

Study Unit Four

Measurement, Valuation, and Disclosure: Liabilities

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This study unit is the **fourth of six** on **external financial reporting decisions**. The relative weight assigned to this major topic in Part 1 of the exam is **15%**. The six study units are

- Study Unit 1: External Financial Statements
- Study Unit 2: Measurement, Valuation, and Disclosure: Assets -- Short-Term Items
- Study Unit 3: Measurement, Valuation, and Disclosure: Assets -- Long-Term Items
- **Study Unit 4: Measurement, Valuation, and Disclosure: Liabilities**
- Study Unit 5: Revenue and Impairment Recognition
- Study Unit 6: Integrated Reporting

This study unit discusses liabilities. Topics covered in this study unit include

- Accounting for contingencies
- Warranties, including the assurance warranty approach and the service warranty approach
- Income taxes, including accounting for assets and liabilities related to deferred income tax
- Leases, including the differences between operating and financing leases and the financial statement presentation of operating and financing leases
- Bonds
 - The financial statement presentation of bonds payable and the bond's related premium or discount
 - The effective interest rate method for calculating the interest expense and amortization of a bond's premium or discount

4.1 Contingencies and Warranties

Contingencies

U.S. GAAP defines a contingency as “an existing condition, situation, or set of circumstances **involving uncertainty** as to possible gain (a gain contingency) or loss (a loss contingency) to an enterprise that will ultimately be resolved when one or more future events occur or fail to occur.”

A contingency may be

- Probable
 - Future events are likely to occur.
- Reasonably possible
 - The chance of occurrence is more than remote but less than probable.
- Remote
 - The chance of occurrence is slight.

A **loss contingency** must be accrued (recognition of a liability and related loss contingency) when the following two conditions are met:

1. It is **probable** that, at a balance sheet date, an asset has been impaired or a liability has been incurred.
2. The amount of the loss can be **reasonably estimated**.
 - The amount with the better estimate within a **range of loss** must be accrued.
 - If no amount within that range appears to be a better estimate than any other, the **minimum** should be accrued.
 - Disclosure of the nature of the accrual and, in some cases, the amount or the range of loss may be required to prevent the financial statements from being misleading.

If at least one condition is not met but the probability of loss is at least **reasonably possible**, the nature of the contingency must be **disclosed** in the notes to the financial statements but is not recorded in the accounts.

Loss contingencies with a **remote** probability ordinarily are **not disclosed**.

Gain contingencies are **recognized only when realized**. A gain contingency must be adequately disclosed in the notes. For example, an award of damages in a lawsuit is not realized if it is being appealed.

Warranties

A warranty is a **written guarantee** of the integrity of a product or service. The seller also agrees to repair or replace a product, refund all or part of the price, or provide additional service.

- A warranty is customarily offered for a limited time, such as 2 years.
- It may or may not be separable.

A warranty that provides a customer assurance that a product will function as expected in accordance with agreed-upon specifications is an **assurance-type warranty**.

- A standard one-year computer warranty against manufacturing defects is an example.
- If a customer does **not** have the option to purchase a warranty separately (or if the warranty is required by law), it is an assurance-type warranty.

A warranty that provides a service in addition to assurance is a **service-type warranty**.

- An example is a warranty against customer-inflicted damage (such as to a smartphone).
- A warranty that can be **purchased separately** by the customer is a service-type warranty.
- Service-type warranties are more likely to have longer coverage periods than assurance-type warranties.

Assurance-Type Warranties

An assurance-type warranty is **not** a separate performance obligation in a contract. No transaction price is allocated to the warranty. An assurance-type warranty creates a **loss contingency**.

Accrual accounting should be used if

- Warranty expense is probable,
- The amount can be reasonably estimated, and
- The amount is material.

A warranty liability is recorded when revenue is recognized **at the time of sale**.

- Even if the warranty extends beyond the period of sale, the **entire liability** (expense) for expected costs is recognized at the time of sale. It is not prorated over the annual periods covered by the warranty.

Beginning warranty liability	
+ Warranty expense recognized in the current period	
– Warranty payments in the current period	
=	Ending warranty liability

- Actual payments for warranty costs reduce the warranty liability and do not affect warranty expense.
 - If warranty payments for the period exceed the warranty liability, the excess is recognized as warranty expense.

