Permanent Debt and Equity Financing

Learning Problems

Answer Keys

Problem: Credit Assessment of All-Weather

1.

Struthers should approve All-Weather’s application for a 3-year term loan. The company’s debt service cover ratio (DSCR) barely meets the bank’s minimum requirement now, but it is expected to increase over the term of the loan as industry conditions improve according to the pro forma financial statements prepared by Struthers. If All-Weather does experience difficulties, sufficient high-quality collateral and a personal guarantee from the owner should ensure payment.

Based on Struthers’ pro forma financial ratios, All-Weather should have a credit score of 5. Given its excellent credit history, the quality of its collateral, the personal guarantee provided by its owner, strong industry growth prospects, and improving company performance, All-Weather should be given a one-step increase in its credit score to 4. An interest rate of 6.20% (prime plus 120 bps) should be negotiated.

**Problem: Capitalizing Leases at Secure Transport**

(10)(2,263.19) = 22,631.90

22,631.90 + 22,631.90 () = 1,800,000

1,800,000 / ((10) (180,000)) = 1.00 or 100%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Period** | **Beginning Balance** | **Payment** | **Interest** | **Ending Balance** |
| 1 | 1,800,000.00 | 22,631.90 | 13,330.26 | 1,790,698.36 |

Note: Since the lease payment is made at the beginning of the period, it is first deducted from the beginning balance and then interest is calculated on what remains. The ending balance is equal to the beginning balance minus the payment plus interest.

**Income Statement**

Interest expense 13,330.26

Depreciation expense1 10,000.00

**Property, Plant, and Equipment**

Equipment held under capital lease 1,800,000.00

Less: Accumulative deprecation 10,000.00

Net equipment held under capital lease 1,790,000.00

**Current Liabilities**

Obligation under capital lease 117,213.66

**Long-term Liabilities**

Obligation under capital lease 1,790,689.36

Less: Current portion 117,204.62

Net obligation2 1,673,484.74

1 1,800,000 / (15 x 12)

2 22,631.90 + 22,631.90 ()

Note: The asset is depreciated over 15 years because the company is taking possession of it at the end of the lease for CAD 0.00 as part of a bargain purchase option. The present value of the lease payments equals the full value of the asset**.**

**Problem: Capitalizing Leases at Wilson**

(2) (1,754.88) = 3,509.76

3,509.76 + 3,509.76 () = 174,249.84

174,249.84 / ((2) (95,000)) = .92

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Period** | **Beginning Balance** | **Payment** | **Interest** | **Ending Balance** |
| 1 | 174,249.84 | 3,509.76 | 1,138.27 | 171,878.35 |

**Income Statement**

Interest expense 1,138.27

Depreciation expense1 2,904.16

**Property, Plant, and Equipment**

Equipment held under capital lease 174,249.84

Less: Accumulative deprecation 2,904.16

Net equipment held under capital lease 171,345.68

**Current Liabilities**

Obligation under capital lease 29,721.75

**Long-term Liabilities**

Obligation under capital lease 171,878.35

Less: Current portion 29,721.75

Net obligation2 142,156.60

1 174,249.83 / (5 x 12)

2 3,509.76 + 3,509.76 ()

Note: The asset is depreciated over 5 years because that is the lease term and the lessee is returning the asset at that time. The present value of the lease payments equals the value of the leased assets relating to the term of the lease only**.**

**Problem: Capitalizing Leases at Porta Power**

1.

(4) (3,585.97) = 14,343.88

14,343.88 + 14,343.88 () = 953,160.40

953,160.40 / ((4) (238,300)) = 1.00 or 100%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Period** | **Beginning Balance** | **Payment** | **Interest** | **Ending Balance** |
| 1 | 953,160.40 | 14,343.88 | 7,823.47 | 946,639.99 |

**Income Statement**

Interest expense 7,823.47

Depreciation expense1 7,943.00

**Property, Plant, and Equipment**

Equipment held under capital lease 953,160.40

Less: Accumulative deprecation 7,943.00

Net equipment held under capital lease 945,217.40

**Current Liabilities**

Obligation under capital lease 82,615.41

**Long-term Liabilities**

Obligation under capital lease 946,639.99

Less: Current portion 82,615.41

Net obligation2 864,024.58

1 953,160.40 / (10 X 12)

2 14,343.88 + 14,343.88 ()

**Problem: Capitalizing Leases at Acme**

1.

