The theory of consumer choice can be used to address the following questions:

- Do all demand curves slope downward?
- How do wages affect labor supply?
- How do interest rates affect household saving?
- Do the poor prefer to receive cash or in-kind transfers?

The Budget Constraint

- The budget constraint depicts the consumption “bundles” that a consumer can afford.
- People’s spending is constrained, or limited, by their income.

It shows the various combinations of goods the consumer can afford given his or her income and the prices of the two goods.
Example: Building a budget

- Two goods: pizza and pepsi.
- The price of pizza is $10 per unit.
- The price of pepsi is $2 dollar per unit.
- Available income is $1,000.

<table>
<thead>
<tr>
<th>Pints of Pepsi</th>
<th>Number of Pizzas</th>
<th>Spending on Pepsi</th>
<th>Spending on Pizza</th>
<th>Total Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
<td>$ 0</td>
<td>$1,000</td>
<td>$1,000</td>
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<tr>
<td>50</td>
<td>90</td>
<td>100</td>
<td>900</td>
<td>1,000</td>
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<tr>
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<td>400</td>
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<tr>
<td>450</td>
<td>10</td>
<td>900</td>
<td>100</td>
<td>1,000</td>
</tr>
<tr>
<td>500</td>
<td>0</td>
<td>1,000</td>
<td>0</td>
<td>1,000</td>
</tr>
</tbody>
</table>

The Consumer's Budget Constraint...

- The slope of the budget constraint line equals the relative price of the two goods, that is, the price of one good compared to the price of the other.
- It measures the rate at which the consumer will trade one good for the other.
Preferences: What the Consumer Wants

A consumer’s preference among consumption bundles may be illustrated with indifference curves.

Indifference curve, $I_1$

The consumer is indifferent, or equally happy, with the combinations shown at points A, B, and C because they are all on the same curve.

The Marginal Rate of Substitution

- The slope at any point on an indifference curve is the marginal rate of substitution.
- It is the rate at which a consumer is willing to substitute one good for another.
- It is the amount of one good that a consumer requires as compensation to give up one unit of the other good.
- It is the willingness to pay for one additional unit of the good.
Properties of Indifference Curves

- Higher indifference curves are preferred to lower ones.
- Indifference curves are downward sloping.
- Indifference curves do not cross.
- Indifference curves are bowed inward.

Property 1: Higher indifference curves are preferred to lower ones.

- Consumers usually prefer more of something to less of it.
- Higher indifference curves represent larger quantities of goods than do lower indifference curves.
Property 2: Indifference curves are downward sloping.

- A consumer is willing to give up one good only if he or she gets more of the other good in order to remain equally happy.
- If the quantity of one good is reduced, the quantity of the other good must increase.
- For this reason, most indifference curves slope downward.

Property 3: Indifference curves do not cross.

Property 4: Indifference curves are bowed inward.

- People are more willing to trade away goods that they have in abundance and less willing to trade away goods of which they have little.
- These differences in a consumer’s marginal substitution rates cause his or her indifference curve to bow inward.
Property 4: Indifference curves are bowed inward.

Two Extreme Examples of Indifference Curves

- Perfect substitutes
- Perfect complements

Perfect Substitutes

- Two goods with straight-line indifference curves are **perfect substitutes**.
  - The marginal rate of substitution is a fixed number.

Perfect Substitutes
Perfect Complements

Two goods with right-angle indifference curves are perfect complements.

Optimization: What the Consumer Chooses

- Consumers want to get the combination of goods on the highest possible indifference curve.
- However, the consumer must also end up on or below his budget constraint.

Optimization: What the Consumer Chooses

- Combining the indifference curve and the budget constraint determines the consumer’s optimal choice.
- Consumer optimum occurs at the point where whatever is better, is not affordable.
The Consumer’s Optimal Choice

The consumer chooses consumption of the two goods so that the marginal rate of substitution equals the relative price.

The Consumer’s Optimal Choice

At the consumer’s optimum, the consumer’s valuation of the two goods equals the market’s valuation.