Example 4-1 Assurance-Type Warranty

In Year 1, a company began selling a product under a 2-year warranty. The estimated warranty costs are 3% of sales in the year of sale and 5% in the following year. Sales and actual warranty payments for Year 1 and Year 2 are as follows:

	<u>Sales</u>	<u>Warranty Payments</u>
Year 1	\$300,000	\$ 5,000
Year 2	500,000	37,000

In Year 1, warranty expense of \$24,000 [$\$300,000 \times (3\% + 5\%)$] is recognized. The warranty liability of \$19,000 ($\$24,000 - \$5,000$) is reported on the December 31, Year 1, balance sheet.

In Year 2, warranty expense of \$40,000 [$\$500,000 \times (3\% + 5\%)$] is recognized. The warranty liability of \$22,000 is reported on the December 31, Year 2, balance sheet.

Beginning warranty liability (1/1/Year 2)	\$19,000
Warranty expense recognized in Year 2	40,000
Warranty payments in Year 2	<u>(37,000)</u>
Ending warranty liability (12/31/Year 2)	<u>\$22,000</u>

Service-Type Warranties

A service-type warranty is a **separate performance obligation in a contract**. A portion of the total transaction price is allocated to the service-type warranty.

- The total transaction price is allocated to the service-type warranty and the related product sold based on their estimated standalone selling prices.
- At contract inception, the consideration received for the service-type warranty is accounted for as an advance payment, and a contract liability is recognized.
- Revenue from a service-type warranty is recognized **over time** (i.e., over the coverage period). The pattern of revenue recognized from a service-type warranty depends on the way the warranty performance obligation is satisfied.
 - If warranty service is provided continuously over the warranty period, revenue is recognized on the **straight-line basis** over the coverage period.
 - If warranty service costs are **not** incurred on a straight-line basis, revenue recognition over the contract's term is proportionate to the estimated service costs.
- Warranty expense is recorded when the entity pays a claim under the warranty.

If an assurance-type warranty and a service-type warranty **cannot** be separated, they are accounted for as a single performance obligation (as a service-type warranty).

4.2 Leases

A lease is a long-term contract in which the owner of property (the lessor) allows another party (the lessee) to use the property for a stated period in exchange for a stated payment.

The primary issue is whether the lease agreement transfers substantially all the benefits and risks of ownership of the asset to the lessee.

Lease Classification Test

A lease is classified as a **finance lease by the lessee** at lease commencement if **at least one** of the following **five criteria** is met:

1. The lease **transfers ownership** of the leased asset to the lessee by the end of the lease term.
2. The lease includes an **option to purchase** (commonly referred to as a bargain purchase option) the leased asset that the lessee is reasonably certain to exercise.
3. The lease term is for the major part of the remaining **economic life** of the leased asset.
 - A lease term of **75%** or more of the remaining economic life of the leased asset generally is considered to be a major part of its remaining economic life.
 - This criterion is inapplicable if the beginning of the lease term is at or near the end of the economic life of the leased asset. This period generally is considered to be the last 25% of the leased asset's total economic life.
4. The present value of the sum of (a) the **lease payments** and (b) any **residual value guaranteed by the lessee** equals or exceeds substantially all of the **fair value** of the leased asset.
 - A present value of **90%** or more of the fair value of the leased asset generally is considered to be substantially all of its fair value.
5. The leased asset is so specialized that it is expected to have **no alternative use** to the lessor at the end of the lease term.

When none of the five classification criteria described above are met, the lease is classified as an **operating lease** by the lessee.



IFRS Difference

IFRS differences related to lease classification are detailed in Appendix B.

Lessee Accounting -- Initial Measurement

For **finance and operating leases**, a **lessee** must recognize a **lease liability** and a **right-of-use asset** at the lease commencement date.

- Finance and operating leases result in the **same accounting** for
 - Initial recognition and measurement of the lease liability
 - Initial recognition and measurement of the right-of-use asset
 - Subsequent measurement of the lease liability
 - ▶ The transaction analysis for finance and operating leases differs, but the ending balance is the same for the lease liability under both types of leases.
- The accounting for subsequent measurement of a right-of-use asset differs under finance and operating leases.

Lease Liability

At the lease commencement date, a **lease liability** is measured at the **present value of the lease payments** to be made over the lease term.

