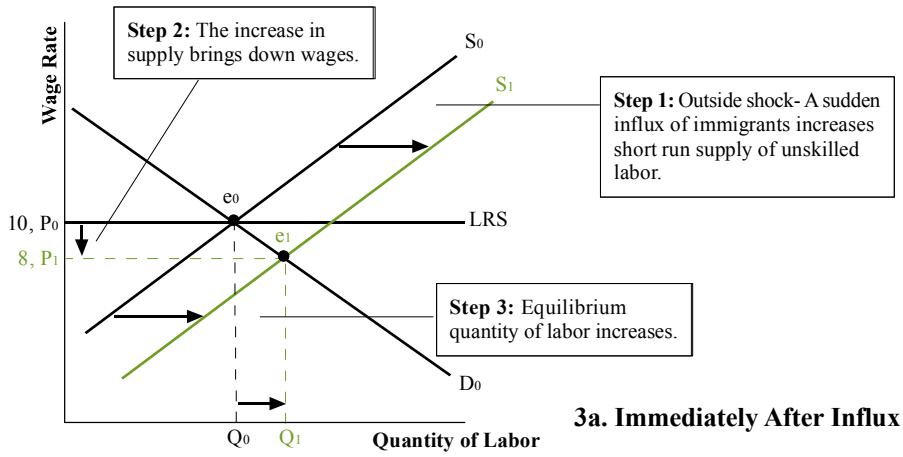
relationship between the quantity of labor supplied and the wage rate after enough time has elapsed to allow people to enter or leave the labor market. If there are no barriers to entry or exit in the unskilled labor market, the long run supply of labor will be *perfectly elastic*.

An example of an outside shock to the labor market is a sudden influx of immigrants who enter the unskilled labor market and increase (shift to the right from S_0 to S_1) the supply of unskilled labor. This development will disrupt initial equilibrium, e_0, reduce prices to P_1 and set up a new equilibrium at e_1 with a higher quantity of labor employed, Q_1. (Figure 3a)

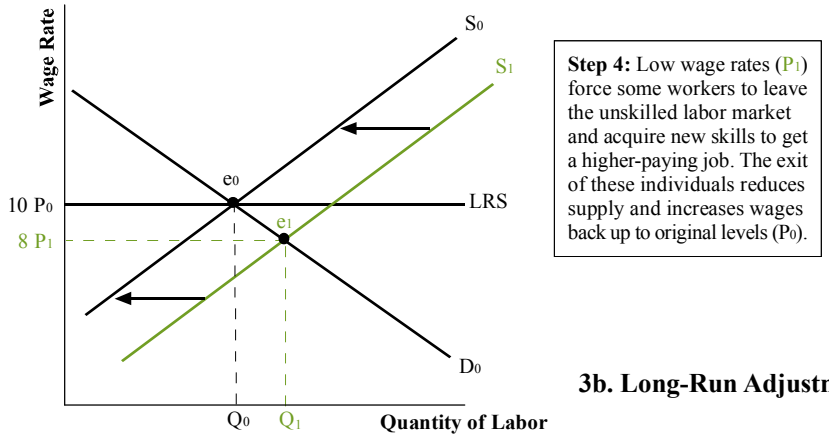
The reduction in wages is an undesirable outcome for most people, so over the long run people would spend time and resources retraining themselves for better (high-paying) employment opportunities. This would decrease the supply of unskilled labor in the economy (supply would shift back towards S_0) and gradually prop wages back up to the initial level of P_0, which lies on the long run supply (LRS) curve. (Figure 3b)

The key to the long run adjustment towards equilibrium was the decrease in wages, which spurred some labor force participants to leave the unskilled labor market and acquire new skills in search of a better wage.

Figure 3: SR and LR Effects on Increase in Supply of Labor



3a. Immediately After Influx of Immigrants



3b. Long-Run Adjustment

If the government were to set a minimum wage at $10 when equilibrium wage rates stand at $8, it would prevent the market's self-adjusting mechanism from playing out (see Figure 4). At a wage rate of $10, the quantity of labor supplied (40) would exceed quantity demanded (20). People would spend valuable time and resources looking for work, especially as every hour of labor would fetch $10 (enforced minimum wage) when they are willing to supply that hour of labor for only $6 (supply curve).

