
Government Intervention in Competitive Markets

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Markets are marvels: they allow large groups of people who don't know each other, who have vastly different arrays of knowledge and skills, and who might not even like one another if they met to cooperate to mutual advantage. When left to its own devices, a well-functioning market will maximize gains from trade. This, in turn, allows us to see how some government policies affect the wellbeing of producers and consumers. In the following pages, we will discuss how intervention affects the wellbeing of consumers and producers in the markets for rental housing and unskilled labor.

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Gains from Trade: Consumer and Producer Surplus

To evaluate the effects of a policy, we want to see how the policy changes consumer and producer surplus. Consumer surplus measures gains from trade that accrue to consumers; it is the difference between the maximum willingness to pay (or *marginal value*) of what is consumed and the price the consumer pays. We add this up across all of the units produced and traded to get a measure of the consumer surplus in a given market.

Producer surplus measures the gains from trade that accrue to producers; it is the difference between the minimum willingness to accept (or *marginal cost*) of what is produced and the price that the producer receives. We add this up across all of the units produced and traded to get a measure of the producer surplus in a given market.

In a supply and demand diagram, consumer surplus is given by the region bounded by the y-axis, the demand curve, and the price paid by demanders. Producer surplus is given by the region bounded by the y-axis, the supply curve, and the price received by suppliers. This is illustrated in Figure 1, which shows consumer and producer surplus in the market for burgers.

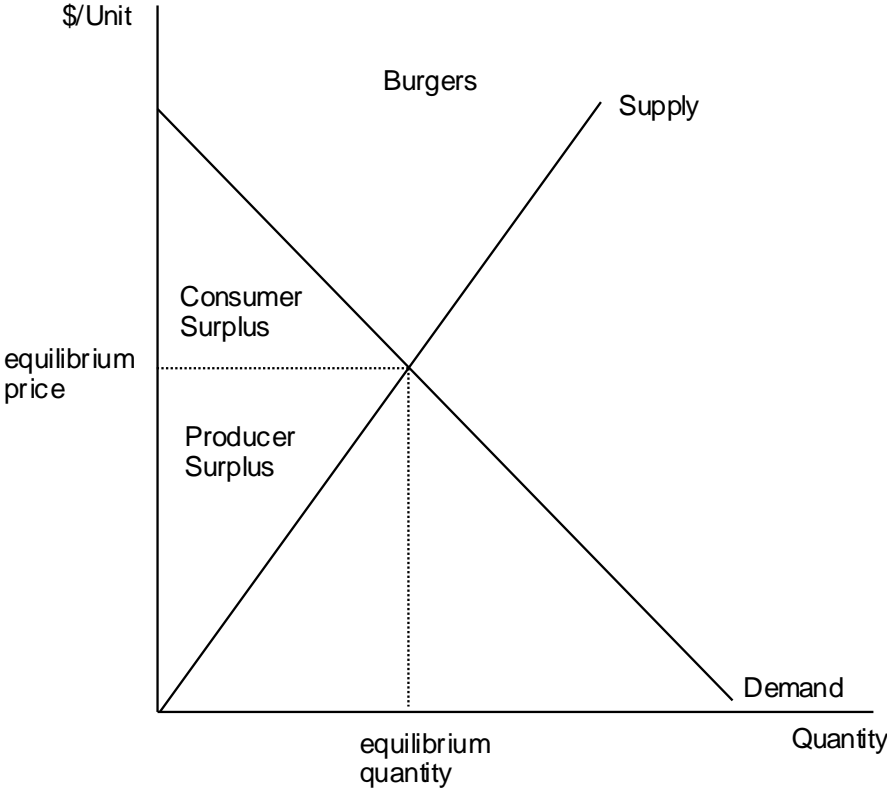


Figure 1: Consumer and Producer surplus in the market for burgers.

Why are these “gains from trade?” Think about what the supply and demand curves *mean*. Reading the graph from the x-axis, the demand curve tells us consumers’ maximum willingness to pay for each burger. The supply curve tells us producers’ minimum willingness to accept for each burger. If a consumer is willing to pay more than a producer are willing to accept, then the trade benefits both the consumer and the producer. The difference between the consumer’s maximum willingness to pay and the producer’s minimum willingness to accept is the gain from trade. When we add this up across every burger that gets sold (every burger up to the equilibrium quantity), we have the total gains from trade produced by the market.

Usually, buyers and sellers will trade at the equilibrium price. Therefore, the consumer surplus for any given trade will be the difference between the consumer’s maximum willingness to pay and the price he actually pays. The producer surplus for any given trade will be the difference between the producer’s minimum willingness to accept and the price he actually receives. Let’s use an example from Chapter 4 of *Modern Principles: Macroeconomics* by Tyler Cowen and Alex Tabarrok. Jules is willing to pay \$8 for a tasty burger while Vincent is willing to sell it for \$3. The gain from trade is the difference between what Jules is willing to pay and what Vincent is willing to accept: \$5. How that will be split depends on the equilibrium price. If the price is \$5, Jules enjoys a consumer surplus of $\$3 = \$8 - \$5$ and Vincent enjoys a producer surplus of $\$2 = \$5 - \$3$. What happens when the government intervenes and passes a law fixing the price?