- The lease payments used to calculate the lease liability depend on the specific terms of each lease contract.
 - If the lease includes a purchase option that the lessee is reasonably certain to exercise, the lease payments consist of the following:
 - ▶ Rental payments
 - ▶ Exercise price of the purchase option
 - If no purchase option exists, the lease payments may have the following three components:
 - ▶ Rental payments
 - ▶ Any penalties for terminating the lease (nonrenewal penalties)
 - ▶ Amounts probable of being owed by the lessee under residual value guarantees

Right-of-Use (ROU) Asset

At the lease commencement date, a right-of-use asset is measured at the amount at which the lease liability was recognized plus initial direct costs incurred by the lessee.

- When no initial direct costs were incurred by the lessee, a **right-of-use asset equals the lease liability** recognized.
- Subsequent to initial recognition, the right-of-use asset is reported in the balance sheet at cost minus accumulated amortization and any impairment losses.

Example 4-2 Finance Lease -- Initial Measurement

On January 1, Year 1, Cottle, Inc., entered into a 3-year lease of a machine from Crimson, LLC. Cottle must pay Crimson three annual payments of \$100,000 starting on December 31, Year 1. The machine's useful life from the lease commencement date is 5 years. The lease allows Cottle the option to purchase the machine at the end of the lease term for \$15,000. Cottle is reasonably certain to exercise this purchase option. Cottle's incremental borrowing rate is 15%, but the rate implicit in the lease is 10%, which is known to Cottle.

- The present value factor for an ordinary annuity at 10% for 3 periods is 2.48685, and the present value of \$1 at 10% for 3 periods is 0.7513.
- The present value factor for an ordinary annuity at 15% for 3 periods is 2.28323, and the present value of \$1 at 15% for 3 periods is 0.65752.

The lease is a **finance lease** because it meets the lease classification criterion of including a purchase option that the lessee is reasonably certain to exercise. The rate implicit in the lease of 10% is used to calculate the present value of the lease payments because Cottle knows this rate.

PV of rental payments ($\$100,000 \times 2.48685$)	\$248,685
PV of purchase option ($\$15,000 \times 0.7513$)	11,270
PV of lease payments	<u>\$259,955</u>

Assets	=	Liabilities	+	Stockholders' Equity
ROU asset \$259,955 ↑		Lease liability \$259,955 ↑		

Example 4-3 Operating Lease -- Initial Measurement

Using the scenario in Example 4-2, assume that (1) Cottle concludes that the contract is an **operating lease**, (2) the lease does not include a purchase option, (3) the rental payments are \$100,000 at the end of Years 1 and 2 and \$160,000 at the end of Year 3, and (4) the rate implicit in the lease is not known to Cottle.

Because Cottle does not know the rate implicit in the lease, it uses its **incremental borrowing rate** of 15% to calculate the present value of lease payments.

The PV of the rental payments is \$267,774 $[(\$100,000 \times 2.28323) + (\$60,000 \times 0.65752)]$.

Assets	=	Liabilities	+	Stockholders' Equity
ROU asset \$267,774 ↑		Lease liability \$267,774 ↑		

Lessee Accounting for Finance Leases -- Subsequent Measurement

Lease Payment

Each periodic lease payment made by the lessee has two components: **interest expense** and the **reduction of the lease liability**.

- If the first periodic lease payment is made at the **commencement date** of the lease, its only component is the reduction of the lease liability. No interest expense is recognized for the first payment because no time has elapsed between the lease commencement date and the payment.
- **Interest expense** is calculated using the effective interest method (also known as the effective-rate method or the interest method). It is calculated as the carrying amount of the lease liability at the beginning of the period times the discount rate of the lease.

$$\text{Interest expense} = \text{Lease liability at the beginning of the period} \times \text{Discount rate}$$

- The **reduction of the lease liability** is the excess of the periodic lease payment over the interest expense recognized during the period.

$$\text{Reduction of lease liability} = \text{Periodic lease payment} - \text{Interest expense}$$

Example 4-4 Finance Lease -- Lease Payment

Assume the required lease payment is \$50,000. If the calculated interest expense is \$10,000, then the remaining portion of the lease payment is a reduction to the lease liability.