Were the minimum wage of $10 not imposed, wages would simply fall to $8 due to excess supply and allocative efficiency would be reached because:

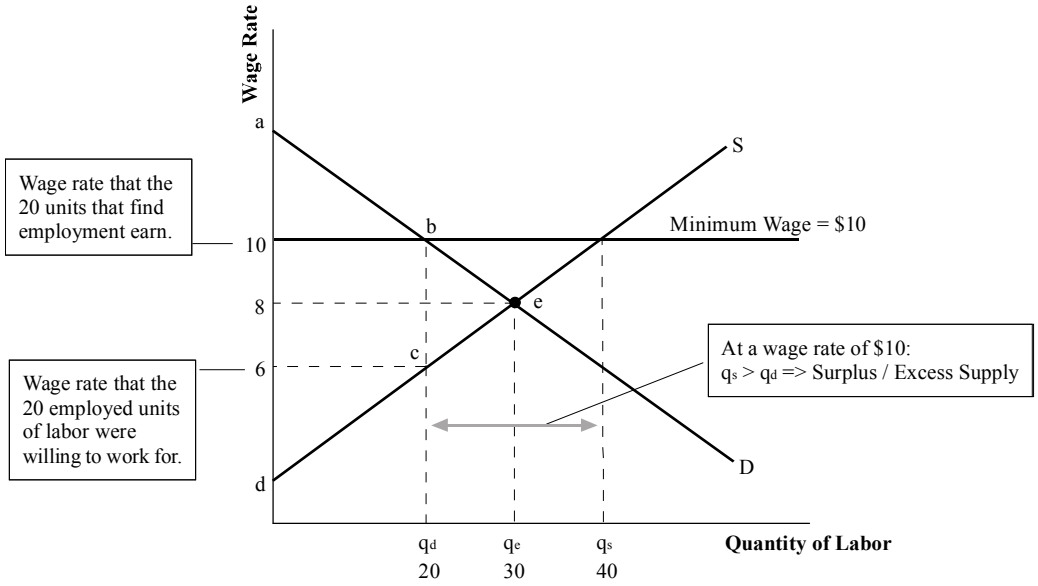
- The sum of consumer and producer surplus would then be maximized (e_0).
- Marginal cost to society would equal marginal benefit to society (demand would equal supply).

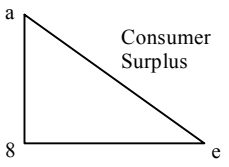
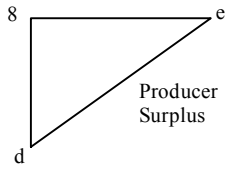
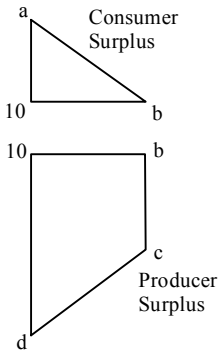
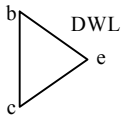
The minimum wage only disrupts market activity if set above the equilibrium wage rate. If the minimum wage is set below the equilibrium wage rate it would have absolutely no effect on economic activity.

With the minimum wage in place however, there is no activity in the market beyond 20 units. Workers are better off in a sense because they receive $10 in wages instead of $8, but also lose out because only 20 units of labor are employed instead of 30. Firms are worse off because they have to pay higher wages ($10 instead of $8) and employ less units of labor than they would ideally like to (At a wage rate of $8, firms would hire 30 units of labor). Society suffers a dead weight loss and allocative efficiency is not reached because:

- The sum of CS and PS is not maximized.
- MC does not equal MB. At 20 units, MC (supply) exceeds MB (demand).

