

Chapter 4

Price Control

Learning Objectives :

After learning this chapter you will understand :

- Price Ceiling.
- Price Floor.

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Basic Concepts

1. **Price Ceiling :** Price ceiling is the maximum price a seller is allowed to charge for a product or service. A price ceiling occurs when the price is artificially held below the equilibrium price and is not allowed to rise. Price ceilings are usually set by law and limit the seller pricing system to ensure fair and reasonable business practices. Price ceilings are usually set for essential expenses; for example, some areas have rent ceilings to protect renters from climbing rent prices. When the government imposes a price ceiling on a competitive market, two outcomes are possible :
 - (i) Non Binding Price Ceiling,
 - (ii) Binding Price Ceiling.

Non Binding Price Ceiling : The price ceiling is not binding if it is set above the equilibrium price, *i.e.*, the equilibrium market price obtained from the interaction of demand and supply is below the maximum price. So here the price ceiling will have no impact whatsoever on the equilibrium price and quantity.

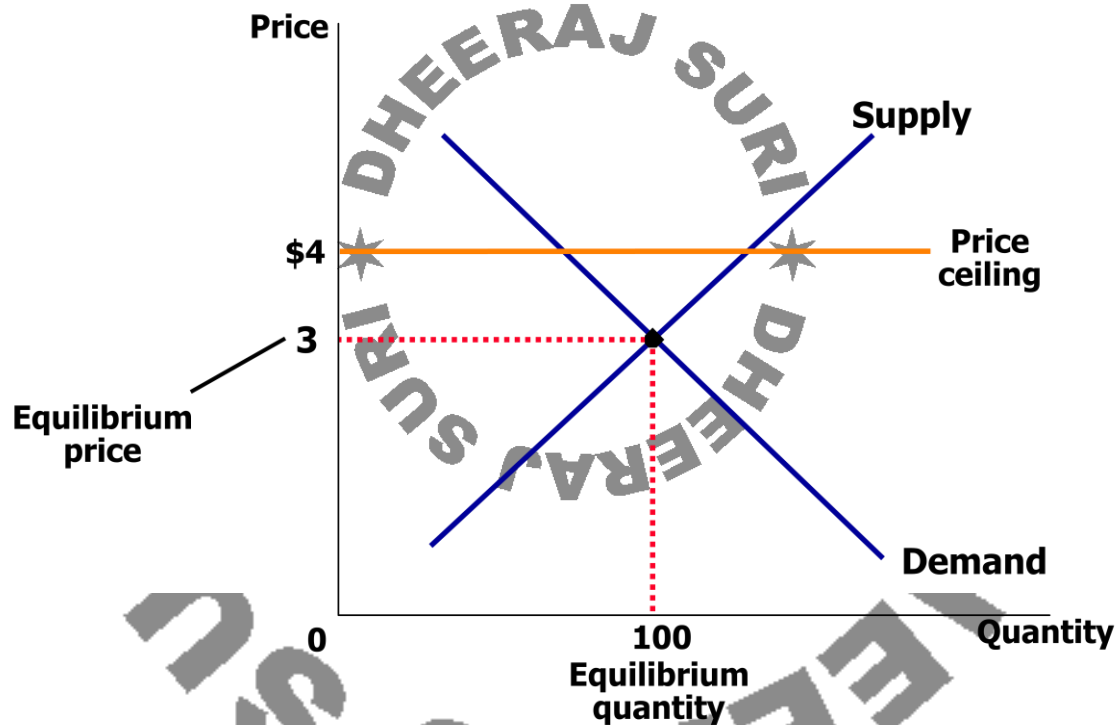


Figure 1 : Non Binding Price Ceiling

As in *Figure 1*, the price ceiling is set by the government at \$4 per unit but the equilibrium price obtained from the interaction of demand and supply is \$3 per unit, so here price ceiling is non binding.

Binding Price Ceiling : The price ceiling is binding if set below the equilibrium price, leading to a shortage. When the government imposes a binding price ceiling

on a competitive market, a shortage of the good arises, and sellers must ration the scarce goods among the large number of potential buyers.