How Changes in Income Affect the Consumer’s Choices

- An increase in income shifts the budget constraint outward.
- The consumer is able to choose a better combination of goods on a higher indifference curve.
An Increase in Income...

1. An increase in income shifts the budget constraint outward...

2. ...raising pizza consumption...

3. ...and Pepsi consumption.

New budget constraint

Normal versus Inferior Goods

- If a consumer buys more of a good when his or her income rises, the good is called a **normal good**.
- If a consumer buys less of a good when his or her income rises, the good is called an **inferior good**.

Initial budget constraint

New optimum

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An Inferior Good...

1. When an increase in income shifts the budget constraint outward...

2. ...pizza consumption rises, making pizza a normal good...

3. ...but Pepsi consumption falls, making Pepsi an inferior good.

New budget constraint

How Changes in Prices Affect Consumer Choices

A fall in the price of any good rotates the budget constraint outward and changes the slope of the budget constraint.
A Change in Price...

1. A fall in the price of Pepsi rotates the budget constraint outward...
2. ...reducing pizza consumption...
3. ...and raising Pepsi consumption.

Income and Substitution Effects

- A price change has two effects on consumption.
  - An income effect
  - A substitution effect

The Income Effect

The income effect is the change in consumption that results from the change in purchasing power of money, abstracting from the change in the relative price.

The Substitution Effect

The substitution effect is the change in consumption that results from the change in the relative price, abstracting from the change in the purchasing power of money.
Income and Substitution Effects When the Price of Pepsi Falls

<table>
<thead>
<tr>
<th>Good</th>
<th>Income Effect</th>
<th>Substitution Effect</th>
<th>Total Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pepsi</td>
<td>Consumer is richer, so he buys more Pepsi. Pepsi is relatively cheaper, so consumer buys more Pepsi.</td>
<td>Income and substitution effects act in the same direction, so consumer buys more Pepsi.</td>
<td>Income and substitution effects act in the same direction, so consumer buys more Pepsi.</td>
</tr>
<tr>
<td>Pizza</td>
<td>Consumer is richer, so he buys more pizza. Pizza is relatively more expensive, so consumer buys less pizza.</td>
<td>Income and substitution effects act in opposite directions, so the total effect on pizza consumption is ambiguous.</td>
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</tr>
</tbody>
</table>

Deriving the Demand Curve

A consumer’s demand curve can be viewed as a summary of the optimal decisions that arise from his or her budget constraint and indifference curves.
Do all demand curves slope downward?

- Demand curves can sometimes slope upward.
- This happens when a consumer buys more of a good when its price rises.

Giffen Goods

- Economists use the term Giffen good to describe a good that violates the law of demand.
- Giffen goods are inferior goods for which the income effect dominates the substitution effect.
- They have demand curves that slope upwards.

A Giffen Good...

How do wages affect labor supply?
The Work-Leisure Decision...

An Increase in the Wage...

An Increase in the Wage...

How do wages affect labor supply?

- If the substitution effect is greater than the income effect for the worker, he or she works more.
- If income effect is greater than the substitution effect, he or she works less.
How do interest rates affect household saving?

An Increase in the Interest Rate...

1. A higher interest rate rotates the budget constraint outward...
2. ...resulting in lower consumption when young and, thus, higher saving.

(a) Higher Interest Rate Raises Saving

(b) Higher Interest Rate Lowers Saving

The Consumption-Saving Decision...

If the substitution effect of a higher interest rate is greater than the income effect, households save more.

If the income effect of a higher interest rate is greater than the substitution effect, households save less.
How do interest rates affect household saving?

Thus, an increase in the interest rate could either encourage or discourage saving.

Do the poor prefer to receive cash or in-kind transfers?

Cash versus In-Kind Transfers...

(a) The Constraint Is Not Binding

(b) The Constraint Is Binding
Do the poor prefer to receive cash or in-kind transfers?

If the recipient does not consume more of the good than he would on his own, then the cash and in-kind transfer have exactly the same effect on his consumption and welfare.