Figure 4: The Inefficiency Of A Minimum Wage



If Wages were Allowed to Fall to $8	With Minimum Wage Fixed at $10
Area between the y-axis, demand curve and equilibrium wage rate ($8)  Area between the y-axis, supply curve and equilibrium wage rate ($8) 	 Area between the y-axis, demand curve and minimum wage rate ($10) Area between the y-axis, supply curve and minimum wage rate. Suppliers benefit from higher prices, but suffer from being unable to sell more than 20 units. The producer surplus does not extend beyond 20 units.
If the market were left to self-adjust, an allocatively efficient outcome would be reached: 1. MB = MC at Point 'e'. 2. Sum of CS and PS is maximized.	 With a minimum wage in place above equilibrium levels, society suffers a dead weight loss from underproduction.

Despite the fact that price floors in the labor market cause unemployment and give rise to deadweight losses, a popular movement is seeking to create a higher floor at a living wage. A **living wage** is the hourly wage rate that enables a person to rent adequate housing for not more than 30 percent of the amount earned.

LOS 15c: Explain the impact of taxes on supply, demand, and market equilibrium, and describe tax incidence and its relation to demand and supply elasticity. Vol 2, pg 77-85

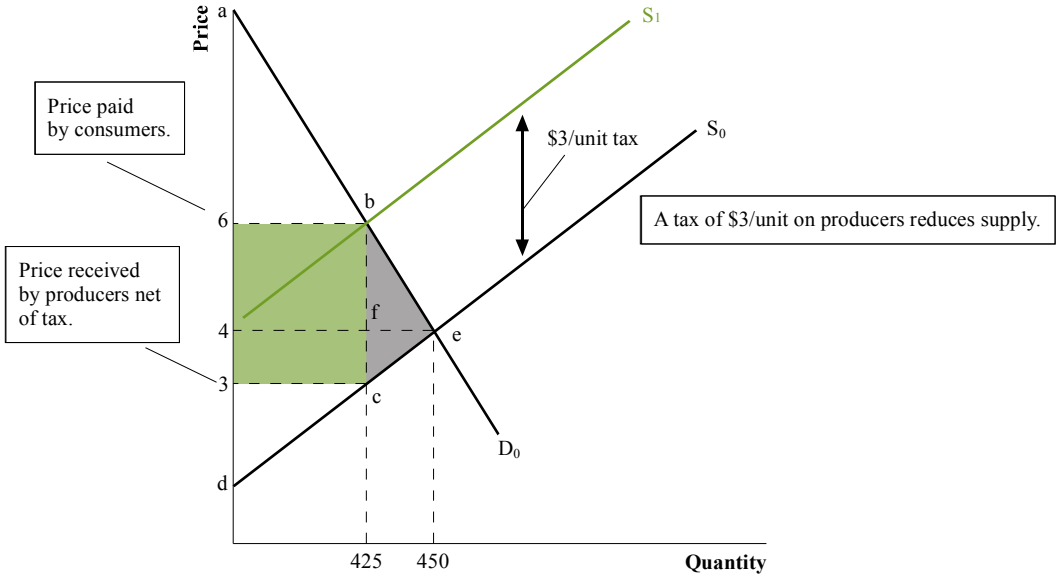
The statutory incidence of a tax refers to whom the law levies the tax upon. As we shall learn soon, just because the government imposes or levies a tax on a particular group does not necessarily mean that the actual incidence of the tax falls entirely on that group. Actual tax incidence refers to how the burden of the tax is shared by consumers and producers in terms of a reduction in consumer and producer surplus respectively.

Let's start with an example in which a tax per-unit of $3 is levied on suppliers (Figure 5). The tax increases cost of production and as a result, supply falls (shifts to the left to S_1). Consequently, prices rise to $6 and equilibrium quantity falls to 425 units.

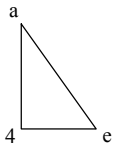
The area of the rectangle shaded in green represents government revenue from tax collection. The government earns $3/unit on 425 units that are sold. Consumers purchase 425 units and pay $6/unit. Effectively prices paid by consumers have gone up by $2 ($6 - $4). Producers sell 425 units at $6/unit but only pocket $3/unit after paying the tax. Effectively, their realized prices have fallen by $1 ($4 - $3).

