This work is protected by United States copyright laws and is provided solely for the use of instructors in teaching their courses and assessing student learning. Dissemination or sale of any part of this work (including on the World Wide Web) will destroy the integrity of the work and is not permitted. The work and materials from it should never be made available to students except by instructors using the accompanying text in their classes. All recipients of this work are expected to abide by these restrictions and to honor the intended pedagogical purposes and the needs of other instructors who rely on these materials.
PART II
The Market System
Choices Made by Households and Firms
Households demand in output markets and supply labor and capital in input markets. To simplify our analysis, we have not included the government and international sectors in this circular flow diagram. These topics will be discussed in detail later.
Basic assumptions pertaining to Chapters 6-12:

**perfect knowledge** The assumption that households possess a knowledge of the qualities and prices of everything available in the market and that firms have all available information concerning wage rates, capital costs, and output prices.

**perfect competition** An industry structure in which there are many firms, each being small relative to the industry and producing virtually identical products, and in which no firm is large enough to have any control over prices.

**homogeneous products** Undifferentiated outputs; products that are identical to or indistinguishable from one another.
CHAPTER OUTLINE

Household Choice in Output Markets
- The Determinants of Household Demand
- The Budget Constraint
- The Equation of the Budget Constraint

The Basis of Choice: Utility
- Diminishing Marginal Utility
- Allocating Income to Maximize Utility
- The Utility-Maximizing Rule
- Diminishing Marginal Utility and Downward-Sloping Demand

Income and Substitution Effects
- The Income Effect
- The Substitution Effect

Household Choice in Input Markets
- The Labor Supply Decision
- The Price of Leisure
- Income and Substitution Effects of a Wage Change
- Saving and Borrowing: Present versus Future Consumption

A Review: Households in Output and Input Markets

Appendix: Indifference Curves
Household Choice in Output Markets

Every household must make three basic decisions:

1. How much of each product, or output, to demand
2. How much labor to supply
3. How much to spend today and how much to save for the future
Household Choice in Output Markets

The Determinants of Household Demand

Several factors influence the quantity of a given good or service demanded by a single household:

- The price of the product
- The income available to the household
- The household’s amount of accumulated wealth
- The prices of other products available to the household
- The household’s tastes and preferences
- The household’s expectations about future income, wealth, and prices
Household Choice in Output Markets

The Budget Constraint

**budget constraint**  The limits imposed on household choices by income, wealth, and product prices.

**choice set or opportunity set**  The set of options that is defined and limited by a budget constraint.

<table>
<thead>
<tr>
<th>Option</th>
<th>Monthly Rent</th>
<th>Food</th>
<th>Other Expenses</th>
<th>Total</th>
<th>Available?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$ 400</td>
<td>$250</td>
<td>$350</td>
<td>$1,000</td>
<td>Yes</td>
</tr>
<tr>
<td>B</td>
<td>600</td>
<td>200</td>
<td>200</td>
<td>1,000</td>
<td>Yes</td>
</tr>
<tr>
<td>C</td>
<td>700</td>
<td>150</td>
<td>150</td>
<td>1,000</td>
<td>Yes</td>
</tr>
<tr>
<td>D</td>
<td>1,000</td>
<td>100</td>
<td>100</td>
<td>1,200</td>
<td>No</td>
</tr>
</tbody>
</table>
Household Choice in Output Markets

The Budget Constraint

Preferences, Tastes, Trade-Offs, and Opportunity Cost

Within the constraints imposed by limited incomes and fixed prices, households are free to choose what they will and will not buy.

Whenever a household makes a choice, it is weighing the good or service that it chooses against all the other things that the same money could buy.

As long as a household faces a limited budget—and all households ultimately do—the real cost of any good or service is the value of the other goods and services that could have been purchased with the same amount of money.
The Budget Constraint

**FIGURE 6.1 Budget Constraint and Opportunity Set for Ann and Tom**
A budget constraint separates those combinations of goods and services that are available, given limited income, from those that are not. The available combinations make up the opportunity set.

**real income** The set of opportunities to purchase real goods and services available to a household as determined by prices and money income.
Household Choice in Output Markets

The Equation of the Budget Constraint

In general, the budget constraint can be written

\[ P_X X + P_Y Y = I, \]

where \( P_X \) = the price of \( X \), \( X \) = the quantity of \( X \) consumed, \( P_Y \) = the price of \( Y \), \( Y \) = the quantity of \( Y \) consumed, and \( I \) = household income.
Household Choice in Output Markets

The Equation of the Budget Constraint

Budget Constraints Change When Prices Rise or Fall

- **FIGURE 6.2** The Effect of a Decrease in Price on Ann and Tom’s Budget Constraint
  When the price of a good decreases, the budget constraint swivels to the right, increasing the opportunities available and expanding choice.
utility The satisfaction a product yields.