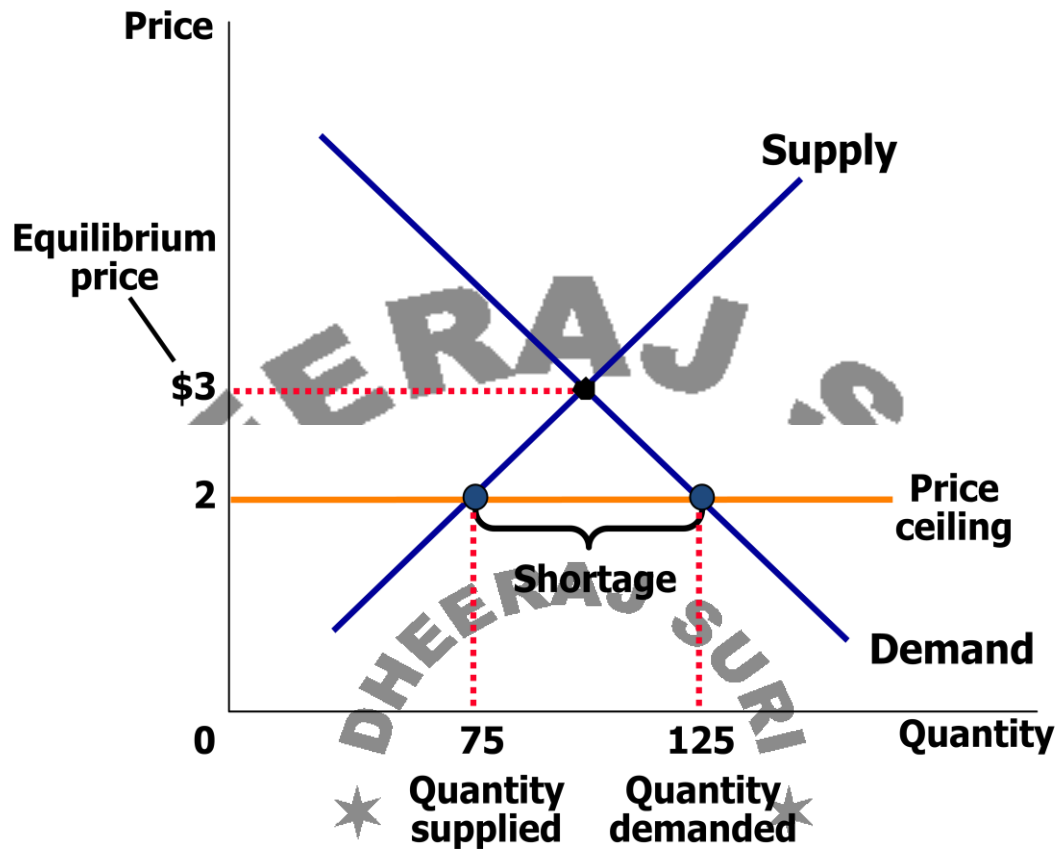


Figure 2 : Binding Price Ceiling

As in *Figure 2*, the price ceiling is set by the government at \$2 per unit but the equilibrium price obtained from the interaction of demand and supply is \$3 per unit, so here price ceiling is binding. At the maximum price of \$2 the quantity demanded is 125 units whereas the quantity supplied is only 75 units. The difference between the quantity demanded and quantity supplied is called shortage. So Binding Price ceilings lead to shortages. Shortages create a rationing problem -- somehow, it must be determined who will get the product and who will not. There are many ways to resolve the shortage problem.

- (i) The most common way is first-come, first-served. Shortages are typically associated with long lines. In the case of apartments, there are perhaps hundreds of people looking for each apartment that is vacant. In the case of gasoline and sports teams, people stand in line for hours or even days to be able to buy.
- (ii) Another common way to resolve the problem of shortages is for the sellers to choose which buyers they will sell to. Landlords often rent to preferred renters. These are likely to be married couples, probably over 30, and without children or pets. Gasoline station owners sell gasoline to those

customers who regularly have their cars repaired at that station. The Chargers and Padres assure that season ticket buyers get tickets for the playoffs.

- (iii) A third way to resolve the problem of shortages is by lottery. Those who pick the right numbers are allowed to buy. The Chargers used a system such as this to determine who would be able to buy some of the tickets for their Super Bowl game.
- (iv) And a fourth way to resolve the problem of shortages is to have the government make the choice of buyer. In 1979, the California government decided that those with license plates that ended in an odd number could buy gasoline only on odd days of the month. Those with license plates that ended in an even number could buy gasoline only on the even days of the month. (Everyone could buy on the 31st.) In Europe, government choice of the buyer has been common, especially for apartments. During World War II, Americans had ration coupons, issued by the government, to determine the quantities of various products that they would be entitled to buy.

2. **Effects of Price Ceiling :** Price ceilings provide a gain for buyers and a loss for sellers. Sellers would like to avoid the loss if they can. One way to do so is called a **black market**. In this case, the sellers illegally raise the price and hope to get away with it. So, for example, tickets to popular events are sold by scalpers at high prices. While there are many other examples, black markets are not smart; it is just too easy to be caught. It is also not smart because of the existence of **gray markets**.

