Price Ceilings

A price ceiling is a maximum legal price.

If no price ceiling was established, the equilibrium that would result is (P*, Q*), our normal undistorted equilibrium determined by the intersection of the Supply and Demand Curves.

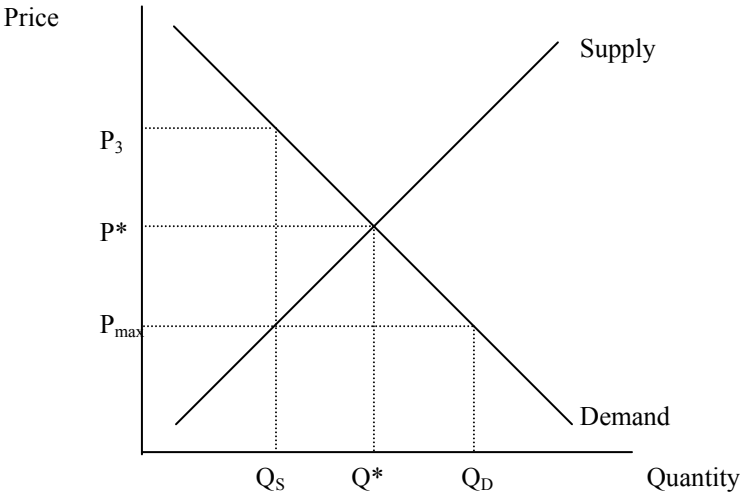
If the price ceiling is set above P*, the price ceiling is said to be non-binding. It does not affect the market, because the market determined equilibrium price is already below the price-ceiling price. If the market demand and supply curves for NYC suggest that $1000 is the monthly rent for apartments, a price ceiling of $7000 does not affect the market for apartments.

However, if the price ceiling is placed below (P*, Q*), we will have a binding price ceiling. This means it will affect the market.

$P_{MAX} > P^*$, non binding.
$P_{MAX} < P^*$, binding

The classic example of a price ceiling is rent controlled apartments in NYC.

Below, a price ceiling is set at P_{max}, chosen to make the price ceiling binding.



At P_{max}, suppliers (landlords) want to supply Q_S units of apartments, while demanders (renters) want to rent Q_D units of apartments. Clearly, there is a shortage of apartments (an excess quantity demanded). Normally, this would create upward pressure on prices, but the price ceiling legally restricts the price from rising.

Now we have a line outside the apartment building of people wanting to live in the apartments, but the landlords will only rent Q_S units of apartments. The price ceiling "equilibrium" will be (P_{max}, Q_S).

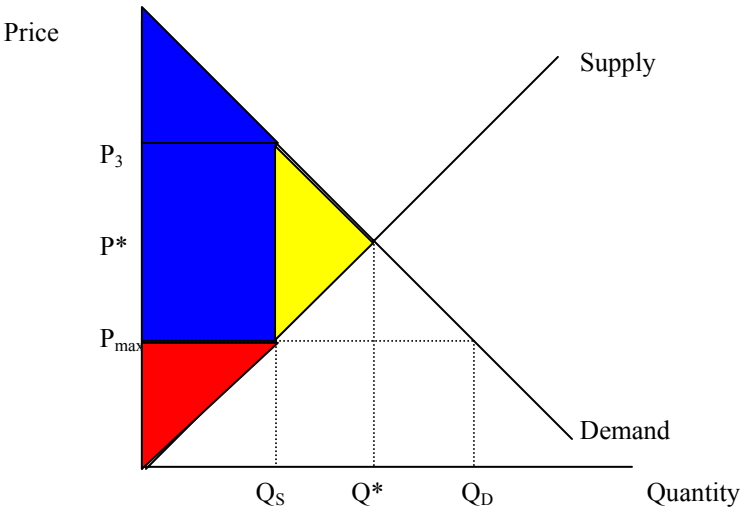
Results
1. The price will fall from P* to P_{max}.
2. Fewer apartments will be rented. Q falls from Q* to Q_S.
3. Those workers who still have apartments are better off. Notice at Q_S, the last apartment renter would be willing to pay a rent as high as P_3, but only must pay P_{max}.
4. There are bunches of people searching for apartments ($Q_D - Q_S$) that can't find them. There are people who are displaced from apartments ($Q^* - Q_S$).
5. Society as a whole is worse off. There are unexploited gains from trade. This is because at Q_S, the MV of an additional unit of apartments (P_3) is greater than the MC of supplying an additional

apartment (P_{MAX}). There are mutually beneficial trades that are not being exploited due to the price ceiling. There is a DWL.

6. Apartment building owners are worse off. They rent fewer apartments at lower prices. Producer surplus falls.

If you are worried about the supply curve of apartments might not be as elastic as I have it drawn, you may be right. It might seem silly to stop supplying apartment units that are really built. However, don't forget the issue of quality and maintenance. It turns out that the landlords may not be able to afford to continue to maintain the apartments. Windows remain broken; pipes remain leaky, etc. Also, the 2nd Law of Supply applies to apartments. As the price ceiling persists, landlords are more responsive to the price change (less maintenance, fewer new buildings being produced, etc.)

