

## Chapter 13: Financial Instruments: Long-term Debt

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\*W            The solution to this assignment is on the text website, Connect.  
                 The solution is marked **WEB**.

## Cases

### Case 13-1 Forestry Incorporated

To: Board  
From: Accounting Advisor

Currently, you are using ASPE for your accounting policies. You have asked me to identify the differences in adopting IFRS which would be necessary if you decide to go public or accept the offer from the public company. IFRS allows more choices for measurement but will be more costly and complex.

You have a number of objectives to consider in selecting your accounting policies. Employees have a stock option based on net income so they will be interested in maximizing net income. The bank is interested in your future cash flows and ability to repay your loan. The new loan does not have the restriction on the payment of dividends however, there is a maximum debt to equity ratio. To avoid loan repayment, you would want to ensure this covenant is met. The bank requires audited financial statements. This will also be required if you decide to go public. The owners are interested in selling or going public therefore they will be interested in strong financial statements.

#### *Issues*

- 1) Bank loans
- 2) Lawsuit
- 3) Construction new sawmill
- 4) Long term supply contracts
- 5) Revenue recognition lumber
- 6) Reforestation
- 7) Lumber
- 8) Bonds

#### *Analysis and Conclusions*

##### *1) Bank loans*

FI has replaced their previous bank loan with a new loan. Since the terms and the amount has changed this is considered a substantial modification and the original loan is derecognized in both IFRS and ASPE. The unamortized transaction costs and financing fees from the old loan will be expensed since that loan will now be derecognized. In ASPE the loan could be measured using amortized cost or we could elect to measure at fair value. To be consistent with past treatment I recommend we use amortized cost. The

\$1.2 million of new transaction costs would be capitalized to the loan which will reduce the value of the loan. There is a choice to use the straight line method or the effective interest method for amortization. I recommend we use the effective interest method since it is required in IFRS as discussed below.

In IFRS it must be decided if the new loan will be classified as FVTPL or other liabilities. Since the previous loan used amortized cost it was in other liabilities. To be consistent I recommend the same classification. If the effective interest method is selected in ASPE there will be no changes then required if FI decides to use IFRS in the future.

## 2) *Lawsuit*

In ASPE we must determine if the lawsuit is likely and if it can be measured. It is likely since medical studies support their claims that the residents will be successful. FI will need to contact their lawyers to see if an estimate can be made for the amount of the claim. I assume that they would be able to look at past lawsuits to determine an amount. I recommend this amount be accrued with note disclosure. In IFRS we would look to determine if the lawsuit was probable which would also be met. There would be the same treatment.

*Note: Students could have also concluded that the lawsuit was in early stages and it would not be possible to estimate an amount and only note disclosure would be provided.*

## 3) *Construction new sawmill*

The new sawmill would be a self constructed asset. The costs of \$6 million associated with construction should be capitalized to the asset. In ASPE FI has a choice to expense or capitalize the interest costs associated with construction costs for any specific loans taken out for the project. Capitalization would stop when the strike is on and restart when the strike is over. I recommend that construction cost be capitalized to be consistent with IFRS and minimize any changes if FI decides to convert to IFRS. FI will be required to have note disclosure of the amount of interest costs capitalized.

In IFRS the construction of the sawmill would be considered a qualifying asset since it will take a year and a half which would be a substantial amount of time to complete. Similar to above the interest costs would be capitalized but this would stop during the strike. IFRS would capitalize both specific loans and general loans if also used for construction.

## 4) *Long term supply contracts*

In ASPE it must be determined if the anticipated penalty costs meet the definition of a liability. FI has not been able to meet the demand related to the contract and anticipate a

future sacrifice of \$250,000. They are required to make the payment based on the contract and it can be measured based on the contract. Therefore, FI should accrue an estimated liability for this amount.

In IFRS this would be considered an onerous contract if the cost of the penalties of \$250,000 exceed the benefits of the contract. Similar to ASPE the \$250,000 should be accrued as a provision assuming this amount exceeds the benefits associated with the contract.

#### 5) *Revenue recognition lumber*

In ASPE we must determine when there is a transfer of risks and rewards. For the sale to the lumber centres performance would be met when the lumber is delivered to the centre. Even though payment is not received for 30 days FI would have history to be able to estimate bad debts. Revenue therefore, would be recognized on delivery to the centre with an allowance established based on past history for bad debts.

For the sales to the agents the contract would be the sale of the lumber to their customers not to the agents. It should be considered if FI is the principal or the agent and if net versus gross revenue should be recognized. FI would be the agent since even though they pay a set amount to their oversea agents FI would control the price, they would have inventory risk, they are responsible for fulfilling the contract. The fee paid to the agents would be recognized as an expense by FI.

In IFRS for the sales to the lumber centres. The contract would be the sale of the lumber to the lumber centres. There is one performance obligation which is the delivery of the lumber to the centre. The overall contract price would be the amount that the lumber centres pay. Since FI has been in business a number of years they would be able to estimate bad debt expense. The performance obligation would be satisfied when the lumber is delivered to the centres. This would be the same treatment as in ASPE.

For the sales to the agents the contract would be the sale of the lumber to their customers not to the agents. Similar to the centres it is one performance obligation. Similar to in ASPE it should be considered if FI is the principal or the agent and if net versus gross revenue should be recognized. This would be the same treatment as in ASPE.

#### 6) *Reforestation*

In ASPE the requirement to reforest the lands would be considered an asset retirement obligation. This would be measured at the PV of the \$2.5 million (15 years, 10%) = \$598,475. This amount would be added to the value of the timber and a liability would be set up for the same amount. At the end of the year depreciation expense would be

recognized of  $\$598,475 / 15 = \$39,898$ . Interest expense would also be recognized for  $\$598,475 \times 10\% = \$59,848$ .

FI would have a similar treatment in IFRS for the reforestation costs. They would set up a decommissioning provision for the same amount as above. What would be different in ASPE would be the treatment of the timber. While the trees are growing they would be considered a biological asset. In IFRS the trees would be recorded using the fair value model which is fair value less costs of sale every reporting date and the gains or losses would be recognized in net income. When the trees are cut they would be agricultural produce. Once the timber is transformed it would be transformed into inventory and measured at the lower of cost and net realizable value. ASPE does not allow the use of the fair value model for biological assets.

#### 7) *Lumber*

In ASPE the timber would be inventory and measured at the lower of cost and net realizable value. The timber would be written down to \$1 million and an impairment loss would be recognized for \$4 million.

The treatment would be similar in IFRS.

#### 8) *Bonds*

The bonds would be measured at fair value on initial recognition. This would be the present value.

$$\begin{array}{r} \$10,000,000 \text{ (10 periods, 5\%)} (.61391) = \$6,139,100 \\ \$400,000 \text{ (10 periods, 5\%)} (7.72173) = \underline{3,088,692} \\ \hline \underline{\underline{\$9,227,792}} \end{array}$$

The bond has been issued at a discount. The bond would be recorded as :

Cash	9,227,792	
Discount	772,208	
Bond Payable		10,000,000

The discount would then be amortized either using the straight line method or the effective interest method. I recommend that the effective interest method be used since this would be required if FI adopted IFRS.

IFRS would require the same accounting for the bond.

## Case 13-2 Huy Publications Ltd.

### *Overview*

Huy Publications Ltd. (HPL) operates in a risky industry, known for its business failures. While HPL itself is reportedly stable, they have had loss years and have new facilities and new debt (government-guaranteed) in addition to that described. Reporting healthy, stable annual profits must be a concern in such an environment, as is complying with any and all debt covenants, some of which are based on financial statement information. Lenders would require GAAP-based financial statements, since covenants are calculated from audited information. ASPE versus IFRS has not been specified, but ASPE seems logical considering the size of the company. The **ethics** of choice are important here, as there might be temptation to pick an alternative that artificially creates acceptable results for key users. Financial position must be accurately portrayed.

### *Issue*

Evaluation of loan alternatives

### *Analysis and Conclusions*

#### *Alternative 1 – Canadian Bank*

- a) The effective interest rate is 8.225% (solved by spreadsheet) over the ten-year life of the loan, after factoring in the \$19,000 up-front fee and the \$5,500 transaction fees. The interest rate is fixed for the ten-year life.
- b) Principal need not be repaid until the end of the loan, allowing HPL flexibility in arranging either operating cash flow to finance the repayment or refinancing through another borrowing arrangement.
- c) HPL would have to switch current banking activities to Canadian Bank away from their current bank, which may not be attractive.
- d) The loan requires corporate guarantees but also personal guarantees from HPL's shareholders, which may be particularly unwelcome in this risky business sector.
- e) Debt: equity ratios must be kept at 2:1, but dividends can be up to 30% of earnings; current levels are only 10-15% of earnings. The debt: equity covenant may be viewed as reasonably restrictive; the dividend covenant less so.

