1 Bundles and the Feasible Set

1.1 Bundles

Bundle: $x = (x_1, x_2)$

Ice Bowls

$(1, 1)$ one scoop of vanilla and one scoop of chocolate.

$(2, 1)$ two scoops of vanilla and one scoop of chocolate.

$(0, 0)$ nothing

1.2 Feasible Set

X the **feasible** set (consumption set, universe of choice objects).

$X = \mathbb{R}^2_+$ the set of all pairs of numbers from 0 to infinity.

$(1, 1) \in X$

$(-1, 0) \notin X$

2 Budget Set

The budget set is what a consumer in your model is actually asked to choose from.

$B \subseteq X$ the budget set is a "weak" subset of the feasible set.

Finn can have up to two total scoops of ice cream of any flavor.

Set-builder notation.

$B = \{(x_1, x_2) \,|\, (x_1, x_2) \in X \,\&\, x_1 + x_2 \leq 2\}$

Finn can have up to two scoops of ice cream of vanilla and up to two scoops of chocolate.

$B = \{(x_1, x_2) \,|\, (x_1, x_2) \in X \,\&\, x_1 \leq 2 \,\& x_2 \leq 2\}$

2.1 Budget Sets from Prices and Income

Competitive Budgets are constructed from prices and income.

p_1, p_2 prices of good 1 and good 2a

m income

The budget set is generated from this inequality:

$$p_1 x_1 + p_2 x_2 \leq m$$

The **budget line**:

$$p_1 x_1 + p_2 x_2 = m$$

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

Three interesting things about the budget line:
x_1 intercept:

$$p_1 x_1 + p_2 x_2 = m$$

$$p_1 x_1 + p_2 (0) = m$$

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

$$\left(\frac{m}{p_1}, 0 \right)$$

x_2 intercept

$$x_2 = \frac{m}{p_2}$$

$$\left(0, \frac{m}{p_2} \right)$$

Slope.
Slope of the budget line represents how a consumer has to **trade off** between the two goods to stay within their budget.
The slope can be interpreted this way:
"If I want one more unit of good 1, how much good 2 do I have to **give up**?"

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

2.2 Changing Prices and Income

See Notes

2.3 Taxes and other scenarios

$$p_1x_1 + p_2x_2 = m$$

Income tax

$$p_1x_1 + p_2x_2 = (1 - 0.4)(m)$$

Income tax is "non-distortionary" because it does not change the tradeoffs which are represented here by the ratio of prices $-\frac{p_1}{p_2}$.

Ad-Valorem Tax on all Goods.

$$(1 + 0.09)(p_1x_1 + p_2x_2) = m$$

$$p_1x_1 + p_2x_2 = \frac{m}{1 + 0.09}$$

Distortionary Taxes.

Quantity Tax on Just One Good.

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

New slope after the tax:

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

3 The Preference Relation $\succsim$

A relation is a mathematical/formal way of defining relationships between pairs of things.

"Is a sibling of" is a relation on the set of people. If we represent this relation with S

$$Greg\, S\, Christina$$

$$Christina\, S\, Greg$$

Greater than is a relation on the set of numbers.

$$8 > 4$$

$$9 > 3$$

Preference relation

$$(2, 0) \succsim (1, 0)$$