Microeconomics

Monika Köppl-Turyna

Department of Economics | ISCTE-IUL

Winter 2014/2015

◆□▶ ◆□▶ ◆臣▶ ◆臣▶ 善臣 - のへで

Köppl-Turyna

The Theory of Consumer Behavior: Rational Consumer Choice

э

★ E ► ★ E ►

Köppl-Turyna

The Budget Constraint I

- Consider a world with only two goods (in our example Shelter and Food)
- A bundle of goods a particular combination of two or more goods.

Köppl-Turyna

The Budget Constraint I

- Consider a world with only two goods (in our example Shelter and Food)
- A bundle of goods a particular combination of two or more goods.
- Income: €100 a week; Prices: $P_S = €5$ and $P_F = €10$

Köppl-Turyna

The Budget Constraint I

- Consider a world with only two goods (in our example Shelter and Food)
- A bundle of goods a particular combination of two or more goods.
- Income: €100 a week; Prices: $P_S = €5$ and $P_F = €10$



Köppl-Turyna

The Budget Constraint II

Definition

Budget constraint – the set of all bundles that exactly exhaust the consumers income at given prices:

$$P_F \cdot F + P_S \cdot S = M$$
 or $F = \frac{M}{P_F} - \frac{P_S}{P_F}S$

イロト 不得下 イヨト イヨト

э

Köppl-Turyna

The Budget Constraint II

Definition

Budget constraint – the set of all bundles that exactly exhaust the consumers income at given prices:

$$P_F \cdot F + P_S \cdot S = M$$
 or $F = \frac{M}{P_F} - \frac{P_S}{P_F}S$

Definition

Affordable set – bundles on or below the budget constraint; bundles for which the required expenditure at given prices is less than or equal to the income available:

$$P_F \cdot F + P_S \cdot S \leq M$$

イロト 不得下 不足下 不足下

3

Köppl-Turyna

The Budget Constraint II

Definition

Budget constraint – the set of all bundles that exactly exhaust the consumers income at given prices:

$$P_F \cdot F + P_S \cdot S = M$$
 or $F = \frac{M}{P_F} - \frac{P_S}{P_F}S$

Definition

Affordable set – bundles on or below the budget constraint; bundles for which the required expenditure at given prices is less than or equal to the income available:

$$P_F \cdot F + P_S \cdot S \leq M$$

In our example: 5S + 10F = 100 or $F = 10 - \frac{1}{2}S$

Köppl-Turyna

Changes to the Budget Constraint I

- The slope and position of the budget constraint are fully determined by the consumers income and the prices of the respective goods.
- If we change any one of these factors, we will have a new budget constraint.

Köppl-Turyna

Changes to the Budget Constraint I

- The slope and position of the budget constraint are fully determined by the consumers income and the prices of the respective goods.
- If we change any one of these factors, we will have a new budget constraint.

Change of Price(s)

• Increase
$$P_{S1} = 5$$
 to $P_{S2} = 10$:



Köppl-Turyna

Changes to the Budget Constraint II

Change of Income

■ Decrease income from €100 to €50:



◆□▶ ◆□▶ ◆三▶ ◆三▶ ○□ ● ●

Köppl-Turyna

Consumer Preferences

Definition

Preference Ordering – a ranking of all possible consumption bundles in order of preference



Köppl-Turyna

Consumer Preferences

Definition

Preference Ordering – a ranking of all possible consumption bundles in order of preference

We assume that for any two bundles, the consumer is able to make one of three possible statements:

イロト イ押ト イヨト イヨトー

3

- 1 A is preferred to B,
- 2 B is preferred to A, or
- 3 A and B are equally attractive.

1. Completness

2. More-Is-Better

3. Transitivity

4. Convexity

< • • • • **•**

* 注 * * 注 *

3



1. Completness

 A preference ordering is complete if it enables the consumer to rank all possible combinations of goods and services.

글 🖌 🖌 글 🕨

э

2. More–Is–Better

3. Transitivity

4. Convexity

1. Completness

 A preference ordering is complete if it enables the consumer to rank all possible combinations of goods and services.

글 🖌 🖌 글 🕨

2. More-Is-Better

• Other things equal, more of a good is preferred to less.

3. Transitivity

4. Convexity

1. Completness

 A preference ordering is complete if it enables the consumer to rank all possible combinations of goods and services.

2. More-Is-Better

• Other things equal, more of a good is preferred to less.

3. Transitivity

• Ordering is transitive means that, for any three bundles *A*, *B*, and *C*, if he prefers *A* to *B* and prefers *B* to *C*, then he always prefers *A* to *C*.

- 4 同 ト 4 回 ト 4 回 ト

4. Convexity

1. Completness

 A preference ordering is complete if it enables the consumer to rank all possible combinations of goods and services.

2. More–Is–Better

• Other things equal, more of a good is preferred to less.

3. Transitivity

• Ordering is transitive means that, for any three bundles *A*, *B*, and *C*, if he prefers *A* to *B* and prefers *B* to *C*, then he always prefers *A* to *C*.

4. Convexity

If you are indifferent between two bundles A and B, your preferences are convex if you prefer a bundle that contains a mixture of A and B to either of the original bundles.

Definition

Indifference $\ensuremath{\text{Curve}}$ – a set of bundles among which the consumer is indifferent



Köppl-Turyna

Definition

Indifference $\ensuremath{\text{Curve}}$ – a set of bundles among which the consumer is indifferent



Köppl-Turyna



◆□▶ ◆□▶ ◆臣▶ ◆臣▶ 善臣 - のへで

Köppl-Turyna



- Bundles that lie above an indifference curve are all preferred to the bundles that lie on it.
- Bundles that lie on an indifference curve are all preferred to those that lie below it.