Assets	=	Liabilities	+	Stockholders' Equity
Cash \$50,000 ↓		Lease liability \$40,000 ↓		Interest expense \$10,000 ↓

Amortization of a Right-of-Use Asset

A lessee amortizes the right-of-use asset on a **straight-line basis**.

- The right-of-use asset is amortized over the shorter of (1) its **useful life** or (2) the **lease term**.
 - However, if, at the end of the lease term, (1) the ownership of the leased asset is transferred to the lessee, or (2) the lessee is reasonably certain to exercise the purchase option, the amortization period is the **useful life of the leased asset**.

Lease Classification Criterion Satisfied	Amortization Period of the ROU Asset
Criterion 1 - Transfer of ownership	Useful life of the leased asset
Criterion 2 - Exercise of purchase option	Useful life of the leased asset
Criterion 3 - Major part of the remaining economic life	Shorter of ROU asset's useful life or lease term
Criterion 4 - Substantially all of the fair value	Shorter of ROU asset's useful life or lease term
Criterion 5 - No alternative use to the lessor	Shorter of ROU asset's useful life or lease term

The following is the entry to record the amortization of the right-of-use asset:

Assets	=	Liabilities	+	Stockholders' Equity
ROU asset ↓				Amortization expense ↓

Lessee Accounting for Operating Leases -- Subsequent Measurement

As noted previously, accounting for finance leases and operating leases is **the same** for

- Initial recognition and measurement of the lease liability and the right-of-use asset
- Subsequent measurement of the lease liability
 - The transaction for the lease payment and reduction in the lease liability is different than the finance lease transaction. However, the ending liability is the same.

The following are the **differences** in accounting for finance and operating leases:

- Subsequent accounting for (amortization of) the right-of-use asset
- Income statement presentation of interest expense and amortization of the right-of-use asset
- Statement of cash flow classification of cash lease payments

Lease Payments

A **single (equal) lease expense** is recognized in each period. It is calculated so that the total undiscounted lease payments are allocated over the lease term on a **straight-line basis**.

$$\text{Single periodic lease expense} = \text{Total undiscounted lease payments (\$)} \div \text{Lease term (years)}$$

- Initial direct costs incurred by the lessee are included in the total undiscounted lease payments. They are recognized in the single periodic lease expense on a straight-line basis over the lease term.
- The single periodic lease expense has two components:
 1. Interest expense on the lease liability
 2. Amortization of the right-of-use asset

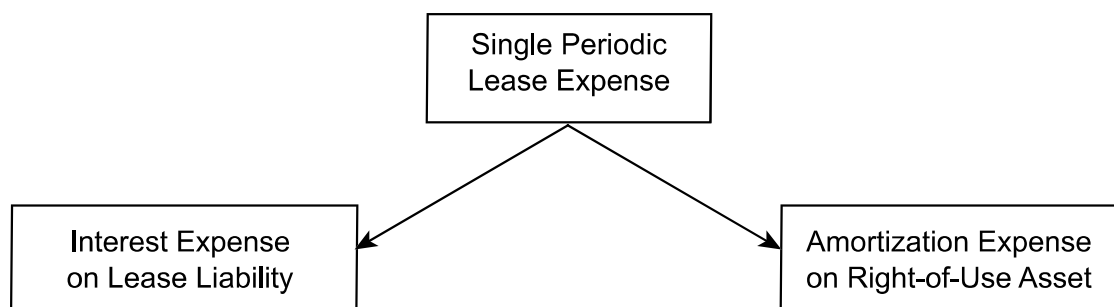


Figure 4-1

- In the **income statement**, a single amount for the total lease expense for the period is reported in income from continuing operations.
 - Interest expense for the lease liability and amortization expense for the right-of-use asset are **not reported separately**.

Example 4-5 Operating Lease -- Subsequent Measurement

Using the same data as Example 4-4, the required lease payment is \$50,000 and the related interest expense is \$10,000. For an operating lease, the difference between the lease payment and the interest expense is the reduction in the lease liability and the amortization of the ROU asset. The recorded lease expense includes both the interest (\$10,000) and the amortization expense (\$40,000).

Assets	=	Liabilities	+	Stockholders' Equity
Cash \$50,000 ↓ ROU asset \$40,000 ↓		Lease liability \$40,000 ↓		Lease expense \$50,000 ↓

Financial Statement Presentation Summary

Balance Sheet Presentation

Finance leases and operating leases report the lease liability.

