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VR Headset Market

Unit Price (P)	Quantity Supply (Q_S)	Quantity Demanded (Q_D)	Price elasticity of Demand (E_P^D) (Midpoint Method)
30	2,000	16,000	-0.42
35	3,000	15,000	-0.52
40	4,000	14,000	-0.63
45	5,000	13,000	-0.76
50	6,000	12,000	-0.91
55	7,000	11,000	-1.1
60	8,000	10,000	-1.32
65	9,000	9,000	-1.59
70	10,000	8,000	-1.93
75	11,000	7,000	-2.38
80	12,000	6,000	-3.0
85	13,000	5,000	-3.89
90	14,000	4,000	-5.29
95	15,000	3,000	-7.8
100	16,000	2,000	-13.67

Table 1: Price, Quantity Supply, Quantity Demanded, and Price Elasticity of Demand in the Market.

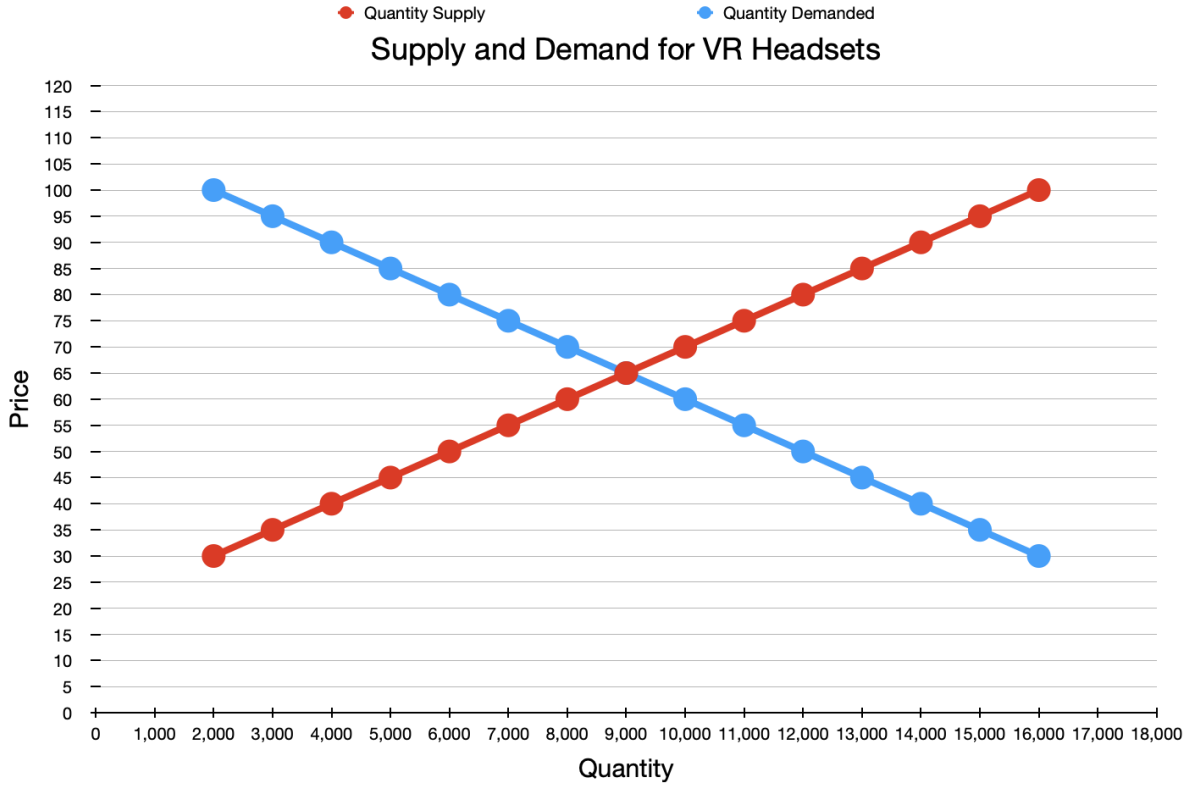

Figure 1: Supply curve and Demand curve in VR Headset Market

Supply & Demand Equations

Supply Equation

$Q_S = c + dP$, where
c = Intercept of supply function
d = Slope of supply function
P = Unit Price

Equation 1: Quantity Supply Equation

$$d = \frac{\Delta Q}{\Delta P} = \frac{Q_2 - Q_1}{P_2 - P_1} = \frac{3,000 - 2,000}{35 - 30} = \frac{1,000}{5} = 200$$

$$3,000 = c + 200(35)$$
$$3,000 = c + 7,000$$
$$c = -4,000$$

$$Q_S = -4,000 + 200P$$

Equation 2: Quantity Supply Equation of VR Headset Market

The supply equation for our VR Headset market is shown in **Equation 2**. We can see that the intercept of our equation is equal to -4,000 and the slope is equal to 200. The slope means that when the price of VR Headset changes by one unit the quantity supplied changes by 200 units. Using this equation, we can find the quantity supply at any specific price. For example, if we plug price $70.00 the value that we get for the quantity supply is 10,000. In addition, we can see that there is a positive relationship between quantity supply and price, this means that when the price unit of VR Headsets increases the quantity supplied also increases and vice versa.

