Consumer Theory

- How do consumers make choices?
- How do consumers react to changes in the world around them?

Rational Choice Model

- Decisions by consumers are based on 2 things:
  - Preferences
    What do people want?
  - ✓ Budgets
    what people can afford

What is a model?

- A collection of assumptions
- assumptions are combined to make predictions about the "real world"
- Predictions are only as good as our assumptions
  - If our assumptions are bad, our predictions will (probably) be bad too!

Problem

All assumptions are false!

- The accuracy of our model depends on the accuracy of assumptions
- There is no "scientific" way to test assumptions

Budget constraints

Example

2 goods: Tacos & Beer

b: # of beers you drink

t: # of tacos

P_b: price of beer

P_t: price of tacos

Total expenditure:

$$P_b b + P_t \cdot t = \text{expenditure}$$

$P_b = \$4$

$P_t = \$2$

you have \$40 in your pocket

$$4b + 2t \leq 40$$

total expenditures must be less than your budget

Suppose you have 5 tacos. How much beer can you buy?

$40 - 2 \cdot 5 = \$30$ left over

$\frac{30}{4} = 7.5$ beers

$$\rightarrow b = \frac{40 - 2t}{4}$$

In general:

- 2 goods: 1 and 2
- Quantity of good 1 consumed is x_1
- Quantity of good 2: x_2
- Prices: P_1 and P_2
- income: m

All variable measured per unit of time

ie dollars per hour
in wages
beers per night

Define: (x_1, x_2) is
a consumption bundle
- the amount of stuff
we are consuming

We say a consumption
bundle is affordable
if:

$$\underbrace{P_1 X_1 + P_2 X_2 \leq m}_{\text{budget constraint}}$$

Example

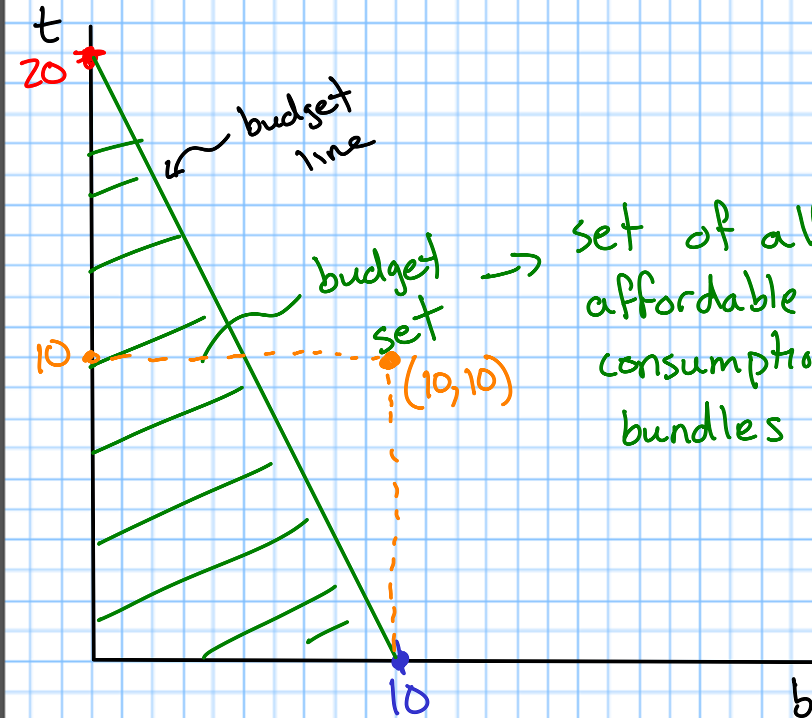
$P_b = 4$, $P_t = 2$, $m = 40$

- Suppose we spend all of our income on b. How much can we consume?

$t=0$, $b = \frac{m}{P_b} = \frac{40}{4} = 10$

- Suppose we spend everything on t:

$b=0$, $t = \frac{m}{P_t} = \frac{40}{2} = 20$



→ set of all affordable consumption bundles

Is $(10,10)$ affordable?

$$10 \cdot 2 + 10 \cdot 4 = 20 + 40$$
$$= 60 > 40$$

Budget line

$$p_1 x_1 + p_2 x_2 = m$$

Any bundle on the budget line uses all of our income

expenditures = income

Let's express x_2 as a function of x_1

$$x_2 = x_2(x_1)$$

Solve for x_2:

$$p_1 x_1 + p_2 x_2 = m$$
$$p_2 x_2 = m - p_1 x_1$$
$$x_2 = \frac{m}{p_2} - \frac{p_1}{p_2} x_1$$
$$x_2(x_1) = \frac{m}{p_2} - \frac{p_1}{p_2} x_1$$

Given x_1, how much x_2 can we buy?