- The lease liability is allocated between current and noncurrent portions. The current portion at a balance sheet date is the reduction of the lease liability in the upcoming year.

Finance lease liabilities and operating lease liabilities must not be presented together in the same line item.

- They are presented in the balance sheet or disclosed in the notes, separately from each other and separately from other liabilities.

Finance lease right-of-use assets and operating lease right-of-use assets must not be presented together in the same line item.

- They are presented in the balance sheet or disclosed in the notes, separately from each other and separately from other assets.

Type of Lease	Income Statement	Statement of Cash Flows
Finance	Interest expense Amortization expense	Principal portion of lease payment is financial cash outflow Interest portion of lease payment is operating cash flow
Operating	Lease expense	Lease payment is operating cash outflow

Short-Term Lease

A short-term lease is a lease that, at the commencement date, has a lease term of **12 months or less** and does not include a purchase option that the lessee is reasonably certain to exercise.

- As an accounting policy for **short-term leases**, a **lessee** may elect **not** to recognize the **right-of-use asset** and **lease liability**.
- Under this short-term lease exception, the lessee recognizes lease payments as rent expense on the straight-line basis over the full lease term.
- A short-term lease is a form of off-balance-sheet financing. The lessee has the right to use the leased asset, but neither the asset nor a liability for future lease payments is recorded in its financial statements.
 - Lessees may prefer to account for a lease as a short-term lease instead of as a finance lease to avoid recognition in the financial statements of
 - ▶ A liability for future lease payments,
 - ▶ Interest expense, and
 - ▶ Depreciation of the leased asset.

Payments for **short-term leases** are cash outflows from **operating activities**.

4.3 Income Taxes

The objectives of accounting for income taxes are to recognize

- The amount of taxes currently payable or refundable
- Deferred tax liabilities and assets for the future tax consequences of events that have been recognized in the financial statements or tax returns

To achieve these objectives, an entity uses the asset-and-liability approach to account for income taxes currently payable or deductible and deferred taxes.

Basic Definitions

Income tax expense or benefit is the sum of (1) current tax expense or benefit and (2) deferred tax expense or benefit.

Current tax expense or benefit is the amount of taxes paid or payable (or refundable) for the year as determined by applying the enacted tax law to the taxable income or excess of deductions over revenues for that year.

- This amount is the **income tax payable** for the period.
- The approach is sometimes called income-tax-basis accounting, which is an other comprehensive basis of accounting (not GAAP). Nontaxable revenues and nondeductible expenses are included in the income statement.

Taxable income is the income calculated under the tax code. Taxable income equals pretax accounting income adjusted for permanent and temporary tax differences.

Deferred tax expense or benefit is the net change during the year in an entity's deferred tax amounts.

A **deferred tax liability (or asset)** records the deferred tax consequences of taxable (or deductible) temporary differences.

- A deferred tax liability or asset is recognized for the estimated future tax effects of temporary differences and carryforwards.
- A deferred tax amount is measured using the enacted tax rate(s) expected to apply when the liability or asset is expected to be settled or realized.

Intraperiod Tax Allocation

Intraperiod tax allocation **is required**. Income tax expense (benefit) is allocated to

- Continuing operations
- Discontinued operations
- Other comprehensive income
- Items debited or credited directly to equity

Intraperiod tax allocation is needed because items included in determining taxable income may be presented in different sections of the income statement. A tax or tax benefit should be shown in the same section as the related income or expense.

Interperiod Tax Allocation

Amounts in the entity's income tax return for a year include the tax consequences of most items recognized in the financial statements for the same year. Significant exceptions may exist because of differences between the GAAP-basis of accounting and the income-tax-basis of calculating taxable income.

Temporary differences result when the GAAP basis and the tax basis of an asset or liability differ. Differences in the two bases arise when items of income and expense are recognized in different periods under GAAP and under the tax code. The effect is that a taxable or deductible amount will occur in future years when the asset is recovered or the liability is settled.