The completeness property of preferences implies that there is an indifference curve that passes through every possible bundle.

Köppl-Turyna

The completeness property of preferences implies that there is an indifference curve that passes through every possible bundle.

3

イロト イ押ト イヨト イヨト

 Indifference map – a representative sample of the set of a consumers indifference curves; a graphical summary of her preference ordering

- The completeness property of preferences implies that there is an indifference curve that passes through every possible bundle.
- Indifference map a representative sample of the set of a consumers indifference curves; a graphical summary of her preference ordering



Köppl-Turyna

Köppl-Turyna

Indifference Curves II

- The completeness property of preferences implies that there is an indifference curve that passes through every possible bundle.
- Indifference map a representative sample of the set of a consumers indifference curves; a graphical summary of her preference ordering



ロト (得) (日) (日) 三日

What counts is the ranking of the indifference curves

Properties of Indifference Curves:

1 Any bundle has an indifference curve passing through it – Assured by completeness

Köppl-Turyna

Properties of Indifference Curves:

1 Any bundle has an indifference curve passing through it – Assured by completeness

◆□▶ ◆□▶ ◆三▶ ◆三▶ ○○○

2 Indifference curves are downward-sloping – Assured by more–is–better

Properties of Indifference Curves:

- 1 Any bundle has an indifference curve passing through it Assured by completeness
- 2 Indifference curves are downward-sloping Assured by more–is–better
- 3 Indifference curves (from the same indifference map) cannot cross Assured by transitivity

イロト 不得下 不良下 不良下 一度

Properties of Indifference Curves:

- 1 Any bundle has an indifference curve passing through it Assured by completeness
- 2 Indifference curves are downward-sloping Assured by more–is–better
- 3 Indifference curves (from the same indifference map) cannot cross Assured by transitivity
- 4 Indifference curves become less steep as we move downward and to the right along them Assured by convexivity

イロト 不得下 不足下 不足下 一足

Marginal Rate of Substitution I

An important property of a consumers preferences is the rate at which he is willing to exchange one good for another.

Köppl-Turyna

Marginal Rate of Substitution I

An important property of a consumers preferences is the rate at which he is willing to exchange one good for another.

Definition

Marginal rate of substitution (MRS) – the rate at which the consumer is willing to exchange the good measured along the vertical axis for the good measured along the horizontal axis; equal to the absolute value of the slope of the indifference curve.

- 4 同 2 4 回 2 4 U

Marginal Rate of Substitution I

An important property of a consumers preferences is the rate at which he is willing to exchange one good for another.

Definition

Marginal rate of substitution (MRS) – the rate at which the consumer is willing to exchange the good measured along the vertical axis for the good measured along the horizontal axis; equal to the absolute value of the slope of the indifference curve.

Indifference curve is a function

$$Y = Y(X)$$

Marginal Rate of Substitution is defined as

$$MRS = \left|\frac{dY(X)}{dX}\right|$$

イロト 不得下 不足下 不足下

Marginal Rate of Substitution II



◆□> ◆□> ◆三> ◆三> ・三> のへで

Köppl-Turyna

Marginal Rate of Substitution III



(4日)(4日)(4日)(4日)(日)(900)

Köppl-Turyna

The Optimal Choice I



▲□▶ ▲圖▶ ▲≣▶ ▲≣▶ = 差 = 釣�?

Köppl-Turyna

The Optimal Choice I



For indifference curves for which a tangent exists a necessary condition for optimality is:

$$MRS_{XY} = \frac{P_X}{P_Y}$$

イロト 不得下 不良下 不良下 一度

Köppl-Turyna

The Optimal Choice II

Definition

Marginal utility of a good is the rate at which total utility changes with consumption of the good:

$$MU_X = \frac{\partial U}{\partial X}$$

Köppl-Turyna

The Optimal Choice II

Definition

Marginal utility of a good is the rate at which total utility changes with consumption of the good:

$$MU_X = \frac{\partial U}{\partial X}$$

By chain rule we have

$$MRS_{XY} = \frac{dY(X)}{dX} = \frac{\partial U}{\partial X} \cdot \frac{\partial Y}{\partial U} = \frac{MU_X}{MU_Y}$$

イロン 不同と 不同と 不同とう

э

The Optimal Choice II

Definition

Marginal utility of a good is the rate at which total utility changes with consumption of the good:

$$MU_X = \frac{\partial U}{\partial X}$$

By chain rule we have

$$MRS_{XY} = \frac{dY(X)}{dX} = \frac{\partial U}{\partial X} \cdot \frac{\partial Y}{\partial U} = \frac{MU_X}{MU_Y}$$

Optimality condition revisited:

$$\frac{MU_X}{MU_Y} = \frac{P_X}{P_Y}$$

In words: The last dollar spent on each commodity yields the same increment in utility.

Köppl-Turyna

The Optimal Choice III

Some other cases:

1 Corner solutions e.g. perfect substitutes



Köppl-Turyna

The Optimal Choice III

Some other cases:

- 1 Corner solutions e.g. perfect substitutes
- 2 Kinky preferences e.g. perfect complements

Köppl-Turyna

The Optimal Choice III

Some other cases:

- 1 Corner solutions e.g. perfect substitutes
- 2 Kinky preferences e.g. perfect complements
- 3 Non-convex preferences



Köppl-Turyna