1 Bundles and Budget

1.1 Bundles

A bundle is an amount of two things "goods"

$$(x_1, x_2)$$

x_1 amount of "good 1"

x_2 amount of "good 2"

Example: bowl of ice cream has a number of scoops of vanilla ice cream and a number of scoops of chocolate ice cream.

$(1, 1)$ bowl with one scoop of each flavor

$(1, 0)$ bowl with one scoop vanilla, zero scoops of chocolate

$(0, 1)$ bowl with zero scoop vanilla, one scoop of chocolate

An example with three flavors

$(1, 1, 1)$ bowl with one scoop vanilla, one scoop of chocolate, one scoop of strawberry

A bundle is a **vector**. A vector is a order pair.

1.2 Feasible Set

The universe of possible bundles. All the bundles tht might be relevant are called the **feasible set**.

X - The feasible set.

$\in$ "in"

The bundle $(1, 1)$ is in the fesible set.

$$(1,1)\in X, (0,1) \in X, (1,0) \in X$$

$$(0.74, 1.27) \in X, (\pi, e) \in X$$

$$(-1, 2) \not\in X$$

The feasible set is all possible bowls ice cream with a positive amount or zero of each flavor.

$$X = \{(x_1, x_2)\,|x_1 \geq 0, x_2 \geq 0\}$$

$$X = \mathbb{R}^2_+$$

1.3 Budget Set

The budget are all of the bundles that actually available to some consumer at some point.

B the budget set.

Finn can have any bowl of ice cream with up to two scoops of ice cream.

$$(1,1) \in B, (2,0) \in B, (0,2) \in B$$

$$(0,0) \in B, (1,0) \in B$$

$$(3,0) \not\in B$$

Here's how we would define this formally:

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

A note. The budget set is always a subset of the feasible set.

$$B \subseteq X$$

1.4 Prices and Income

Income m

Prices: p_1, p_2

Budget are the bundles that cost no more than your income.

What is cost of a bundle when good 1 costs p_1 (per unit) and good 2 cost p_2 (per unit).

To buy bundle (x_1, x_2) it costs:

$$p_1 x_1 + p_2 x_2$$

The affordable bundles are the ones that cost no more than m.

$$p_1x_1 + p_2x_2 \leq m$$

$p_1 = 1, p_2 = 2, m = 10$

To check whether (x_1, x_2) is affordable, see if this is true:

$$1\,(x_1) + 2\,(x_2) \leq 10$$

This defines all of the afford bundles and so it defines the budget set itself. We often refer to it simply as **the budget set**.

1.4.1 Budget Line

The interior of the budget set are the bundles that cost strictly less than m.

The bundles on the boundary cost exactly m. We refere to this boundary as the **the budget line.** It is the set of bundles tht meet this equation:

$$p_1x_1 + p_2x_2 = m$$

$p_1 = 1, p_2 = 2, m = 10$

The budget line is:

$$x_1 + 2x_2 = m$$

1.5 Endpoints

The amount of good 1 I can buy if I only buy good one is:

$$\frac{m}{p_1}$$

The amount of good 2 I can buy if I only buy good two is:

$$\frac{m}{p_2}$$

Endpoints of the budget line are $\left(\frac{m}{p_1}, 0\right)$ and $\left(0, \frac{m}{p_2}\right)$.

The budget line is a line between these points.

1.5.1 Slope of Budget Line

The slope of the budget line qunatifies the trade-off that consumer have to make is they are spending all of their income.

It measures **how much good 2 do you have to give up to get one more unit of good 1.**

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

$p_1 = 1, p_2 = 2,\ -\frac{1}{2}$

$p_1 = 2, p_2 = 1,\ -2$