### *Alternative 2 – Ottawa Bank*

- a) The interest rate for the first five years (6.5%) is lower than the interest rate for Alternative 1. If the up-front fee is factored in (over ten years), the loan would have to bear a stated interest rate of 10.5% (solved by spreadsheet) over the second five years in order to have an overall cost equivalent to Alternative 1. Will the interest rate in the second five-year period be below 10.5% or above 10.5%? Accurate response to this question will tell HPL which alternative is cheaper, but interest rates are notoriously unpredictable.
- b) The up-front fee is considerably larger, which is less attractive to HPL.
- c) The debt covenants are more restrictive for HPL, requiring that no new long-term debt be issued and that dividends not exceed current percentages of income.
- d) Corporate security is quite similar to Alternative 1, but also requires a floating charge on all corporate assets. Significantly, no personal guarantee is required, which may be a major factor for HPL.
- e) Principal payment is not required until the end of the term.

### *Alternative 3 - Pension fund bond*

- a) The effective interest rate on this loan is 8.2% (solved by spreadsheet), considering both the fact that the interest is compounded semi-annually and there are \$227,500 in legal, etc. fees paid up front. The loan cost is fixed over the life on the loan.
- b) The security is the least onerous for any alternative; general credit rating only.
- c) The covenants are severe (no dividends unless current ratio is 3.5 or above after declaration, no repurchase or issue of common shares, restrictions on current ratio and debt ratios, no changes in management, etc.)
- d) HPL would have to agree to put a representative of the lender on their Board, which is potentially undesirable.
- e) Upfront fees are high, which is less attractive to HPL because less net cash is available at the beginning of the loan period.

### *Conclusion*

When comparing these alternatives, the cost of borrowing must be revised to include fees and transaction costs so that comparisons are fair and complete.

Senior management of HPL must prioritize the factors that are different for these loans. Cost of borrowing, future interest rates, restrictive covenants, personal guarantees, security, and a position on the Board are all factors.

In addition, there may be some leeway to further negotiate unattractive terms if HPL can articulate the tradeoffs they are willing to make.



## Case 13-3 Dry Clean Depot Limited

### *Overview*

Dry Clean Depot Limited (DCDL) is a private company that has elected to comply with IFRS. The company is reasonably small, with \$7 million in sales, and 40 retail locations. DCDL has just negotiated a new equipment loan, with covenants that specify a maximum 2-to-1 debt-to-equity ratio. Other covenants require a minimum level of \$500,000 in cash, and restrict dividends to \$100,000 per year. These latter covenants require compliance, but are not affected by accounting policies. The debt-to-equity ratio restriction means that the company would prefer to maximize equity (earnings) and minimize debt, but **ethical** boundaries must be respected.

### *Issues*

1. Effective cost of loan
2. Capitalization of borrowing costs
3. Capital cost of equipment and depreciation
4. Lease arrangement
5. Environmental obligation
6. Revenue recognition
7. Lease terms

### *Analysis and conclusion*

#### 1. Effective cost of loan

DCDL has a choice of using amortized cost of fair value through profit and loss for the loan. They have decided to use amortized costs since this is the most common method used for loans.

The effective interest rate for the \$2,000,000 loan is determined by looking at the annual carrying cost (\$90,000 per year) and also the \$377,000 upfront fee. When both are factored in, the effective interest rate is 7.2%:

Effective interest rate =

Solve for x in,

$$\begin{aligned} \$2,000,000 &= \$377,000 + \$90,000 (P/A, x \%, 10) + \$2,000,000 (P/F, x \%, 10) \\ x &= \underline{7.2\%} \end{aligned}$$

Upfront fees are recorded as a discount and amortized to interest expense (etc.) during the life of the loan. Since the discount is netted with the loan on the SFP, this helps modestly reduce debt balances for covenant calculations.

## 2. Capitalization of borrowing costs

The loan is specific to the equipment purchase, and interest must be capitalized during the acquisition period, which is lengthy. After the acquisition period, interest is an expense. If there were investment earnings on idle loan cash, for the period between the time that the loan money is advanced and amounts are paid out to suppliers, such earnings are netted in the interest capitalization calculation.

General borrowing costs for the portion of the purchase price financed through DCDL cash flows are also be capitalized, but no imputed costs for equity. The borrowing cost must be calculated on a weighted average basis. Further information on each of these issues must be gathered.

Interest to be capitalized:

$$\text{Loan balance} \quad \$2,000,000 \times 7.2\% \times 10/12 \quad \underline{\underline{\$120,000}}$$

The ten month period consists of six months for production, three months for shipping plus one month for installation and testing. In terms of time line, the loan is assumed to be advanced and the equipment immediately ordered. If there is a time lag, the capitalization period will be longer because capitalization will start when the loan commences. Interest is capitalized when the loan monies are advanced, in the current fiscal period.

Additional interest will be capitalized for amounts financed from general borrowings. This amount is not determinable but information must be gathered to calculate the adjustment.

Interest capitalization will preserve levels of earnings (equity), making the debt-to-equity ratio easier to achieve.

## 3. Capital cost of equipment and depreciation

Many of the costs associated with equipment acquisition will be capitalized, as follows:

<b>Description</b>	<b>Amount</b>
Invoice price	\$2,450,000
Interest cost (above)	120,000
Interest on general borrowing	??
Shipping	34,000
Duty (\$2,450,000 x 20%)	490,000
Installation & testing	<u>38,000</u>

	<u>\$3,132,000 + ??</u>
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Equipment is depreciated over its life using an acceptable depreciation method such as straight-line or declining balance. Policy for this must be set, along with a determination of the useful life and salvage value, or the declining balance rate. The equipment should be evaluated to see if components have various life spans; if so, then depreciation must be stratified to reflect this fact.

#### 4. Lease Arrangement

DCDL must evaluate the need to record a liability for the onerous contract that is represented by the lease situation in Sudbury. The landlord has been informed that DCDL will vacate, and a sub-tenant located, with a signed contract for the sub-lease. This proves positive intent to act.

DCDL has an obligation to pay \$27,500 for occupancy costs each year for the next three years, and has a sub-tenant that is willing to pay at least \$5,000 per year. Therefore, there is an unfunded obligation of \$22,500 per year. This may be less if the extra sub-rent in years 2 and 3, 10% of the sub-tenant sales in excess of \$150,000, can be reliably estimated. However, since DCDL has had negative experience with this location, and the nature of the sub-tenant operation is unknown, no amount has been estimated in these calculations. This area must be explored further.

Since the payments take place over three years, the time value of money must be estimated to value the liability. Interest expense (accretion) will then be recorded each year. The interest rate to use should be a borrowing rate for operating activities over a three-year period. This rate is not known and must be established. A rate of 7%, based on the equipment loan (7.2%) has been used but this rate may not be comparable because term (10 years) and security are different.

Using the 7% rate, and assuming rent is payable at the beginning of each year:

Liability balance	$\$22,500 \times (P/AD, 7\%, 3)$ (rounded)	<u>\$63,000</u>
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This amount will be recorded as a liability, worsening the debt-to-equity ratio. It is not avoidable.

## 5. Environmental obligation

DCDL has a contractual liability in eight locations for environmental remediation in the event of contamination caused by dry cleaning operations, in particular, contamination caused by perc.

These obligations must be estimated and discounted for the time value of money if payment is delayed. As for the onerous contract obligation, an interest rate of 7% will be used as an estimate but a more appropriate interest rate (term and security) must be estimated.

The liability exists because DCDL stands ready to meet any potential costs. The major issue is measurement of the liability. If there is no contamination, then the liability has a zero value and there is no amount recorded. This appears to be the case for most premises, and regular testing provides comfort that liabilities are identified on a timely basis.

For one location, however, it appears as though there might be an environmental issue. Further testing is being done to confirm this, and the outcome of this testing will determine if remediation, and liability recognition, is needed.

If action is needed, then the cost and the timing of action must be determined. The cost has been suggested in the \$250,000 to \$500,000 range. Costs must be further explored, and an expected value established. If, for example, both of these estimates were equally likely, then the amount to be accrued would be \$375,000. Discounted for two years at 7%, this is a \$325,000 (rounded) liability. This amount is also capitalized as an asset, amortized over the remaining lease term.

Note that additional liability recognition of a significant amount has negative implications for the covenant agreement. The annual interest expense on the provision should also be considered. Some covenant renegotiation might be considered, or perhaps additional equity financing might be possible.

More importantly, the environmental obligations call the business model into question, and appropriate pricing and management of operational risks should be considered and evaluated at a strategic level.

The cost of vacating premises at the end of the lease would also have to be identified and evaluated for recognition. If DCDL has agreed to move after environmental cleanup, and this has costs, then the amount must be reflected in the financial statements. It may well be immaterial.

## 6. Revenue recognition

DCDL sold prepaid dry cleaning services cards (gift cards) this year. When cards are issued, a contract liability is recognized, and when the cards are used, the liability is decreased and revenue is recognized. This is appropriate accounting. Card value of \$126,000 (\$468,000 - \$342,000) is outstanding at year-end, or 27% of the gross cards issued.

The issue that needs to be examined is how the initial \$20 price reduction is treated. A \$120 card costs \$100 for the customer, which is in essence a sales discount. The amount must be relabeled as a sales discount, not an expense, and shown as a contra account to sales. This is a presentation issue. Revenue should reflect cash value.

