Unit 1
Review
9/30

ECON 323 – MICROECONOMIC THEORY – DR. STRICKLAND

Exam 1: Thursday 10/2

Covers unit 1 (chapters 4, 5, and part of 2)

Multiple choice

- Mix of conceptual and math problems

What you need to bring

- Calculator that can handle exponents
- Pencil
- TAMU Student ID

What will be provided

- Exam booklet
- Gradescope scantron

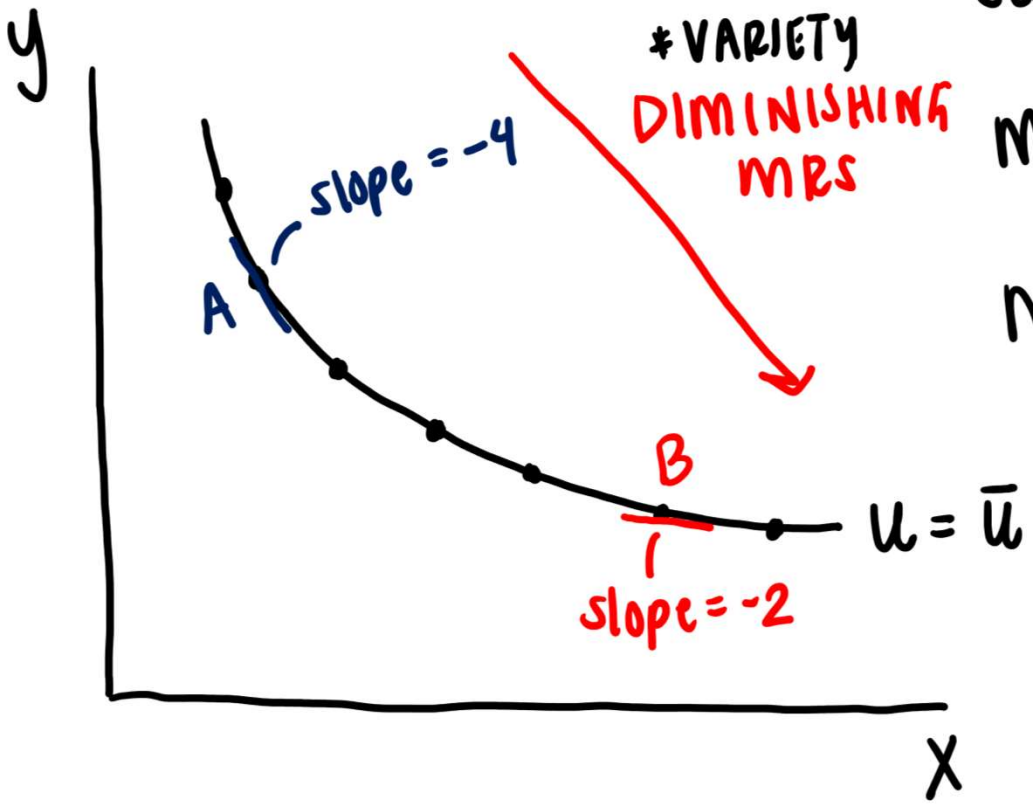
Consumer preferences

What assumptions do we make about consumer preferences?

