

Molecular Gastronomy 1010

What is molecular gastronomy?

What is economics?

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 - ▶ Friendships/love

What is economics *really*?

Theory of human behavior

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 - ▶ Know that cookies actually are valuable, because people buy them.
 - ▶ “People are incentivized by cookies” is a testable *hypothesis*

What are incentives?

Incentives: benefits and cost

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Benefits: what you get

Costs: what you give up

Determinants of choice: example

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- ▶ Probably do think of this, though

Sunk costs

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- ▶ Trying to blame you for their faulty use of theory
- ▶ Economic model can account for this behavior
- ▶ Implicit psychological costs: guilt

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- ▶ Does not mean they do what is “good”
- ▶ Does not mean you would do what they do
- ▶ Does not mean they list out pros and cons of decisions
- ▶ Means they behave in a way that is consistent with *some* set of values

Marginal Analysis

People compare *marginal* benefits and *marginal* costs

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"Should I have one more?"

# of slices	MC	MB
1		
2		
3		
4		
5		
6		
7		
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1	\$2	
2	\$2	
3	\$2	
4	\$2	
5	\$2	
6	\$2	
7	\$2	
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"Should I have one more?"

# of slices	MC	MB
1	\$2	\$4
2	\$2	
3	\$2	
4	\$2	
5	\$2	
6	\$2	
7	\$2	
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# of slices	MC	MB
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2	\$2	\$3
3	\$2	
4	\$2	
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"Should I have one more?"

# of slices	MC	MB
1	\$2	\$4
2	\$2	\$3
3	\$2	\$2.50
4	\$2	
5	\$2	
6	\$2	
7	\$2	
8	\$2	

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4	\$2	\$2
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3	\$2	\$2.50
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5	\$2	\$1.50
6	\$2	\$1
7	\$2	\$.70
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How many slices would you buy?

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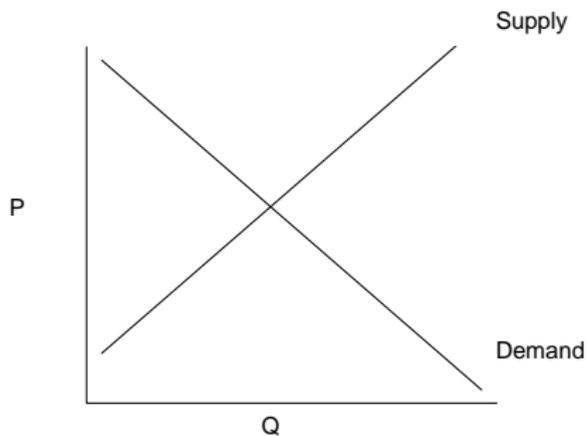
How many slices would you buy?

Would you buy 6 if 6 and 0 were the only options?

Supply and Demand

Supply:

Demand:

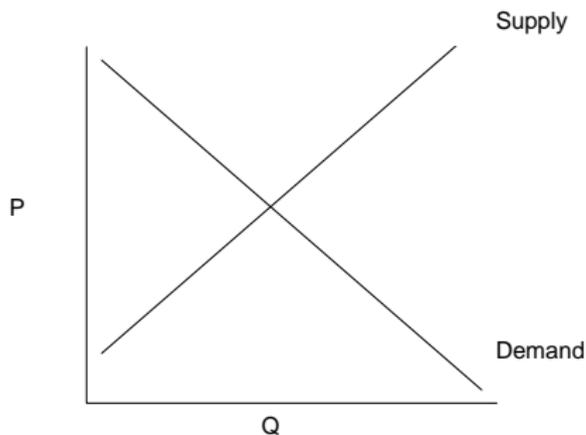


Supply and Demand

Supply:

- ▶ Maximum suppliers willing to provide at given prices

Demand:

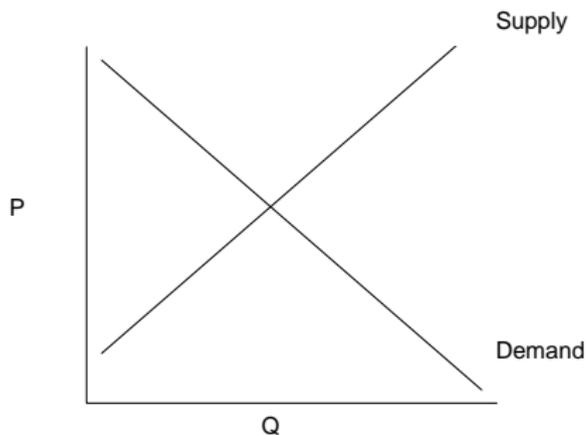


Supply and Demand

Supply:

- ▶ Maximum suppliers willing to provide at given prices
- ▶ Minimum suppliers need to be compensated for given quantity

Demand:

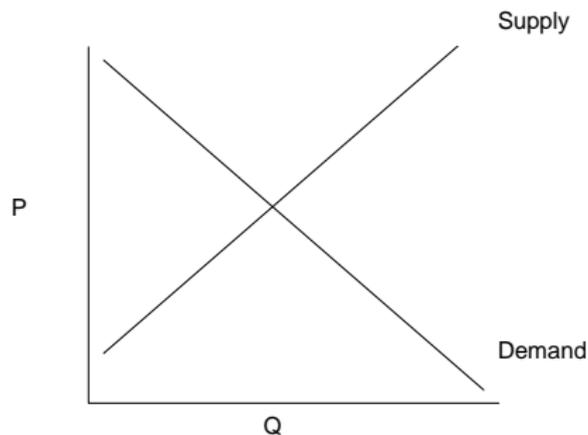


Supply and Demand

Supply:

- ▶ Maximum suppliers willing to provide at given prices
- ▶ Minimum suppliers need to be compensated for given quantity
- ▶ Marginal cost

Demand:



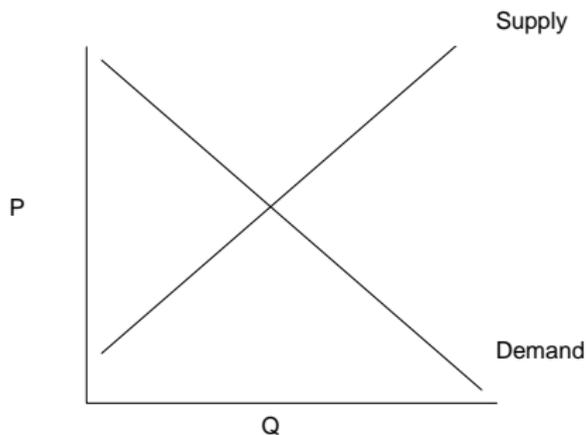
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Demand:

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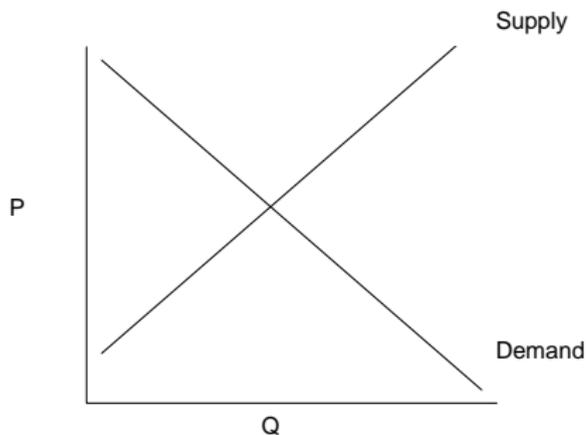
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Demand:

- ▶ Minimum quantity buyers willing to get at given prices
- ▶ Maximum buyers willing to pay for given quantity



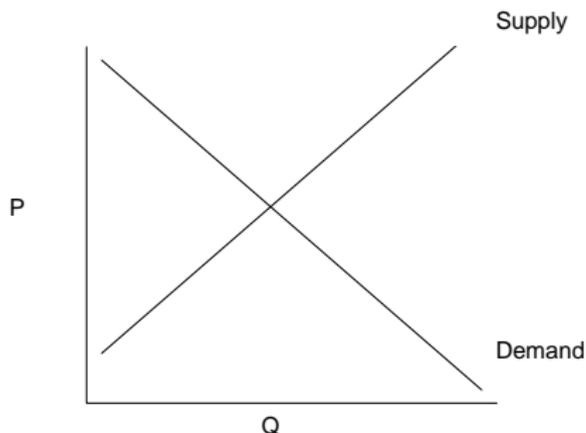
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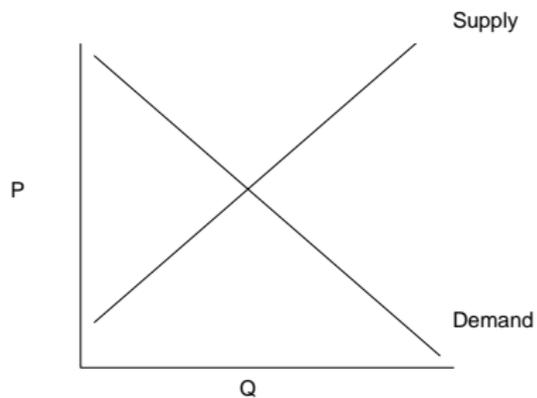
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- ▶ Minimum suppliers need to be compensated for given quantity
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Demand:

