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Price Controls

Econ 304K: Chapter 6

Price Controls causes Surpluses and Shortages

Price controls are not a new idea — the first recorded attempt to regulate price was 4,000 years ago in ancient Babylon, when King Hammurabi decreed how much corn a farmer could pay for a cow. Similar attempts to control prices occurred in ancient Egypt, Greece, and Rome — each attempt ended badly. History has shown us that price controls generally do not work, why? Because they disrupt the normal functioning of the market; yet, they are tried time and again, as seen in the frequent calls for price controls during the COVID-19 pandemic. By the end of this chapter, you will understand why price controls are rarely the win-win proposition that legislators often claim. To help you understand why price controls lead to disequilibrium in markets, this chapter focuses on the two most common types of price controls: ***price ceilings*** and ***price floors***.

Big Questions

- When do price ceilings matter?
  - A price ceiling is legally imposed maximum price. When the price is set below the equilibrium price, the price quantity demanded will exceed the quantity supplied. The result is a shortage, price ceiling matter when they are binding (below the equilibrium price)
- What effects do price ceilings have on economic activity?
  - Price ceilings create two unintended consequences: a smaller quantity supplied of the good (Q_S) and a higher price for consumers who turn to illegal markets
- When do price floors matter?
  - A price floor is a legal imposed minimum price. The minimum wage is an example of a price floor. If the minimum wage is set above the equilibrium wage, a surplus of labor will develop, however, if the minimum wage is non-binding, it will have no effect on the market wage. Thus, price floors matter when they are set above the equilibrium price
- What effects do price floors have on economic activity?

- Price floors lead to many unintended consequences, including surpluses, the creation of illegal markets, and artificial attempts to bring the market back into balance. For example, proponents of a higher minimum wage are concerned about finding ways to alleviate the resulting surplus of labor or unemployment.

When do price ceilings matter?

Price controls attempt to set prices through government regulations in the market; in most cases, and certainly in the United States, price controls are enacted to ease perceived burdens on society. ***A price ceiling*** creates a legally established maximum price for a good or service; in the next section, we consider what happens when a price ceiling is in place. *Price ceilings create many unintended effects that policymakers rarely acknowledge.*

Understanding Price Ceilings

To understand how price ceilings work, suppose that most prices are rising as a result of ***inflation***, an overall increases in prices. The government is concerned that people with low incomes will not be able to afford to ear; to help the disadvantage, legislators pass a law stating that no one can charge more than $0.50 for a loaf of bread (***Note that this price ceiling is about one-third the typical price of a loaf of generic white bread)***. Does the new law accomplish its goal? What happens?

The law of demand tells us that if the price drops, the quantity that consumers demand will increase. At the same time, the law of supply tells us that the quantity supplied will fall because producers will be receiving lower profits for their efforts. This combination of increased quantity demanded and reduced quantity supplied will cause a shortage of bread.

On the demand side, consumers will want more bread than is available at the legal price; there will be long lines for bread, and many people will not be able to get the bread that they want. On the supply side, producer will look for ways to maintain their profits. They can reduce the size of each loaf they produce; they can also use cheaper ingredients, thereby lowering the quality of their product and they can stop making fancier variants.

In addition, illegal markets will develop; in other words, sellers will go "underground" and charge higher price to customers who want bread.

Table 6.1

Price Ceiling on Bread		
Questions	**Answer(s) (Explanations**	**Result**
Will there be more bread or less bread for sale?	Consumers will want to buy more because the price is lower (the law of demand), but producers will manufacture less (the law of supply). The net result will be a shortage of bread.	***Empty Shelves***
Will the size of a typical loaf change?	Because the price is capped at $0.50 per loaf, manufactures will try to maintain profits by reducing the size of each loaf.	***No more giant loaves***
Will the quality change?	Because the price is capped, producers will use cheaper ingredients, and many expensive brands and varieties will no longer be profitable to produce. Thus the quality of available bread decline.	***Focaccia bread will disappear***
Will the opportunity cost of finding bread change?	The opportunity cost of finding bread will rise. Consumers will spend significantly resources going from store to store to see if a bread shipment has arrived and waiting in line for a chance to get some.	***Bread lines will become the norm***
Will people have to break the law to buy bread?	Because bread will be hard to find and people will still need it, an illegal market will develop. Those selling and buying on these markets will be breaking the law.	***Bread dealers in illegal markets will help reduce the shortage***