This issue can be explained in one of two ways:

1. Services are being sold for a lower price, but this is not below cost (gross profit is usually 60%); services are still profitable after the reduction granted with the cards. Valuation of revenue and liability should be at the cash amount received not the regular price. Therefore, sales of the period should be \$285,000 ( $\$342,000/1.2$ ), and the liability should be recorded at \$105,000 ( $\$126,000/1.2$ ). This increases net income (now has  $\$342,000 - \$78,000$  recorded) and liabilities.
2. Alternatively, valuation can be explained through the discount account. The discount amount, \$78,000 for the cards issued, has been entirely expensed in the current period. The question is whether this relates to this period, or whether the \$78,000 should be prorated consistent with card use. If it were prorated, the unused portion would reduce the reported liability.

There is no need to establish a liability for more than the proceeds received. Accordingly, the sales discount should be recognized as it is used. The discount should be adjusted to \$57,000 ( $\$78,000 \times 342/468$ ) and the remaining \$21,000 recorded as a contra to the liability account, reducing it to \$105,000 ( $\$126,000 - \$21,000$ ).

Either of these explanations is acceptable.

DCDL expects that 5 to 10% of the value on the cards will not be used. At the volumes sold this year, this represents \$23,400 to \$46,800 of the liability (gross) outstanding at year-end or \$19,500 to \$39,000 when deflated to the lower cash amount. At year-end, this is approximately 20% to 45% of the outstanding liability, which is very high. The company has a legal obligation in perpetuity for these amounts, and must stand ready to honor the cards if they are used at any

point in the future. The company lacks history to use in determining any unused percentage. Accordingly, at this stage in the life of this program, it would not be advisable to decrease the liability for expected unused cards.

In terms of covenant implications, scaling back the liability and increasing earnings this year are both positive outcomes. It would be preferable to reduce the liability for unused cards, but if this cannot be measured, it certainly cannot be manipulated.

#### 7. Lease arrangements

DCDL is a tenant in forty locations. The leases have been described as short-term rentals, over three to five years. As such, they would almost certainly qualify as operating leases, and no liability for the leases would be recorded. DCDL should be aware, though, that the IASB is considering a proposal to capitalize all leases regardless of length of term. This would result in liability recognition for DCDL. The loan contract just negotiated puts a limit on debt-to-equity over a ten-year time span, and capitalization might be required within this window. Therefore, DCDL should negotiate in advance with the lender around the scenario of an eventual capitalization, perhaps asking that such lease obligations be excluded from the ratio, or that the ratio be increased to reflect the alternate accounting rules.

*Note that if the company decided to early adopt the new lease standard IFRS 16 then the lease would be treated as a finance lease.*

#### *Conclusion*

Overall, liabilities have been established for environmental issues, onerous contracts, and potentially for leases. If DCDL is now close to the debt covenant for debt-to-equity, this will be uncomfortable. It is still the inception of the loan contract. The company should look at projections for key financial variables and decide whether the loan covenant is reasonable. If not, re-negotiation or alternate financing sources must be explored.

## Technical Review

### Technical Review 13-1

1. T
2. F – if the financial liability was measured in FVTPL the transaction costs would be expensed
3. T
4. F – amortization of the discount will increase interest expense
5. T

### Technical Review 13-2

1. F – there is the option to measure the bonds at fair value every reporting date
2. F – there is option to use either straight line or effective interest method for amortization
3. F – if the financial liabilities are measured at fair value the transaction costs would be expensed. If the financial liabilities were measured at amortized cost the transaction costs would be capitalized to the financial liability
4. F – only interest from specific loans can be capitalized not general loans
5. T

### Technical Review 13-3

#### Requirement 1

Principal \$1,000,000 (P/F, 5%, 10) = \$1,000,000 × (0.61391) .....	\$613,910
Interest \$40,000 (P/A, 5%, 10) = \$40,000 × (7.72173) .....	<u>308,869</u>
	<u>\$922,779</u>

Cash	922,779	
Discount	77,221	
Bond Payable		1,000,000

#### Requirement 2

June 30

Interest Expense	46,139	
Amortization of Discount		6,139
Cash		40,000

(922,779 x 5% = \$46,139)

Dec 31

Interest Expense	46,446	
Amortization of Discount		6,446
Cash		40,000

[(922,779 + 6,139) x 5% = \$46,446]

#### Requirement 3

June 30

Interest Expense	47,722	
Amortization of Discount		7,722
Cash		40,000

(77,221 / 10 = 7,722 )

Dec 31

Interest Expense	47,722	
Amortization of Discount		7,722
Cash		40,000

(77,221 / 10 = 7,722 )



## Technical Review 13-4

### Requirement 1

Principal \$5,000,000 (P/F, 4%, 20) = $\$5,000,000 \times (0.45639)$ .....	2,281,950
Interest \$150,000 (P/A, 4%, 20) = $\$150,000 \times (13.59033)$ .....	<u>2,038,550</u>
	<u>\$4,320,500</u>

### Requirement 2

Principal \$5,000,000 (P/F, 2.5%, 16) = $\$5,000,000 \times (0.67362)$ .....	3,368,100
Interest \$150,000 (P/A, 2.5%, 16) = $\$150,000 \times (13.05500)$ .....	<u>1,958,250</u>
	<u>\$5,326,350</u>

### Requirement 3

Present value at 1 August (Requirement 1) .....	4,320,500
Present value at 1 February (n=19, below) .....	<u>4,343,291</u>
	\$ <u>22,791</u>

Issuance proceeds:  $\$4,320,500 + (2/6 \text{ of } \$22,791)$  .....

	<u>4,328,097</u>
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Present value at n=19:

Principal \$5,000,000 (P/F, 4%, 19) = $\$5,000,000 \times (0.47464)$ .....	2,373,200
Interest \$150,000 (P/A, 4%, 19) = $\$150,000 \times (13.13394)$ .....	<u>1,970,091</u>
	<u>\$4,343,291</u>

### Technical Review 13-5

#### Requirement 1

Principal \$6,000,000 (P/F, 3%, 20) = \$6,000,000 × (0.55368) .....	3,322,080
Interest \$150,000 (P/A, 3%, 20) = \$150,000 × (14.87747) .....	<u>2,231,621</u>
	<u>\$5,553,701</u>

#### Requirement 2

Period	Cash interest paid	Interest expense	D or P amortization	Closing net bond liab.
Op. balance				5,553,701
1	150,000	172,315	22,315	5,576,016
2	150,000	172,315	22,315	5,598,331
3	150,000	172,315	22,315	5,620,646
4	150,000	172,315	22,315	5,642,961

(1) The amount of the discount is  $\$6,000,000 - 5,553,701 = \$446,299 / 20 = \$22,315$  amortized each period.

### Technical Review 13-6

#### Requirement 1

Principal \$6,000,000 (P/F, 3%, 20) = \$6,000,000 × (0.55368) .....	3,322,080
Interest \$150,000 (P/A, 3%, 20) = \$150,000 × (14.87747) .....	<u>2,231,621</u>
	<u>\$5,553,701</u>

#### Requirement 2

Period	Cash interest paid	Interest expense (3%)	D or P amortization	Closing net bond liab.
Op. balance				5,553,701
1	150,000	166,611	16,611	5,570,312
2	150,000	167,109	17,109	5,587,421
3	150,000	167,622	17,622	5,605,043
4	150,000	168,151	18,151	5,623,194

### Technical Review 13-7

#### Requirement 1

Power receives \$9,360,000 (\$10,000,000 less \$640,000)

#### Requirement 2

The IRR of the payment stream is 3%, compounded semi-annually, or 6% per year.

Solve for  $i$  in:

$$\$10,000,000 = \$640,000 + [\$225,000 \times (P/A, i, 10)] + [\$10,000,000 \times (P/F, i, 10)]$$

#### Requirement 3

Period	Cash interest paid	Interest expense (3%)	D or P amortization	Closing net bond liab.
Op. balance				9,360,000
1	225,000	280,800	55,800	9,415,800
2	225,000	282,474	57,474	9,473,274
3	225,000	284,198	59,198	9,532,472
4	225,000	285,974	60,974	9,593,446

### Technical Review 13-8

Borrowing rate =  $\$174,000 / \$2,900,000 = 6\%$

Payment	Calculation	Capitalizable
Early June	$\$1,200,000 \times 4/12 \times 6\%$ (June to September)	\$ 24,000
October	$\$126,000 \times 0$ Capitalization period ends at the end of September because goods available for sale.	
		<u>\$24,000</u>

To capitalize borrowing costs:

Inventory	24,000	
Interest expense		24,000

### Technical Review 13-9

To update interest expense and amortization:

Interest expense.....	22,533	
Premium on bonds payable .....	800	
Cash ( $\$10,000,000 \times 20\% \times 7\% \times 2/12$ ).....		23,333

To record the retirement:

Bonds payable ( $\$10,000,000 \times 20\%$ ).....	2,000,000	
Premium on bonds payable ( $\$84,000 \times 20\%$ ) less \$800 .....	16,000	
Loss, retirement of debt .....	184,000	
Cash.....		2,200,000

### Technical Review 13-10

The note would be recorded at  $\$325,000 \times \$1.01 = \$328,250$ .