Below I have shaded in CS (blue), PS (red), and the DWL (yellow) after the price ceiling is imposed. Clearly, producers are worse off (#6). Society is worse off because there is a DWL (#5). Between Q_S and Q*, mutually beneficial exchange could occur, but is prohibited due to restrictions on prices. There are two effects on consumer (renters). Those people who can find apartments (out to Q_S) get lower prices and higher consumer surplus (#3). Some people (from Q_S to Q*) are displace from apartments (#4). You should compare this situation to the undistorted case.



Here, those who get rent-controlled apartments benefits, while the rest of the people who can't find apartments, landlords, and society as a whole are made worse off. Should you be in favor of rent-controlls? Only if you, or someone you know, will get to live in one. On top of all this, we have the issues with rationing. Keep reading…

Price Floors

A price floor is a minimum legal price.

If no price floor was established, the equilibrium that would result is (P*, Q*), our normal, undistorted equilibrium determined by the intersection of the Supply and Demand Curves.

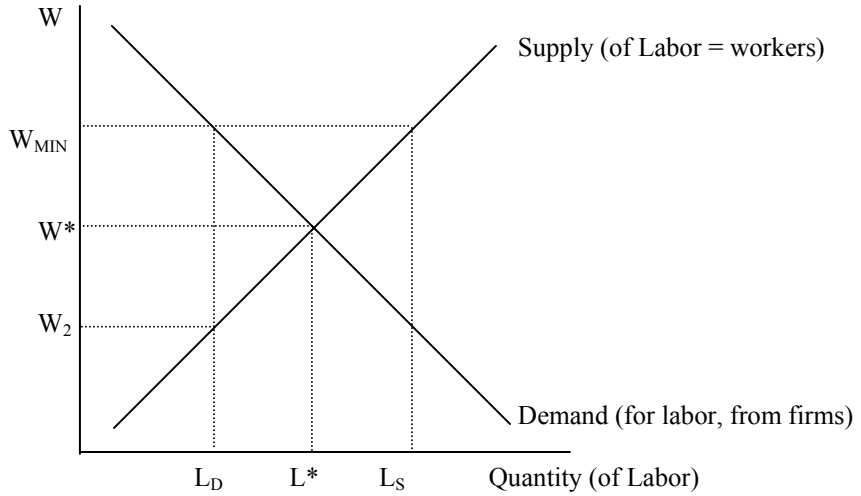
If the price floor is set below P*, the price floor is said to be non-binding. It does not affect the market, because the market determined equilibrium price is already above the price floor price. If the market demand and supply curves for surgeons suggest that $150 is the wage for surgeons, a minimum wage law of $5.15 does not affect the market for surgeons.

However, if the price floor is placed above (P*, Q*), we will have a binding price floor. This means it will affect the market.

$P_{MIN} < P^*$ non binding
$P_{MIN} > P^*$ binding

There is a notational issue. You can certainly think of this in terms of prices and quantities, like we usually do, but the classic example of a price floor is a minimum wage law. Here we call the price of labor a wage, W, and the quantity of labor hired, L, the amount of labor. In the notes below I will this notation. If you prefer, you can think of Ps and Qs.

Below, a price floor is set at W_{min}, chosen to make the minimum wage binding.



At W_{MIN}, suppliers (workers) want to supply L_S units of labor, while demanders (firms) want to hire L_D units of labor. Clearly, there is a surplus (an excess quantity supplied of labor). Normally, this would create downward pressure on wages, but the minimum wage law legally restricts the price wage from falling to its undistorted equilibrium level.

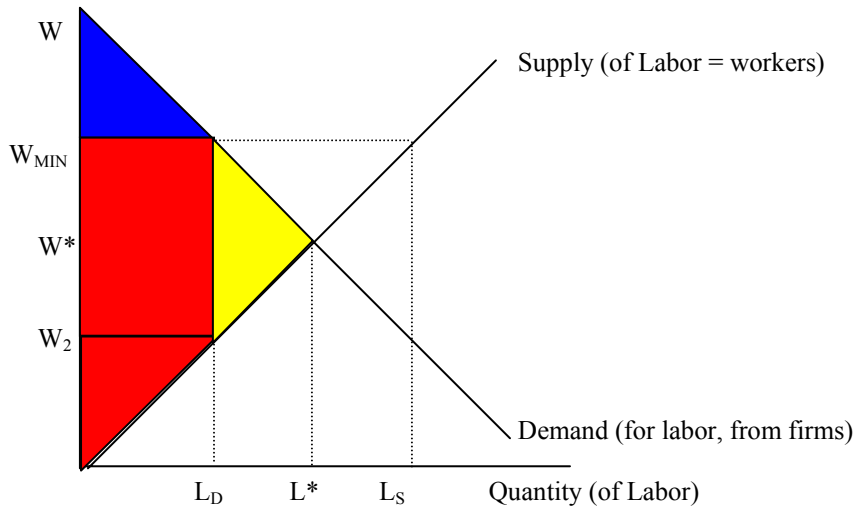
Now we have a line outside the factory of people willing to work at this new high wage, but the firms will only hire L_D workers. The price floor "equilibrium" will be (W_{min}, L_D).