- ▶ Minimum quantity buyers willing to get at given prices
- ▶ Maximum buyers willing to pay for given quantity
- ▶ Marginal benefit (marginal value)

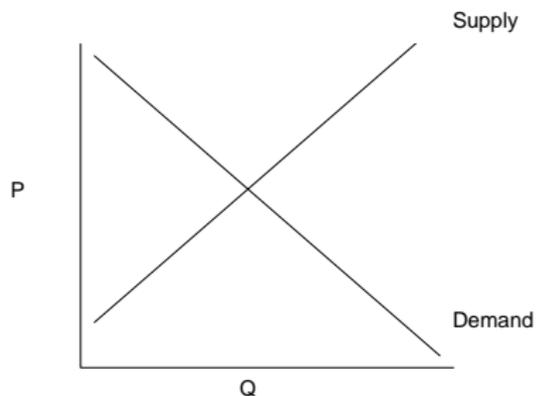


Facts about Supply and Demand



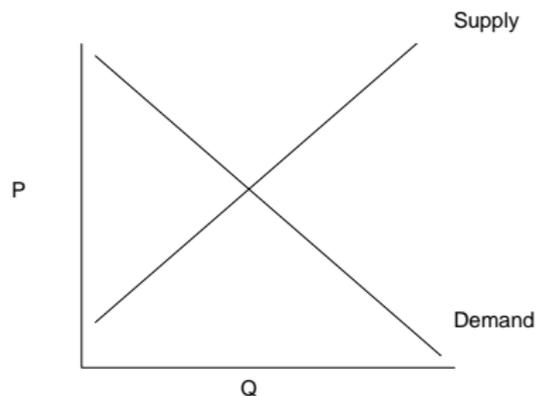
- ▶ Demand slopes down
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Facts about Supply and Demand



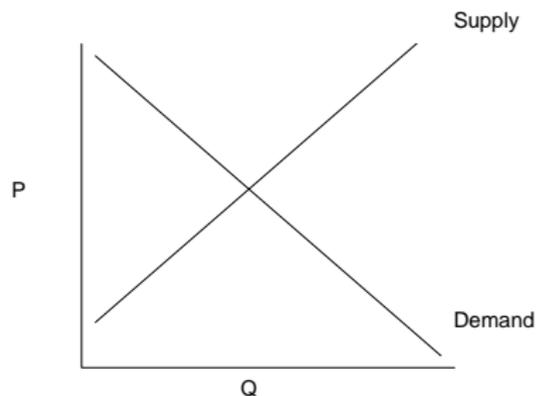
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- ▶ What goes on axes?
- ▶ How much will be consumed?
- ▶ Demand price
- ▶ Supply price

Supply and Demand: numerical example

$$\text{Demand: } P = 10 - Q$$

$$\text{Supply: } P = 2 + Q$$

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$$\text{Equilibrium: } 10 - Q = 2 + Q$$

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$$\text{Demand: } P = 10 - Q$$

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$$\begin{aligned} \text{Equilibrium: } \quad 10 - Q &= 2 + Q \\ \Rightarrow \quad 10 &= 2 + 2Q \end{aligned}$$

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What are the slopes?

