Learning Objectives

1. Identify accounting topics where the time value of money is relevant.
2. Distinguish between simple and compound interest.
3. Use appropriate compound interest tables.
4. Identify variables fundamental to solving interest problems.
5. Solve future and present value of 1 problems.
7. Solve present value of ordinary and annuity due problems.
8. Solve present value problems related to deferred annuities and bonds.
9. Apply expected cash flows to present value measurement.
Accounting and the Time Value of Money

Basic Time Value Concepts
- Applications
- The nature of interest
- Simple interest
- Compound interest
- Fundamental variables

Single-Sum Problems
- Future value of a single sum
- Present value of a single sum
- Solving for other unknowns

Annuities
- Future value of ordinary annuity
- Future value of annuity due
- Examples of FV of annuity
- Present value of ordinary annuity
- Present value of annuity due
- Examples of PV of annuity

More Complex Situations
- Deferred annuities
- Valuation of long-term bonds
- Effective-interest method of bond discount/premium amortization

Present Value Measurement
- Choosing an appropriate interest rate
- Example of expected cash flow
Basic Time Value Concepts

Time Value of Money

- A relationship between time and money.

- A dollar received today is worth more than a dollar promised at some time in the future.

LO 1 Identify accounting topics where the time value of money is relevant.
Applications to Accounting Topics:

1. Notes
2. Leases
3. Pensions and Other Postretirement Benefits
4. Long-Term Assets
5. Shared-Based Compensation
6. Business Combinations
7. Disclosures
8. Environmental Liabilities

LO 1 Identify accounting topics where the time value of money is relevant.
The Nature of Interest

- Payment for the use of money.
- Excess cash received or repaid over the amount borrowed (principal).

VARIABLES IN INTEREST COMPUTATION

1. **PRINCIPAL.** The amount borrowed or invested.
2. **INTEREST RATE.** A percentage of the outstanding principal.
3. **TIME.** The number of years or fractional portion of a year that the principal is outstanding.

**LO 1** Identify accounting topics where the time value of money is relevant.
Simple Interest

- Interest computed on the principal only.

**Illustration:** KC borrows $20,000 for 3 years at a rate of 7% per year. Compute the total interest to be paid for the 3 years.

\[
\text{Interest} = p \times i \times n
\]

\[
= 20,000 \times 0.07 \times 3
\]

\[
= 4,200
\]

Many regulatory frameworks require disclosure of interest rates on an annual basis.

**LO 2** Distinguish between simple and compound interest.
Basic Time Value Concepts

Simple Interest

- Interest computed on the principal only.

**Illustration:** KC borrows $20,000 for 3 years at a rate of 7% per year. Compute the total interest to be paid for the 1 year.

\[
\text{Interest} = p \times i \times n
\]

\[
= 20,000 \times 0.07 \times 1
\]

\[
= 1,400
\]

*LO 2 Distinguish between simple and compound interest.*
Simple Interest

- Interest computed on the principal only.

Illustration: On March 31, 2011, KC borrows $20,000 for 3 years at a rate of 7% per year. Compute the total interest to be paid for the year ended Dec. 31, 2011.

\[ \text{Interest} = p \times i \times n \]

\[ = 20,000 \times 0.07 \times \frac{9}{12} \]

\[ = 1,050 \]
Compound Interest

Computes interest on

- principal and
- interest earned that has not been paid or withdrawn.

Most business situations use compound interest.
**Illustration:** Tomalczyk Company deposits $10,000 in the Last National Bank, where it will earn simple interest of 9% per year. It deposits another $10,000 in the First State Bank, where it will earn compound interest of 9% per year compounded annually. In both cases, Tomalczyk will not withdraw any interest until 3 years from the date of deposit.

### Illustration 6-1
Simple vs. Compound Interest

<table>
<thead>
<tr>
<th>Last National Bank</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simple Interest Calculation</strong></td>
<td><strong>Simple Interest</strong></td>
</tr>
<tr>
<td>Year 1 $10,000.00 × 9%</td>
<td>$900.00</td>
</tr>
<tr>
<td>Year 2 $10,000.00 × 9%</td>
<td>$900.00</td>
</tr>
<tr>
<td>Year 3 $10,000.00 × 9%</td>
<td>$900.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,700.00</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First State Bank</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compound Interest Calculation</strong></td>
<td><strong>Compound Interest</strong></td>
</tr>
<tr>
<td>Year 1 $10,000.00 × 9%</td>
<td>$900.00</td>
</tr>
<tr>
<td>Year 2 $10,900.00 × 9%</td>
<td>$981.00</td>
</tr>
<tr>
<td>Year 3 $11,881.00 × 9%</td>
<td>$1,069.29</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,950.29</strong></td>
</tr>
</tbody>
</table>

$250.29 Difference

**LO 2** Distinguish between simple and compound interest.