The Effect of Price Ceilings

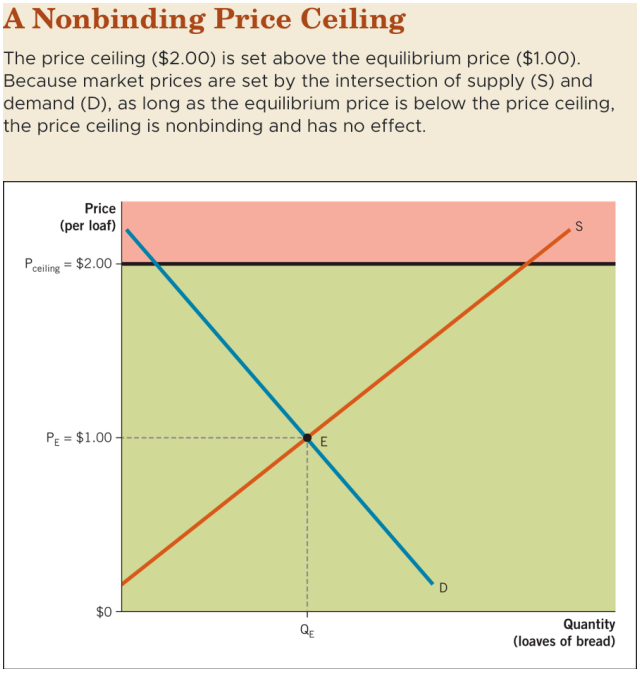
Now that we have some understanding of how a price ceiling works, we can transfer that knowledge into the supply and demand model for a deeper analysis of how price ceilings affect the market. To explain when price ceilings matter in the short run, we examine two types of price ceilings: ***Non-binding and binding***. Both are set by law, but only one actually makes a difference to prices.

Non-biding price ceilings

Figure 6.1

The effect of a price ceilings depends on the level at which it it set relative to the equilibrium price. When a price ceiling is above equilibrium, we say it is ***non-binding***. Price above the price ceiling are illegal; but because the market equilibrium occurs in the green area, the price ceiling does not influence the market: it is non-binding. As long as the equilibrium price remains below the price ceiling, price will continue to be regulated by supply and demand.

Figure 6.1



Binding Price Ceilings

Figure 6.2

When a price ceiling is below the market price, it creates a binding constraint that prevents supply and demand from clearing the market. In Figure 6.2, the price ceiling for bread is set at $0.50 per loaf because $0.50 is well below the equilibrium price of $1.00, the price ceiling is ***binding***. Notice that at a price of $0.50, the quantity demanded (Q_D) is greater than the quantity supplied (Q_S); in other words, a shortage exists. Shortages typically causes prices to rise, but imposed price ceiling prevents that from happening. A price ceiling of $0.50 allows

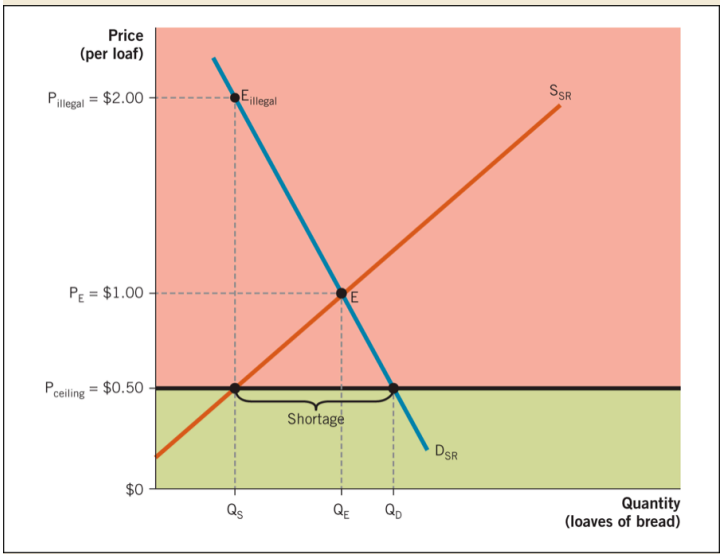
only the prices in the green area; the market cannot reach equilibrium point E at $1.00 per loaf because it is located above the price ceiling, in the red area