- Let's suppose we are consuming (x_1, x_2) and we decide to increase our consumption of x_1 by 1 unit. How much x_2 do we need to give up?

$\rightarrow$ $-p_1/p_2$

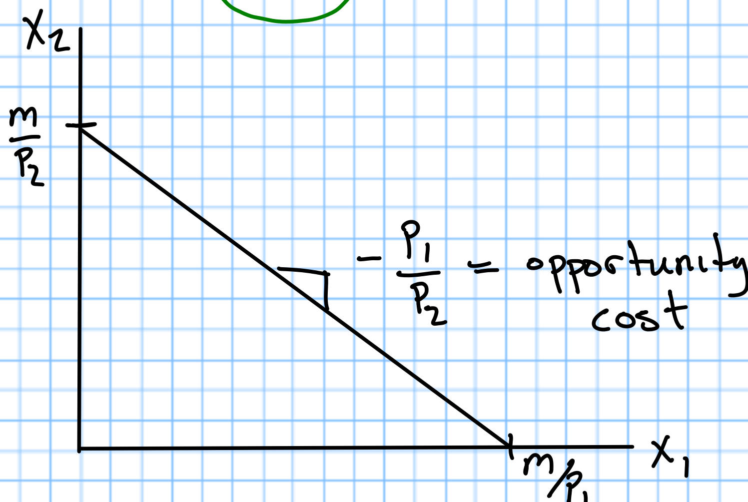
$-\frac{p_1}{p_2}$ is the opportunity cost of x_1 in terms of X_2

$$X_2(X_1) = \frac{m}{P_2} - \frac{P_1}{P_2} X_1$$

- What is the slope of this function?