A gray market is a way of getting around the price ceiling without actually doing anything illegal. There are two forms of gray market.

One form of gray market involves charging for goods or services that were formerly provided free. If the rent cannot be raised on the apartment, there is nothing preventing the landlord from charging for the parking space, charging for use of the elevator, charging for gardening and cleaning services, forcing the tenants to pay for electricity and water, and so forth. In New York, a rent-controlled apartment near Central Park might rent for \$300 to \$400 per month; in a free market, the rent would probably be \$2,000 per month. To get in, one needs the key. This has been known to cost \$1,000. This is not a refundable deposit; this is a charge to have the key. It is obviously worth it to be able to rent the apartment for \$300 to \$400 per month. A Berkeley apartment owner converted his apartment into a church. To be able to live there, one had to pay church dues of \$1,200 per year in addition to the rent. Gasoline stations would commonly charge for washing the windows, checking the tires, and so forth. The price of oil used in oil changes would be raised. (Those having oil changes at the station were favored in access to gasoline during the years of the price ceiling. In these years, Americans had the cleanest engines in history.) Some gas station owners ran the line to the gasoline pump through the car wash.

The second form of gray market is to provide less service for the same price. The apartment owner would not repair, clean, paint, nor otherwise maintain the apartment building. Some people argue that rent controls are one reason for the dilapidated state of many apartments in New York and for the fact that nearly half of furnaces in New York apartment buildings do not work. The gasoline companies would lower the octane rating. Unleaded gasoline, which was 91 octane, becomes 89 octane and then 87 octane. (For a while, Texaco even tried 85 octane.) If you want 91 octane, you must now buy Super Unleaded, and pay \$0.30 per gallon extra.

3. **Long Gas Lines :** In 1973 OPEC raised the price of crude oil in world markets. Because crude oil is the major input used to make gasoline, the higher oil prices reduced the supply of gasoline. Motorists had to wait for long duration to get few gallons of gas. Economists blame government regulations that limited the price oil companies could charge for gasoline. This can be explained with the help of *Figure 3* and *Figure 4* as shown below :

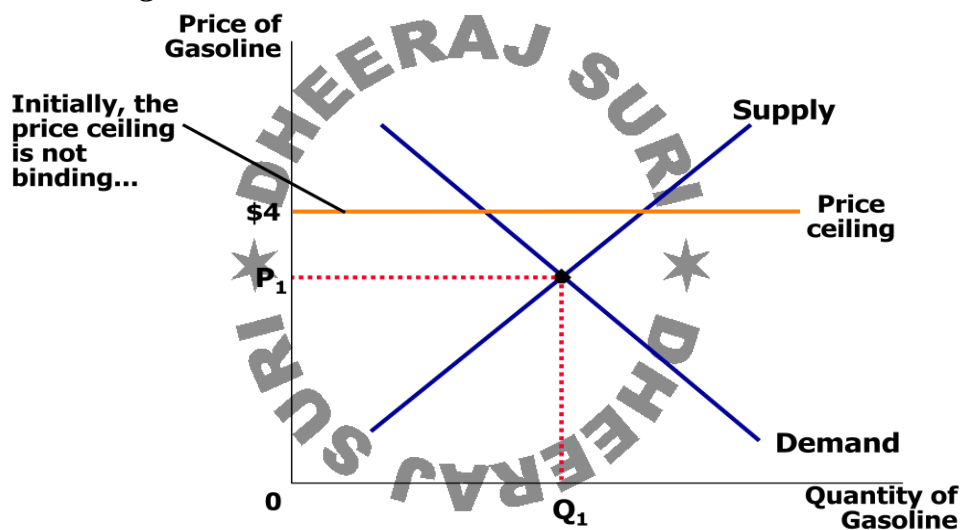


Figure 3 : Non Binding Price Ceiling on Gasoline

Before OPEC raised the price of crude oil, the equilibrium price of gasoline P_1 was below the price ceiling and thus price ceiling had no effect.