The illegal price is also set by supply and demand, because prices above $0.50 are illegal, sellers are unwilling to produce more than Q_S. Because a shortage exists, this market will form in response to the shortage; here, purchasers can illegally resell what they have just bought at $0.50 for far more than what they just paid. Because the supply of legally produced bread is Q_S, the intersection of the vertical dashed line reflects Q_S with the demand curve D_{SR} at point E_{illegal} establishes a market price (P_{illegal}) at $2.00 per loaf for illegally sold bread. The market price is substantially more than the market price equilibrium (P_E) of $1.00. As a result, the price in these illegal markets eliminates the shortage caused by the price ceiling, however, the price ceiling has created two unintended consequences: smaller

Figure 6.2

The Effect of a Binding Price Ceiling in the Short Run

A binding price ceiling prevents sellers from increasing the price and causes them to reduce the quantity they offer for sale. As a consequence, prices no longer signal relative scarcity. Consumers desire to purchase the product at the price ceiling level, which creates a shortage in the short run (SR); many will be unable to obtain the good. As a result, those who are shut out of the market will turn to other means to acquire the good, establishing an illegal market for it at a higher, illegal price.



quantity of bread supplied (Q_S is less than Q_E), and higher price for those who purchase it there.

Price Ceilings in the long run

In the long run, supply and demand became more elastic, or flatter; recall that when consumers have additional time to make choices, they find more ways to avoid high-priced goods and more ways to take advantage of low prices. Additional time also gives producers the opportunity to produce more when prices are high and less when prices are low. In this section, we consider what happens if a binding price ceiling on bread remain in effect for a long time; we have already observed that binding price ceilings create shortages and illegal markets in the short run. Are the long-run implications of price ceilings more problematic than the short-run implications?

Figure 6.3 shows the result of a price ceiling that remains in place for a long time; here the supply curve is more elastic than its short-run counterpart in Figure 6.2. The supply curve is flatter because producers respond in the long run by producing less bread and converting their facilities to make similar products that are not subject to price controls and that will bring them a reasonable return on their investments — for example, bagels and rolls. Therefore, in the long run the quantity supplied (Q_S) shrinks even more.

The demand curve is also more elastic (flatter) in the long run; in the long run, more people will attempt to take advantage of the price ceiling by changing their eating habits to consume more bread. Even though consumers will often find empty shelves in the long run, the quantity demanded of cheap bread will increase; the flatter demand curve means that consumers are more flexible. As a result, the quantity demanded (Q_D) expands and bread is harder to find at $0.50 per loaf. The shortage will become acute (compare Figure 6.3 with Figure 6.2) that consumers will turn to bread substitutes, like bagels and rolls, that are more plentiful because they're not price controlled.

Increased elasticity on the part of producers and consumers magnifies the unintended consequences we observed in the short run. Therefore, products subject to a price ceiling become progressively harder to find in the long run and the illegal market continues to operate. However, in the long run our bread consumers will choose substitutes for this expensive bread, leading to somewhat lower prices.

What effects do price ceilings have on economic activity?

We have seen the logical repercussions of hypothetical price ceiling on bread and the incentives it creates. Now let's use supply and demand analysis to examine two real-world price ceilings: ***rent control and price gouging laws***.

Rent control

Under **rent control**, a local government caps the price of apartment rentals to keep housing affordable; while this goal may be laudable, rent control doesn't work. In fact, it doesn't help the low-income residents of the city find affordable housing or gain access to housing at all; in addition, these policies contribute to dangerous living conditions

Figure 6.4

Rent Control in the Short Run and the Long Run

Because rent-controlled apartments are vacated slowly, the quantity supplied contracts in the short run and the supply curve become more elastic in the long run. Demand also becomes more elastic in the long run, causing the quantity demanded to rise. The combination of fewer units available to rent and more consumers looking to find rent-controlled units leads to a larger shortage in the long run.