We represent preferences mathematically with **utility functions**

- Utility functions determine the shape of **indifference curves**

Indifference curves



$$\text{SLOPE IC} = \frac{\Delta y}{\Delta x}$$

$$MRS_{xy} = -\frac{\Delta y}{\Delta x}$$

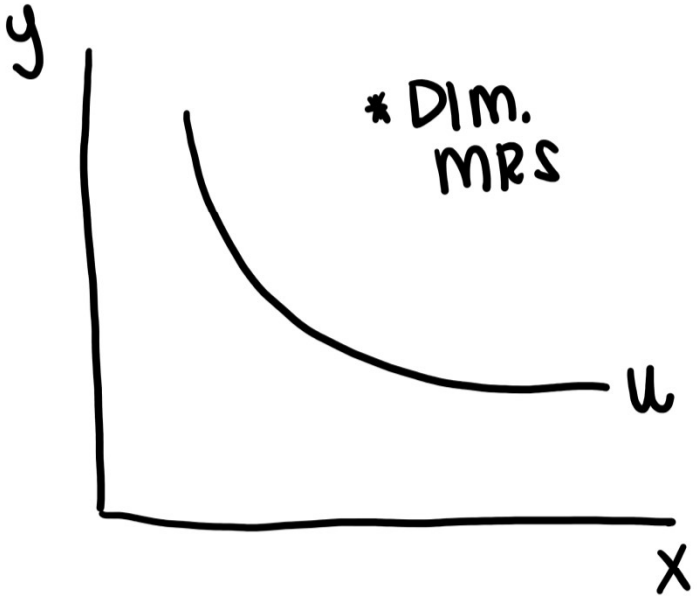
$$MRS_{xy} = \frac{MU_x}{MU_y}$$

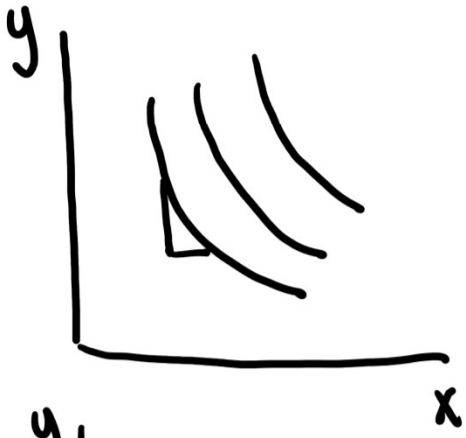
WILL TRADE 1 UNIT OF X AND MRS_{xy} UNITS OF y & KEEP u CONSTANT

ex. $MRS_{xy} = 4$

Cobb-Douglas (imperfect substitutes)