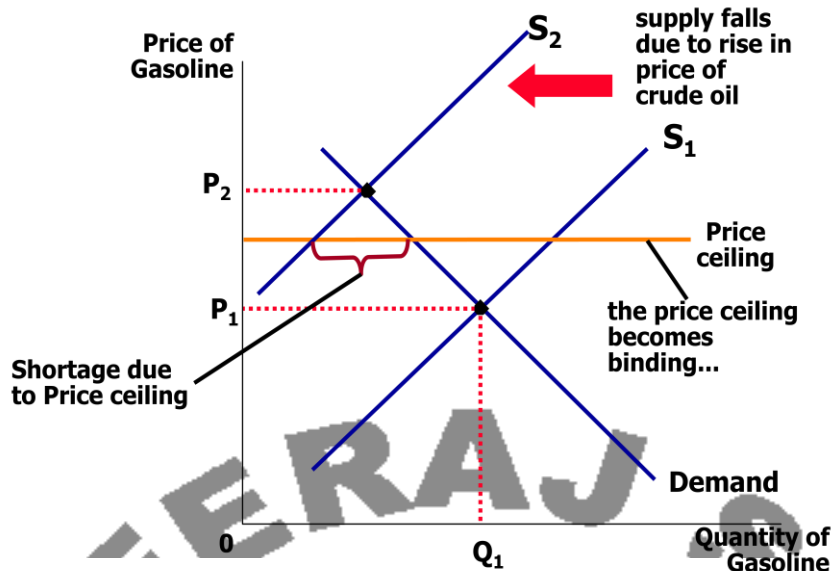


Figure 4 : Binding Price Ceiling on Gasoline

When OPEC raised the price of oil, the cost of producing gasoline also increased and the supply curve shifted from S_1 to S_2 . If the market would remain unregulated then this shift in supply would have increased the price to P_2 and the new equilibrium would have obtained. But the price ceiling prevented the price to rise upto new equilibrium. So it resulted in shortage.

4. **Rent Control :** Rent controls are ceilings placed on the rents that landlords may charge their tenants. The goal of rent control policy is to help the poor by making housing more affordable. But economists often criticize the rent control, because it is highly inefficient way to help the poor raise their standard of living. One economist called rent control “the best way to destroy a city, other than bombing.” The effects of rent control in the short run and the long run can be explained separately.

Rent Control in Short Run : In the short run the supply and demand for apartments is relatively inelastic, because the landlords have fixed number of apartments to rent and they cannot adjust this number quickly when the rent of the apartments changes. Also, the number of people searching for the apartments may not be highly responsive to rents in short run, because people take time to adjust their housing arrangements. So the price ceiling imposed by rent control causes only a small shortage of housing. As shown in **Figure 5**.

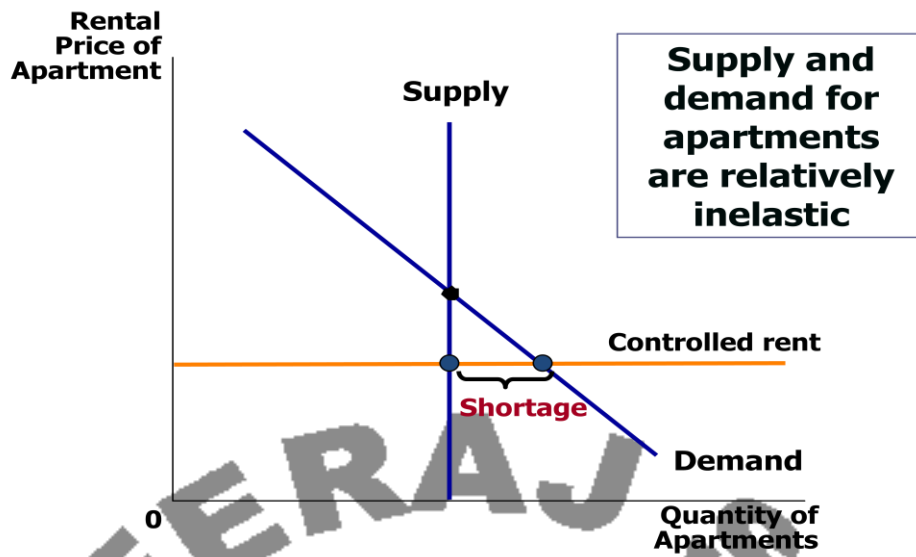


Figure 5 : Rent Control in Short Run

Rent Control in Long Run : In the long run the rent control cause large shortage of housing. This is because in the long run the demand of housing is more elastic because people can adjust their demand for housing. Also the supply of housing is elastic in the long run because the landlords can build more apartments in the long run as the rent increases. So, in the long run the shortage of housing is very large. This has been shown in Figure 6.