Demand Equation

$$Q_D = a - bP, \text{ where}$$
$$a = \text{Intercept of demand function}$$
$$b = \text{Slope of demand function}$$
$$P = \text{Unit Price}$$

Equation 3: Quantity Demand Equation

$$b = \frac{\Delta Q}{\Delta P} = \frac{Q_2 - Q_1}{P_2 - P_1} = \frac{15,000 - 16,000}{35 - 30} = \frac{-1,000}{5} = -200$$

$$15,000 = a - 200(35)$$
$$15,000 = a - 7,000$$
$$a = 22,000$$

$$Q_D = 22,000 - 200P$$

Equation 4: Quantity Demand Equation of VR Headset Market

The demand equation for our market is shown in **Equation 4**. The intercept of our equation is equal to 22,000 and the slope is equal to -200, which is the change in price divided by the change in quantity demanded. In other words, this means that when the price of VR Headset changes by one unit the quantity demanded changes by -200 units. Using this equation, we can find the quantity demanded at any given price. For example, if we plug $70.00 then we get 8,000 for quantity demanded. There is an inverse relationship between quantity demanded and price because as the unit price of VR Headset increase the quantity demanded decreases and vice versa.

Consumer & Producer Surplus

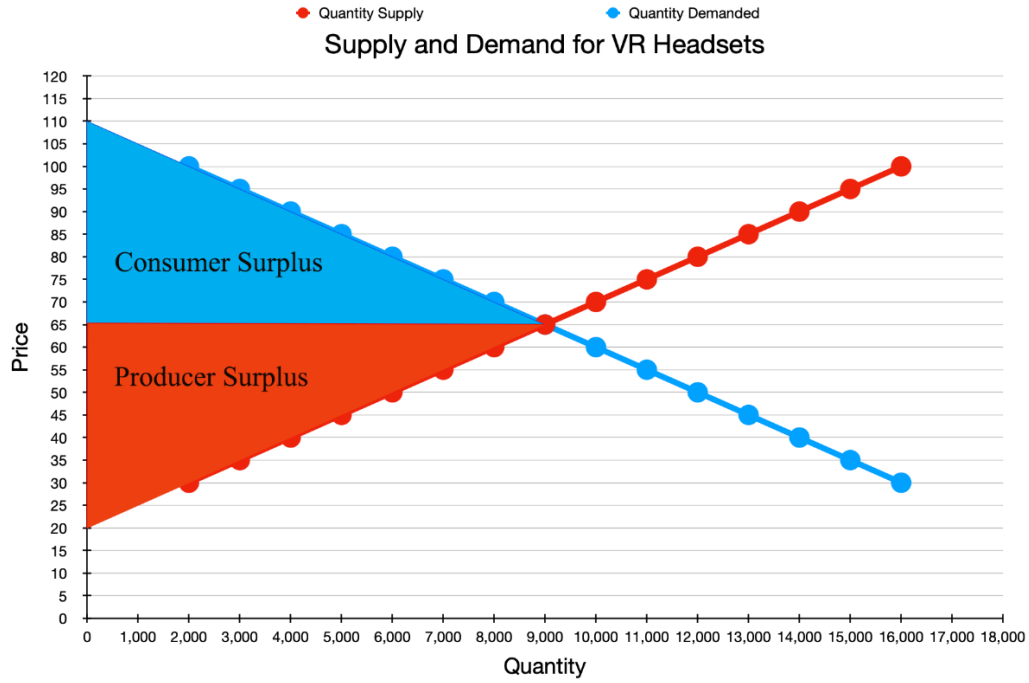

Figure 2: Supply and Demand Curve showing the Consumer Surplus and Producer Surplus

$$Q_D = 22,000 - 200P$$
$$0 = 22,000 - 200P$$
$$P = 110 \leftarrow \text{Max P}$$
$$\text{Consumer Surplus} = \frac{1}{2} \cdot B \cdot H = (\text{Max P} - \text{Equilibrium P}) \cdot \frac{1}{2} \cdot \text{Equilibrium Q} = \frac{1}{2} \cdot (110 - 65) \cdot (9,000 - 0) = \frac{1}{2} \cdot 45 \cdot 9,000 = 202,500$$