Even though this tax was levied on suppliers only, consumers end up bearing the brunt of the tax in the form of an effective increase in prices of $2, versus an effective decrease in producer realized prices of only $1. The government earns $3/unit in tax revenue, but notice that the increase in government tax revenue from the imposition of the tax does not entirely offset the reduction in consumer and producer surplus. The triangle shaded in grey represents the dead weight loss to society from underproduction caused by the imposition of the tax.

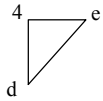
Figure 5 : Tax on Sellers



Before the Tax is Imposed

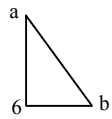


Consumers surplus is the area of the triangle between the demand curve, y-axis and market price ($4).

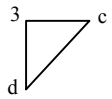


Producer surplus is the area of the triangle between the supply curve, y-axis and market price ($4).

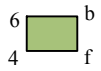
After the Tax is Imposed



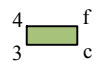
Consumers pay $6/unit for 425 units.



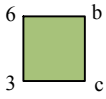
Producers receive $6-$3 = $3/unit for 425 units.



Reduction in consumer surplus that is offset by tax revenue for the government.



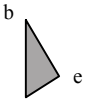
Reduction in producer surplus that is offset by tax revenue for the government.



Total government tax revenue.

Allocative efficiency is reached because:

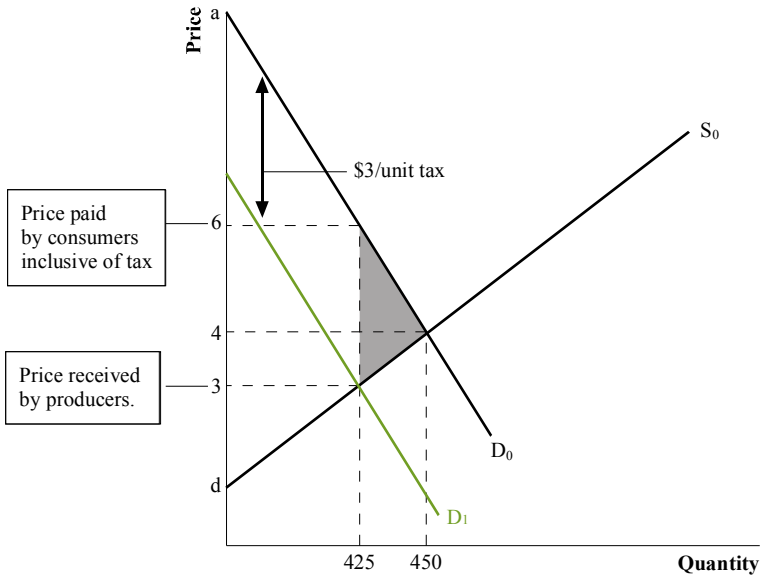
a. MB=MC and demand = supply.
b. Sum of consumer and producer surplus is maximized.



There is a dead weight loss because there is no activity in the market beyond 425 units. The dead weight loss to society from underproduction equals the reduction in consumer and producer surplus that is not offset by government tax revenue.

Now assume that instead of being levied upon producers, the same $3/unit tax is imposed on consumers (Figure 6). The demand curve would shift to the left to D_1. Once again the increase in government revenue from tax collections will not entirely offset the reduction in consumer and producer surplus, and society will suffer a dead weight loss from underproduction (the region shaded in grey in Figure 6).

Figure 6 : Tax on Consumers



The factor that determines how the actual tax burden is shared between producers and consumers is the relative elasticity of the demand and supply curves. The more inelastic the demand curve, the greater the actual burden borne by consumers regardless of whom the tax was imposed upon by law. The more inelastic the supply curve, the greater the actual burden borne by producers regardless of whom the tax was levied upon.

- If demand is relatively *more* elastic than supply, it implies that consumers are more flexible and hold leverage in the market to substitute away from the good if the price rises. In this case, more of the actual burden of the tax will fall on suppliers.

- If demand is *less* elastic than supply, it implies that consumers cannot respond to price increases as easily, and hold less leverage in the market to substitute away from the good when faced with an adverse price change. In this case, more of the actual burden of the tax will be borne by consumers.

Finally, let's study a situation where demand is perfectly inelastic (Figure 7).

