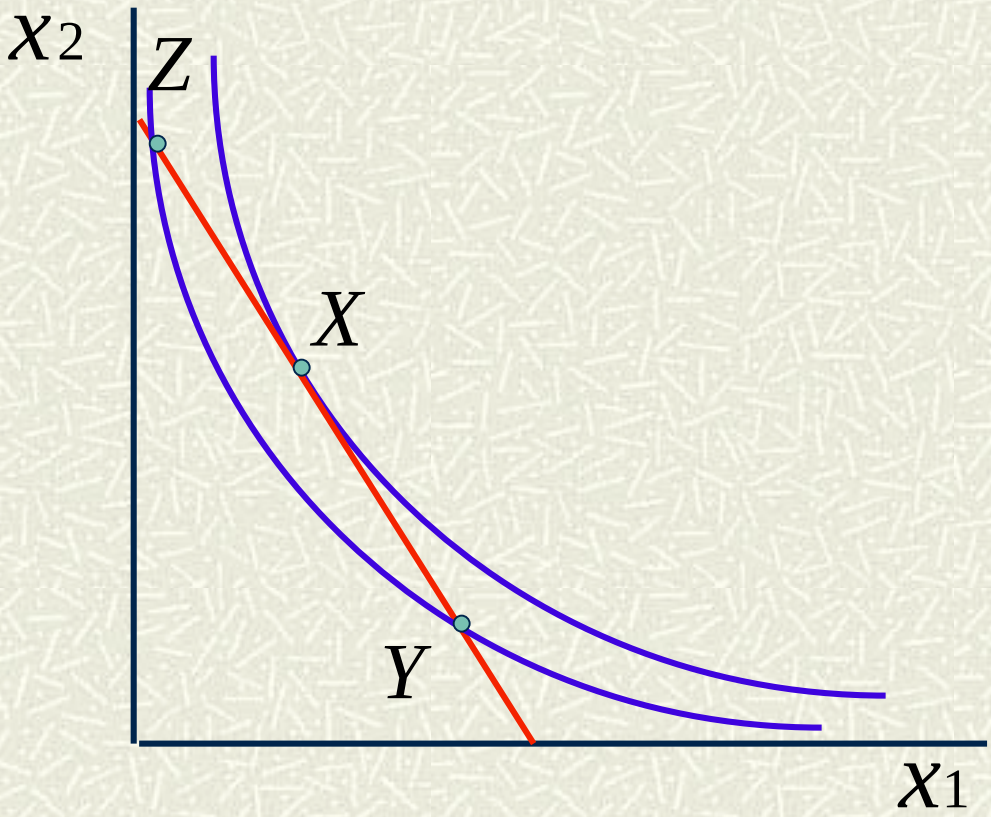
Choice Continued

Interpretation



- At Z:

$$\frac{p_1}{p_2} < -MRS(x_1, x_2)$$

- At Y:

$$\frac{p_1}{p_2} > -MRS(x_1, x_2)$$

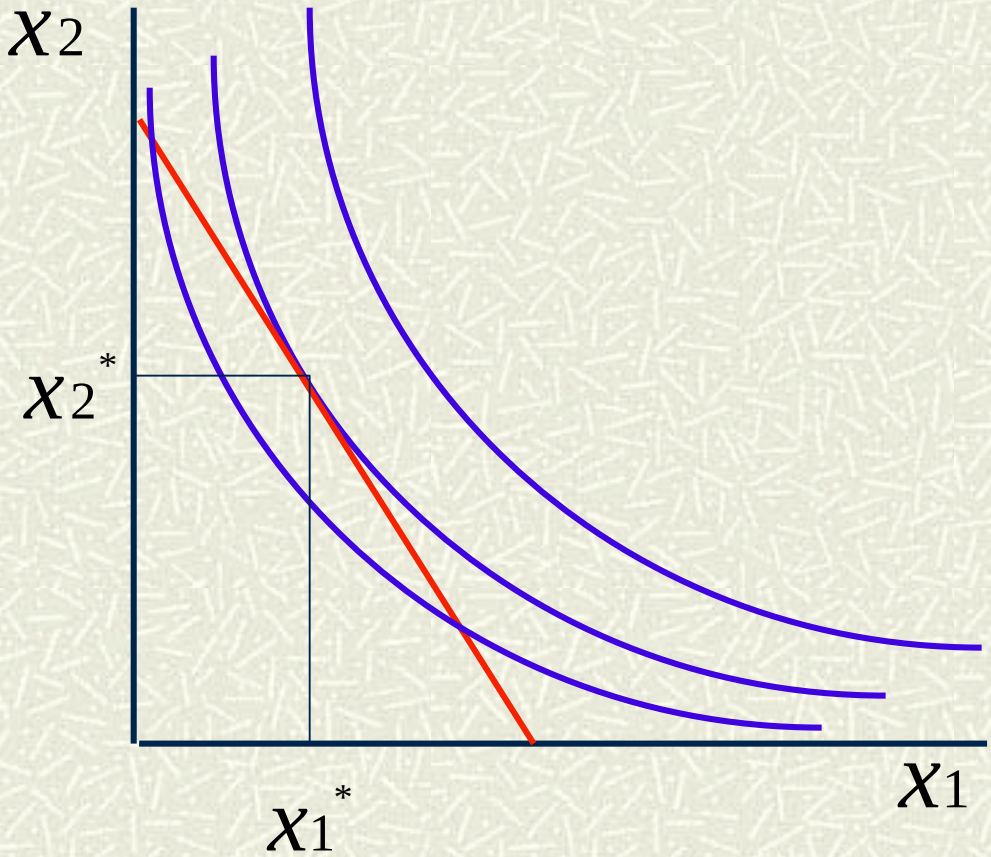
Consumer Demand

- Consumer's **demanded bundle**: optimal choice of goods 1 and 2 for given prices and income.
- Consumer's **demand functions**:

$$x_1 = x_1(p_1, p_2, m)$$

$$x_2 = x_2(p_1, p_2, m)$$

Cobb-Douglas



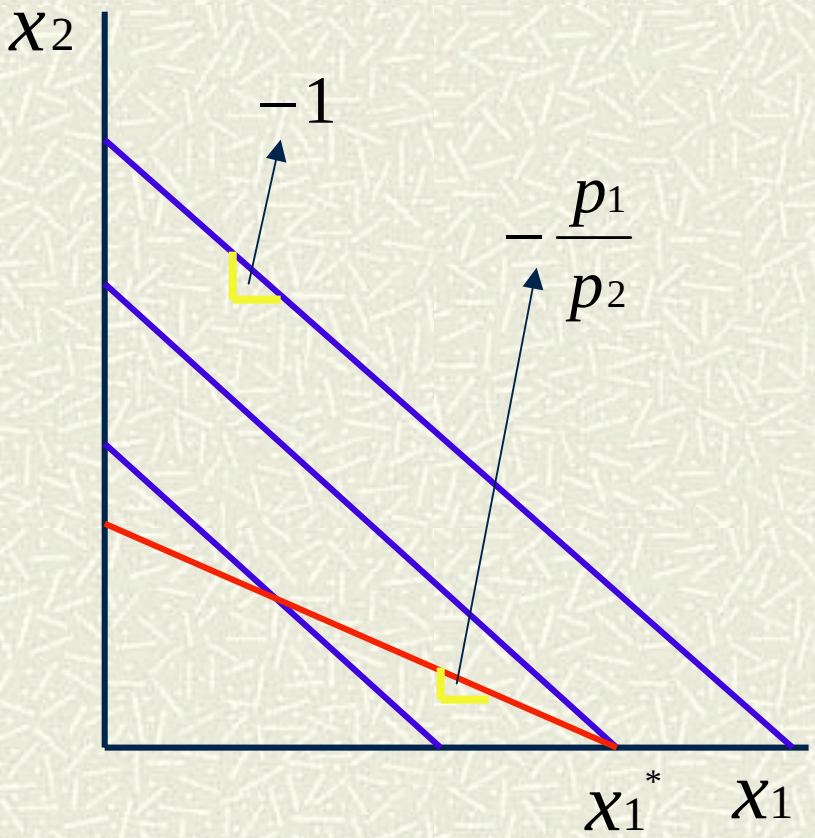
- Demand function for good 1:

$$x_1 = c\frac{m}{p_1}$$

- Demand function for good 2:

$$x_2 = (1-c)\frac{m}{p_2}$$

Perfect Substitutes



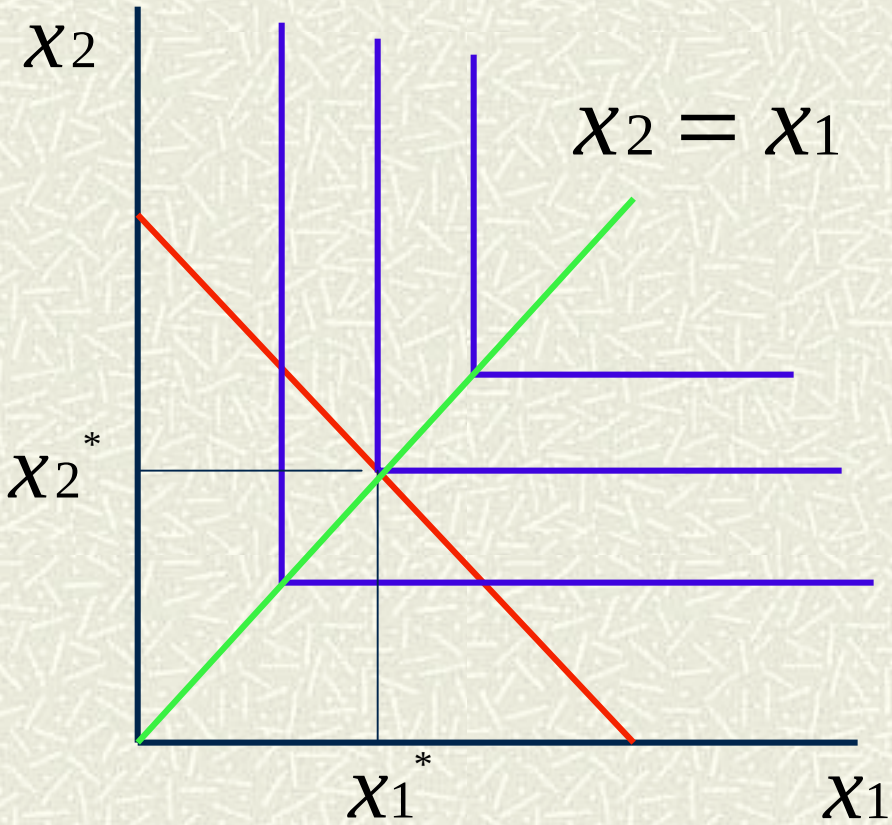
- Demand function for good 1:

$$x_1 = m / p_1 \quad \text{if } p_1 < p_2$$

$$x_1 = 0 \quad \text{if } p_1 > p_2$$

$$x_1 = (0, m / p_1) \quad \text{if } p_1 = p_2$$

Perfect Complements



- Optimal choice: $x_2 = x_1$
- Budget line:

$$p_1 x_1 + p_2 x_2 = m$$

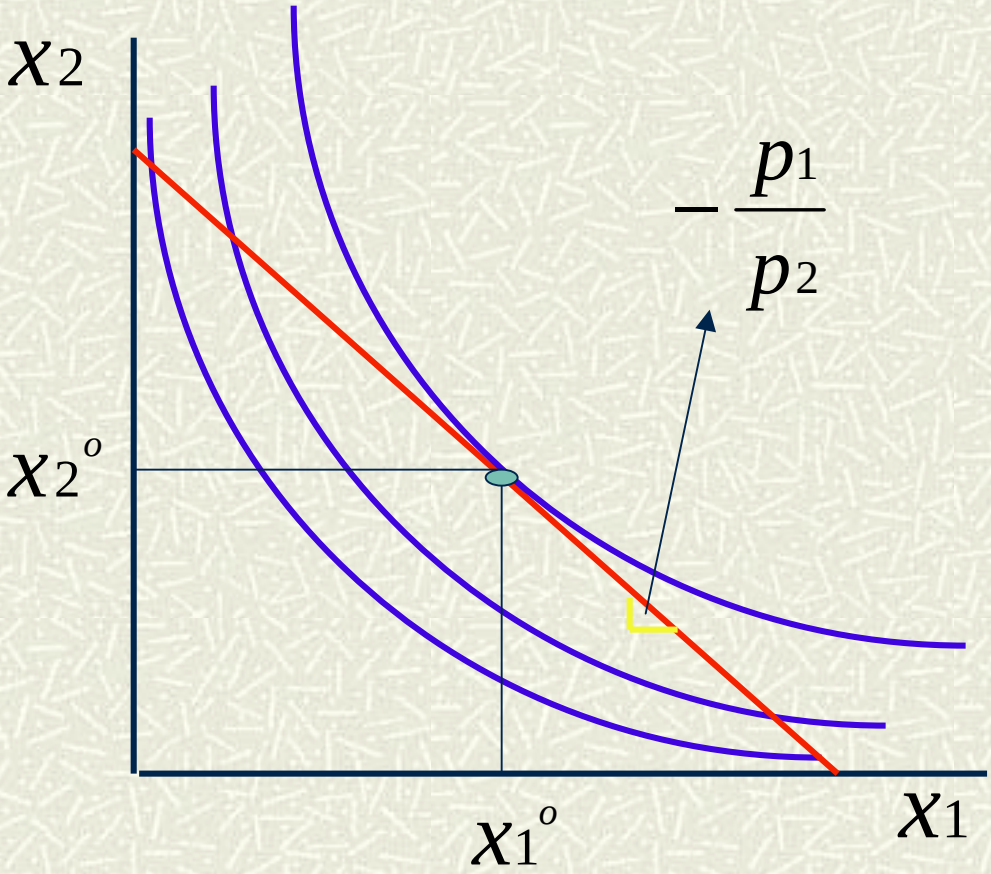
- Demand function for goods 1 and 2:

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

Example: Choosing a Tax

Q: Suppose that the government wants to raise a certain amount of revenue. Is it better to raise it via a **quantity** tax or an **income** tax?

Before the Tax



- Budget line:

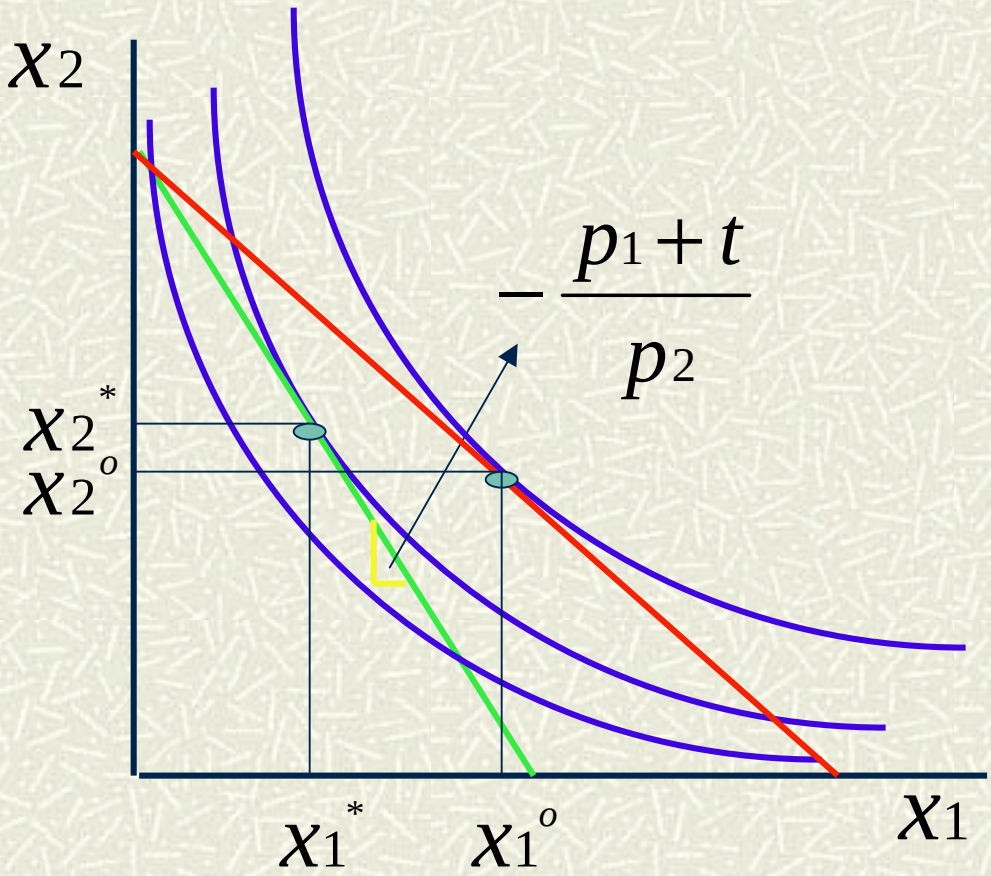
$$p_1 x_1 + p_2 x_2 = m$$

- Well-behaved preferences

- Consumer chooses:

$$\left(x_1^o, x_2^o\right)$$

Quantity Tax



- Budget line with quantity tax:

$$(p_1+t)x_1+p_2x_2=m$$

- Tax revenues:

$$R^*=tx_1^*$$

Income Tax

New budget line:

$$p_1 x_1 + p_2 x_2 = m - R^*$$

where

$$R^* = t x_1^*$$

Questions

- Q1: What is the slope of the budget line with the income tax?
- Q2: Which kind of tax is **this** income tax?
- Q3: Can the consumer afford X^* when he is paying the income tax?

Answers

- A1: Slope of the budget line with income tax is:

$$-\frac{p_1}{p_2}$$

- A2: Lump-sum.

A3: Yes. X^* Is still Affordable

- Budget line with income tax:

$$p_1 x_1 + p_2 x_2 = m - t x_1^*$$

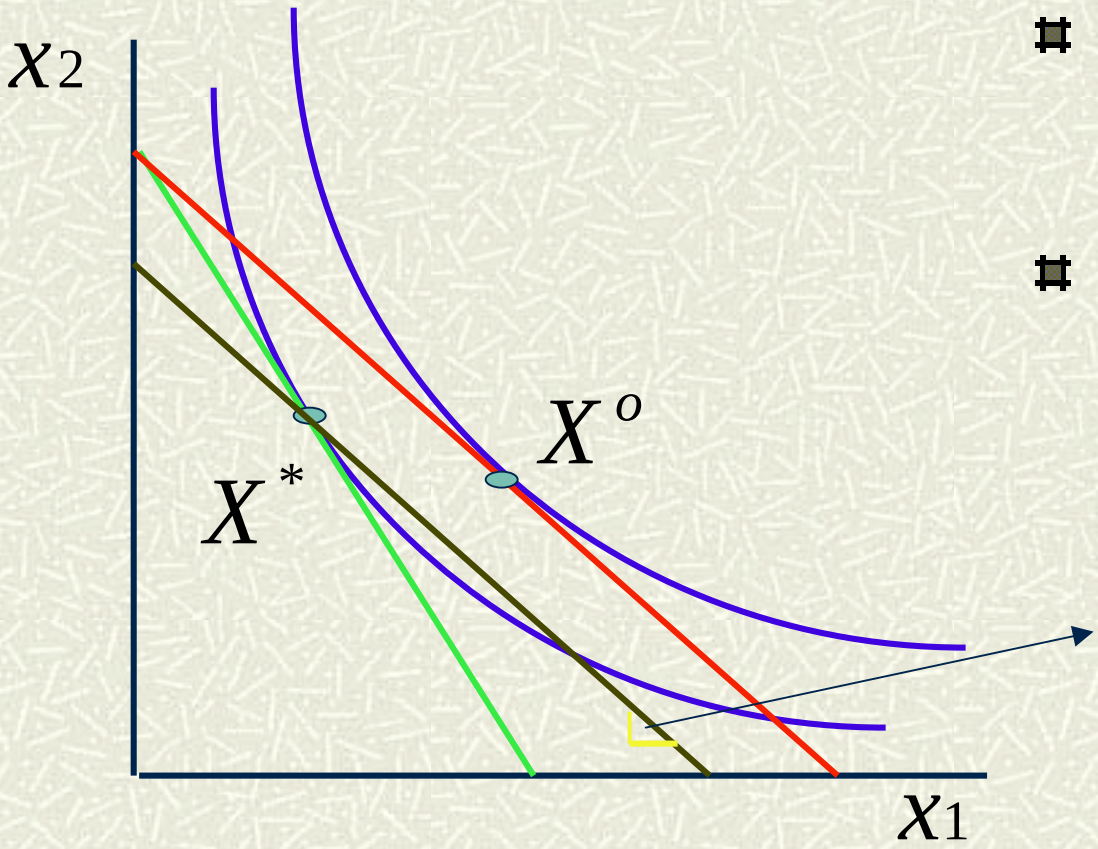
- Substitute X^*:

$$p_1 x_1^* + p_2 x_2^* = m - t x_1^*$$

- Rearrange:

$$(p_1 + t) x_1^* + p_2 x_2^* = m$$

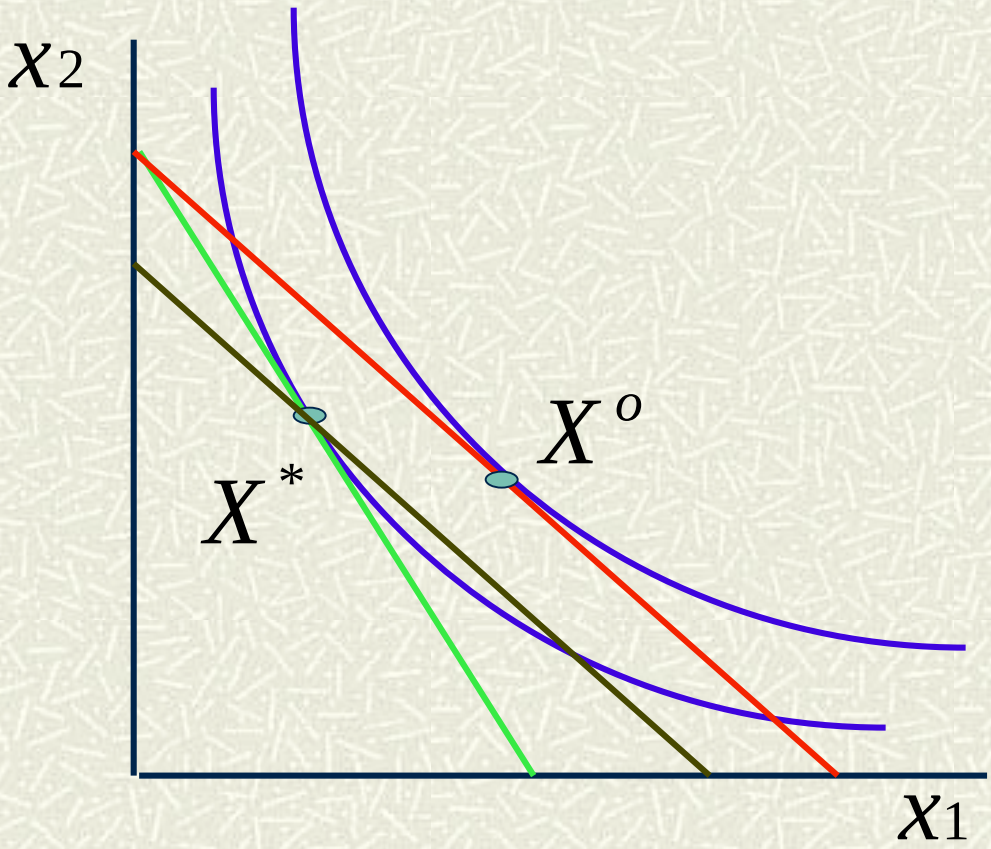
On the Graph



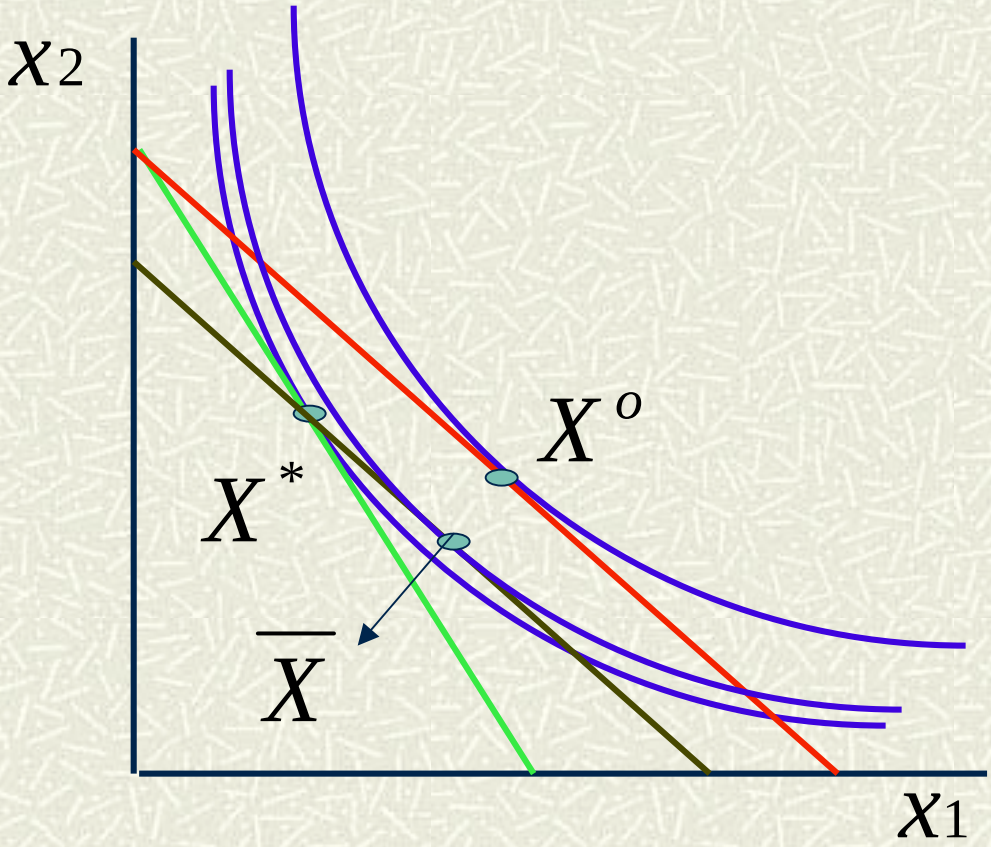
- Budget line with income tax:
- Budget line with quantity tax:

$$-\frac{p_1}{p_2}$$

Q: Is X^* Optimal with the Income Tax?