Equation 5: Consumer Surplus of VR Headset Market

$$Q_S = -4,000 + 200P$$
$$0 = -4,000 + 200P$$
$$P = 20 \leftarrow \text{Min P}$$
$$\text{Producer Surplus} = \frac{1}{2} \cdot B \cdot H = (\text{Equilibrium P} - \text{Min P}) \cdot \frac{1}{2} \cdot \text{Equilibrium Q} = \frac{1}{2} \cdot (65 - 20) \cdot (9,000 - 0) = \frac{1}{2} \cdot 45 \cdot 9,000 = 202,500$$

Equation 6: Producer Surplus of VR Headset Market

The Consumer surplus in our VR Headset market is the difference between the price that consumers pay and the price that they are willing to pay. In **Figure 2** we can see that the consumer surplus is the area between the equilibrium price and the demand curve. The Producer Surplus is the difference between the amount the producer is willing to supply a VR Headset for

and the actual amount received when making the trade. In **Figure 2** we can see that the producer surplus is the area between the equilibrium price and the supply curve.

Price Floor & Market Surplus / Price Ceiling & Market Shortage

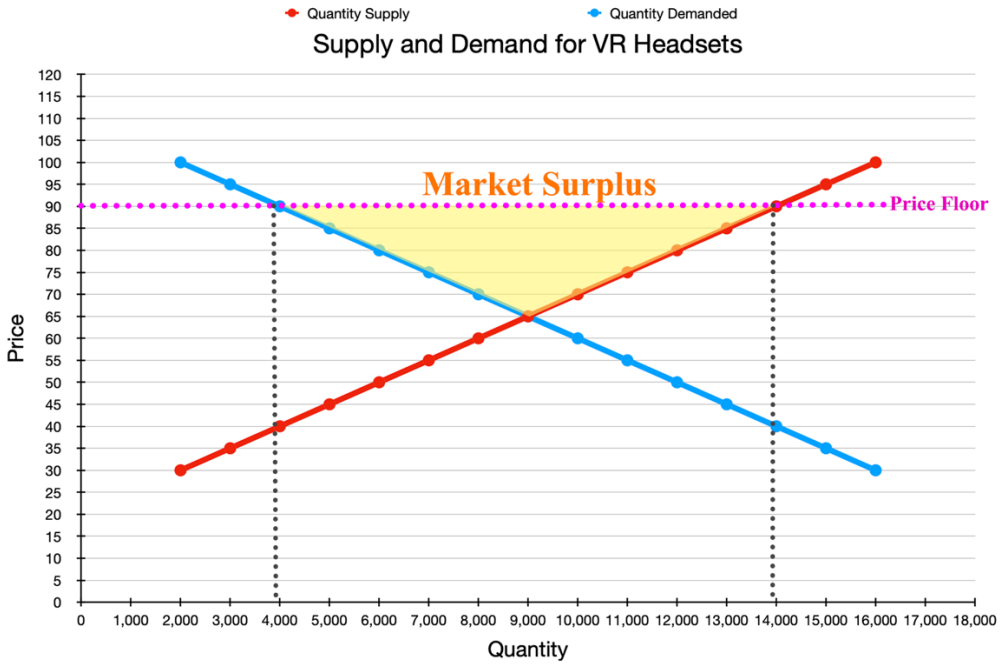

Figure 3: Supply and Demand Curve with Price Ceiling and Market Surplus.

Assuming the government imposes a price floor at $90.00 above the equilibrium price, then the quantity supplied will exceed the quantity demanded and this will create a market surplus. Imposing a price floor above the equilibrium price, can affect both the producers and consumers, as it can lead to unintended consequences.