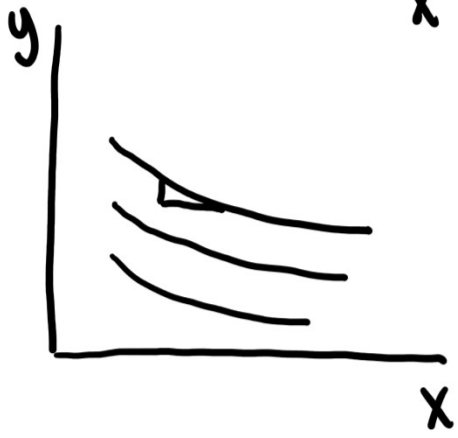
$U = x^a y^b$





REL. PREF X

$a > b$



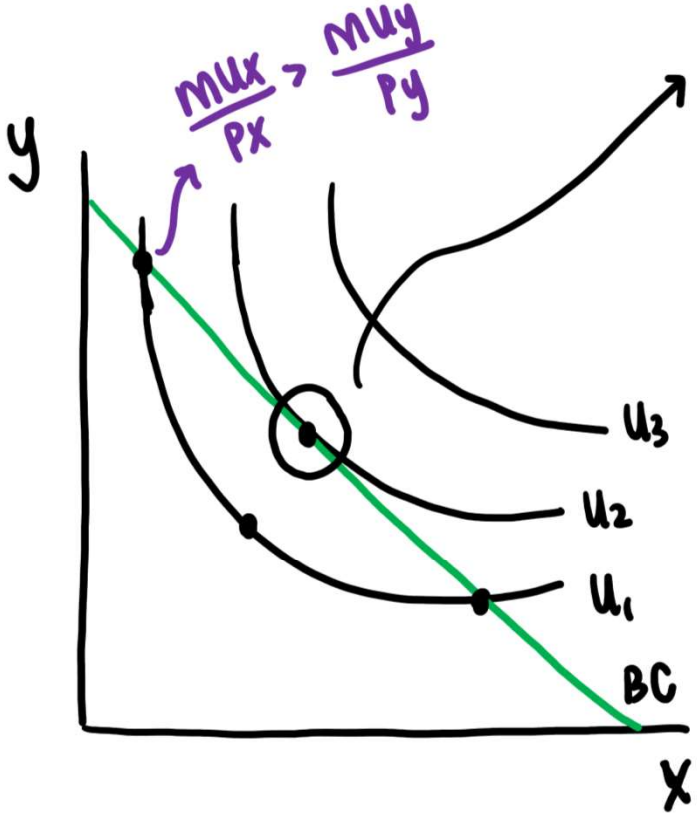
REL. PREF y

$a < b$

Consumer choice with Cobb-Douglas

(IMPERFECT SUBS)

Consumers **maximize utility** subject to their **budget**



[TANGENCY CONDITION]

slope IC = slope BC

$$-MRS_{xy} = -\frac{P_x}{P_y}$$

$$MRS_{xy} = \frac{P_x}{P_y}$$

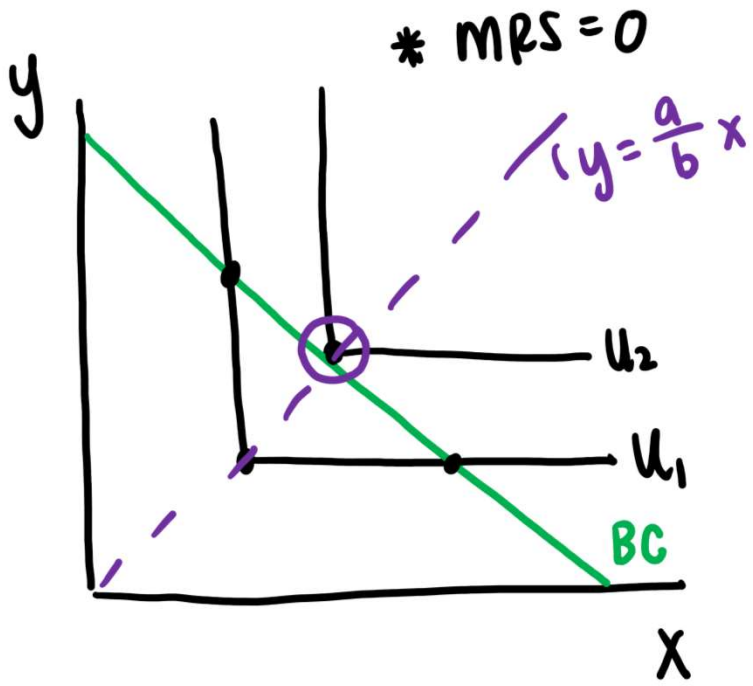
$$\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

TO SOLVE:

1. TANG. COND. GIVES OCR ($y = \_\_ x$)
2. PLUG OCR INTO BC & SOLVE FOR X^*
3. PLUG X^* INTO OCR & SOLVE FOR y^*

Perfect complements & choice



$U = \min\{ax, by\}$

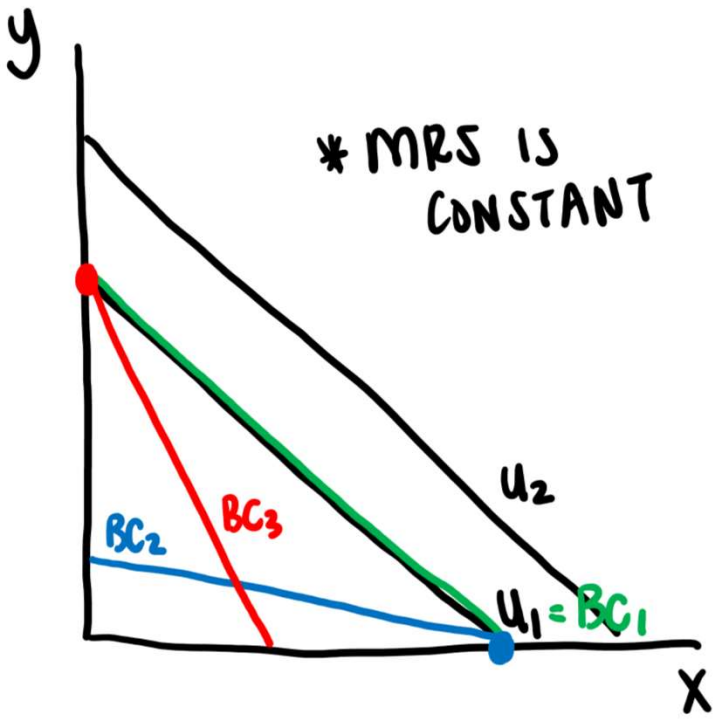
TO SOLVE:

① FROM UTIL. FCN: $ax = by$
GIVES OCR: $y = \frac{a}{b}x$

② PLUG OCR IN BC TO GET x^*

③ PLUG x^* IN OCR TO GET y^*

Perfect substitutes & choice



$U = ax + by$

TO SOLVE:

① CHECK TANG. COND. W/

$\frac{MU_x}{P_x}$ vs. $\frac{MU_y}{P_y}$

Income & choice

* SHIFTS IN BC

* INCOME ELASTICITY

$$\varepsilon_I = \frac{\%\Delta Q_D}{\%\Delta I} = \underbrace{\frac{\Delta Q_D}{\Delta I}}_{\text{INCOME EFFECT}} \cdot \frac{I_{-OLD}}{Q_{D\,-OLD}}$$

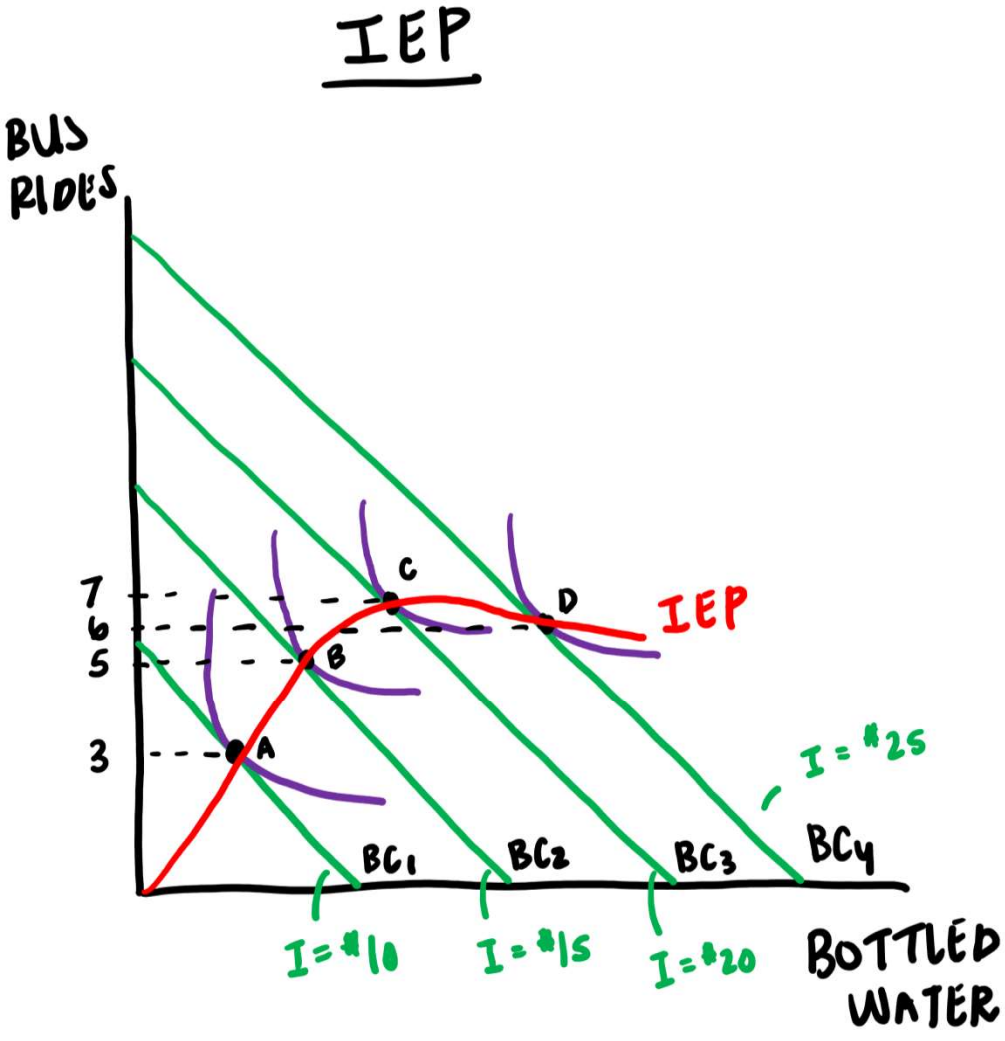
NORMAL: $\varepsilon_I \geq 0$

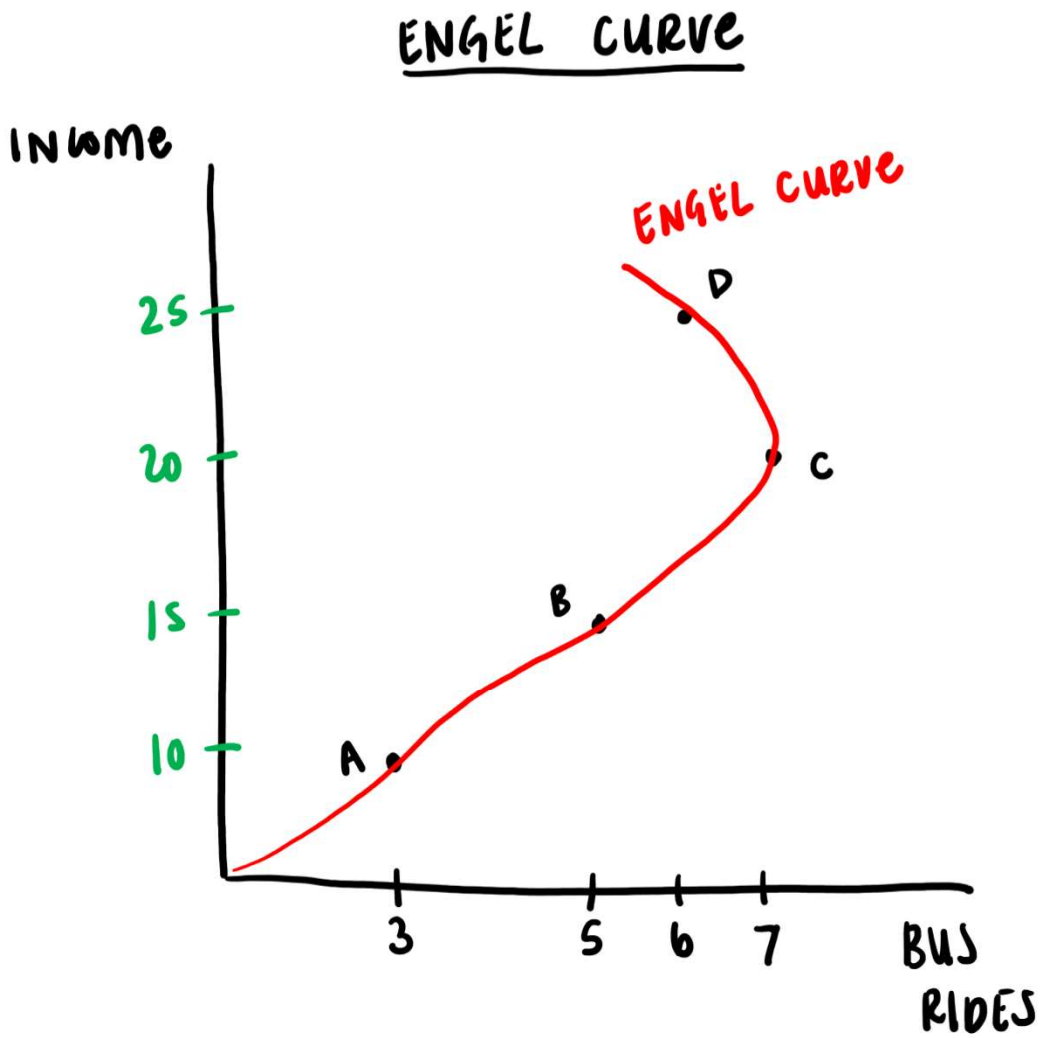
↳ NECESSITY $0 \leq \varepsilon_I \leq 1$