$y = mx + b$

$\rightarrow -\frac{P_1}{P_2}$

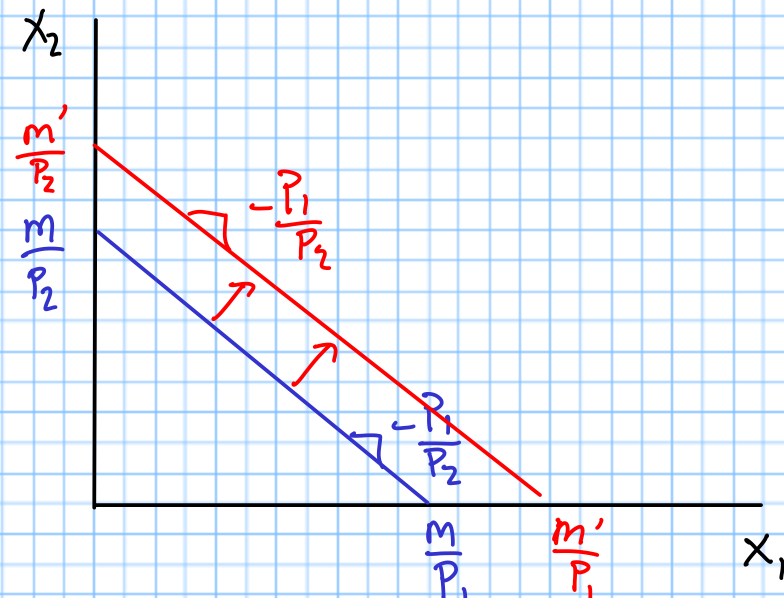


Income Changes

$$P_1 X_1 + P_2 X_2 = m$$

Suppose m increases to $m' > m$

m' is a number, different than m

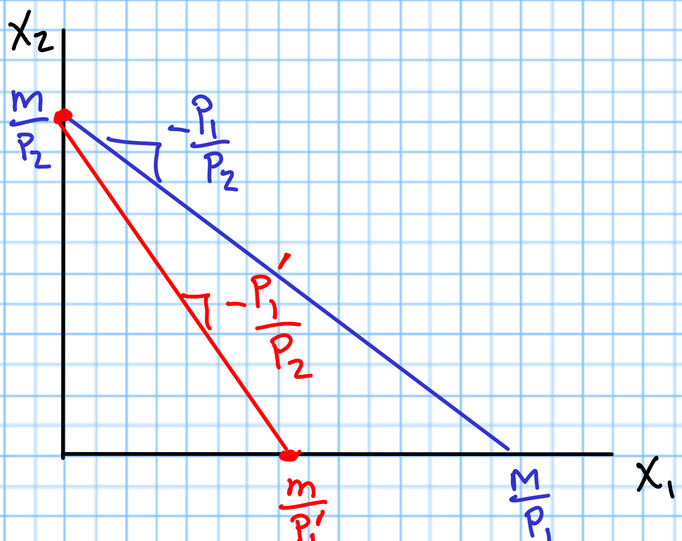


- Changes in income don't affect opportunity costs
- Slope remains the same, budget line shifts

Price Changes

$$P_1 X_1 + P_2 X_2 = m$$

Suppose P_1 increases to P_1'



- Opportunity costs change
- The budget set gets smaller

Example

Suppose P_1 and P_2 increase by a factor of t

$$P_1' = tP_1$$

$$P_2' = tP_2 \quad , \quad t > 1$$

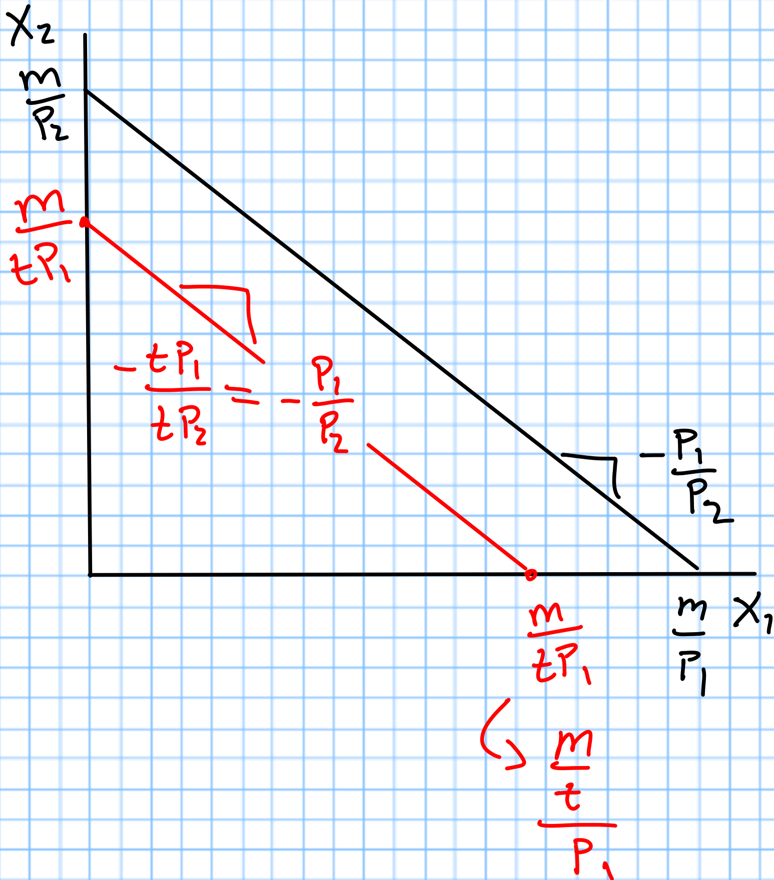
$$P_1 X_1 + P_2 X_2 = m$$

$$tP_1 X_1 + tP_2 X_2 = m$$

$$t(P_1 X_1 + P_2 X_2) = m$$

$$P_1 X_1 + P_2 X_2 = \frac{m}{t}$$

$$\frac{m}{t} < m$$



Suppose P_1, P_2, m increase by t (inflation)

$$P_1 x_1 + P_2 x_2 = m$$

$$tP_1 x_1 + tP_2 x_2 = tm$$

$$\cancel{t}(P_1 x_1 + P_2 x_2) = \cancel{t} m$$

$$P_1 x_1 + P_2 x_2 = m$$

Nothing changes!