2,000 + 2,000 () = 45,777.75

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Period | Beginning Balance | Payment | Interest | Ending Balance |
| 1 | 45,777.75 | 2,000.00 | 182.41 | 43,960.16 |

**Income Statement**

Interest expense 182.41

Depreciation expense1 1,907.41

**Property, Plant, and Equipment**

Equipment held under capital lease 45,777.75

Less: Accumulative deprecation 1,907.41

Net equipment held under capital lease 43,870.34

**Current Liabilities**

Obligation under capital lease 22,410.96

**Long-term Liabilities**

Obligation under capital lease 43,960.16

Less: Current portion 22,410.96

Net obligation2 21,549.20

1 45,777.75 / (2 x 12)

2 2,000 + 2,000 ()

Note: The incremental borrowing rate was used because the rate implicit in the lease was not available.

**Problem: Calculating Lease Payments at Stead**

1.

5,000,000 – (5,000,000) (.3) () () = (1 - .3) (P + P ()) + -

P = CAD 75,985.29

2.

5,000,000 – (5,000,000) (.3) () () = (1 - .3) (82,000 + 82,000 ()) + -

i = 13.48%

3.

5,000,000 – (5,000,000) (.3) () () = (1 - .3) (P + P ()) + -

P = CAD 80,886.96

Note: Compared to Part 1, the lease payments are higher because the lessee is paying for the full value of the asset over the lease term.

**Problem: Lease or Buy at Hawkeye**

Lease? No – purchase with a bank loan

|  |  |
| --- | --- |
| Present value of loan payments1 | 3,000.00 |
| Present value of lost CCA tax shield2 | (595.82) |
| Present value of lease payments3 | (2,560.66) |
| **Total** | **(156.48)** |

Note: Other qualitative advantages of leasing may still cause the company to select this more costly option.

1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | Principal | Interest  (11.2%) | Tax Savings  (.25) | After-tax Cost of Buying | Present Value (8.40%) |
| 1 | (1,000) | (336) | 84 | (1,252.00) | (1,154.98) |
| 2 | (1,000) | (224) | 56 | (1,168.00) | (994.00) |
| 3 | (1,000) | (112) | 28 | (1,084) | (851.02) |
| Total | | | |  | (3,000.00) |

(.112) (1 - .25) = .084

Note: The present value of loan payments will always equal the value of the asset as long as the loan is not subsidized which means the loan rate is less than the current market rate.

2 (3,000) (.25) () ()

3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Lease Payment | Tax Savings (.25) | After-tax Cost of Leasing | Present Value (8.40%) |
| 0 | (1,200.00) | 0.00 | (1,200.00) | (1,200.00) |
| 1 | (1,200.00) | 300.00 | (900.00) | (830.26) |
| 2 | (1,200.00) | 300.00 | (900.00) | (765.92) |
| 3 |  | 300.00 | 300.00 | 235.52 |
| Total | | | | (2,560.66) |

1. The after-tax cost of debt was used as the discount rate and not the WACC because the lease is a substitute for the loan. It represents the riskiness of those future cash flows.

**Problem: Lease or Buy at Shaw**

1. Lease? No

|  |  |
| --- | --- |
| Investment | 100,000.00 |
| Lost CCA tax shield1 | (18,686.50) |
| Present value of lease payments2 | (85,508.96) |
| Present value of lost disposal value3 | (6,274.12) |
| Present value of CCA tax shield on lost disposal value4 | 1,172.41 |
| **Total** | **(9,297.17)** |

1 (100,000) (.25) () ()

(.08) (1 - .25) = .06

2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Lease Payments | Tax Shield (.25) | After-tax Cost of Leasing | Present Value (6.00%) |
| 0 | (17,000.00) |  | (17,000.00) | (17,000.00) |
| 1 | (17,000.00) | 4,250.00 | (12,750.00) | (12,028.30) |
| 2 | (17,000.00) | 4,250.00 | (12,750.00) | (11,347.45) |
| 3 | (17,000.00) | 4,250.00 | (12,750.00) | (10,705.15) |
| 4 | (17,000.00) | 4,250.00 | (12,750.00) | (10,099.19) |
| 5 | (17,000.00) | 4,250.00 | (12,750.00) | (9,527.54) |
| 6 | (17,000.00) | 4,250.00 | (12,750.00) | (8,988.25) |
| 7 | (17,000.00) | 4,250.00 | (12,570.00) | (8,479.48) |
| 8 |  | 4,250.00 | 4,250.00 | 2,666.50 |
| Total | | | | (85,508.86) |