Diminishing Marginal Utility

marginal utility (MU) The additional satisfaction gained by the consumption or use of one more unit of a good or service.

total utility The total amount of satisfaction obtained from consumption of a good or service.

law of diminishing marginal utility The more of any one good consumed in a given period, the less satisfaction (utility) generated by consuming each additional (marginal) unit of the same good.
The Basis of Choice: Utility

Diminishing Marginal Utility

<table>
<thead>
<tr>
<th>Trips to Club</th>
<th>Total Utility</th>
<th>Marginal Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>34</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>34</td>
<td>0</td>
</tr>
</tbody>
</table>

> FIGURE 6.3 Graphs of Frank’s Total and Marginal Utility
Marginal utility is the additional utility gained by consuming one additional unit of a commodity—in this case, trips to the club. When marginal utility is zero, total utility stops rising.
# TABLE 6.3 Allocation of Fixed Expenditure per Week Between Two Alternatives

<table>
<thead>
<tr>
<th>(1) Trips to Club per Week</th>
<th>(2) Total Utility</th>
<th>(3) Marginal Utility ($MU$)</th>
<th>(4) Price ($P$)</th>
<th>(5) Marginal Utility per Dollar ($MU/P$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>12</td>
<td>$3.00</td>
<td>4.0</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>10</td>
<td>3.00</td>
<td>3.3</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>6</td>
<td>3.00</td>
<td>2.0</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>4</td>
<td>3.00</td>
<td>1.3</td>
</tr>
<tr>
<td>5</td>
<td>34</td>
<td>2</td>
<td>3.00</td>
<td>0.7</td>
</tr>
<tr>
<td>6</td>
<td>34</td>
<td>0</td>
<td>3.00</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(1) Basketball Games per Week</th>
<th>(2) Total Utility</th>
<th>(3) Marginal Utility ($MU$)</th>
<th>(4) Price ($P$)</th>
<th>(5) Marginal Utility per Dollar ($MU/P$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>21</td>
<td>$6.00</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>12</td>
<td>6.00</td>
<td>2.0</td>
</tr>
<tr>
<td>3</td>
<td>42</td>
<td>9</td>
<td>6.00</td>
<td>1.5</td>
</tr>
<tr>
<td>4</td>
<td>48</td>
<td>6</td>
<td>6.00</td>
<td>1.0</td>
</tr>
<tr>
<td>5</td>
<td>51</td>
<td>3</td>
<td>6.00</td>
<td>0.5</td>
</tr>
<tr>
<td>6</td>
<td>51</td>
<td>0</td>
<td>6.00</td>
<td>0</td>
</tr>
</tbody>
</table>
The Basis of Choice: Utility

The Utility-Maximizing Rule

In general, utility-maximizing consumers spread out their expenditures until the following condition holds:

utility-maximizing rule: \( \frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} \) for all goods,

where \( MU_X \) is the marginal utility derived from the last unit of \( X \) consumed, \( MU_Y \) is the marginal utility derived from the last unit of \( Y \) consumed, \( P_X \) is the price per unit of \( X \), and \( P_Y \) is the price per unit of \( Y \).

utility-maximizing rule  Equating the ratio of the marginal utility of a good to its price for all goods.

diamond/water paradox  A paradox stating that (1) the things with the greatest value in use frequently have little or no value in exchange and (2) the things with the greatest value in exchange frequently have little or no value in use.
The Basis of Choice: Utility

Diminishing Marginal Utility and Downward-Sloping Demand

**FIGURE 6.4 Diminishing Marginal Utility and Downward-Sloping Demand**

At a price of $40, the utility gained from even the first Thai meal is not worth the price. However, a lower price of $25 lures Ann and Tom into the Thai restaurant 5 times a month. (The utility from the sixth meal is not worth $25.)

If the price is $15, Ann and Tom will eat Thai meals 10 times a month—until the marginal utility of a Thai meal drops below the utility they could gain from spending $15 on other goods. At 25 meals a month, they cannot tolerate the thought of another Thai meal even if it is free.
Income and Substitution Effects

The Income Effect

Price changes affect households in two ways. First, if we assume that households confine their choices to products that improve their well-being, then a decline in the price of any product, *ceteris paribus*, will make the household unequivocally better off.