Maximum Prices and Minimum Prices

All markets tend toward *equilibrium*, which is a situation in which no one has an incentive to alter his or her behavior. The equilibrium price is the price at which quantity supplied is exactly equal to quantity demanded, and the equilibrium quantity is the quantity of output for which the marginal value is exactly equal to the marginal cost. In other words, people want to consume exactly as much as firms are willing to supply, firms are willing to supply exactly as many units as people want, and all possible mutually-beneficial trades are made.

The competitive process increases welfare by maximizing total gains from trade (net benefits to buyers plus net benefits to sellers, also known as *total surplus*). At equilibrium in a competitive market, it is impossible to increase gains from trade, and it is impossible to make one person better off without harming someone else. Nonetheless, people sometimes chafe at the outcome of the competitive marketplace and argue that while it might maximize gains from trade the competitive outcome is inconsistent with other values.

The economic way of thinking helps us clarify and illustrate the tradeoffs associated with trying to achieve these “other values.” We can see specifically how price controls affect consumer and producer welfare. We will consider two types of price controls under two different scenarios. First, we will consider minimum prices and maximum prices if they are implemented perfectly. Second, we will use the insight that people respond to incentives to consider how minimum prices and maximum prices will affect welfare in the real world.

A Price Ceiling: Rent Control

Consider the market for rental housing. In response to claims that housing is unaffordable, governments sometimes pass laws specifying the maximum rent that landlords can charge for apartments. This has occurred in and around San Francisco, Santa Monica, and New York City, and rent control ordinances were proposed in New Orleans after Hurricane Katrina.

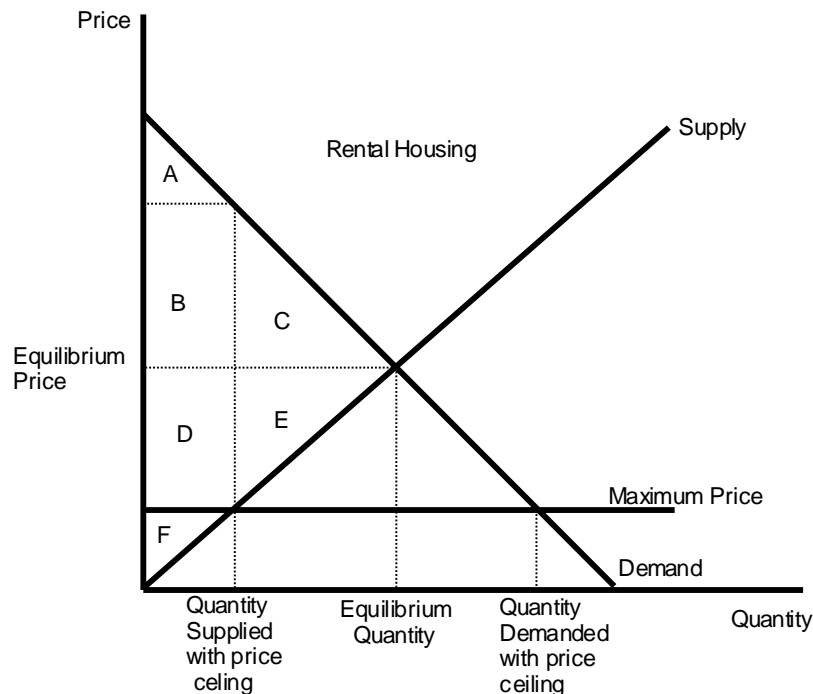
Let’s consider how rent control affects social welfare. Consumer’s surplus is the sum of the differences between the marginal value and the price for every unit that gets produced. In a supply and demand diagram, it is the area bounded by the y-axis, the demand curve, and the price. Producer’s surplus is the difference between the marginal cost and the price for every unit gets produced. In a supply and demand diagram, it is the area bounded by the y-axis, the supply curve, and the price.

Consider the diagram below. In the absence of rent control consumers pay (and producers receive) the equilibrium price. Consumer’s surplus is area A+B+C. Producer’s surplus is the area D+E+F. Rent control reduces the legal maximum price that consumers can pay and that firms can charge. This transfers some of the gains from trade from producers to consumers.

However, it also reduces producers' incentives to supply rental apartments and increases the number of apartments consumers wish to rent. Therefore, rent control creates a shortage of rental housing.

The welfare consequences are as follows. The quantity of apartments falls from the original equilibrium quantity to the quantity supplied under the rent control. This creates deadweight loss, which means that apartments for which marginal value is greater than marginal cost will not appear on the market, and some potential gains from trade will go unrealized. Graphically, this is given by C+E. The area D is transferred from producers to consumers. Consumers now get the gains from trade represented by the difference between the equilibrium price and the legal maximum price, added up across all apartments supplied at the rent controlled price. After rent control, consumer's surplus is A+B+D, producer's surplus is F, and deadweight loss is C+E.