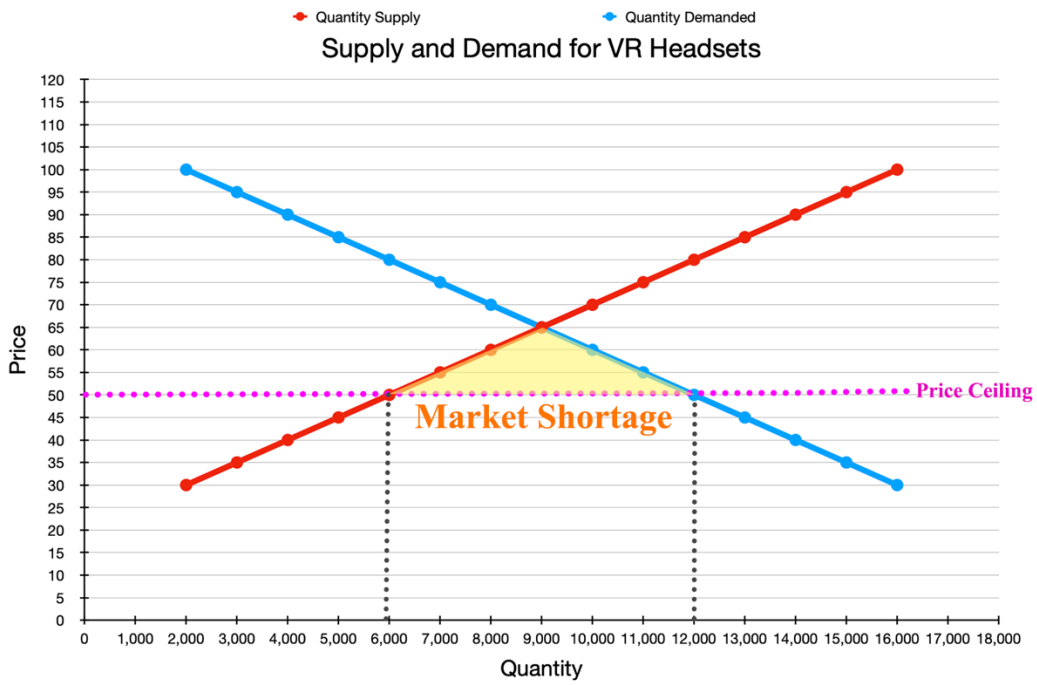

Figure 4: Supply and Demand Curve with Price Floor and Market Shortage

Assuming the government imposes a price ceiling at $50.00 below the equilibrium price, then the quantity demanded will exceed the quantity supplied and a market shortage (excess demand) will occur. Overall, this is not good for the market, as both producers and consumers are affected negatively.

Price Elasticity of Demand

Unit Price (P)	Quantity Supply (Q_S)	Quantity Demanded (Q_D)	|Price Elasticity of Demand| $\|E_P^D\|$
30	2,000	16,000	0.42
35	3,000	15,000	0.52
40	4,000	14,000	0.63
45	5,000	13,000	0.76
50	6,000	12,000	0.91
55	7,000	11,000	1.1
60	8,000	10,000	1.32
65	9,000	9,000	1.59
70	10,000	8,000	1.93
75	11,000	7,000	2.38
80	12,000	6,000	3.0
85	13,000	5,000	3.89
90	14,000	4,000	5.29
95	15,000	3,000	7.8
100	16,000	2,000	13.67

< 1 (Inelastic)

> 1 (Elastic)

Table 2: Price, Quantity Supply, Quantity Demanded, and Absolute Value of Price Elasticity of Demand.

By analyzing the Price Elasticity of Demand, we can see that as the price unit of VR Headset decreases the Price Elasticity of Demand also decreases. The reason this happens is because when the price is low, we get large percentage change in price for smaller percentage change in quantity, this means that the market becomes inelastic when we lower the price. On the other hand, as the price increases, we become elastic and we get large percentage change in quantities for small percentage change in price. In other words, when PED > 1 quantity changes a lot for given price change and when PED < 1 quantity changes a little for given price change.

Table: Total Revenue of VR Headset Market

Price	|PED|	Total Revenue
30	0.42	480000
35	0.52	525000
40	0.63	560000
45	0.76	585000
50	0.91	600000
55	1.1	605000
60	1.32	600000
65	1.59	585000
70	1.93	560000
75	2.38	525000
80	3.0	480000
85	3.89	425000
90	5.29	360000
95	7.8	285000
100	13.67	200000

Table 3: VR Headset market total revenue

Price Elasticity of Demand allows us to determine if we should raise or lower prices to get the most revenue. According to our Elasticity of Demand, while we are elastic then decreasing the price will increase total revenue hence it will be more profitable. On the other hand, while the market is inelastic increasing the price is the best option to make more profit, as it will increase our total revenue. If our market price for VR headset is at $65 then the best choice is lower the price to $55, there we will have an increase in total revenue while we are elastic.

If I were to start a business, then I would prefer a market with price inelastic demand because I will be able to increase the prices and make more profit. For example, let's say insulin has an inelastic price of demand, then no matter if price increases people would still buy it, as is a necessity. Elastic products suggest that there is more competition therefore it will be more difficult to make profits, as opposed to inelastic products. Therefore, I believe an inelastic market is the best choice to make more profit.