Year one  $\$325,000 \times (\$1.01 - \$1.03) = \$6,500$  exchange loss

Year two  $\$325,000 \times (\$1.03 - \$0.98) = \$16,250$  exchange gain

## Assignments

### Assignment 13-1

Logical circumstances for:

Operating line of credit	Need for short-term financing; Accounts receivable and/or inventory available for security.
Commercial paper	Large corporation with good credit rating; financial intermediary available.
Term loan	Medium-term loan from a financial institution, with tangible capital assets available for security.
Commercial mortgage	Loan from a financial institution secured against land and buildings; term is often 5 years but amortization period for blended payments is longer.
Long-term bond payable	Need for long-term financing.
Equity financing	No concern loss of control need for financing but no requirement for annual cash flows for interest.

### Assignment 13-2

		Financing source
<b>Case A</b>	The company's primary assets are land and buildings	Commercial mortgage; typical security for a mortgage
<b>Case B</b>	The company is a large public company with significant tangible assets and a need for millions of dollars in long-term financing.	Long-term bonds payable; tangible assets are possible security and company size and capital need match the bond market
<b>Case C</b>	The company's primary assets are intangible and earnings are erratic	Equity financing; No tangible assets for security for a loan and risk high because of erratic earnings
<b>Case D</b>	The company requires short-term financing and has sizeable inventory and account receivable balances	Operating line of credit; typical security for an operating line of credit

### Assignment 13-3

		Financing source
<b>Case A</b>	The company is a large public company with significant tangible assets, an excellent credit rating, and a need for short-term loans at low cost.	Commercial paper; Circumstances qualify for commercial paper as long as an intermediary exists. Operating line of credit is another alternative
<b>Case B</b>	The company has significant tangible assets that are all pledged as security for other loans, and the industry sector is very risky.	Equity financing; No tangible assets for security for a loan and risk high because of industry
<b>Case C</b>	The company's primary assets are machinery and equipment.	Term loan; typical security for a term loan
<b>Case D</b>	The company's primary assets are accounts receivable.	Operating line of credit; typical security for an operating line of credit

## Assignment 13-4

### Requirement 1

Principal: $\$4,000,000 \times (P/F, 2.5\%, 16) = \$4,000,000 \times 0.67362 =$	\$2,694,480
Interest: $(\$4,000,000 \times 2.25\%) \times (P/A, 2.5\%, 16) = \$90,000 \times 13.055 =$	<u>1,174,950</u>
Issue proceeds at 30 April 20X0	<u>\$3,869,430</u>

### Requirement 2

Principal: $\$4,000,000 \times (P/F, 2\%, 11) = \$4,000,000 \times 0.80426 =$	\$3,217,040
Interest: $(\$4,000,000 \times 2.25\%) \times (P/A, 2\%, 11) = \$90,000 \times 9.78685 =$	<u>880,817</u>
Issue proceeds at 30 October 20X2	<u>\$4,097,857</u>

### Requirement 3

Principal: $\$4,000,000 \times (P/F, 4\%, 14) = \$4,000,000 \times 0.57748 =$	\$2,309,920
Interest: $(\$4,000,000 \times 2.25\%) \times (P/A, 4\%, 14) = \$90,000 \times 10.56312 =$	<u>950,681</u>
Issue proceeds at 30 April 20X1	<u>\$3,260,601</u>

### Requirement 4

At 30 October 20X5, there are five interest periods remaining:

#### a. Book value

Principal: $\$4,000,000 \times (P/F, 2.5\%, 5) = \$4,000,000 \times 0.88385$	\$3,535,400
Interest: $(\$4,000,000 \times 2.25\%) \times (P/A, 2.5\%, 5) = \$90,000 \times 4.64583 =$	<u>418,125</u>
	<u>\$3,953,525</u>

#### b. Fair value

Principal: $\$4,000,000 \times (P/F, 5\%, 5) = \$4,000,000 \times 0.78353$	\$3,134,120
Interest: $(\$4,000,000 \times 2.25\%) \times (P/A, 5\%, 5) = \$90,000 \times 4.32948 =$	<u>389,653</u>
	<u>\$3,523,773</u>

## Assignment 13-5

### Requirement 1

Principal: $\$20,000,000 \times (P/F, 3\%, 20) =$	
$\$20,000,000 \times 0.55368 =$	\$11,073,600
Interest: $(\$20,000,000 \times 2.75\%) \times (P/A, 3\%, 20) =$	
$\$550,000 \times 14.87747 =$	<u>8,182,609</u>
Issue proceeds at 1 June 20X5	<u>\$19,256,209</u>
Interest expense:	
$\$19,256,209 \times 3\% =$	<u>\$577,686</u>
Interest paid:	<u>\$550,000</u>

### Requirement 2

Principal: $\$20,000,000 \times (P/F, 4\%, 16) =$	
$\$20,000,000 \times 0.53391 =$	\$10,678,200
Interest: $(\$20,000,000 \times 2.75\%) \times (P/A, 4\%, 16) =$	
$\$550,000 \times 11.65230 =$	<u>6,408,765</u>
Issue proceeds at 1 June 20X7	<u>\$17,086,965</u>
Interest expense:	
$\$17,086,965 \times 4\% =$	<u>\$683,479</u>
Interest paid:	<u>\$550,000</u>

### Requirement 3

Principal: $\$20,000,000 \times (P/F, 2\%, 11) =$	
$\$20,000,000 \times 0.80426 =$	\$16,085,200
Interest: $(\$20,000,000 \times 2.75\%) \times (P/A, 2\%, 11) =$	
$\$550,000 \times 9.78685 =$	<u>5,382,768</u>
Issue proceeds at 30 November 20X9	<u>\$21,467,968</u>
Interest expense:	
$\$21,467,968 \times 4\% =$	<u>\$ 429,359</u>
Interest paid:	<u>\$ 550,000</u>

### Requirement 4

In all cases, interest expense is not cash paid. Interest expense is dictated by the yield rate, not the nominal rate. Interest paid will always remain consistent at the nominal rate.



## Assignment 13-6

### Requirement 1

Principal	\$10,000,000 x (P/F 3%, 20) (.55368) =	\$5,536,800
Interest	\$325,000 x (PVA 3%, 20) (14.87747) =	<u>4,835,178</u>
		<u>\$10,371,978</u>

### Requirement 2

Period	Cash interest paid	Interest expense	D or P amortization	Closing net bond liab.
Op. balance				10,371,978
1	325,000	311,159	13,841	10,358,137
2	325,000	310,744	14,256	10,343,881
3	325,000	310,316	14,684	10,329,197
4	325,000	309,876	15,124	10,314,073

### Requirement 3

#### 1 October 20x4

Cash .....	10,371,978	
Premium on bonds payable .....		371,978
Bonds payable .....		10,000,000

#### 31 December 20x4

Interest expense (\$311,159 x 3/6) .....	155,580	
Premium on bonds payable (\$13,841 x 3/6) .....	6,920	
Interest payable (\$325,000 x 3/6) .....		162,500

#### 31 March 20x5

Interest expense (\$311,159 x 3/6) .....	155,579	
Interest payable .....	162,500	
Premium on bonds payable (\$13,841 x 3/6) .....	6,921	
Cash .....		325,000

#### 30 September 20x5

Interest expense .....	310,744	
Premium on bonds payable .....	14,256	
Cash .....		325,000

#### 31 December 20x5

Interest expense (\$310,316 x 3/6) .....	155,158	
Premium on bonds payable (\$14,684 x 3/6) .....	7,342	
Interest payable (\$325,000 x 3/6) .....		162,500

**Assignment 13-7 (WEB)**

*Requirement 1*

Bond proceeds:

$$\begin{aligned}
 P &= \$3,000,000 \times (P/F, 4\%, 20) + (\$3,000,000 \times 5\%) \times (P/A, 4\%, 20) \\
 &= (\$3,000,000 \times 0.45639) + (\$150,000 \times 13.59033) \\
 &= \$1,369,170 + \$2,038,550 \\
 &= \$3,407,720
 \end{aligned}$$

*Requirement 2*

30 September 20x1:

Cash .....	3,407,720	
Bonds payable .....		3,000,000
Premium on bonds .....		407,720

31 March 20x2:

Interest expense .....	136,309	
Premium on bonds .....	13,691	
Cash .....		150,000
[interest expense = 4% of \$3,407,720]		

30 September 20x2:

Interest expense .....	135,761	
Premium on bonds .....	14,239	
Cash .....		150,000
[interest expense = 4% of (\$3,407,720 – \$13,691) = .04(\$3,394,029)]		

31 March 20x3:

Interest expense .....	135,192	
Premium on bonds .....	14,808	
Cash .....		150,000
[interest expense = .04(\$3,394,029 – \$14,239) = .04(\$3,379,790)]		

30 September 20x3:

Interest expense .....	134,599	
Premium on bonds .....	15,401	
Cash .....		150,000
[interest expense = .04(\$3,379,790 – \$14,808) = .04(\$3,364,982)]		

*Requirement 3*

The unamortized premium on 1 October 20x7, using the effective interest method, is the present value of the remaining cash flows at that date, less the principal amount of the bonds at 1 October 20x7, four years before maturity:

$$\begin{aligned}\text{Unamortized premium} &= [\$3,000,000(\text{P/F}, 4\%, 8) + \$150,000(\text{P/A}, 4\%, 8)] - \$3,000,000 \\ &= [\$3,000,000(.73069) + \$150,000(6.73274)] - \$3,000,000 \\ &= (\$2,192,070 + \$1,009,911) - \$3,000,000 \\ &= \$3,201,981 - \$3,000,000 \\ &= \$201,981\end{aligned}$$

*Requirement 4*

Premium amortization for next 6 months:

Using the answer to requirement 4:

- The present value of the bonds at 1 October 20x7 is \$3,201,981.
- Interest expense for the next six months is 4% of the PV, or \$128,080.
- Premium amortization is the difference between the expense of \$128,080 and the payment of \$150,000, or \$21,920.