Function notation

$$P_D(Q) = 10 - Q$$

$$P_S(Q) = 2 + Q$$

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- ▶ Q : input

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Sometimes do not know exact relationship

Example: $I(r)$

Function notation

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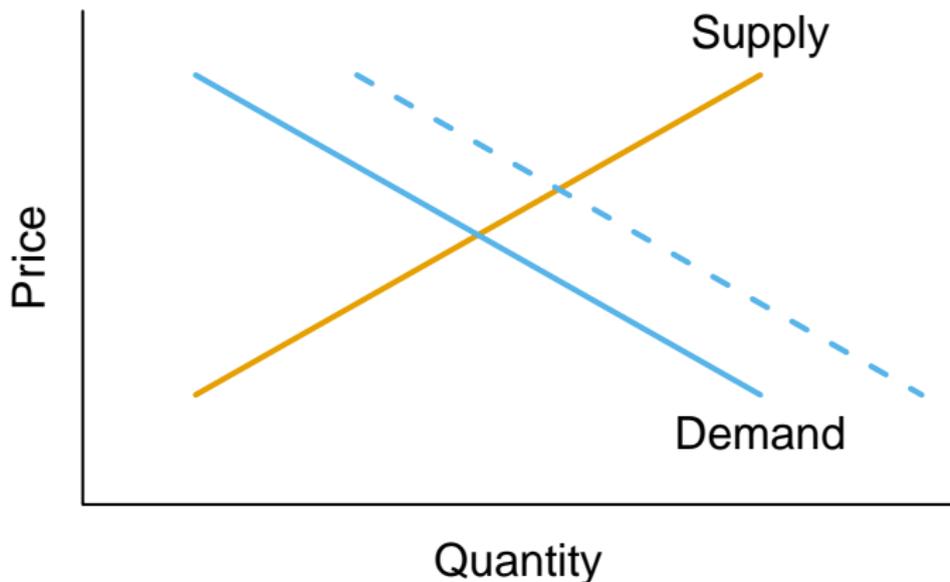
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Example: $I(r)$

Definitions:

- ▶ Demand: $Q(P)$
- ▶ Inverse demand: $P(Q)$

Shifts in curves

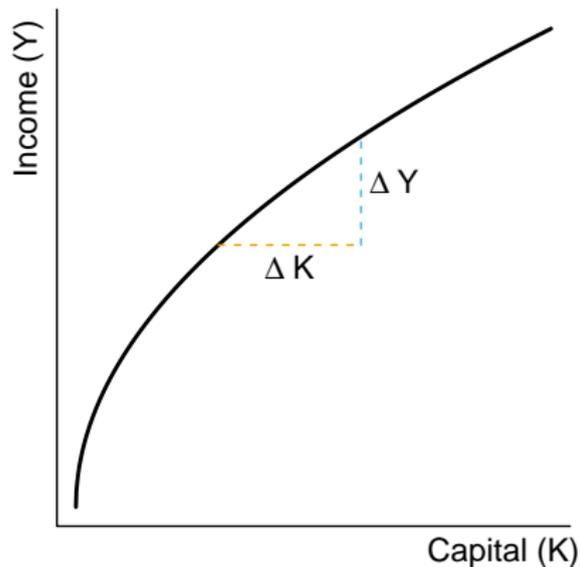


“At any given price, people want to buy more”

“At any given quantity, people are willing to pay more”