Results

1. The wage will rise from W* to W_{min}.
2. Fewer workers will be hired. L falls from L* to L_D.
3. Those workers who still have jobs are better off. Notice at L_D, the last worker hired would be willing to supply their labor at a wage as low as W_2, but are receiving W_{min}. They get higher wages. (These people enjoy higher producer surplus).
4. There is unemployment, in the amount of $L_S - L_D$. These are people who are willing to work at the wage at W_{min}, but can not find jobs. $L - L_S$ people lose their jobs as a result. They are worse off.
5. Society as a whole is worse off. There are unexploited gains from trade. This is because at L_D, the MV of hiring an additional worker is greater than the MC of hiring an additional worker. There are mutually beneficial trades that are not being exploited due to the price floor. There is a DWL.
6. Firms are worse off (as demanders of labor); they hire fewer laborers and must pay a higher price. Consumer surplus falls.

Below I have shaded in CS (blue) , PS (red), and the DWL (yellow) after the minimum wage law is imposed. Clearly, consumers of labor (firms) are worse off (#6). Society is worse off because there is a DWL (#5). Between L_D and L*, mutually beneficial exchange could occur, but is prohibited due to restrictions on wages. There are two effects on producers of labor (workers). Those workers who keep

their jobs (out to L_D) get hire wages and higher producer surplus (#3). Some workers (from L_D to L*) lose their jobs (#4). You should compare this situation to the undistorted case.



In the end, what we see is that society as a whole is worse off, as are demanders of labor (firms). Some workers lose their jobs as a result of the minimum wage, and thus are worse off. The only group that is better off are those that still have jobs after the law is invoked. Thus, they benefit at the expense of those who lose their job, firms, and society as a whole.

Should you be in favor of a minimum wage law, then? Not unless you will be one of those who will still have a minimum wage law (or knows someone that does) after it is invoked. There are subtler effects that will be mentioned briefly below, and further in the supplemental reading.

Rationing

Normally, the price mechanism decides who gets to consume the goods and who gets to produce the goods. The consumer who is willing to pay the most for it gets to consume the good, and the supplier who is willing to supply the good for the lowest price will supply the good. We say that the price system rations goods. Markets take care of this for us.

However, as a result of the restrictions on price above, some non-price mechanism must ration the price. Some other form of non-price rationing must occur. The candidates are queues (waiting in line), bribery, and other forms of discrimination. Maybe you have to wait in line 9 months to get a job. Maybe you bribe the factory owner to give you a job, or he only hires his nephew (nepotism). Consider the minimum wage case. There is a line of people outside the factory who, say for argument's sake, have identical qualifications. They are willing to work at the minimum wage. How do firms decide whom to hire if they don't do it by hiring those who will work for the lowest wages? Perhaps they hire only people who are 5'8" and under, maybe only blond-haired persons, maybe only their cousins, or sometimes, unfortunately enough, they chose to hire on the basis of race. Empirical studies show that minorities, especially minority urban teenagers bear a large portion of the unemployment brought on by minimum wage law.

Consider the apartment case. There is a line outside the apartment building. Who gets the apartments? Same story. Here it is single parents that get the bum deal. Apartment renters will select those with the best jobs and perhaps rent to those with no children. Those who retain their apartments tend to be members of the upper middle class, who are least likely to miss rent payments.

Also, people come up with clever ways around this one. Tie in sales, where landlords require their tennants to rent overpriced furniture is a means of avoiding the legal restriction. Large sums of "key money" is another example. More in M,B, & N.

Fun activities to test your understanding?

1. Make sure you can shade in the appropriate CS / PS / DWL and compare to the undistorted equilibrium.

2. In the price floor (minimum wage) case, can you identify the following areas of surplus:

   a. the surplus that is transferred directly from producers (firms) to consumers (workers)
   b. the producer (worker) surplus that is lost by those that no longer have jobs
   c. the consumer (firm) surplus that is lost by hiring only L_D instead of L*.

3. In the price ceiling (rent control) case, can you identify the following areas of surplus:
   a. the surplus that is transferred directly from producers (landlords) to consumers (renters)
   b. the consumer (renter) surplus that is lost due the reduction from Q* to Q_S.
   c. The producer (landlords) surplus that is lost due to the reduction from Q* to Qs.

The point in #2 and #3 is too see where the surplus if flying around. In both cases there is a direct transfer from one group to another, while both groups suffer losses due to the restriction of output below Q* (the dead weight loss portion). See if you can sort it out.

What should I be reading?

O' Sullivan and Sheffrin –

Chapter 6, p. 119 – 128. O' Sullivan does at a little different. He looks at CS / PS / GFT one unit at time, but it's OK. You'll have to read a few pages before the brief discussion he actually gives on minimum (price floor) and maximum (price ceiling) prices.

Miller, Benjamin, and North.

Chapters 11 and 13, and if you have time, Chapter 12 and 14. Chapter 11 is on rent controls, Chapter 13 on minimum wage laws.