In other words, if a household continues to buy the same amount of every good and service after the price decrease, it will have income left over. That extra income may be spent on the product whose price has declined, hereafter called good $X$, or on other products.

The change in consumption of $X$ due to this improvement in well-being is called the *income effect of a price change*. 
Income and Substitution Effects

The Substitution Effect

When the price of a product falls, that product also becomes relatively cheaper. That is, it becomes more attractive relative to potential substitutes. A fall in the price of product X might cause a household to shift its purchasing pattern away from substitutes toward X. This shift is called the *substitution effect of a price change*.

Everything works in the opposite direction when a price rises, *ceteris paribus*. When the price of a product rises, that item becomes more expensive relative to potential substitutes and the household is likely to substitute other goods for it.
For normal goods, the income and substitution effects work in the same direction. Higher prices lead to a lower quantity demanded, and lower prices lead to a higher quantity demanded.
Household Choice in Input Markets

The Labor Supply Decision

As in output markets, households face constrained choices in input markets. They must decide

1. Whether to work
2. How much to work
3. What kind of a job to work at

In essence, household members must decide how much labor to supply. The choices they make are affected by:

1. Availability of jobs
2. Market wage rates
3. Skills they possess
Household Choice in Input Markets

The Labor Supply Decision

The decision to enter the workforce involves a trade-off between wages (and the goods and services that wages will buy) on the one hand and leisure and the value of nonmarket production on the other hand.

FIGURE 6.6 The Trade-Off Facing Households

The diagram illustrates the trade-off facing households. On the product market, the decision is made regarding the quantity of goods and services produced (Q) and the price (Px). On the labor market, the decision is made regarding the quantity of labor (L) and the wage (W). The scale measures the maximum utility, balancing wages and leisure.

Leisure, nonmarket production (home-grown food, child-raising, etc.)

Wages

Maximum utility

0.0000

0.0000

HOUSEHOLDS
Household Choice in Input Markets

The Price of Leisure

Trading one good for another involves buying less of one and more of another, so households simply reallocate *money* from one good to the other.

“Buying” more leisure, however, means reallocating time between work and nonwork activities.

For each hour of leisure that you decide to consume, you give up one hour’s wages.

Thus, the wage rate is the *price of leisure*.
Household Choice in Input Markets

Income and Substitution Effects of a Wage Change

**labor supply curve** A curve that shows the quantity of labor supplied at different wage rates. Its shape depends on how households react to changes in the wage rate.
Household Choice in Input Markets

Income and Substitution Effects of a Wage Change

**FIGURE 6.7 Two Labor Supply Curves**
When the substitution effect outweighs the income effect, the labor supply curve slopes upward (a). When the income effect outweighs the substitution effect, the result is a “backward-bending” labor supply curve: The labor supply curve slopes downward (b).
Household Choice in Input Markets

Saving and Borrowing: Present versus Future Consumption

Just as changes in wage rates affect household behavior in the labor market, changes in interest rates affect household behavior in capital markets.

Most empirical evidence indicates that saving tends to increase as the interest rate rises. In other words, the substitution effect is larger than the income effect.

financial capital market The complex set of institutions in which suppliers of capital (households that save) and the demand for capital (firms wanting to invest) interact.
A Review: Households in Output and Input Markets

We now have a rough sketch of the factors that determine output demand and input supply. (You can review these in Figure II.1.)

In the next three chapters, we turn to firm behavior and explore in detail the factors that affect output supply and input demand.
<table>
<thead>
<tr>
<th>REVIEW TERMS AND CONCEPTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>budget constraint</td>
</tr>
<tr>
<td>choice set or opportunity set</td>
</tr>
<tr>
<td>diamond/water paradox</td>
</tr>
<tr>
<td>financial capital market</td>
</tr>
<tr>
<td>homogeneous products</td>
</tr>
<tr>
<td>labor supply curve</td>
</tr>
<tr>
<td>law of diminishing marginal utility</td>
</tr>
<tr>
<td>marginal utility ((MU))</td>
</tr>
<tr>
<td>perfect competition</td>
</tr>
<tr>
<td>perfect knowledge</td>
</tr>
<tr>
<td>real income</td>
</tr>
<tr>
<td>total utility</td>
</tr>
<tr>
<td>utility</td>
</tr>
<tr>
<td>utility-maximizing rule</td>
</tr>
</tbody>
</table>