More on slopes and marginal analysis

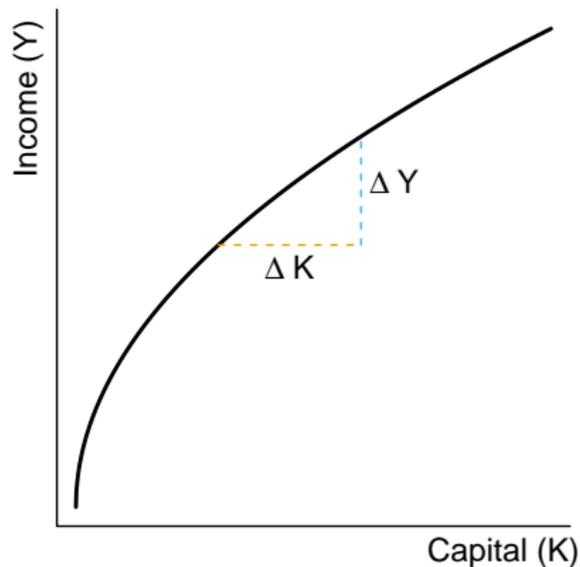
Example: production function: $Y(K)$



More on slopes and marginal analysis

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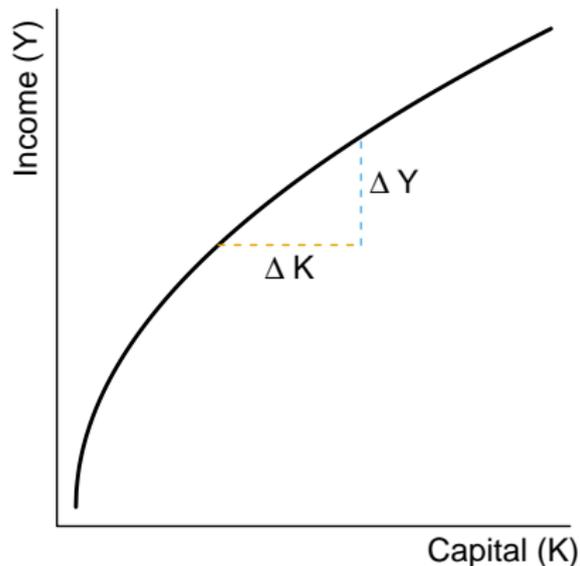
- ▶ “Marginal product of capital”



More on slopes and marginal analysis

Example: production function: $Y(K)$

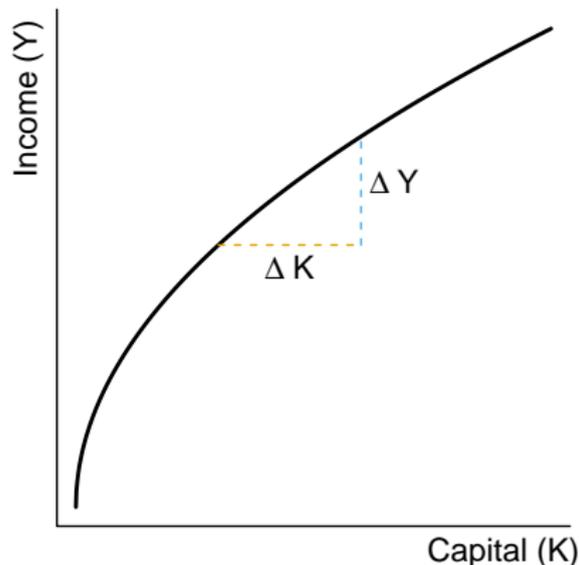
- ▶ “Marginal product of capital”
- ▶ Derivative or slope of the production function



More on slopes and marginal analysis

Example: production function: $Y(K)$

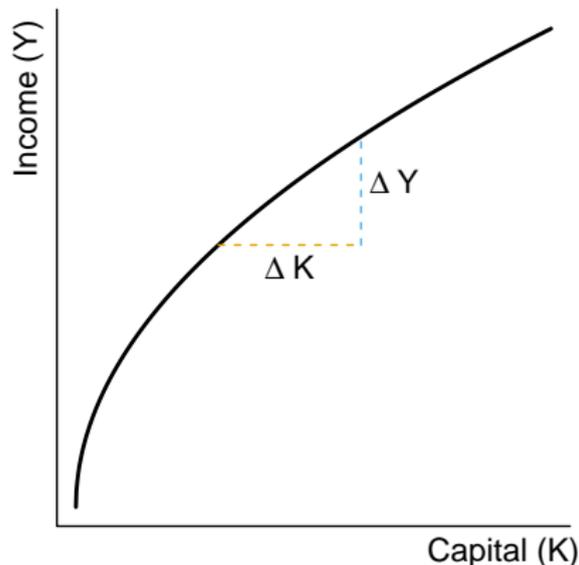
- ▶ “Marginal product of capital”
- ▶ Derivative or slope of the production function
- ▶ $Y'(K) = \frac{dY}{dK} \approx \frac{\Delta Y}{\Delta K}$



