

Supply and Demand: Key

1. A key assumption in our model of supply and demand is that there are many buyers and sellers so that neither group is able to exhibit market power. This assumption fits the market for insulin well. For nuclear missiles, however, there are very few buyers. So a buyer, like the U.S. government is likely to be able to restrict quantity in order to attain a lower, more favorable price.
2. Demand is marginal utility. So the demand curve is flat and always equal to this constant marginal utility.
3. As in class, this implies an upward sloping supply curve.
4. This reduces marginal cost so that firms produce more output at any price. Graphically, supply shifts to the right. Quantity increases. But because demand is flat, the price is unchanged. Were demand downward sloping, the price would have decreased.
5. When the amount of a complement increases, demand increases. When demand shifts up, quantity and price both increase.
6. In this case, the demand curve is vertical. When supply increases (from #4), price decreases but there is no change in quantity.

For #7-8, we calculate marginal cost and marginal supply:

Table 1: Market for Insulin

Units	Total Utility	Total Cost	Marginal Utility	Marginal Cost
1	\$1000	\$100	\$1000	\$100
2	\$1950	\$150	\$950	\$50
3	\$2850	\$250	\$900	\$100
4	\$3700	\$400	\$850	\$150
5	\$4400	\$600	\$700	\$200
6	\$5100	\$850	\$700	\$250
7	\$5700	\$1150	\$600	\$300
8	\$6300	\$1500	\$600	\$350
9	\$6800	\$1900	\$500	\$400
10	\$7300	\$2400	\$500	\$500

7. Demand is marginal utility because a rational, utility maximizing household will purchase the good as long as marginal utility is greater than the price. We are assuming that insulin displays

decreasing marginal utility which then causes the demand curve to be downward sloping. This is true for most, but not all, goods and services.

8. Supply is marginal cost because a rational, profit maximizing firm will produce the good as long as the price is greater than marginal cost. Notice that marginal cost is *mostly* increasing. There is a small, downward sloping part for low levels of output. I am sneaky like that.

9. Price equals \$500 and quantity equals 10.

10.

Table 2: Market for Insulin

Units	Total Utility	Total Cost	Marginal Utility	Marginal Cost
1	\$1000	\$200	\$1000	\$200
2	\$1950	\$300	\$950	\$100
3	\$2850	\$500	\$900	\$200
4	\$3700	\$800	\$850	\$350
5	\$4400	\$1200	\$700	\$400
6	\$5100	\$1700	\$700	\$500
7	\$5700	\$2300	\$600	\$600
8	\$6300	\$3000	\$600	\$700
9	\$6800	\$3800	\$500	\$800
10	\$7300	\$4800	\$500	\$1000

Now price equals \$600 and quantity equals 7.

11. This question is a little out of place as we have not yet introduced the concept of firms passing costs on. But here we go...

Before the change in costs, it cost the firm \$850 to produce the first 6 units. Because each unit cost \$500, households spent \$3000 on these six units.

Now with higher costs, these 6 units cost double, \$1700. Costs have risen by \$850. The price is now \$600 so households pay \$3600 in total, an increase in \$600.

So firms have \$850 in added costs and households pay \$600 more. We might say that households pay for $\frac{600}{850} = 71\%$ of the added costs, This is the amount that is passed on to households.

Later, we will see that the slope of the demand curve affects how cost increases are passed on. If it is vertical, 100% of cost increases are passed on. If it is flat, cost increases are not passed on at all.

12. The goal of this question is to get students to think about sources of utility apart from the consumption of goods and services. Some examples include leisure time, the utility of others (altruism), the disutility of others (spite), health, etc.

13. There is no single correct answer. Most goods exhibit decreasing marginal utility but there are counterexamples. One common example is a good that is part of a set where the set must be complete to fully serve its function. The fourth tire on a car, for example, provides more marginal utility than the third.

14. To solve for equilibrium, set supply equal to demand:

$$50 - 10Q = 2 + 2Q \tag{1}$$

which yields $Q = 4$ and $P = 10$.

15. There is no Rocky V. It does not exist because the marginal cost of producing it is 12, while the price is 10. They would lose money and that is why the series ended after Rocky knocked out Ivan Drago to end the Cold War.

16.

$$50 - 10Q = 11 + 3Q \tag{2}$$

which yields $Q = 3$ and $P = 20$. In this example, Rocky III is the final film. The loss to the world is unfathomable.

17. Ceteris Parabis means that we are holding all else equal, so that the change in supply is the only thing that happens. This allows us to isolate the effect of higher costs.

If all else is not equal, then we cannot say what happens to the equilibrium price and quantity. Demand could, for example, also change.

18. Both supply and demand have increased in recent decades. On the demand side, higher incomes have boosted demand because organic food is a normal good. Information promoting

health benefits (regardless if it is fully accurate) also may have boosted demand. On the supply side, more farmers have entered the organic food market, shifting supply to the right.

19. The inclusion of “effective” is important here because it implies that the price ceiling is below the equilibrium price. As a result, demand exceeds supply and there is a shortage.

In the short-term, renters who are able to obtain apartments at the rent controlled price win. Landlords and renters unable to find housing lose. The longer-term is more complex, most economists believe that it leads to a long-term, reduction in supply and quality.