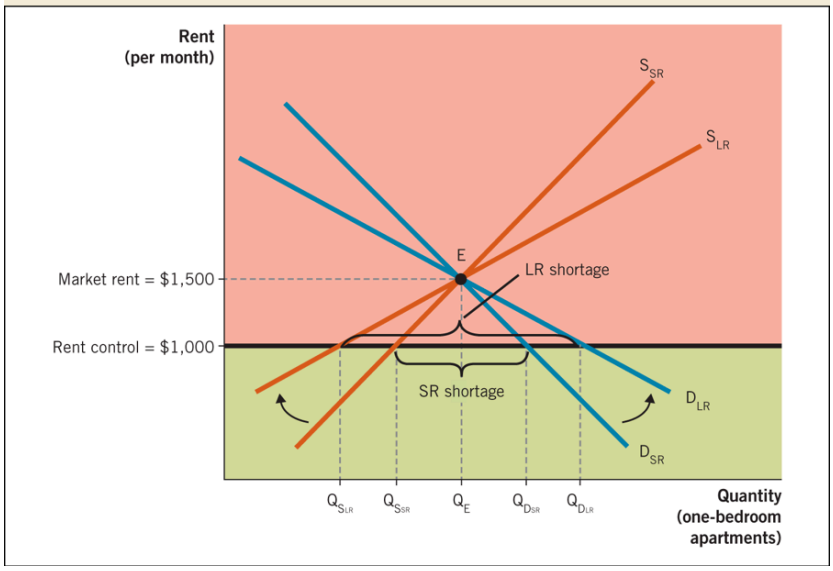


Figure 6.4 shows why rent control fails; as with any binding price ceiling, rent control causes a shortage because the quantity demanded in the short run (Q_{DSR}) is greater than

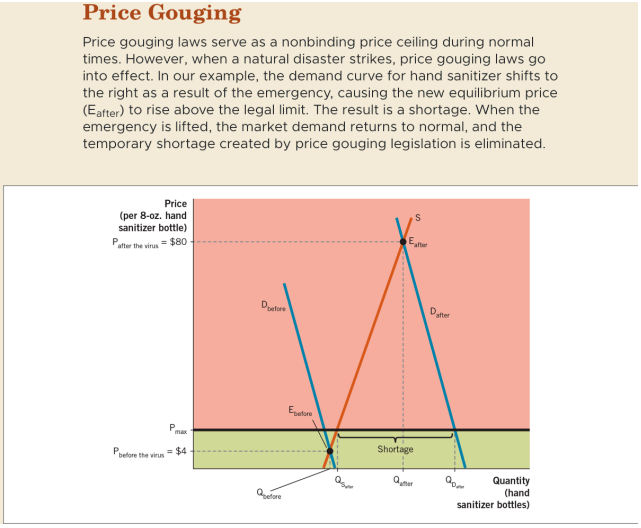
the quantity supplied in the short run (Q_{SSR}). The combination of fewer available units and more consumers looking for rent-controlled units leads to a larger shortage in the long run.

Price Gouging

Another kind of price control, ***price gouging laws***, place a temporary celling on the prices that sellers can charge during times of emergency. Over 30 U.S states have laws against price gouging; the intent is to keep people in desperate circumstances from being charged an arm and a leg for basic, essential goods. Like all price controls, price gouging laws have unintended consequences.

For a time, then, the normal ability of supply and demand to ration the available hand sanitizer is wiped away because more people demand hand sanitizer after the emergency than before it, those who don't get to the store soon enough are out of luck. When the emergency is lifted and the market returns to normal, the temporary shortage created by price gouging laws will be eliminated. This does not mean that price gouging laws are automatically bad policy; after all, there's a limit to what we are willing to allow in the free market, but from an economic point of view, price going laws are mostly downside.

Figure 6.5



When do Price Floors matter?