↳ LUXURY $\varepsilon_I > 1$

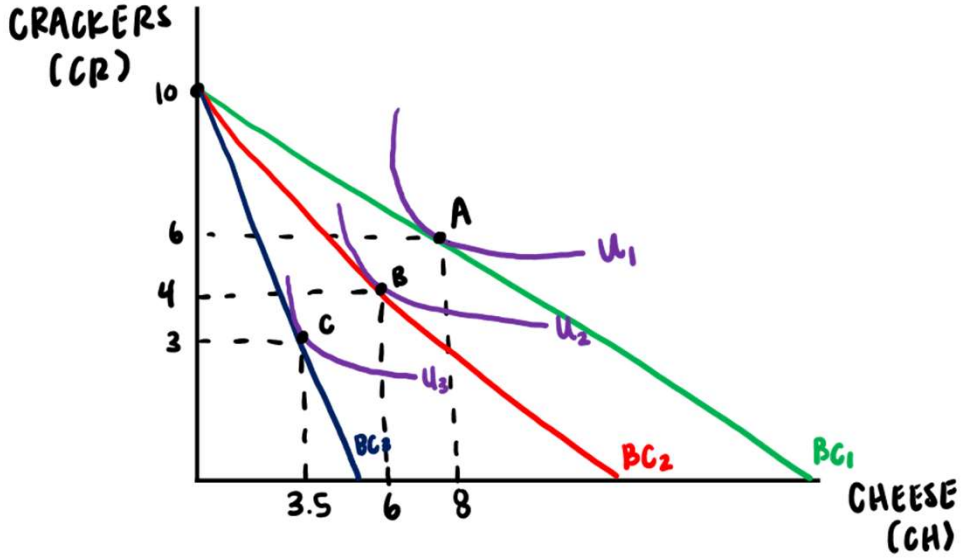
INFERIOR: $\varepsilon_I < 0$

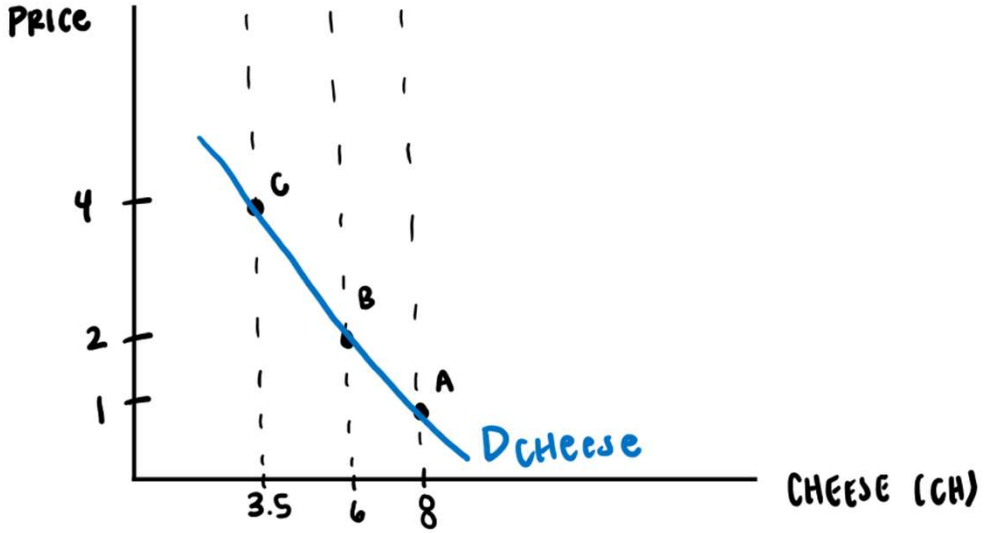
Income & choice



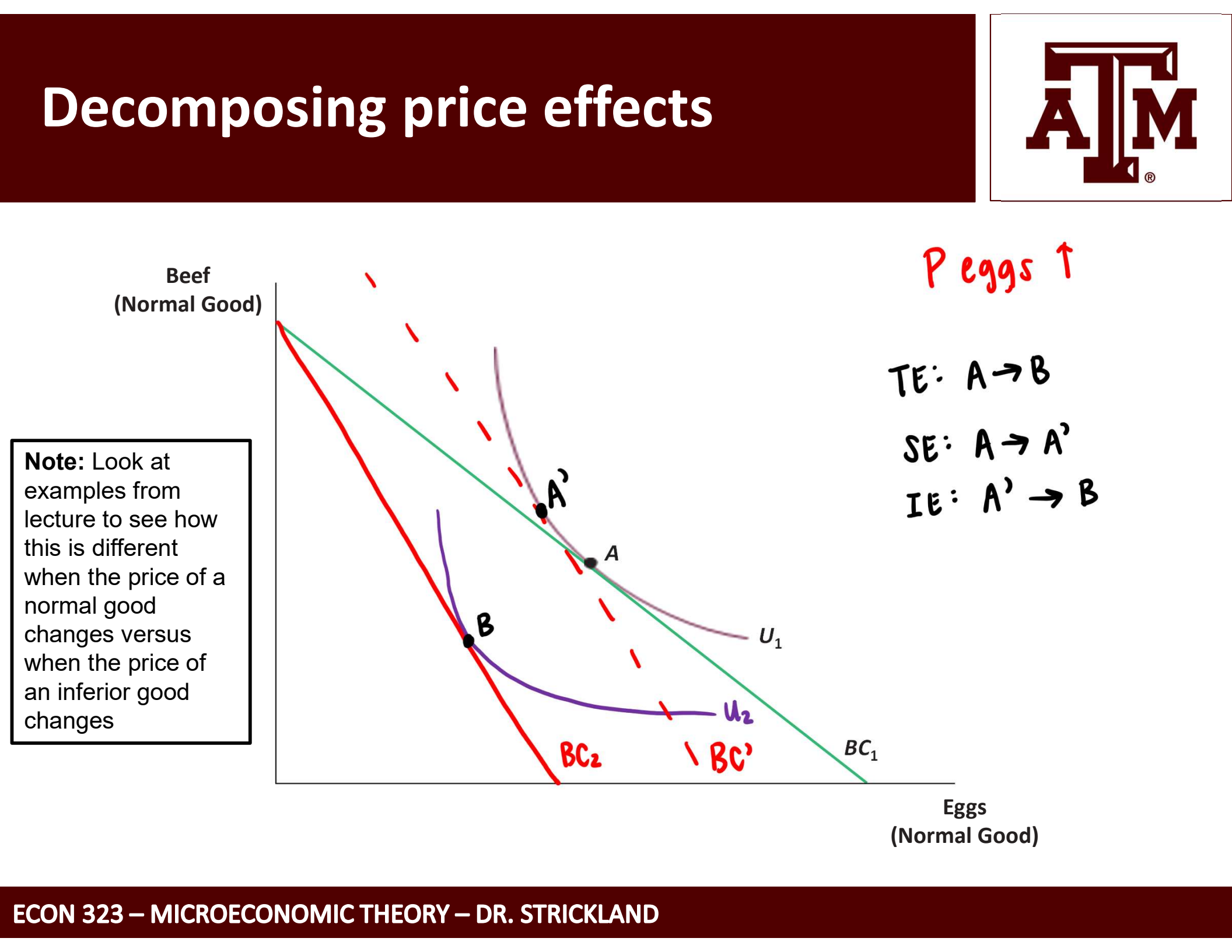


Price & choice





Decomposing price effects



Note: Look at examples from lecture to see how this is different when the price of a normal good changes versus when the price of an inferior good changes

Decomposing price effects

TO SOLVE

NEED: ORIG. BUNDLE, NEW BUNDLE, SUB BUNDLE

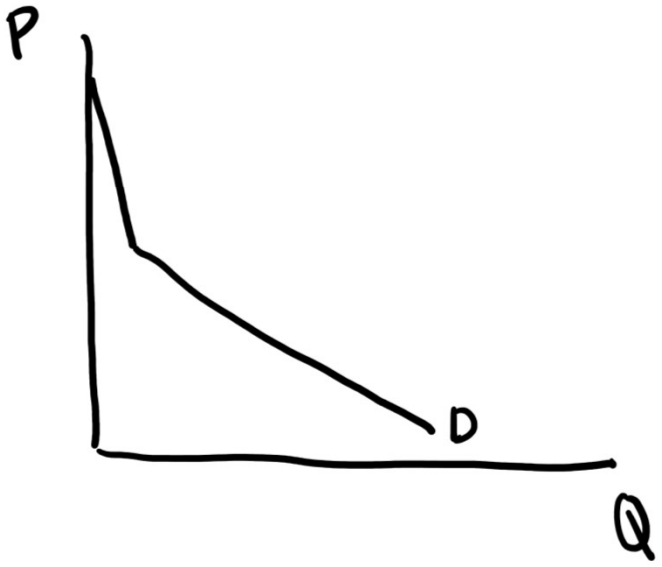