3 10,000 / (1 + .06)8

4 (10,000) (.25) () () / (1 + .06)8

**Problem: Lease or Buy at Anzio**

1. Lease? No

|  |  |
| --- | --- |
| Investment | 2,700,000.00 |
| Lost CCA tax shield on the building1 | (220,840.48) |
| Present value of lease payments2 | (2,580,732.27) |
| Present value of lost disposal value of the building3 | (31,180.47) |
| Present value of lost CCA tax shield disposal on the building4 | 3,442.96 |
| Present value of lost disposal value of the land5 | (300,112.05) |
| **Total** | **(429,422.31)** |

1 (2,000,000) (.25) () ()

(.08) (1 - .25)

2 (300,000) (1 - .25) ()

3 100,000 / (1 + .06)20

4 (100,000) (.25) () () / (1 + .06)20

5 (1,000,000 – (1,000,000 - 700,000) (.50) (.25)) / (1 + .06)20

**Problem: Lease or Buy at Olesen**

1. Lease? Yes

|  |  |
| --- | --- |
| Investment | 40,000.00 |
| Lost CCA tax shield1 | <8,097.48> |
| Present value of lease payments2 | <25,988.29> |
| Present value of lost residual3 | <7,920.94> |
| Present value of lost CCA tax shield on residual4 | 2,024.37 |
| **Total** | **17.66** |

1 (40,000) (.25) () ()

(.08) (1 - .25)

2 (10,000) (1 - .25) ()

3 10,000 / (1 + .06)4

4 (10,000) (.25) () () / (1 + .06)4

**Problem: Lease or Buy at Halo**

1. Lease? No

|  |  |
| --- | --- |
| Machine | 80,000.00 |
| Lost CCA tax shield on the machine1 | <16,194.97> |
| Present value of lease payments2 | <55,595.21> |
| Present value of lost disposal value of the machine3 | <14,945.16> |
| Present value of lost CCA tax shield disposal on the machine4 | 3,025.46 |
| **Total** | **(3,708.88)** |

1 (80,000) (.25) () ()

2 (16,900) (1 - .25) + (16,900) (1 - .25) ()

(.08) (1 - .25) = .06

3 20,000 / (1 + .06)5

4 (20,000) (.25) () () / (1 + .06)5

**Problem: Specified Leasing Property**

1.

High Country would declare the lease payment as income and deduct against it the lower of: 1) CCA or 2) the principal a lessor receives if a lease is treated as a loan equal to the fair value of the leased asset. The net of these two amounts is equivalent to the interest portion of the loan payment. This is what the lessor would recognize if they treated the lease as a loan, which is the intention of the government. The interest rate used to calculate the principal is the prescribed rate published by the Bank of Canada.

|  |  |
| --- | --- |
| Lease payment | 48,750 |
| Minus CCA calculated as the lesser of: |  |
| Actual CCA: (200,000) (.40) (.50) = 40,000 |  |
| Principal portion of loan: 48,750 – (200,000)(.06) = 36,750 | (36,750) |
| Net amount | 12,000 |

2.

Normally Langston deducts the entire lease payment as an expense, but it can elect to instead deduct the interest portion of the payment and CCA.

|  |  |
| --- | --- |
| Lease Payment | 48,750 |
|  |  |
| CCA: (200,000) (.40) (.50) = 40,000 | 40,000 |
| Interest: (200,000) (.06) = 12,000 | 12,000 |
| Total | 52,000 |

Langston would have higher deductions by electing to treat the leased asset as if they bought it with a loan. The difference will be greater next year when the Half-Year Rule no longer applies. Lessees will make this election for assets that are written off quickly and have a high CCA rate.

**Problem: Bond Refunding at Acme**

1. Yes

|  |  |
| --- | --- |
| Call premium1 | (150,000.00) |
| Issuance costs new issue2 | (82,191.49) |
| Issuance costs old issue3 | 7,300.00 |
| Overlapping interest4 | (37,762.50) |
| Cost savings of lower interest5 | 436,996.35 |
| **Total** | **174,342.36** |

1 (5,000,000) (.04) = 200,000

(200,000) (1 - .25) = 150,000

2 105,000.00 – 122,808.51 = 82,191.49

1(105,000 / 5) = 21,000

(21,000) (.25) = 5,250

5,250 () = 22,808.51

3 (60,000 + 13,000) / 5 = 14,600

(14,600) (2) (.25) = 7,300

4 (.08) (2/12) (5,000,000) (1 - .25) = 50,000.00

(.02) (2/12) (14,895,000) (1 - .25) = 12,237.50

50,000.00 – 12,237.50 = 37,762.50

1 5,000,000 – 105,000

5 (5,000,000) (.08) (1 - .25) = 300,000

(5,000,000) (.065) (1 -.25) = 243,750

300,000 – 243,750 = 56,250

56,250 () = 436,996.35

2.