A ***price floor*** creates a legally established minimum price for a good or service; the minimum wage law is an example for a price floor in the market for labor. Like price ceilings, price floors create many unintended effects that policymakers rarely acknowledge, however, unlike price ceilings, price floors result from political pressure of suppliers to keep prices high. Most

consumers prefer lower prices when they shop, so the idea of a law that keeps the prices high may sound like a bad one to you; however, if you are selling a product or service, you might think that legislation to keep prices high is a very good idea.

In this section, we follow the same progression that we did with price ceilings. We being with a simple thought experiment. Once we understand how price floors work, we use supply and demand analysis to examine the short- and long-run implications for economic activity.

The Effect of Price Floors

We have seen that price floors create unintended consequences. Now we will use the supply and demand model to analyze how price floors affect the market. We loom at the short run first.

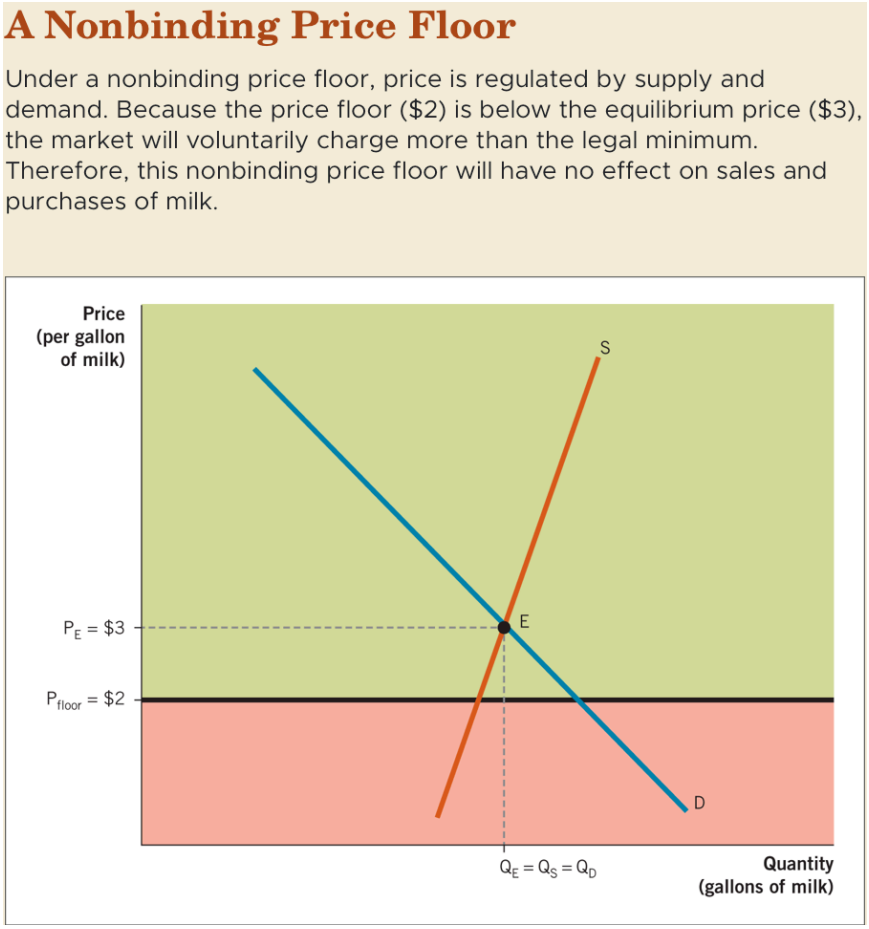
Non-binding price floors

Like price ceilings, price floors can be binding or non-binding. As you can see in Figure 6.6, at $2 the price floor is below equilibrium price (P_E), so the price floor is non-binding, because the actual market price is above the legally established minimum price (P_{floor}), the price floor does not prevent the market form reaching equilibrium at Point E. Consequently, the price floor has no impact on the market, as long as the equilibrium price remains above the price floor, price is determined by supply and demand.

