

ECONOMICS 8100

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Part 1. Budget

1. CONSUMPTION SET X

Assumptions: (Universe of Choice Objects): X

Bundles: Elements of X . $x \in X$

Assumptions about X .

1. $\emptyset \neq X \subseteq \mathbb{R}_+^n$.
2. X is closed.
3. X is convex.
4. $0 \in X$.



FIGURE 1.1. Examples of a Convex/Non-Convex Set.

2. BUDGET SET B

Budget Set: $B \subseteq X$

X defines the scope of the model. B is what an *individual consumer* chooses among.

Example. Budget Set with Prices and Income

$$B = \{x \mid x \in X \text{ \& } x_1 p_1 + x_2 p_2 \leq m\}$$

Example. Ice Cream Bowls

Every ice cream bowl x has some non-negative number of scoops of Vanilla, Chocolate, Strawberry.

$$X = \mathbb{R}_+^3$$

Budget B is the set of bowls with *no more than one scoop of ice cream*.

$$B = \left\{ x \mid x \in \mathbb{R}_+^3 \text{ \& } \sum_{i=1}^3 x_i \leq 1 \right\}$$

This is the unit-simplex in \mathbb{R}_3 .

$(1, 0, 0) \in B$. (On the boundary.)

$(0.5, 0.5, 0) \in B$. (On the boundary.)

$(0.25, 0.25, 0.25) \in B$. (In the interior.)

$(2, 0, 0) \notin B$