- Tax consequences of some items may be recognized in **tax returns** for a year different from that in which their **financial-statement effects** are recognized. The following are examples:
 - Different depreciation methods may be used for tax purposes and in the financial statements.
 - ▶ Accelerated depreciation is allowed for tax purposes for certain assets, but they may be depreciated using the straight-line method in the financial statements.
 - Expenses for warranty liability are recognized in the financial statements on the date of the sale under the accrual method of accounting.
 - ▶ For tax purposes, warranty expenses are recognized under the cash basis when actual payments of warranty costs are made.
 - Credit loss expense is recognized in the financial statements under the allowance method in accordance with the income-statement or balance-sheet approach.
 - ▶ For tax purposes, credit loss expense is recognized when the debts are determined to be uncollectible using the direct write-off method or a special allowance method subject to reasonableness limitations.

A **permanent difference** is an event that is recognized either in pretax financial income or in taxable income **but never in both**.

- It does not result in a deferred tax amount.
- The following are examples:
 - Payments of fines or penalties are recognized as an expense in the financial statements but are never deducted in the tax return.
 - Interest on state or municipal bonds is recognized as income in the financial statements but not in taxable income for tax purposes.

When tax consequences and financial-statement effects differ, income taxes currently payable or refundable also may differ from income tax expense or benefit. The accounting for these differences is **interperiod tax allocation**.

Deferred Taxes

Deferred tax liabilities and assets result from temporary differences, not permanent differences.

Deferred Tax Liabilities

Taxable temporary differences result in future taxable amounts and deferred tax liabilities (DTL).

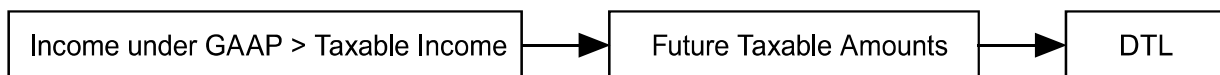


Figure 4-2

- DTLs arise when **revenues or gains** are recognized under GAAP before they are included in taxable income.
 - An example is income recognized under the equity method for financial statement purposes and at the time of distribution in taxable income.
- DTLs also result when **expenses or losses** are deductible for tax purposes before they are recognized under GAAP.
 - An example is accelerated tax depreciation of property.

$$\text{DTL} = \text{Future taxable amount} \times \text{Tax rate}$$

Deferred Tax Assets

Deductible temporary differences result in future deductible amounts and deferred tax assets (DTA).

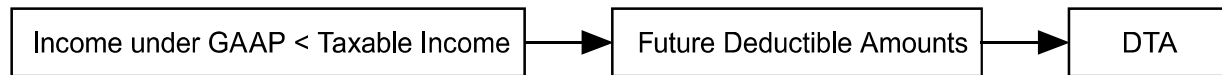


Figure 4-3

- DTAs result when **revenues or gains** are included in taxable income before they are recognized under GAAP.
 - Examples are unearned revenues such as rent and subscriptions received in advance. Rent or subscriptions received in advance are taxable when received but are only reported for accounting purposes when the revenue has been earned.
- DTAs also result when **expenses or losses** are recognized under GAAP before they are deductible for tax purposes.
 - Examples are credit loss expense recognized under the allowance method and warranty costs.

$$\text{DTA} = \text{Future deductible amount} \times \text{Tax rate}$$

Calculating Tax Expense or Benefit

Income tax expense or benefit reported on the income statement is the sum of the current component and the deferred component.

- **Current tax expense or benefit** is the amount of taxes paid or payable (or refundable) for the year based on the enacted tax law.

$$\text{Current tax expense or benefit} = \frac{\text{Taxable income}}{\text{(or excess of deductions over revenue)}} \times \text{Tax rate}$$

- **Deferred tax expense or benefit** is the net change during the year in an entity's deferred tax amounts.

$$\text{Changes in DTL balances} \pm \text{Changes in DTA balances}$$

Example 4-6 Calculating Tax Expense or Benefit

Lucas Company had the following deferred tax balances for the year just ended. The deferred tax asset is fully realizable. The company’s taxable income was \$1,000,000 for the year. The enacted tax rate is 40%.

	Beginning Balance	Ending Balance
Deferred tax asset	\$ 9,000	\$17,000
Deferred tax liability	13,000	23,000

Lucas calculates income tax expense for the year as follows:

- Current tax expense is \$400,000 (\$1,000,000 × 40%).
- Deferred tax expense is the net change in the deferred tax liability and asset balances for the year. The DTL balance increased by \$10,000 (\$23,000 – \$13,000), and the DTA balance increased by \$8,000 (\$17,000 – \$9,000). Thus, the net DTL increase is \$2,000 (\$10,000 – \$8,000).