## Assignment 13-8

### Requirement 1

Price of bond:

P	\$4,000,000 (P/F, 2%, 7) = \$4,000,000 × (.87056)	\$3,482,240
I	\$100,000 (P/A, 2%, 7) = \$100,000 × (6.47199)	647,199
		<u>\$4,129,439</u>

### Requirement 2

Date	Interest Payment	Interest Expense	Premium Amortization	Unamortized Premium	Net bond Liability
Opening				\$129,439	\$4,129,439
1	\$100,000	\$82,589	\$ 17,411	112,028	4,112,028
2	100,000	82,241	17,759	94,269	4,094,269
3	100,000	81,885	18,115	76,154	4,076,154
4	100,000	81,523	18,477	57,677	4,057,677
5	100,000	81,154	18,846	38,831	4,038,831
6	100,000	80,777	19,223	19,608	4,019,608
7	100,000	80,392	19,608	0	4,000,000

### Requirement 3

Cash	4,129,439	
Premium on bonds payable		129,439
Bonds payable		4,000,000
31 December 20x9 (adjusting entry):		
Interest expense (4/6)	55,059	
Premium on bonds payable	11,607	
Accrued interest payable		66,666
28 February 20X10		
Accrued interest payable	66,666	
Interest expense (2/6)	27,530	
Premium on bonds payable (2/6)	5,804	
Cash		100,000

31 August 20x10		
Interest expense .....	82,241	
Premium on bonds payable .....	17,759	
Cash .....		100,000
31 December 20x10 (adjusting entry):		
Interest expense (4/6).....	54,590	
Premium on bonds payable .....	12,076	
Accrued interest payable .....		66,666

*Requirement 4*

20x9

Interest expense	<u>\$55,059</u>
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20x10

Interest expense (\$27,530 + \$82,241 + \$54,590)	<u>\$164,361</u>
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*Requirement 5*

20x9

Bonds payable, 5%, effective rate 4%, due 28 February 20X13	\$4,000,000
Premium on bond payable (\$129,439 – \$11,607)	<u>117,832</u>
	<u>\$4,117,832</u>

20x10

Bonds payable, 5%, effective rate 4%, due 28 February 20X13	\$4,000,000
Premium on bond payable (\$117,832 - \$5,804 - \$17,759 - \$12,076)	<u>82,193</u>
	<u>\$4,082,193</u>

## Assignment 13-9

### Requirement 1

1 April 20x1		
Cash .....	814,003	
Premium on bonds payable .....		14,003
Bonds payable .....		800,000
30 September 20x1		
Interest expense .....	20,350	
Premium on bonds payable .....	1,250	
Cash .....		21,600
31 December 20x1 (adjusting entry):		
Interest expense (3/6).....	10,159	
Premium on bonds payable .....	641	
Accrued interest payable .....		10,800
30 March 20x2		
Accrued interest payable .....	10,800	
Premium on bonds payable .....	640	
Interest expense (3/6).....	10,160	
Cash .....		21,600
30 September 20x2		
Interest expense .....	20,287	
Premium on bonds payable .....	1,313	
Cash .....		21,600
31 December 20x2 (adjusting entry):		
Interest expense (3/6).....	10,127	
Premium on bonds payable .....	673	
Accrued interest payable .....		10,800

### Requirement 2

Bonds payable, 5.4%, effective rate 5%, due 30 March 20X6	\$800,000
Premium on bond payable (\$10,159 – \$673)	<u>9,486</u>
	<u>\$809,486</u>

### Assignment 13-10 (WEB)

#### Requirement 1

Price of bond:

P	\$200,000 (P/F, 4%, 8) = \$200,000 × (.73069).....	\$146,138
I	\$7,600 (P/A, 4%, 8) = \$7,600 × (6.73274).....	<u>51,169</u>
		<u>\$197,307</u>

#### Requirement 2

<i>Date</i>	<i>Interest Payment</i>	<i>Interest Expense</i>	<i>Discount Amortization</i>	<i>Unamortized Discount</i>	<i>Net bond Liability</i>
Opening				\$2,693	\$197,307
31 Aug. 20x4	\$7,600	\$7,892	\$292	2,401	197,599
28 Feb. 20x5	7,600	7,904	304	2,097	197,903
31 Aug. 20x5	7,600	7,916	316	1,781	198,219
28 Feb. 20x6	7,600	7,929	329	1,452	198,548
31 Aug. 20x6	7,600	7,942	342	1,110	198,890
28 Feb. 20x7	7,600	7,956	356	754	199,246
31 Aug. 20x7	7,600	7,970	370	384	199,616
28 Feb. 20x8	7,600	7,984	384	0	200,000

#### Requirement 3

Proceeds of bond = \$197,599 + 1/6 of (\$197,903 - \$197,599) = \$197,650

Accrued interest = \$200,000 × 7.6% × 1/12 = \$1,267

*Requirement 4*

30 September 20x4

Cash ( $\$197,650 + \$1,267$ ).....	198,917	
Discount on bonds payable ( $\$200,000 - \$197,650$ ).....	2,350	
Bonds payable .....		200,000
Interest payable .....		1,267

31 December 20x4 (adjusting entry):

Interest expense .....	3,952	
Interest payable ( $\$200,000 \times 7.6\% \times 3/12$ ) .....		3,800
Discount on bond payable ( $\$304 \times 3/6$ ).....		152

Note: If interest expense had been credited in the first entry, it would have to be adjusted now, to set up the proper payable (\$5,067) and expense (\$3,952) at year-end. Crediting interest expense in the initial entry is only a “wash” *after the first six month payment*.

28 February 20x5:

Interest payable .....	5,067	
Interest expense .....	2,634	
Discount on bonds payable ( $\$304 \times 2/6$ ).....		101
Cash .....		7,600



## Assignment 13-11

### Requirement 1

Present value at 1 April (per table) .....	\$814,003
Present value at 1 September .....	<u>812,753</u>
	\$ <u>1,250</u>
Issuance proceeds: \$814,003 - (4/6 of \$1,250) .....	<u>\$813,170</u>
Accrued interest (\$21,600 x 4/6) .....	<u>\$ 14,400</u>

### Requirement 2

1 August 20x1

Cash (\$813,170 + \$14,400) .....	825,570	
Interest payable .....		14,400
Premium on bonds payable .....		13,170
Bonds payable .....		800,000

30 September 20x1

Interest expense (\$20,350 x 2/6) .....	6,783	
Premium on bonds payable (\$1,250 x 2/6) .....	417	
Interest payable .....	14,400	
Cash .....		21,600

31 December 20x1 (adjusting entry):

Interest expense (3/6) .....	10,159	
Premium on bonds payable .....	641	
Accrued interest payable .....		10,800

31 March 20x2

Accrued interest payable .....	10,800	
Premium on bonds payable .....	640	
Interest expense .....	10,160	
Cash .....		21,600

30 September 20x2

Interest expense .....	20,287	
Premium on bonds payable .....	1,313	
Cash .....		21,600

31 December 20x2 (adjusting entry):		
Interest expense (3/6).....	10,127	
Premium on bonds payable .....	673	
Accrued interest payable .....		10,800

*Requirement 3*

Interest expense, 20x1 (\$6,783+ \$10,159)	<u>\$ 16,942</u>
Bonds payable, 5.4%, effective rate 5%, due 30 March 20X6	\$800,000
Premium on bond payable (\$12,753 – \$641)	<u>12,112</u>
	<u>\$812,112</u>

## Assignment 13-12

### Requirement 1

Price of bond:

P	\$80,000 (P/F, 4%, 8) = \$80,000 × (.73069).....	\$58,455
I	\$2,800 (P/A, 4%, 8) = \$2,800 × (6.73274).....	<u>18,852</u>
		<u>\$77,307</u>

### Requirement 2

**Bond Amortization Table**  
(Stated rate 3.5%; effective rate 4%; semi-annual)

<i>Date</i>	<i>Cash Payment</i>	<i>Effective Interest</i>	<i>Discount Amortization</i>	<i>Unamortized Discount</i>	<i>Net Bond Liability</i>
Opening				2,693	77,307
31 May 20x6	2,800	3,092	292	2,401	77,599
30 Nov. 20x6	2,800	3,104	304	2,097	77,903
31 May 20x7	2,800	3,116	316	1,781	78,219
30 Nov. 20x7	2,800	3,129	329	1,452	78,548
31 May 20x8	2,800	3,142	342	1,110	78,890
30 Nov. 20x8	2,800	3,156	356	754	79,246
31 May 20x9	2,800	3,170	370	384	79,616
30 Nov. 20x9	2,800	3,184	384	0	80,000