Even though rent control makes the housing market less efficient, people sometimes argue that it is still justified on distributional grounds because it transfers wealth from landlords to renters. However, the fact that people respond to incentives suggest that even this is incorrect. Why? The imposition of rent control drives a wedge between the marginal value and marginal cost of the apartments in the market: this is represented by the area B+D. Since people cannot pay with money, they will pay with something else that is valuable (like their time). B+D will not materialize. These gains will be frittered away as people search for non-price ways to allocate the apartments. Therefore, the real deadweight loss is not just C+E. The full deadweight loss, the true forgone gains from trade as a result of the rent control, is C+E+B+D. Therefore, rent control reduces social welfare from A+B+C+D+E+F to A+F. The table is on the next page.



	No Price Ceiling	Price Ceiling, Step 1	Price Ceiling, Step 2
Consumer Surplus	A+B+C	A+B+D	A
Producer Surplus	D+E+F	F	F
Deadweight Loss	None!	C+E	C+E+B+D
Total Surplus	A+B+C+D+E+F	A+B+D+F	A+F

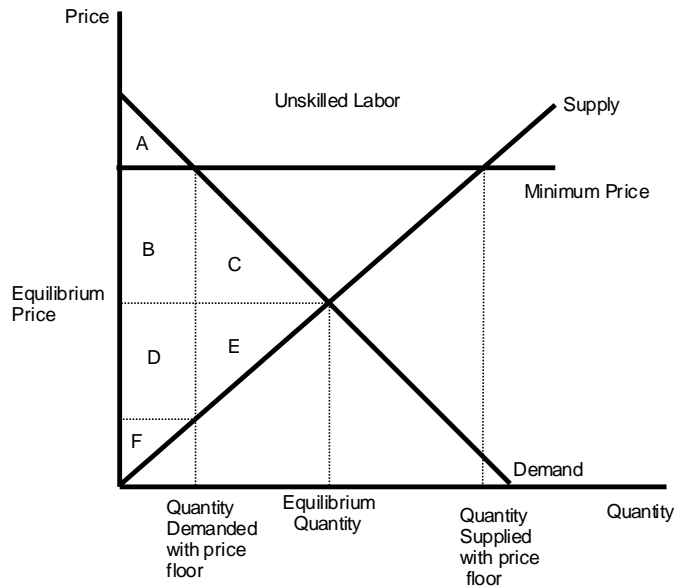
A Price Floor: Minimum Wage

We can use the same logic to analyze the effects of a price floor like the minimum wage. Some people advocate the imposition of a minimum wage in order to transfer wealth from employers to workers. In an unfettered labor market, consumer's surplus (gains from trade accruing to employers) is the area bounded by the demand curve, the y-axis, and the equilibrium price (A+B+C). Producer's surplus (gains from trade accruing to workers) is the area bounded by the supply curve, the y-axis, and the equilibrium price (D+E+F).

After a minimum wage is imposed, the quantity of labor supplied increases while the quantity of labor demanded decreases. This creates a surplus of unemployed labor. Since wages are higher, people want to work more. However, since wages are higher, firms want to hire fewer workers. Generally, we will think of quantity as the number of labor hours rather than the number of laborers: it is possible that unemployment manifests itself in reduced hours rather than layoffs.

Regardless, this will reduce welfare. Since it reduces the quantity of labor firms wish to hire, the minimum wage creates deadweight loss equal to C+E. These are units of labor for which the marginal value to firms is higher than workers' opportunity cost of working but which will not be hired because of the minimum wage.

Still, some proponents of the minimum wage argue that the transfer of B from employers to workers justifies the minimum wage even if it reduces the market's efficiency. Once again, though, the difference between the marginal value and the marginal cost of each unit of labor will be wasted. Since prices can't be used to allocate labor, people will use something else valuable (their time, for example) to "pay" for the opportunity to work. The entire difference between the minimum wage and the opportunity cost of working will be frittered away. The welfare cost of the minimum wage is thus C+E+B+D rather than just C+E. Employers are left with A, and employees are left with F. The graph is on the next page.



	No Price Floor	Price Floor, Step 1	Price Floor, Step 2
Consumer Surplus	A+B+C	A	A
Producer Surplus	D+E+F	B+D+F	F
Deadweight Loss	None!	C+E	C+E+B+D
Total Surplus	A+B+C+D+E+F	A+B+D+F	A+F

Exercises on Price Ceilings and Price Floors

1. People have debated whether the government should control executive pay. Use an appropriate diagram to show how a binding price ceiling on executive pay will affect consumer surplus, producer surplus, and total surplus.
2. An article on the online satire site *The Onion* once posited a federal executive minimum wage of \$565.15 per hour (I think). Use an appropriate diagram to show how this would affect consumer surplus, producer surplus, and total surplus if the minimum wage is binding. Do the same if it is non-binding.
3. After natural disasters, governments often impose price controls on essential items like flashlights, ice, plywood, and gasoline. Use an appropriate diagram to show how a binding price ceiling on gasoline will affect consumer surplus, producer surplus, and total surplus if the price ceiling is binding.
4. Price ceilings and price floors reduce efficiency. Why do we have them?