Figure 7: Actual Tax Burden when Demand is Perfectly Inelastic

Consumers bear the entire burden of the tax in the form of a reduction in consumer surplus. The reduction in consumer surplus equals the increase in government tax revenue so there is no dead weight loss to society.

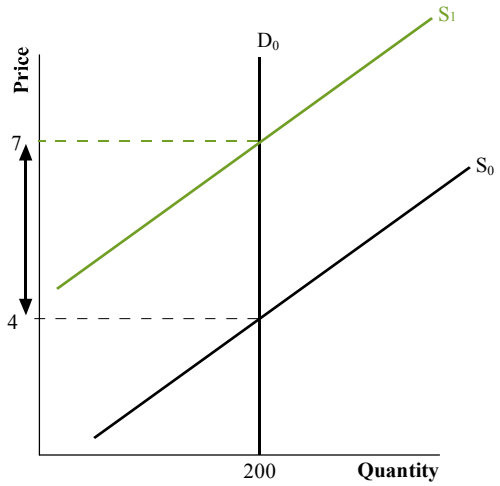


Figure 7 shows the effects of a $3/unit tax imposed on suppliers when the demand curve is perfectly inelastic. What we find is that the entire tax burden is borne by consumers in the form of reduction in consumer surplus. Another interesting fact is that there is *no* dead weight loss to society. The reduction in consumer surplus in entirely offset by an increase in tax revenue. When supply and demand are *relatively inelastic*, society suffers *less* of a dead weight loss and the government collects *greater* tax revenue than when supply and demand are relatively elastic.

Summary:

- An imposition of a tax on buyers reduces demand, while an imposition on producers reduces supply.
- Actual tax burden does not depend on whom the tax is imposed upon.
- If the demand curve is *more inelastic*, consumers will actually bear a greater burden of the tax in the form of a reduction in consumer surplus.
- If the supply curve is *more inelastic*, producers will actually bear a greater burden of the tax in the form of a reduction in producer surplus.
- The more inelastic the demand and supply curves, the lower the total dead weight loss to society from tax imposition, and greater the tax revenue for the government.

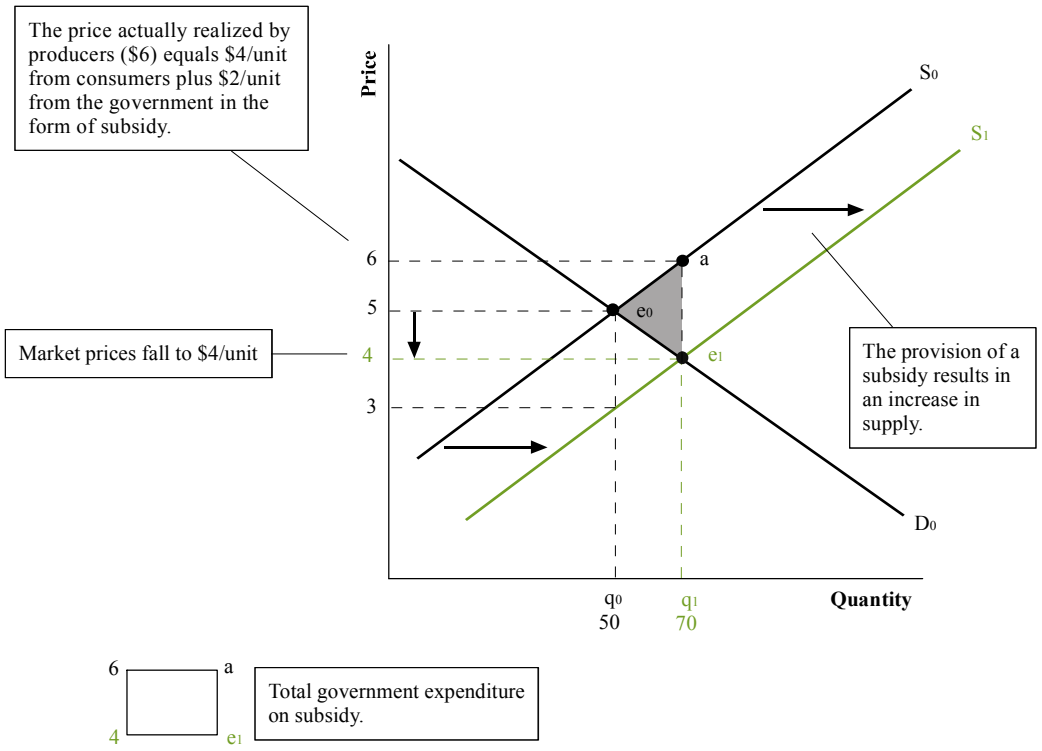
LOS 15d: Discuss the impact of subsidies, quotas, and markets for illegal goods on demand, supply, and market equilibrium. Vol 2, pg 85-92