### Requirement 3

Proceeds of bond = \$77,307 + 2/6 of (\$77,599 - \$77,307) = \$77,404

Accrued interest = \$80,000 × 7% × 2/12 = \$933

### Requirement 4

Discount amortization to 31 May 20x6 is \$195 (\$77,599 - \$77,404)



## Assignment 13-14

### Requirement 1

Effective interest rate = Solve for x in,

$$\begin{aligned} \$1,000,000 &= \$106,920 + \$20,000 (P/A, x \%, 3) + \$1,000,000 (P/F, x \%, 3) \\ x &= 6\% \end{aligned}$$

Proof:

$$\begin{aligned} \$1,000,000 &= \$106,920 + \$20,000 (P/A, 6\%, 3) + \$1,000,000 (P/F, 6\%, 3) \\ \$1,000,000 &= \$106,920 + \$20,000 (2.67301) + \$1,000,000 (.83962) \\ \$1,000,000 &= \$1,000,000 \end{aligned}$$

Net amount advanced on borrowing:  $\$1,000,000 - \$106,920 = \$893,080$

### Requirement 2

Interest expense: (table not required)

Period	Cash interest paid	Int. expense (6%)	Amortization	Closing net liability
Op. balance				893,080
1	20,000	53,584	33,584	926,664
2	20,000	55,600	35,600	962,264
3	20,000	57,736	37,736	1,000,000

## Assignment 13-15

### Requirement 1

Cash .....	19,800,000
Long-term note payable (US\$20,000,000 × 0.99) .....	19,800,000

### Requirement 2

#### Statement of financial position

Long-term note payable (US\$20,000,000 × \$0.95)	\$19,000,000
Accrued interest payable (US\$20,000,000 × 6% × 8/12 × \$0.95)	\$ 760,000

#### Statement of comprehensive income

Interest expense (US\$20,000,000 × 6% × 8/12 × \$0.98)	\$ 784,000 dr.
Foreign exchange gain (\$19,800,000 – \$19,000,000) + (\$784,000 - \$760,000)	\$ 824,000 cr.

Note that interest expense is measured at the average rate for the year, and the interest liability is measured at the closing exchange rate. There is an exchange gain for the difference.

**Assignment 13-16 (WEB)**

*Requirement 1*

Date		Loan Balance	(Gain)/Loss
1 May 20x2	@ \$1.09	\$8,720,000	
31 December 20x2	@ \$1.12	<u>8,960,000</u>	\$240,000
31 December 20x3	@ \$1.10	<u>8,800,000</u>	(160,000)

Earnings, year ended 31 December 20x2

Exchange loss	
re: principal.....	240,000

31 December 20x2 SFP

Loan payable .....	\$8,960,000
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Earnings, year ended 31 December 20x3

Exchange (gain)	
re: principal.....	(160,000)

31 December 20x3 SFP

Loan payable .....	\$8,800,000
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*Requirement 2*

Interest Expense

20x2	$\$8,000,000 \times .0725 \times 8/12 \times \$1.11$	<u>\$429,200</u>
20x3	$\$8,000,000 \times .0725 \times \$1.09$	<u>\$632,200</u>

Exchange G/L (Interest)

20x2

Interest payable/paid at 31 December 20x2	
$(\$8,000,000 \times .0725 \times 8/12 \times \$1.12)$	\$433,067
Interest expense (above)	<u>429,200</u>
Exchange loss	<u>\$ 3,867</u>

There is an exchange gain or loss on interest expense because it is accrued at the average rate and paid at a specific date when the exchange rate is different than the average. The payable is revalued at the year end exchange rate, while the interest expense is recorded at the average rate.

## Assignment 13-17

### Requirement 1

Cost of borrowing, general borrowing:

$$(\$84,000 + \$280,000) / (\$1,200,000 + \$4,300,000) = \underline{6.6\%}$$

The capitalization period ends when the warehouse is put into use, or early December.

### Requirement 2

Payment	Calculation	Capitalizable
1 February	$\$560,000 \times 10/12 \times 6.6\%$	\$ 30,800
Late March	$\$500,000 \times 8/12 \times 6.6\%$	22,000
Late August	$\$1,700,000$ specific loan* $\$35,500 \times \frac{3}{4}$ *  $\$ 300,000$ general borrowing $\$300,000 \times 3/12 \times 6.6\%$	26,625  4,950
Late November	$\$1,200,000 \times 0/12 \times 6.6\%$	<u>0</u>
		<u>\$84,375</u>

\* Sources of financing assumed because timing aligns. \$2,000,000 spent; \$1,700,000 from the specific loan and \$300,000 from general borrowing.

The \$35,500 cost for the specific loan is for the entire year, that is, the four months that the loan was outstanding. The capitalization period ends at the end of November, so only  $\frac{3}{4}$  of this amount is capitalizable.



## Assignment 13-18

### Requirement 1

Any eligible borrowing cost that is directly attributable to the acquisition, construction or production of the inventory and the storage facility forms part of the cost of that asset and is capitalized. This includes interest on the specific loan for the storage facility and general borrowing costs for the storage facility and inventory.

### Requirement 2

Inventory .....	29,948	
Interest expense .....		29,948

Cost of borrowing:  $\$520,000 / (\$1,500,000 + \$8,000,000) = 5.47\%$

Capitalization ends when goods are available for sale.

Interest has already been expensed, so this entry re-allocates the amount to be capitalized.

Payment	Calculation	Capitalizable
Early March payment	$\$730,000 \times 9/12 \times 5.47\%$ (1 March – 30 November)	<u>\$ 29,948</u>

Storage facility .....	21,788	
Interest expense .....		15,955
Interest payable ( $\$1,000,000 \times 7\% \times 1/12$ ) .....		5,833

Interest on the specific loan is capitalizable after the loan is issued, presumably concurrently with the \$1,200,000 early December payment. Interest is not yet recorded. Other interest is capitalizable out of general borrowing cost. This interest has already been expensed, so this entry re-allocates the amount to be capitalized. Capitalization continues until the building is completed in January of next year.

Payment	Calculation	Capitalizable
Late July	$\$500,000 \times 5/12 \times 5.47\%$	\$ 11,396
Late October	$\$400,000 \times 2/12 \times 5.47\%$	3,647
Early December	$(\$1,200,000 - \$1,000,000$ through specific loan) $\times 1/12$ $\times 5.47\%$	<u>912</u>
		<u>\$15,955</u>

## Assignment 13-19

### Requirement 1

Cash (\$90,000 - \$15,165).....	74,835	
Discount/ financing cost .....	15,165	
Note payable .....		90,000

The company receives \$74,835 in cash.

Effective interest rate for specific loan = Solve for x in,

$$\$90,000 = \$15,165 + \$1,800 (P/A, x \%, 5) + \$90,000 (P/F, x \%, 5)$$

$$x = 6\%$$

Proof:

$$\$90,000 = \$15,165 + \$1,800 (P/A, 6\%, 5) + \$90,000 (P/F, 6\%, 5)$$

$$\$90,000 = \$15,165 + \$1,800 (4.21236) + \$90,000 (.74726)$$

$$\$90,000 = \$90,000$$

### Requirement 2

<i>Payment</i>	<i>Calculation</i>	<i>Capitalizable</i>
Mid-January	Invoice price	\$180,000
July	Customization	\$ 15,000
August	Training	10,000
Specific loan	$(\$90,000 - \$15,165) \times 6\% \times$ $7.5 / 12 \text{ months}$ (mid-January – early September)(1)	2,806
General borrowing	$(\$180,000 - \$74,835 \text{ paid}$ $\text{through specific loan}) \times 5.67\%$ $(2) \times 7.5 / 12 \text{ months}$ $\$15,000 \times 5.67\% (2) \times 1 / 12$ $\$10,000 \times 5.67\% (2) \times 0 / 12$ July and August payments are assumed to take place at the end of the month.	3,798
	Note: may not exceed fair value of a customized bulldozer	<u>\$211,604</u>

(1) Capitalization period ends in early September

(2) Average borrowing cost on general borrowing  
 = 5.67%  $(\$160,000 + \$95,000) / (\$3,000,000 + \$1,500,000)$

This excludes the mortgage loan for the manufacturing facility because it is not general borrowing. No cost for equity financing is capitalizable.

## Assignment 13-20

### Requirement 1

Principal: $\$6,000,000 \times (P/F, 3\%, 20) = \$6,000,000 \times (.55368) =$	\$3,322,080
Interest payments: $\$150,000 \times (P/A, 3\%, 20) = \$150,000 \times (14.87747) =$	<u>2,331,620</u>
Bond price	<u>\$5,553,700</u>

1 July 20x2 - Issuance of bonds:

Cash .....	5,553,700	
Discount on bonds payable .....	446,300	
Bonds payable, 5% .....		6,000,000

### Requirement 2

1 July 20x5 - Purchased \$2,400,000 bonds at effective rate of 8%:

Bonds payable, 5%.....	2,400,000	
Gain, retirement of debt .....		244,713
Discount on bonds payable (1).....		135,548
Cash (2).....		<u>2,019,739</u>

Computations:

(1) Book value is present value with 14 periods remaining:

$2,400,000 \times (P/F, 3\%, 14) = \$2,400,000 \times (.66112)$ .....	\$1,586,688
$(\$400,000 \times 2.5\%) \times (P/A, 3\%, 14) = \$60,000 \times (11.29607)$	<u>677,764</u>
Book value (PV) .....	<u>\$2,264,452</u>
Discount ( $\$2,400,000 - \$2,264,452$ ) .....	<u>\$135,548</u>

(2) Purchase price:

$\$2,400,000 \times (P/F, 4\%, 14) = \$2,400,000 \times (.57748)$ .....	\$1,385,952
$(\$2,400,000 \times 2.5\%) \times (P/A, 4\%, 14) = \$60,000 \times (10.56312)$	<u>633,787</u>
Purchase price (PV) .....	<u>\$2,019,739</u>

### Requirement 3

The change in market value, which did cause a gain for the issuer and a loss for the investor, occurred when interest rates changed. Since the yield rate rose, the borrower was made better off (PV of debt declined) and the investor worse off. However, this economic event is not captured in the financial statements of the borrower.