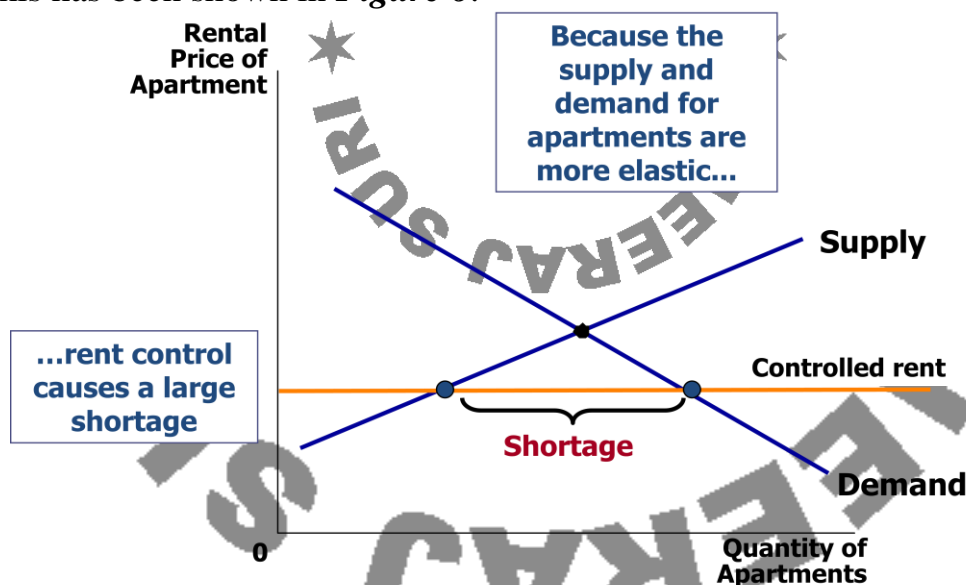


Figure 6 : Rent Control in Long Run

5. **Price Floors :** A price floor is a legal minimum price for a commodity, *i.e.*, it is illegal to sell the commodity for less than the floor price. In this case market forces cannot move the price to equilibrium and there will be an on-going disequilibrium in the market, which creates a surplus. A price floor is usually imposed to keep up the price of something perceived as too cheap. To have any effect, it must be set above the market price. Price floors are usually enacted to please suppliers,

examples are agricultural price support and minimum wage. When the government imposes a price floor on a competitive market, two outcomes are possible :

- (i) Non Binding Price Floor,
- (ii) Binding Price Floor.

6. **Non Binding Price Floor :** The price floor is not binding if it is set below the equilibrium price, *i.e.*, the equilibrium market price obtained from the interaction of demand and supply is above the maximum price. So here the price floor will have no impact whatsoever on the equilibrium price and quantity.

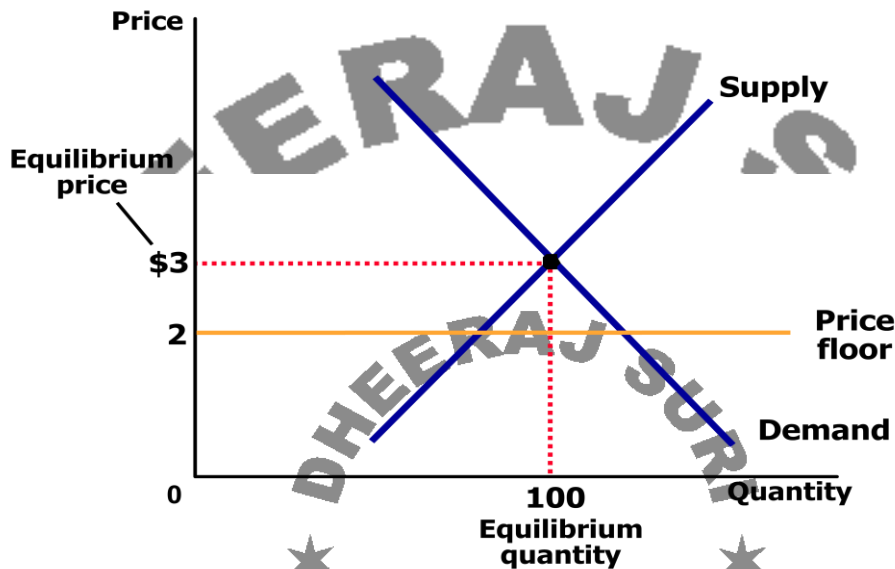


Figure 7 : Non Binding Price Floor

As in **Figure 7**, the price floor is set by the government at \$2 per unit but the equilibrium price obtained from the interaction of demand and supply is \$3 per unit, so here price floor is non binding.