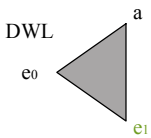
Subsidies

Think of subsidies as negative taxes. Governments offer subsidies in order to encourage the production of a good by subsidizing or reducing the cost of producing it. Subsidies bring about an increase in supply.

Figure 8 analyzes the impact of a $2/unit subsidy that is offered to producers. Suppliers, who were previously willing and able to supply 50 units at $5/unit, are now willing and able to supply 50 units at a price of $3/unit because the subsidy compensates them for the difference.

Figure 8: Subsidies





Society suffers from a dead weight loss from overproduction. The marginal cost to society from producing 70 units is greater than the marginal benefit from consuming 70 units. The subsidy results in too many resources being dedicated to the production of the good.

The provision of the subsidy results in an output level (70 units) that is greater than the allocatively efficient quantity of output (50 units). At this higher level of output, marginal cost exceeds marginal benefit. Consumers are better off in the form of lower prices paid ($4 versus $5 earlier) and producers are better off in the form of higher take-home prices ($4 from consumers + $2 subsidy = $6, versus $5 earlier). However, the amount that the government spends on the subsidy outweighs the increase in consumer and producer surplus. Society suffers a dead weight loss from *overproduction*.

Summary:

Subsidies result in:

- An increase in realized prices for producers.
- An increase in output.
- A decrease in prices paid by consumers.
- Dead weight losses from overproduction.

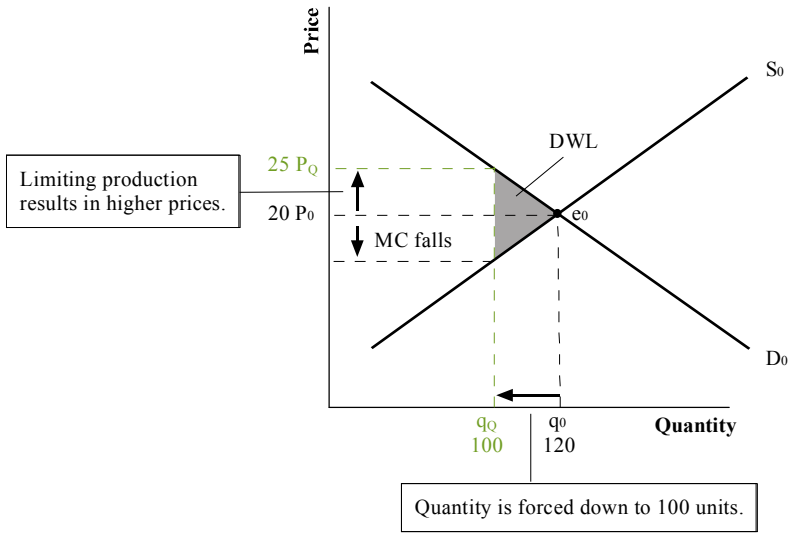
Production Quotas

A quota limits the total amount of a good that can be produced in the economy. In Figure 9, we assume that a quota of 100 units is set on the production of a particular good, whose allocatively efficient quantity is 120 units.

The imposition of the quota prevents any activity in the market beyond a quantity of 100 units. The total amount of welfare attributable to consumer and producer surplus is reduced and there is a dead weight loss due to *underproduction*. Quotas are usually imposed to appease lobbyists who are interested in earning higher profits. Quotas reduce costs for producers and increase prices paid by consumers, and are therefore very effective in increasing profits.