As far as the retirement itself is concerned, it does result in gain recognition for the borrower. However, in economic terms, the transaction itself did not create an economic gain or loss because the cash paid was equal to the current present value of the 5% bonds.

## Assignment 13-21 (WEB)

### Case A

31 December 20x16 - Retirement of the debt:

Bonds payable, 12%.....	200,000	
Premium on bonds payable (1) .....	21,340	
Gain, retirement of debt .....		15,340
Cash ( $\$200,000 \times 1.03$ ).....		206,000
(1) $\$21,340 = \$200,000 - [ \$200,000 \times (P/F, 10\%, 8) + (\$24,000) \times (P/A, 10\%, 8) ]$		

### Case B

#### Requirement 1

Principal: $\$200,000 \times (P/F, 11\%, 10) = \$200,000 \times (.35218) =$	\$70,436
Interest payments: $\$20,000 \times (P/A, 11\%, 10)$	
$= \$20,000 \times (5.88923) =$	<u>117,785</u>
Bond price	<u>\$188,221</u>

1 January 20x2

Cash .....	188,221	
Discount on bonds payable .....	11,779	
Bonds payable, 10%, 10-year.....		200,000

#### Requirement 2

Book value at the end of 20X4:

Principal: $\$200,000 \times (P/F, 11\%, 7) = \$200,000 \times (.48166) =$	\$96,332
Interest payments: $\$20,000 \times (P/A, 11\%, 7) = \$20,000 \times (4.71220) =$	<u>94,244</u>
Bond price	<u>\$190,576</u>

1 July 20x5

To update interest expense and discount amortization for 20x5:

Interest expense ( $\$190,576 \times 11\% \times 6/12$ ).....	10,482	
Discount on bonds payable .....		482
Interest payable ( $\$200,000 \times 10\% \times 6/12$ ).....		10,000

To record the retirement:

Bonds payable .....	200,000	
Interest payable .....	10,000	
Loss, retirement of debt .....	10,942	
Discount on bonds payable* .....		8,942
Cash ( $\$202,000 + \$10,000$ ).....		212,000

\*Unamortized balance:  
 $(\$200,000 - \$190,576 = \$9,424 - \$482)$

## Assignment 13-22

### Case A

To update interest expense and amortization:

Interest expense.....	91,923	
Discount on bonds payable .....		1,494
Deferred upfront costs.....		429
Interest payable ( $\$15,000,000 \times 60\% \times 6\% \times 2/12$ ) .....		90,000

To record the retirement:

Bonds payable .....	9,000,000	
Interest payable ( $\$15,000,000 \times 60\% \times 6\% \times 8/12$ ) .....	360,000	
Gain, retirement of debt .....		37,743
Discount on bonds payable ( $\$186,750 \times 60\%$ ) less \$1,494 .....		110,556
Deferred issue costs ( $\$53,550 \times 60\%$ ) less \$429 .....		31,701
Cash ( $\$9,000,000 \times .98$ ) + \$360,000.....		9,180,000

### Case B

To record interest payment:

Interest expense ( $\$240,000 + \$8,000$ ).....	248,000	
Interest payable ( $\$12,000,000 \times 4\% \times 3/6$ ) (from 31 Dec. 20X7) ..	240,000	
Discount on bonds payable .....		8,000
Cash ( $\$12,000,000 \times 4\%$ ).....		480,000

To record retirement:

Bonds payable .....	3,600,000	
Gain, retirement of debt .....		61,000
Discount on bonds payable ( $\$88,000 - \$8,000$ ) $\times 30\%$ .....		24,000
Cash.....		3,515,000

### Assignment 13-23

#### Requirement 1

Interest expense ( $\$256,565 \times .3 \times 2/6$ ).....	25,656	
Discount on bonds payable ( $\$31,565 \times 2/6 \times .3$ ).....		3,156
Cash ( $\$225,000 \times .3 \times 2/6$ ).....		22,500

#### Requirement 2

Bonds payable.....	2,700,000	
Loss on bond retirement.....	158,244	
Discount on bonds payable ( $\$448,000 \times .3$ ) – \$3,156.....		131,244
Cash ( $\$2,700,000 \times 101\%$ ).....		2,7270,000

#### Requirement 3

Interest expense ( $\$256,565 \times .7$ ).....	179,596	
Discount on bonds payable ( $\$31,565 \times .7$ ).....		22,096
Cash ( $\$225,000 \times .7$ ).....		157,500

## Assignment 13-24

### Requirement 1

Issuance proceeds: $\$38,301,565 + 1/6 \times \$32,063$ (see table) =	<u>\$38,306,909</u>
Accrued interest = $\$40,000,000 \times 7.5\% \times 1/12 =$	<u>\$250,000</u>
Principal: $\$40,000,000 \times (P/F, 4\%, 29) = \$40,000,000 \times (.32065) =$	\$12,826,000
Interest payments: $\$1,500,000 \times (P/A, 4\%, 29)$ = $\$1,500,000 \times (16.98371) =$	<u>25,475,565</u>
Bond price (rounded)	<u>\$38,301,565</u>

Interest expense: (table not required)

Period	Cash interest paid	Int. expense (4%)	Amortization	Closing net liability
Op. balance				38,301,565*
1	1,500,000	1,532,063	32,063	38,333,628**
2	1,500,000	1,533,345	33,345	38,366,973
3	1,500,000	1,534,679	34,679	38,401,652

\* n = 29

\*\* n = 28

### Requirement 2

Cash ( $\$38,306,909 + \$250,000$ ).....	38,556,909
Discount on bonds payable .....	1,693,091
Bonds payable .....	40,000,000
Interest payable (or expense).....	250,000

*Requirement 3*

Interest expense .....	1,276,719	
Interest payable .....	250,000	
Discount on bonds payable (\$32,063 x 5/6)		
or (\$38,308,909 - \$38,333,628) .....		26,719
Cash (\$40,000,000 x 7.5% x 6/12) .....		1,500,000

*Requirement 4*

Interest expense (\$1,533,345 x 2/6) x 10%.....	51,112	
Discount on bonds payable (\$33,345 x 2/6) x 10% .....		1,112
Interest payable (\$4,000,000 x 7.5% x 2/12).....		50,000
Bonds payable .....	4,000,000	
Interest payable .....	50,000	
Loss on bond retirement.....	125,525	
Cash (\$4,000,000 x 99%) + \$50,000 .....		4,010,000
Discount on bonds payable (1).....		165,525

(1)  $(\$38,333,628 - \$40,000,000) \times .10 = \$166,637$ ;  $\$166,637 - \$1,112 = \$165,525$



## Assignment 13-25

### Requirement 1

1 July 20x1		
Cash <sup>1</sup> .....	499,575	
Discount on bonds payable .....	100,425	
Bonds payable .....		600,000
<sup>1</sup> \$600,000 (P/F, 6%, 19) (.33051) + \$27,000 (P/A, 6%, 19) (11.15812)		
31 December 20x1		
Interest expense* .....	29,975	
Discount on bonds payable .....		2,975
Cash .....		27,000
*\$499,575 × .06		

### Requirement 2

Book value at 30 June 20x6 of the \$180,000 of bonds defeased 1 August 20x6 (9 semiannual period remaining) =  $\$180,000 \times (\text{P/F}, 6\%, 9) + (\$180,000 \times 4.5\%) \times (\text{P/A}, 6\%, 9) = \$161,636$ .

Unamortized discount remaining =  $\$18,364 = \$180,000 - \$161,636$

1 August 20x6		
Interest expense ( $6\% \times \$161,636 \times 1/6$ ) .....	1,616	
Discount on bonds payable .....		266
Interest payable ( $4.5\% \times \$180,000 \times 1/6$ ) .....		1,350
Interest payable .....	1,350	
Bonds payable .....	180,000	
Loss on bond defeasance .....	23,498	
Discount on bonds payable ( $\$18,364 - \$266$ ) .....		18,098
Cash [ $(1.03 \times \$180,000) + \$1,350$ ] .....		186,750

### Requirement 3

The critical element of a defeasance that permits de-recognition of the liability is that the creditor agrees to the arrangement and legal release is given to the borrower. In an in-substance defeasance, the transaction is the same except there is no legal release by the creditor. Debt subject to a defeasance arrangement is derecognized, but debt subject to an in-substance defeasance is left on the books.