7. **Binding Price Floor :** The price floor is binding if set above the equilibrium price, leading to a surplus, because the quantity supplied at price floor exceeds the quantity demanded. As in **Figure 8**, the price floor is set by the government at \$4 per unit but the equilibrium price obtained from the interaction of demand and supply is \$3 per unit, so here price floor is binding. At the minimum price of \$4 the quantity supplied is 120 units whereas the quantity demanded is only 80 units.

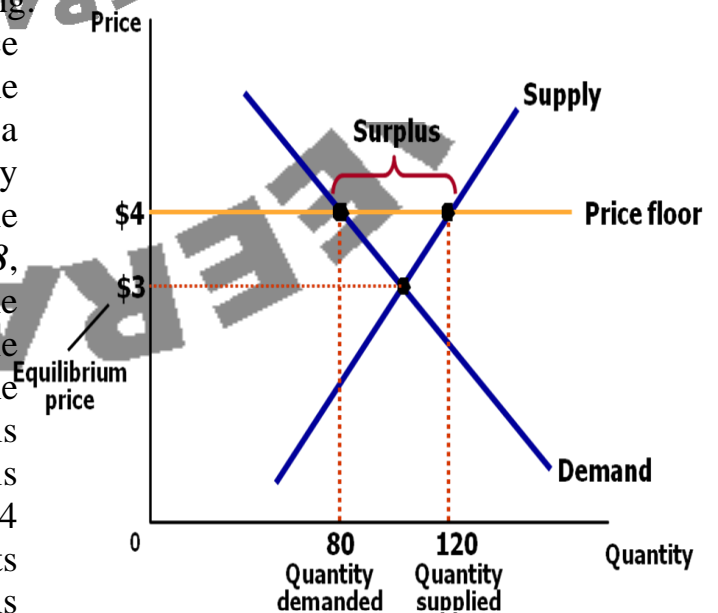


Figure 8 : Binding Price Floor

The difference between the quantity supplied and quantity demanded is called *surplus*. Just as price ceilings and shortages can lead to undesirable rationing mechanisms, so can price floors and surpluses. In the case of a price floor, some sellers are unable to sell all they want at the market price. The sellers who appeal to the personal biases of the buyers, perhaps due to racial and family ties, are in a better position to sell their goods.

8. **Minimum Wage :** An important example of a price floor is the minimum wage. Minimum wage laws dictate the lowest price possible for labor that any employer may pay. In a free market the equilibrium wage is set at a point where labour demand is equal to labour supply as shown in **Figure 9**. Even if the minimum wage exists but if it is below the equilibrium wage in the market even then it will be inconsequential. This means the demand and supply of workers determine the equilibrium wage.

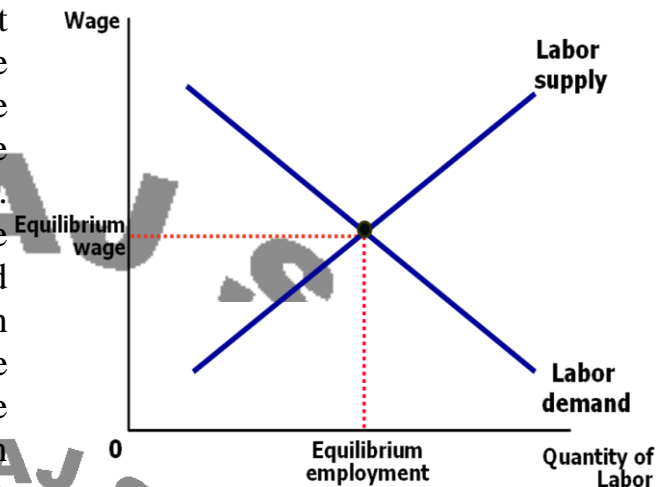


Figure 9 : Equilibrium Wage in the free labour market

Binding Minimum Wage : But when the minimum wage is binding, then it is a price floor so it causes the surplus in labour. This is because at minimum wage the demand of labour is less than the supply of labour. The result of minimum wage is unemployment. Thus, the minimum wage increases the income of the workers who have jobs but it lowers the incomes of workers who cannot find jobs.