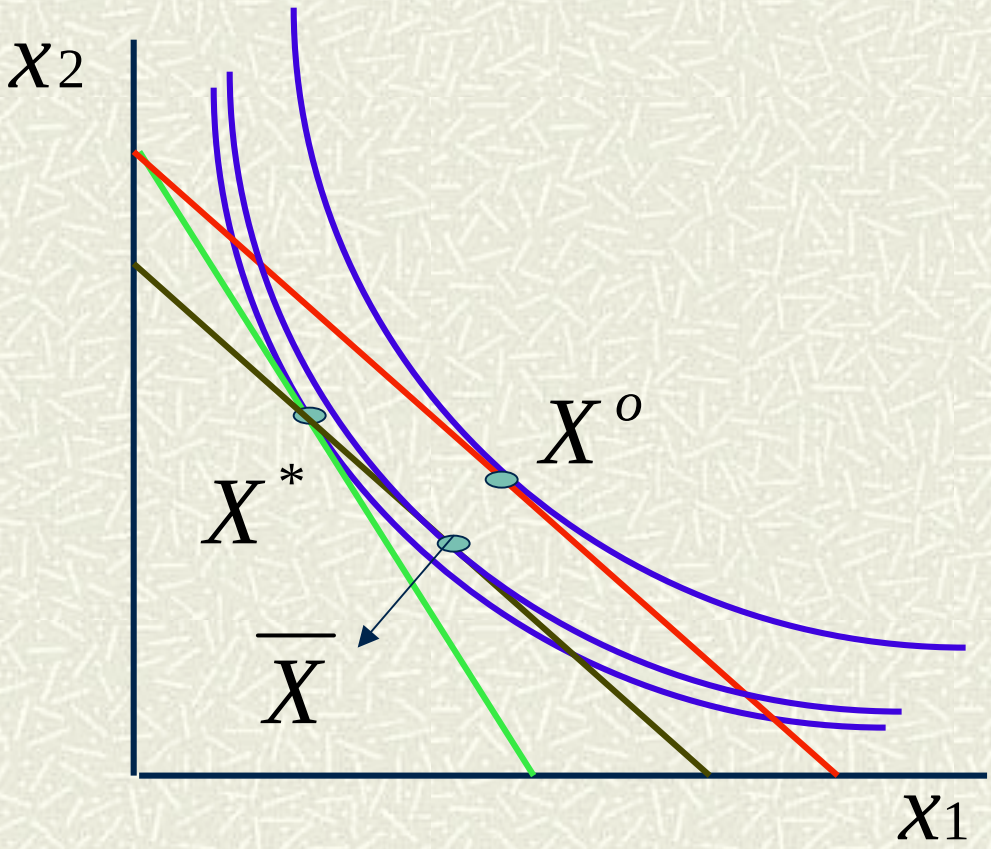


A: No, it is not.



- The _____ budget line is **not** tangent to indifference curve at X^*.
- Optimal choice: $\overline{X}$

Q: Which Tax Does the Consumer Prefer?



A: Income Tax Gives Higher Utility to the Consumer

Caution:

- A **uniform** income tax for **all** consumers is not necessarily better than a **uniform** quantity tax.

- Assumption that income tax is lump-sum is key.

Another Question

- Suppose that the government can use a uniform value tax on goods 1 and 2 to raise revenue (e.g. a sales tax). Does the consumer still prefer an income tax?

Answer

- With a uniform value tax, the budget consumer line reads

$$(1+t)p_1x_1+(1+t)p_2x_2=m$$

- Rearranging:

$$p_1x_1+p_2x_2=\frac{m}{(1+t)}$$

Answer Continued

- Rearranging:

$$p_1 x_1 + p_2 x_2 = \frac{m}{(1+t)}$$

- Budget line with income tax:

$$p_1 x_1 + p_2 x_2 = m - R^*$$

$$R^* = t p_1 x_1^* + t p_2 x_2^* = \frac{t}{1+t} m$$

Answer Continued

- Budget line with income tax:

$$p_1 x_1 + p_2 x_2 = \frac{m}{1+t}$$

- Same as budget line under value tax:

$$p_1 x_1 + p_2 x_2 = \frac{m}{1+t}$$