Lucas records the following entry:

Assets	=	Liabilities	+	Stockholders’ Equity
Deferred tax asset \$8,000 ↑		Income tax payable \$400,000 ↑ Deferred tax liability \$10,000 ↑		Income tax exp. -- current \$400,000 ↓ Income tax exp. -- deferred \$2,000 ↓

4.4 Accounting for Bonds Payable

Nature of Bonds

A bond is a formal contract to pay an amount of money (face amount) at the maturity date plus interest at the stated rate at specific intervals.

Example 4-7 Nature of Bonds

At the beginning of the year, a company issues 200 8%, 5-year, \$5,000 bonds. Annual cash interest payments will be made at the end of each year. The total face amount of bonds issued is \$1,000,000 (200 bonds × \$5,000 face amount), and the annual interest payment is \$80,000 (\$1,000,000 face amount × 8% stated rate).

The proceeds received from the investors on the day the bonds are sold equal the present value of the sum of the future cash flows expected to be received from the bonds, calculated as follows:

Present value of the face amount + Present value of the annuity of interest payments



Author's Note

Calculating a bond's issue price is tested on Part 2 of the CMA exam. In Part 1, candidates need to know how to record bonds and their impact on the financial statements.

The bonds are recognized in the financial statements as the amount of proceeds paid for them, i.e., the face amount of the bonds plus any premium or minus any discount. They are recorded as a debt in the issuer's financial statements and as an investment in the investors' financial statements.

Bond Issuance

The cash proceeds from the sale of bonds can be equal to, less than, or greater than the face amount of the bonds depending on the relationship of the bonds' stated rate of interest to the market rate of interest on the date the bonds are sold.

Rate Relationship	Comparison of Cash Proceeds to Face Amount	Bonds Are Issued at . . .
Stated rate = Market rate	Cash proceeds = Face amount	Par
Stated rate > Market rate	Cash proceeds > Face amount	Premium
Stated rate < Market rate	Cash proceeds < Face amount	Discount

Amortization of Premium or Discount

Bond premium or discount must be amortized over the life of the bonds using the **effective-interest method** (the market interest rate on the date the bond was sold). Under this method, interest expense changes every period and equals the following:

$$\text{Annual interest expense} = \frac{\text{Carrying amount of the bond at the beginning of the period}}{\text{at the beginning of the period}} \times \text{Effective interest rate}$$

The annual interest expense consists of the cash interest paid plus the effect of amortization of premium or discount.

- When the bond is issued at a premium, annual interest expense equals cash interest paid minus the amount of premium amortized.
- When the bond is issued at a discount, annual interest expense equals cash interest paid plus the amount of discount amortized.

The carrying amount of bonds presented in the financial statements equals the face amount plus the premium (or minus the discount).

Example 4-8 Amortization of Premium and Discount

Using the data from Example 4-7:

1. Assume the market interest rate was 6% and the bonds were issued at \$1,083,960. The premium is \$83,960 (\$1,083,960 – \$1,000,000). The related interest expense and amortization for the first 2 years is as follows:

Year	A			Interest Expense	Cash Interest Paid	B		A – B		
	Beginning Carrying Amount of Bonds	Rate				Premium Amortized	Remaining Premium	Ending Carrying Amount of Bonds		
1	\$1,083,960	x 6%	=	\$65,038	–	\$80,000	=	\$14,962	\$68,998	\$1,068,998
2	1,068,998	x 6%	=	64,140	–	80,000	=	15,860	53,138	1,053,138

2. Assume the market interest rate was 10% and the bonds were issued at \$924,280. The discount is \$75,720 (\$1,000,000 – \$924,280). The related interest expense and amortization for the first 2 years is as follows:

Year	A			Interest Expense	Cash Interest Paid	B		A + B		
	Beginning Carrying Amount of Bonds	Rate				Discount Amortized	Remaining Discount	Ending Carrying Amount of Bonds		
1	\$924,280	x 10%	=	\$92,428	–	\$80,000	=	\$12,428	\$63,292	\$936,708
2	936,708	x 10%	=	93,671	–	80,000	=	13,671	49,621	950,379

- At the maturity date, the discount or premium is fully amortized, and the carrying amount of the bonds equals the face amount.