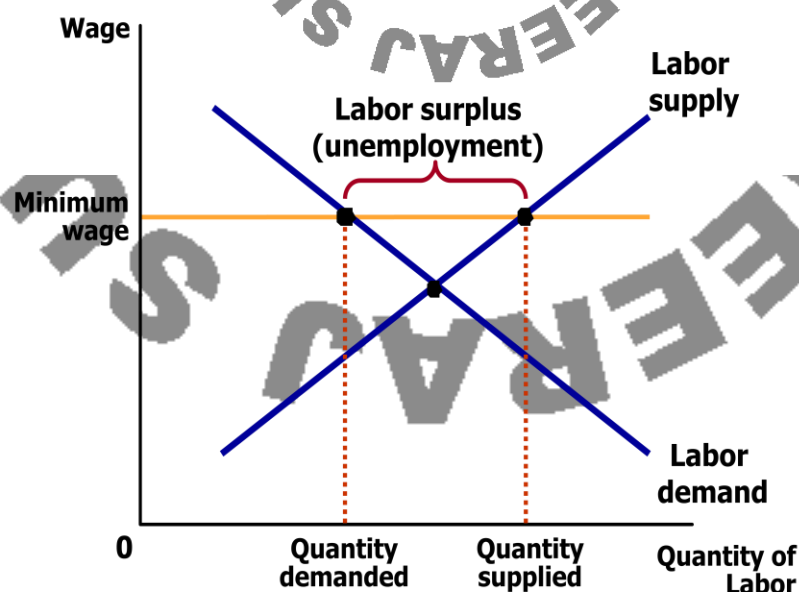


Figure 10 : Labour market with minimum wage

Exercise 1**Theoretical Questions**

- Q1. What is price ceiling? What effect does a ceiling on rents have on the market for rental accommodation?
- Q1. Explain : Price Floor.
- Q2. If the minimum wage is above the equilibrium wage in a competitive labour market, what effect will this have on employment? Show using a diagram.

Numerical Problems

- Q1. Consider a market in which the supply and demand functions are given by the following equations :
 $P = 100 - 0.2Q$ (demand); $P = 40 + 0.1Q$ (supply)
- (i) Determine the equilibrium quantity and price and compute the price elasticity of supply at the equilibrium point.
- (ii) Determine the effect of a Rs. 50 price ceiling on the price and quantity traded.
- [Ans. : (i) $P = 60$, $Q = 200$, $e_s = 3$ (ii) $P = 50$, $Q_D = 250$, $Q_S = 100$]
- Q2. The government imposes price ceiling on the retail price of onion at Rs. 20 per kg. The demand and supply curves for onion are $Q^d = 120 - 2P$ and $Q^s = 2P$ respectively.
- (a) In the absence of price control, what is the equilibrium price and quantity.
- (b) With price ceiling show the quantity traded.
- (c) Do the consumer and producer surplus change with this policy, if yes then calculate the change.
- (d) Calculate the deadweight loss.
- Q3. Consider a market in which the supply and demand functions are given by the following equations :
 $P = 80 - 0.1Q$ (demand); $P = 40 + 0.1Q$ (supply)
- (i) Determine the equilibrium quantity and price and compute the price elasticity of supply at the equilibrium point.
- (ii) Determine the effect of a Rs. 40 price floor on the price and quantity traded.
- (iii) Determine the effect of a Rs. 80 price floor on the price and quantity traded.
- [Ans. : (i) $P = 60$, $Q = 200$, $e_s = 3$, (ii) No effect, (iii) $P = 80$, $Q_D = 72$, $Q_S = 48$, shortage = 24]
- Q4. The government imposes price floor on the retail price of onion at Rs. 40 per kg. The demand and supply curves for onion are $Q^d = 120 - 2P$ and $Q^s = 2P$ respectively.
- (a) In the absence of price control, what is the equilibrium price and quantity.
- (b) With price floor show the quantity traded.
- (c) Do the consumer and producer surplus change with this policy, if yes then calculate the change.
- (d) Calculate the deadweight loss.

Multiple Choice Questions (MCQ's)

- Q1. If there is a price ceiling, there will be
(a) shortages (b) surpluses
(c) equilibrium (d) None of the above
- Q2. A price ceiling will have no impact on a market if it is set
(a) below the equilibrium price
(b) by knowledgeable government officials
(c) to maintain parity (d) above the equilibrium price
(e) below last year's average price
- Q3. If there is a price ceiling, which of the following is NOT likely to occur?
(a) rationing by first-come, first-served
(b) black markets (c) gray markets
(d) sellers providing goods for free that were formerly not free
- Q4. If a government-imposed price ceiling causes the observed price in a market to be below the equilibrium price,
(a) there will be excess demand. (b) there will be excess supply.
(c) the curves will shift to make a new equilibrium at the regulated price.
(d) None of the above.
- Q5. Rent controls are examples of
(a) price floors (b) price ceilings
(c) parity prices (d) target prices
(e) equilibrium prices
- Q6. All of the following are problems associated with price ceilings except
(a) chronic excess demand
(b) an eventual decline in the number of suppliers
(c) the need to use ration coupons to purchase the good
(d) chronic excess supply
(e) landlords failing to maintain rent-controlled properties adequately
- Q7. One way to cope with chronic excess demand is to
(a) simply give the goods away for free
(b) force parity between the quantity demanded and the quantity supplied
(c) issue ration coupons for the quantity supplied
(d) lower the price ceiling (e) impose crop limitations
- Q8. Ration coupons are used to
(a) cope with chronic excess supply
(b) cope with price floors
(c) establish parity between farmers' incomes and nonfarm incomes
(d) raise prices in a market
(e) cope with chronic excess demand
- Q9. Chronic excess demand will be a bigger problem in markets with price ceilings for goods where the demand is very _____ and the supply is very _____.
(a) elastic; elastic (b) inelastic; inelastic

