# TOPIC 03: MARGINAL ANALYSIS & SUPPLY AND DEMAND

I. Thinking on the Margin
   a. The *Marginal Revolution* refers to a change in economic thinking in the late 19th century by economists William Stanley Jevons, Léon Walras, and Carl Menger (all working independently, they came to the same conclusion).
      i. People put value on something based on marginal analysis. In other words, value doesn't derive by how good something is, but by how good a little bit more is. Water is necessary for life, but water is cheap because the marginal value of water is low.
      ii. *Margin*—the change in total
      iii. *Marginal analysis*—decisions are made on the margin; a little bit more or a little bit less.
   b. Diminishing Marginal Utility
      i. *Utility*—economic lingo for satisfaction or benefit
      ii. Each additional unit—each marginal change—generates less and less utility (we call this diminishing marginal utility).
      iii. The first ice cream I eat is great, the second isn't as good as the first, the third is even less, the fourth starts tasting disgusting
   c. Oranges example
      i. Suppose I hand you 12 oranges. What do you use them for and in what order?

| ORANGE | UTILITY | ORANGE | UTILITY | ORANGE | UTILITY |
|--------|---------|--------|---------|--------|---------|
| $1^{st}$ | $20 | $5^{th}$ | $16 | $9^{th}$ | $12 |
| $2^{nd}$ | $19 | $6^{th}$ | $15 | $10^{th}$ | $11 |
| $3^{rd}$ | $18 | $7^{th}$ | $14 | $11^{th}$ | $10 |
| $4^{th}$ | $17 | $8^{th}$ | $13 | $12^{th}$ | $9 |

      ii. Note that each item down the list would be worth less and less to you.
   d. Marginal utility
      i. The value of one more gallon of water is very low but the value of one more diamond is quite high
      ii. Use the most valuable ends first, then go down the list
   e. Marginal cost
      i. Marginal cost follows the same pattern as marginal utility, it just goes in the opposite direction

1. Marginal cost *increases* (instead of *decreases*)
2. Start with the *lowest cost* (instead of the *highest value*)

   f.  Oranges example, cont.

      i.  Now suppose that I'm picking the oranges I'm handing you form a large tree. This time, I start with the lowest cost first.

| ORANGE | COST | ORANGE | COST | ORANGE | COST |
|---|---|---|---|---|---|
| $1^{st}$ | $8 | $5^{th}$ | $12 | $9^{th}$ | $16 |
| $2^{nd}$ | $9 | $6^{th}$ | $13 | $10^{th}$ | $17 |
| $3^{rd}$ | $10 | $7^{th}$ | $14 | $11^{th}$ | $18 |
| $4^{th}$ | $11 | $8^{th}$ | $15 | $12^{th}$ | $19 |

II.   Synthesis

   a.  Suppose instead of giving or handing you the oranges, I sell you them.

      i.  For the first orange, it costs me $8 to get the orange and you are willing to pay $20. Thus there are many opportunities for us to agree on price

      ii.  For the next orange, it costs me $9 and you value it at $19. Again, there are many opportunities to agree on a price (though there are slightly fewer).

      iii.  This continues until the $7^{th}$ orange, where the only price we can agree on is $14.

      iv.  Note if we try to exchange an $8^{th}$ orange, we wouldn't agree on a price.

| ORANGE | UTILITY | COST | ORANGE | UTILITY | COST |
|---|---|---|---|---|---|
| $1^{st}$ | $20 | $8 | $7^{th}$ | *$14* | *$14* |
| $2^{nd}$ | $19 | $9 | $8^{th}$ | $13 | $15 |
| $3^{rd}$ | $18 | $10 | $9^{th}$ | $12 | $16 |
| $4^{th}$ | $17 | $11 | $10^{th}$ | $11 | $17 |
| $5^{th}$ | $16 | $12 | $11^{th}$ | $10 | $18 |
| $6^{th}$ | $15 | $13 | $12^{th}$ | $9 | $19 |

   b.  The key idea behind marginal decision making is that people will engage in an action until marginal benefit equals marginal cost

   c.  Again, the miracle of prices appears. If the price rises, then you will forgo your *least* valuable action. If it falls, then the costliest item doesn't get produced. These socially desirable results emerge without a central planner. Prices solve problems.

III.   Demand

a. The neoclassical framework leads us nicely to the notion of equilibrium—the point at which no one can be better off by changing his or her behavior.
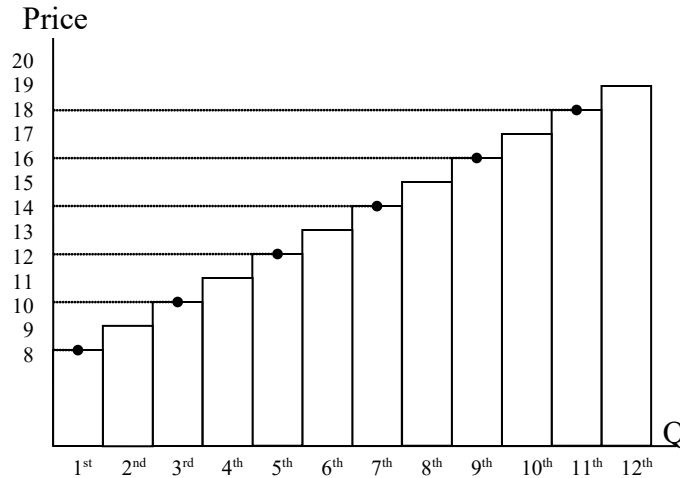    i. This is notably similar to the notion that people act until marginal cost = marginal benefit.