Table 6.2

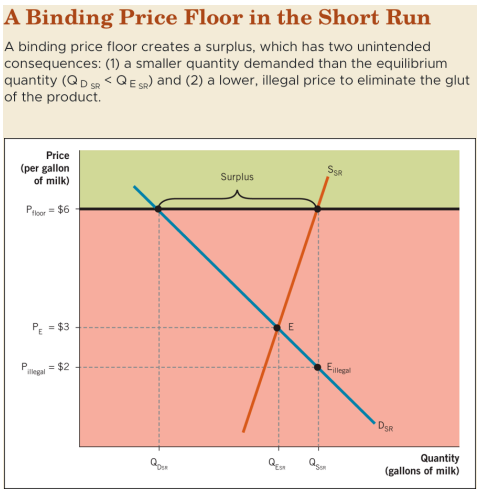
A Price Floor on Milk		
Questions	**Answer(s) (Explanations)**	**Result**
Will the quantity of milk for sale change?	Consumers will purchase less because the price is higher (the law of demand), but producers will manufacture more (the law of supply). The net result will be a surplus of milk	There will be a surplus of milk
Would producers sell below the price floor?	Yes. A surplus of milk would give sellers a strong incentive to undercut the price floor to avoid having to discard leftover milk	Illegal discounts will help reduce the milk surplus.
Will dairy farmer be better off?	Not if they have trouble selling what they producer.	There might be a lot of spoiled milk.

Figure 6.6



Binding Price Floors

Figure 6.7



For a price floor to have an impact on the market, it must be set above the market equilibrium price. In this case, it is a binding price floor; with a binding price floor, the quantity supplied will exceed the quantity demanded.

Price Floors in the long run

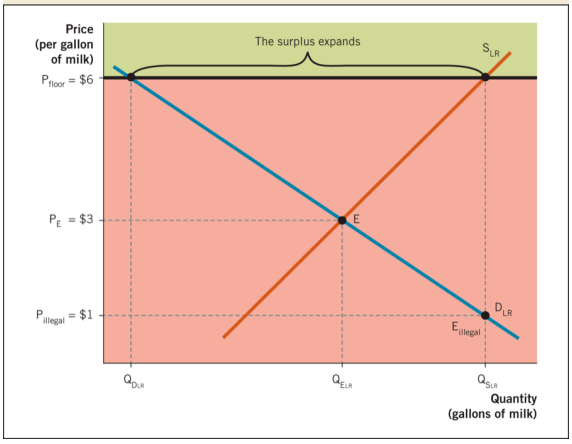
Once price floor legislation is passed, it can be politically difficult to repeal. What happens if a binding price floor on milk stays in effect for a long time? To answer that question, we need to consider elasticity. We have already observed that in the short run, binding price ceilings cause shortages and that illegal markets follow.

What happens to supply? In the long run, producers are more flexible and therefore supply is more elastic. The pool of potential milk producers rises as other closely related businesses retool their operations to supply more milk. The flatter supply curve in Figure 6.8 reflect flexibility; as a result, (QSLR) expands and becomes much larger than in Figure 6.7. The increased elasticity on the part of both producers and consumers makes the surplus larger in the long run and magnifies the unintended consequences we observed in the short run.

Figure 6.8

The Effect of a Binding Price Floor in the Long Run

When a price floor is left in place over time, supply and demand both become more elastic. The result is a larger surplus ($Q_{SLR} > Q_{DLR}$) in the long run. Because sellers are unable to sell all that they produce at $6 per gallon, an illegal market develops to eliminate the glut of milk.



What effects do Price floors have on economic activity?

We have seen the logical repercussion of a hypothetical price floor on milk and the incentives it creates. Now let's use supply and demand analysts to examine two real-world price floors: ***minimum wage laws and sugar subsidies***.

The Minimum Wage

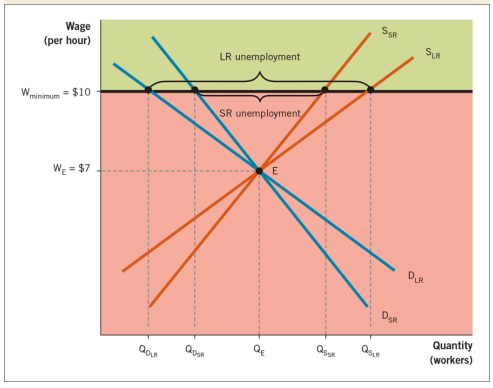
The **minimum wage** is the lowest hourly wage rate that firms may legally pay their workers. Minimum wage workers can be skilled or unskilled and experienced or inexperienced. The common thread is that these workers, for a variety of reasons, lack better prospects.