More on slopes and marginal analysis

Example: production function: $Y(K)$

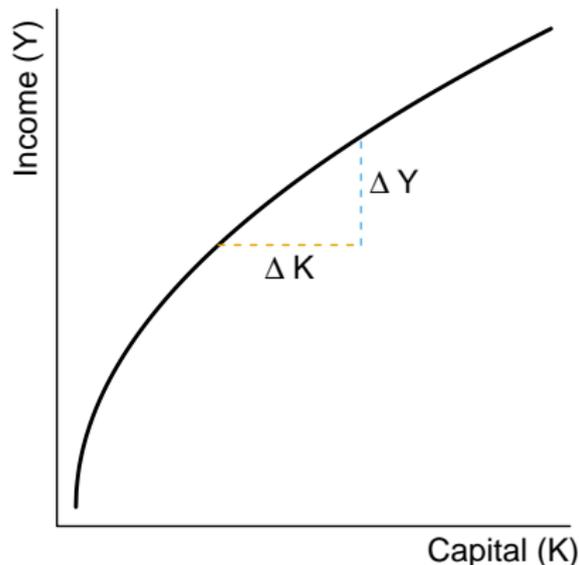
- ▶ “Marginal product of capital”
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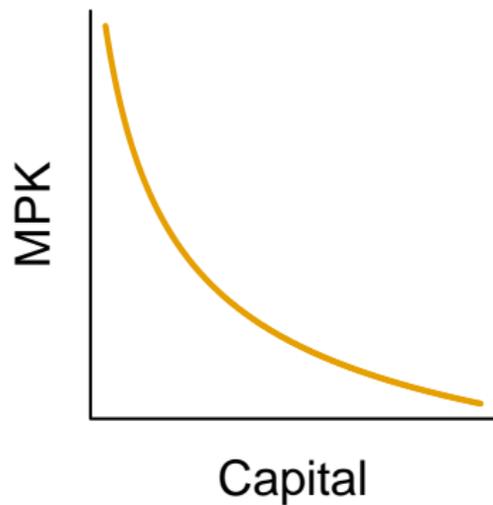
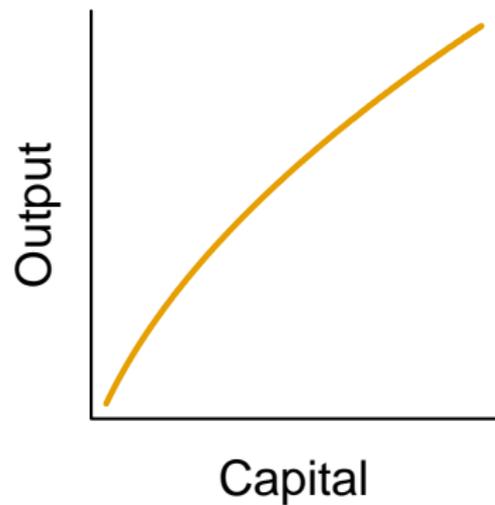
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- ▶ What happens as $\uparrow K$?



More on slopes and marginal analysis



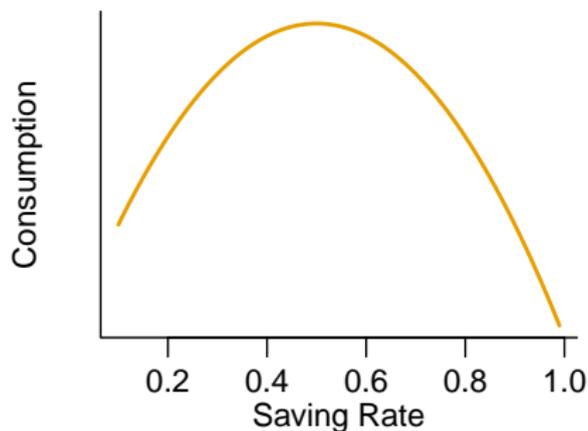
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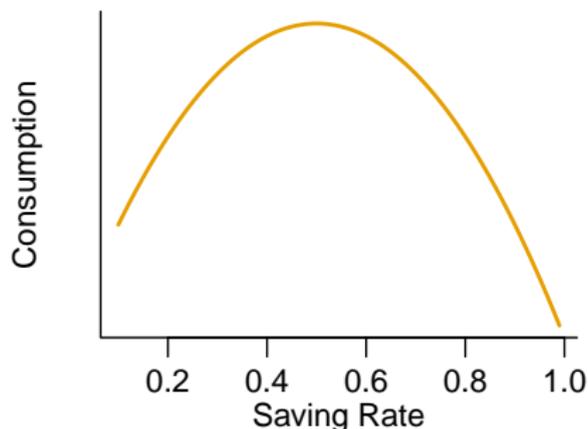
Example: saving more leads to higher consumption (in the long run) unless saving rates get very high



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At the max, the marginal effect of saving on consumption is zero

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The way we deal with not knowing things in economics:

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Model-building errors:

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- ▶ Oversimplification
 - ▶ Ex: Model that only includes demand
 - ▶ Price goes up. I want to buy less, so less is purchased
 - ▶ Problem: price could go up because demand increased.

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