- (c) elastic; inelastic (d) inelastic; elastic
(e) steep; flat
- Q10. If there is a price floor, there will be
(a) shortages (b) surpluses
(c) equilibrium (d) None of the above
- Q11. When a price floor is imposed, it has an impact on a market if it is set
(a) below the equilibrium price (b) at the equilibrium price
(c) above the equilibrium price because quantity demanded exceeds quantity supplied
(d) above the equilibrium price because quantity supplied exceeds quantity demanded
(e) below the equilibrium price because quantity demanded exceeds quantity supplied
- Q12. In the labor market, if the government imposes a minimum wage that is below the equilibrium wage, then
(a) workers who wish to work at the minimum wage will have a difficult time finding jobs.
(b) firms will hire fewer workers than without the minimum wage law.
(c) some workers may lose their jobs as a result.
(d) nothing will happen to the wage rate or employment.
- Q13. In order for a price floor to be effective, it must be set _____ the equilibrium price, while a price ceiling must be set _____ the equilibrium price in order to be effective.
(a) above; below (b) above; above
(c) below; above (d) below; below
(e) at; at
- Q14. The agricultural price support program is an example of
(a) a price ceiling (b) a price floor
(c) equilibrium pricing (d) None of the above
- Q15. If the minimum wage is increased,
(a) the number of workers hired will fall
(b) those still working will have higher incomes
(c) the overall wage cost of employers will increase
(d) all of the above
- Q16. Price floors were established in agricultural markets for all of the following reasons except to
(a) keep farmers' incomes in parity with nonagricultural workers' incomes
(b) prevent surpluses of agricultural goods from occurring
(c) counteract falling agricultural prices caused, over the long run, by technological change
(d) counteract the low price elasticity of demand for farm goods
(e) counteract the low income elasticity of demand for farm goods

- Q17. Which of the following is not a problem associated with price floors?
- (a) chronic excess supply
 - (b) the transfer of income nonfarm taxpayers to farmers
 - (c) large subsidies paid by the government
 - (d) a higher price for consumers
 - (e) the emergence of black markets for agricultural commodities
- Q18. One lesson to be drawn from our discussion of price ceilings and price floors is that
- (a) government intervention in the economy should be routine and extensive
 - (b) the government can easily solve most economic problems
 - (c) price ceilings work better than price floors
 - (d) in most cases, prices should be set by the interaction of demand and supply
 - (e) price controls work best if left in place over long periods

MA Entrance

D. S. E.

Next two questions are based on following information

‘Suraksha’ is the sole producer and supplier of security systems in India and the sole employer of locksmiths in the labour market. The demand for security systems is $D(p) = 100 - p$, where p is the price. The production of security systems only requires locksmiths and the production function is given by $f(L) = 4L$, where L is the number of locksmiths employed. The supply curve for locksmiths is given by

$$L(w) = \max\left(0, \frac{w}{2} - 20\right), \text{ where } w \text{ is the wage rate. [DSE MA Ent. Eco. 2009]}$$

- Q19. How many locksmiths will ‘Suraksha’ employ?
- (a) 5
 - (b) 10
 - (c) 15
 - (d) 20
- Q20. If the government sets the minimum wage is 70, how many locksmiths will Suraksha employ?
- (a) 5
 - (b) 10
 - (c) 15
 - (d) 20

Answers

MCQ

1. (a), 2. (d), 3. (d), 4. (a), 5. (b), 6. (d), 7. (c),
8. (e), 9. (a), 10. (b), 11. (d), 12. (d), 13. (a), 14. (b),
15. (d), 16. (b), 17. (e), 18. (d), 19. (b), 20. (b)

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