Quotas only distort the market when they are imposed at an output level that is lower than the equilibrium quantity. If they are imposed at a quantity higher than equilibrium output they will have no impact on economic activity.

Figure 9: Quotas



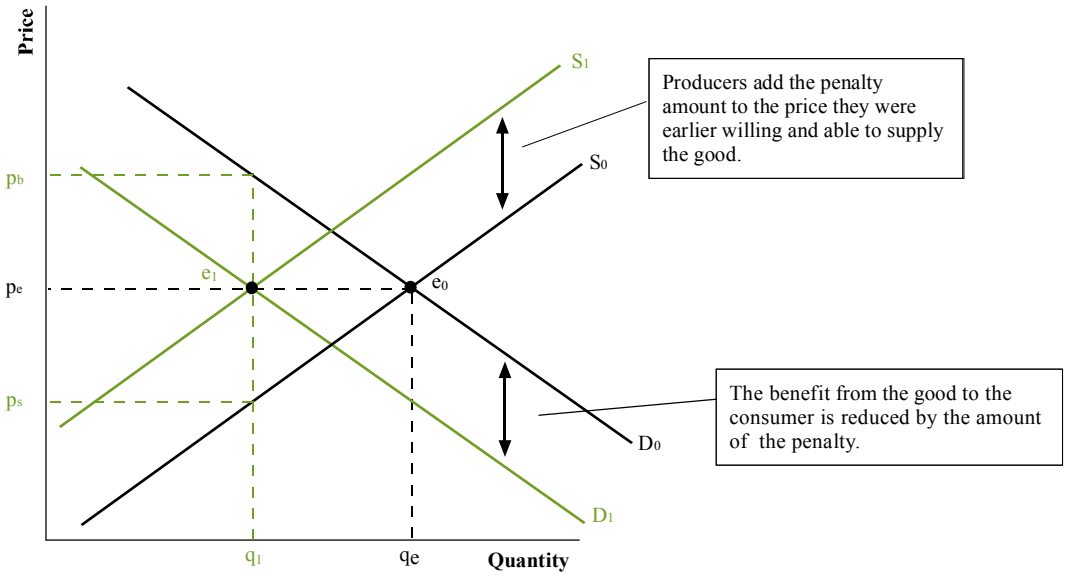
Summary

- Production quotas limit the production of a good in an economy in order to raise realized prices for producers.
- They result in inefficiency because at the quantity corresponding to the quota (q_Q), MB exceeds MC, resulting in a dead weight loss due to underproduction.

Illegal Goods

If an illegal good were legal, its market would function like any other market, with demand and supply determining the equilibrium price, p_e, and equilibrium quantity, q_e (Figure 10). When a good is declared illegal, penalties are levied on buyers and sellers who are in possession of the good (Figure 10). Because there is a risk of having to pay the penalty, buyers reduce their demand to D_1. This is because the amount of the penalty would be subtracted from the value of the good by buyers to determine the maximum price they would be willing to pay for the good. Similarly, supply will fall to S_1. Suppliers will add the amount of the penalty to the minimum price at which they would be willing and able to supply the product.

Figure 10: Illegal Goods



If the penalty on suppliers and consumers is the same, supply and demand would both shift to the left by the same magnitude, resulting in the same price level p_e, but a lower equilibrium quantity q_1. Notice that the buyer pays p_e to the seller, but effectively pays a price of p_b (p_e plus the penalty). Similarly, suppliers receive p_e, but effectively pocket only p_s (p_e minus the penalty).

If the penalty on suppliers is greater than the penalty on buyers, supply will shift by a greater magnitude, and prices would actually rise. Were a heavier penalty imposed on consumers, the shift in demand would be more significant, and prices would actually fall.

You might wonder whether it would just be wiser to legalize illegal goods and tax them heavily. A hefty tax would decrease supply, increase prices and achieve the same decrease in equilibrium quantity that a penalty does. Further, the tax revenue could be used by the government for societal welfare programs. However, opponents of legalizing these goods assert that laws send out a message to society, and decrease the demand for illegal products, which taxes do not.