Price



1st  2nd  3rd  4th  5th  6th  7th  8th  9th  10th  11th  12th
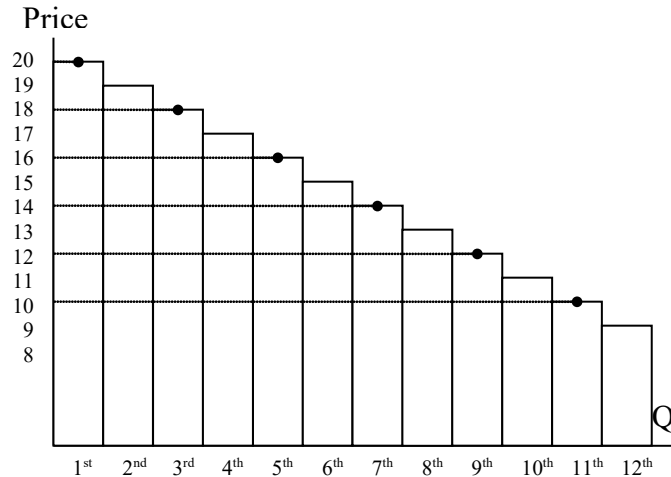
b. Recall from last time when we explored marginal benefit. We can summarize a person's marginal utilities for oranges with a diagram.
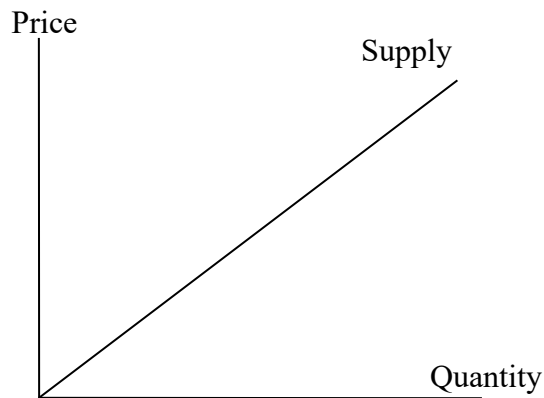
Price



Demand

Quantity
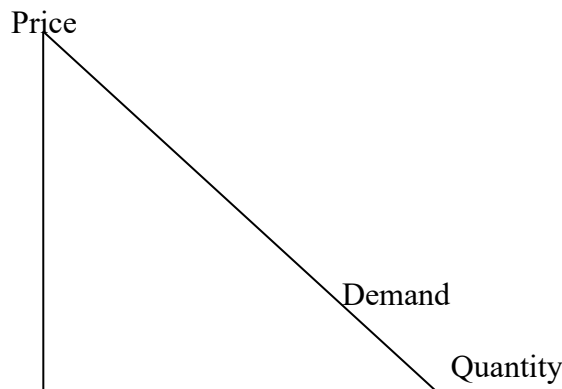
c. Now, instead of focusing on one person, consider *everyone* in the whole of a market, such as the market for socks or chicken. As each person's marginal utility fills the graph, the marginal benefits resemble a line. This is the demand curve.
d. Note how this diagram makes intuitive sense. As the price of something moves in one direction, the quantity people demand will move in the opposite direction. This is called the *Law of Demand*.

IV.  Supply

Price

20
19
18
17
16
15
14
13
12
11
10
9
8

1ˢᵗ  2ⁿᵈ  3ʳᵈ  4ᵗʰ  5ᵗʰ  6ᵗʰ  7ᵗʰ  8ᵗʰ  9ᵗʰ  10ᵗʰ  11ᵗʰ  12ᵗʰ

Q

a. Same goes with MC.

Price

Supply

Quantity

b. And once again we can expand our thinking to the whole a market with all the sellers. Like our previous example, we come up with a smooth line but this time of marginal costs. Economists call this the supply curve.

c. Note how this diagram also makes intuitive sense. As the price of something changes in one direction, the amount people will supply will move in that same direction. This is called the *Law of Supply*.

V. Equilibrium

a. Not surprisingly, the supply and demand curves can be combined into a single diagram. This diagram is perhaps the most important and insight in all of economics. It forms the foundation of much of economic thinking.

Price
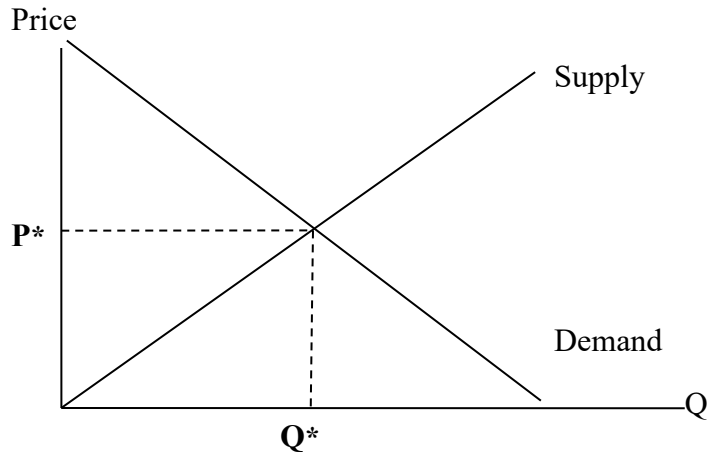


b. Remember that because supply and demand curves also double as marginal cost and marginal benefit curves, the same rules apply: people consume until marginal cost equals marginal benefit. Thus we achieve an equilibrium where **P\*** is the equilibrium price and **Q\*** is the equilibrium quantity.

c. Note that the equilibrium price is the market price, the price that people cannot deviate from nor influence.