*Requirement 4*

Interest rates have declined since Pasquali Limited issued its bonds. They were issued at a discount and now sell at a premium. The relative attractiveness has increased reflecting a drop in overall interest rates.

*Requirement 5*

The loss is caused by changing interest rates and valuation of the bond liability at a value based on its issuance price. The loss does not equal the change in Pasquali's economic status. Many would argue that Pasquali has experienced no change in economic status because a liability has been defeased at market value. To the extent that a company's financial position improves with an equal reduction of debt and assets, Pasquali may be a stronger company. In addition, the defeasance may be a smart move. Pasquali may be able to replace the 9% debt with lower interest rate debt, improving its long-run liquidity position.

*Requirement 6*

Book value at 30 June 20x6 of the \$420,000 of bonds remaining =  $[\$420,000 \times (P/F, 6\%, 9)] + [\$420,000 \times 4.5\% \times (P/A, 6\%, 9)] = \$377,150$

31 December 20x6

Interest expense (6% × \$377,150).....	22,629	
Discount on bonds payable .....		3,729
Cash (4.5% × \$420,000) .....		18,900

## Assignment 13-26

### Requirement 1

Merit Ltd  
Partial Statement of Cash Flow  
Year ended 31 December 20x9

Cash used for financing activities:

Bond retirement (7% bond) (\$3,000,000 x 101%)	(3,030,000)
Bond retirement (6.5% bond) (\$6,000,000 x 97.5%)	(5,850,000)

### Requirement 2

Cash paid for interest

Interest expense (given) .....	\$2,110,000
Discount, 7% bond .....	(14,700)
Discount, 6.5% bond .....	(5,200)
Discount, 7.25% bond .....	(17,200)
Cash paid .....	<u>\$2,072,900</u>

### Requirement 3

Gain or loss:	7% Bond	6.5% Bond
Price paid .....	\$3,030,000	\$5,850,000
Book value.....	3,000,000	6,000,000
Discount * .....	<u>(21,000)</u>	<u>(35,000)</u>
Total .....	2,979,000	5,965,000
(Gain)/loss .....	<u>\$51,000</u>	<u>\$(115,000)</u>

\*  $\$152,500 - \$14,700 - \$116,800 = \$21,000$ ;  $\$61,500 - \$5,200 - \$21,300 = \$35,000$

Issuance of the 7.25% bond for land is a non-cash transaction and is excluded from the SCF. Supplementary disclosure is required.

## Assignment 13-27

### Requirement 1

Forsythe Solutions Corp  
Partial Statement of Cash Flow  
Year ended 31 December 20x2

Financing activities:

Bond issued (5% bond).....	\$ 7,800,000
Bond retirement (6% bond) (\$20,000,000 x 102%)	(20,400,000)

### Requirement 2

Cash paid for interest

Interest expense (given) .....	\$625,000
Discount, 5% bond (\$200,000 - \$196,000) .....	(4,000)
Discount, 6% bond (given) .....	(54,000)
Increase in interest payable (\$62,500 - \$49,000).....	(13,500)
Cash paid .....	<u>\$553,500</u>

### Requirement 3

Gain or loss:	6% Bond
Price paid (req. 1).....	\$20,400,000
Book value.....	20,000,000
Discount (\$603,000 - \$54,000).....	(549,000)
Total .....	19,451,000
Loss .....	<u>\$949,000</u>

**Assignment 13-28 (ASPE)**

*Requirement 1*

(unchanged from A 13-6)

Principal	\$10,000,000 x (P/F 3%, 20) (.55368) =	\$ 5,536,800
Interest	\$325,000 x (PVA 3%, 20) (14.87747) =	<u>4,835,178</u>
		<u>\$10,371,978</u>

*Requirement 2*

Period	Cash interest paid	Interest expense	Discount or premium amortization	Closing net bond liability
Opening balance				10,371,978
1	325,000	306,401	18,599 (1)	10,353,379
2	325,000	306,401	18,599	10,334,780
3	325,000	306,401	18,599	10,316,181
4	325,000	306,401	18,599	10,297,582

(1) \$371,978/20

*Requirement 3*

*1 October 20x4*

Cash .....	10,371,978
Premium on bonds payable .....	371,978
Bonds payable .....	10,000,000

*31 December 20x4*

Interest expense .....	153,200
Premium on bonds payable (\$18,599 × 3/6) .....	9,300
Interest payable (\$325,000 × 3/6) .....	162,500

*31 March 20x5*

Interest expense .....	153,201
Interest payable .....	162,500
Premium on bonds payable (\$18,599 × 3/6) .....	9,299
Cash .....	325,000

*30 September 20x5*

Interest expense .....	306,401
Premium on bonds payable .....	18,599
Cash .....	325,000

31 December 20x5

Interest expense .....	153,200	
Premium on bonds payable ( $\$18,599 \times 3/6$ ).....	9,300	
Interest payable ( $\$325,000 \times 3/6$ ) .....		162,500

*Requirement 5*

The effective interest method is required under IFRS. It is preferable because it measures interest expense as a constant percentage of the outstanding liability – a better measure of cost of debt. Straight-line might be preferable because it is simpler. ASPE allows straight-line method because there is a more restricted user group and potentially a less complicated business situation/reporting environment.

**Assignment 13-29 (ASPE)**

*Requirement 1*

**Amortization Schedule, Straight-line Method:**

<b>Interest Period</b>	<b>Cash Interest</b>	<b>Interest Expense (\$21,600 - \$1,400)</b>	<b>Premium Amortization (1/10)</b>	<b>Balance Unamortized Premium</b>	<b>Carrying Amount of Bonds</b>
	Opening			\$14,003	\$814,003
1 (30 Sept, 20X1)	\$21,600	\$20,200	\$1,400	12,603	812,603
2	21,600	20,200	\$1,400	11,203	811,203
3	21,600	20,200	\$1,400	9,803	809,803
4	21,600	20,200	\$1,400	8,403	808,403
5	21,600	20,200	\$1,400	7,003	807,003
6	21,600	20,200	\$1,400	5,603	805,603
7	21,600	20,200	\$1,400	4,203	804,203

*Requirement 2*

1 April 20x1

Cash .....	814,003	
Premium on bonds payable .....		14,003
Bonds payable .....		800,000

30 September 20x1

Interest expense .....	20,200	
Premium on bonds payable .....	1,400	
Cash .....		21,600

31 December 20x1 (adjusting entry):

Interest expense (3/6).....	10,100	
Premium on bonds payable .....	700	
Accrued interest payable .....		10,800

30 March 20x2		
Accrued interest payable .....	10,800	
Premium on bonds payable .....	700	
Interest expense .....	10,100	
Cash .....		21,600
30 September 20x2		
Interest expense .....	20,200	
Premium on bonds payable .....	1,400	
Cash .....		21,600
31 December 20x2 (adjusting entry):		
Interest expense (3/6).....	10,100	
Premium on bonds payable .....	700	
Accrued interest payable .....		10,800

*Requirement 3*

Bonds payable, 5.4%, effective rate 5%, due 30 March 20X6	\$800,000
Premium on bond payable (\$9,803 – \$700)	<u>9,103</u>
	<u>\$809,103</u>

*Requirement 4*

In the first period, interest expense is 2.48% (\$20,200/\$814,003) of the opening liability balance. This rate is 2.51 % (\$20,200/\$805,603) in period 7. The rate changes because of the use of straight-line amortization. If the effective interest method were used, interest expense would always reflect the yield rate of 2.5% (5% annually). This measurement inconsistency is the reason that the effective interest method is preferable.



**Assignment 13-30 (ASPE)**

*Requirement 1*

Cash (Given).....	1,606,617	
Premium on bonds payable .....		106,617
Bonds payable.....		1,500,000

*Requirement 2*

Interest expense .....	66,115	
Premium on bonds payable ( $\$106,617 \times 1/10 \times 5/6$ ) .....	8,885	
Interest payable ( $\$1,500,000 \times 12\% \times 5/12$ ) .....		75,000

*Requirement 3*

Interest expense .....	13,222	
Interest payable .....	75,000	
Premium on bonds payable ( $\$106,617 \times 1/10 \times 1/6$ ) .....	1,778	
Cash ( $\$1,500,000 \times 12\% \times 6/12$ ).....		90,000

*Requirement 4*

Bonds payable ( $\$1,500,000 \times 40\%$ ).....	600,000	
Premium on bonds payable ( $\$31,985 \times 40\%$ ) (1).....	12,794	
Gain on bond retirement .....		24,794
Cash ( $\$1,500,000 \times 40\% \times .98$ ).....		588,000

(1) With n=3 on this date, the remaining premium is  $\$106,617 \times 3/10 = \$31,985$

*Requirement 5*

Financing section,	
Retirement of bonds payable,	(\$588,000)
Operating activities section, indirect method,	
Less: gain on bond retirement	(\$24,794)

If the direct method were used, the gain on bond retirement would not be listed.

*Requirement 6*

Long-term liabilities:	
Bond payable, 12%, due 31 January 20x7	\$900,000
Plus: premium on bonds payable	<u>19,191*</u>
	<u>\$919,191</u>

\*  $\$31,985 \times 60\%$