0. FIND ORIG BUNDLE (UMP w/ ORIG. PRICES)
1. FIND NEW BUNDLE (UMP w/ NEW PRICE)
2. FIND SUB BUNDLE (NEW PRICE, ORIG. UTILITY)
   - (i) TANG. CONDITION w/ NEW PRICES => OCR
     * SAME OCR AS NEW BUNDLE
   - (ii) PLUG OCR INTO U FUNCTION
     * U = ORIG U LEVEL
   - (iii) PLUG (ii) INTO OCR
3. CALC EFFECTS

Note: Consider how you would solve this problem if you started at different steps. What information would have to be given to you in the problem?

Individual & market demand

$$Q^D_{MKT} = Q^D_1 + Q^D_2 + Q^D_3 + \ldots$$

Note: What are the determinants of demand? What affects quantity demanded? What affects demand?



DEMAND: $Q = f(P)$

INVERSE DEMAND: $P = f(Q)$

Price elasticity of demand

$$\varepsilon_D = \frac{\%\Delta Q_D}{\%\Delta P} = \frac{\Delta Q_D}{\Delta P} \cdot \frac{P_{-old}}{Q_{D\,-old}}$$

* BTWN 2 PRICES

$$\varepsilon_D = \frac{1}{\text{slope}} \cdot \frac{P}{Q_D}$$

* AT A PRICE

Cross-price elasticity of demand

$$\varepsilon^{D}_{xy} = \frac{\%\Delta Q_{Dx}}{\%\Delta P_y} = \frac{\Delta Q_{Dx}}{\Delta P_y} \cdot \frac{P_y}{Q_{Dx}}$$

< 0 : COMPS

> 0 : SUBS

$= 0$: UNRELATED