A minimum wage functions as a floor price; Figure 6.9 shows the effect of a binding minimum wage. Note that the wage, or the cost of labor, on the y-axis ($10 per hour) is the price that must be paid. However, the market equilibrium wage ($7) or W_E, is below the minimum wage; the minimum wage prevents the market from reaching W_E at E (the equilibrium point) because only the wages in the green area are legal. The minimum wage raises the cost of hiring workers. Therefore, a higher minimum wage will lower the quantity of labor demanded; at the same time, firms will look for ways to substitute capital for workers. As a result, a binding minimum wage results in unemployment in the short run because (QSSR > QDSR).

Figure 6.9

Price Floors and a Binding Minimum Wage Market in the Short Run and Long Run

A binding minimum wage is a price floor above the current equilibrium wage, W_E. At $10 per hour, the number of workers willing to supply their labor (S_{SR}) is greater than the demand for workers (D_{SR}). The result is a surplus of workers (which we recognize as unemployment). Because the supply of workers and demand for workers both become more elastic in the long run, unemployment expands ($Q_{S_{LR}} > Q_{D_{LR}}$).



Businesses generally want to keep costs down, so in the long run they will try to reduce the amount they spend on labor. They often might replace workers with machinery, shorten work hours, offer reduced customer service, or even relocate to countries that do not have minimum wage laws. As we move past the short run, more people will attempt to take advantage of higher minimum wages. Like firms, workers will adjust to the higher minimum wage over time; some workers who might decided to go to school full-time or remain retired or who simply want some extra income will enter the labor market because of minimum wage is now higher. As a result, minimum wage jobs will become progressively harder to find and unemployment will increase, the irony is that in the long run, the minimum wage, just like any other price floor, has created two unintended consequences: a smaller demand for workers by employers (QDLR is significantly less than Q_E) and a larger supply of workers (QSLR) looking for jobs.

Proponents of minimum wage legislation are aware that it often creates unemployment; to address the problem, they support investment in training, education, and the creation of government jobs program to provide work opportunities. While jobs programs increase the number of minimum wage jobs, training, and additional education enable workers to acquire skills needed for jobs that pay more than the minimum wage. Economists generally believe that education and training programs have longer-lasting benefits to society as a whole because they enable workers to obtain better paying jobs on a permanent basis.

The minimum wage is sometimes non-binding

Most people believe that raising the minimum wage is a simple step that the government can take to improve the standard of living of the working poor. However, in some places the minimum wage is non-binding and therefore has no impact on the market. Why would we have minimum wage if it's largely unbinding?

A Nonbinding Minimum Wage

An increase in the minimum wage from $7 to $9 remains nonbinding. Therefore, it will not change the demand for labor or the unemployment rate. If the minimum wage rises above the market wage, unemployment will occur.

To help us answer this question, consider the two non-binding minimum wage rates ($7 and $9) shown in the Figure 6.10. A minimum wage of $7 per hour is far below the equilibrium wage of $10 ($W_E$), so at that point supply and demand push the

equilibrium wage up to $10; suppose that politicians decide to raise the minimum wage to $9. This new minimum wage of $9 would remain below the market wage, so there would be no impact on the labor market for workers who are willing to accept the minimum wage. Therefore, an increase in minimum wage from $7 to $9 an hour will not create unemployment; unemployment will occur only when the minimum wage rise above $10

Conclusion

The policies presented in this chapter — rent control, price gouging laws, the minimum wage, and agricultural price controls — create unintended consequences. Attempts to control prices should be viewed cautiously. When the price signal is suppressed through a binding price floor or ceiling, the market's ability to allocate goods and services is diminished, surpluses and shortages develop and expand through time, and obtaining goods and services becomes difficult.

The role of markets in society has many layers, and we've only just begun our analysis. In the next chapter, we consider two cases —externalities and public goods — in which the unregulated market produces an output that is not socially desirable.