(.065) (1 - .25) = .04875

The after-tax cost of the new bonds was used to reflect the riskiness of these cash flows.

**Problem: Bond Refunding at Hanson Brothers**

1. Yes

|  |  |
| --- | --- |
| Call premium1 | (450,000.00) |
| Issuance costs2 | (319,628.06) |
| Overlapping interest3 | (42,828.12) |
| Cost savings of lower interest4 | 1,076,139.14 |
| **Total** | **263,682.96** |

1 (15,000,000) (.04) = 600,000

(600,000) (1 - .25) = 450,000

2 410,000.00 – 190,371.94 = 319,628.06

1(410,000 / 5) = 82,000

(82,000) (.25) = 20,500

(.058) (1 - .25) = .0435

20,500 () = 90,371.94

3 (.07) (1/12) (15,000,000) (1 - .25) = 65,625.00

(.025) (1/12) (114,590,000) (1 - .25) = 22,796.88

65,625.00 – 22,796.88 = 42,828.12

1 15,000,000 – 410,000

4 (15,000,000) (.070) (1 - .25) = 787,500

(15,000,000) (.058) (1 -.25) = 652,500

787,500 – 652,500 = 135,000

135,000 () = 1,076,139.14

1. To eliminate restrictive covenants contained in the previous loan agreement.
2. Hanson Brothers will have to buy back the bonds at an amount that approximates their current market value. Similar bonds are currently yielding 5.8 % and Hanson Brothers will have to buy back the bonds at value computed using a discount rate of 5.7 % (Canada Bond rate of 4.5 % plus a premium of 1.2 %). This value will fairly compensate the bondholders for the higher interest rates they are being forced to give up and eliminates any interest savings the borrower can realize. Remember that when market interests fall, bond prices rise because investors continue to receive the higher coupon rate stipulated in the bond indenture.

Problem: Preferred Share Refunding at Spencer

1. Yes

|  |  |
| --- | --- |
| Call premium1 | <100,000.00> |
| Issuance costs2 | <127,198.42> |
| Cost savings of lower interest3 | 857,142.86 |
| **Total** | **629,944.44** |

1 (2,000,000) (.05) = 100,000

Note: Call premiums on equity securities are not tax-deductible.

2 160,000 – 132,801.58 = 127,198.42

1(160,000 / 5) = 32,000

(32,000) (.25) = 8,000

8,000 () = 32,801.58

5 / 71.43 = .07

Notes: Discount rate for preferred shares financing is equal to the dividend divided by the market value of a preferred share. Dividends are not tax-deductible so do not include the tax effect.

3 (2,000,000) (.10) = 200,000

(2,000,000) (.07) = 140,000

200,000 – 140,000 = 60,000

60,000 / .07 = 857,142.86

**Problem: Classifying Assets and Liabilities**

1. Classified as equity because the preferred share dividends can be delayed indefinitely and there are no required sinking fund payments.
2. Classified as equity because the preferred share dividends can be delayed indefinitely and there are no required sinking fund payments. The preferred share dividends are cumulative which means the common shareholders cannot receive a dividend until all the dividends in arrears are paid, but if the company is in financial distress these dividends can still be delay indefinitely.
3. Classified as debt because the preferred share dividends must be paid or the company can be forced into bankruptcy.
4. Classified as debt because the preferred shares have required sinking fund payments. If the sinking fund payments only had to be paid on a best efforts basis, then these payments would not be required so the preferred share would be classified as equity.
5. Classified as debt because the bondholder can force the company to buy back the bonds. The company has no control over this decision.
6. Classified as debt because the dividend grows over time and eventually the company will have no choice but to buy back these shares if it is to survive.
7. Classified as debt since the interest must be paid even though the bonds have an unlimited life.
8. Classified as equity since interest payments are not guaranteed and principal payments are subordinate to all other bondholders.
9. Classified as equity since the interest and principal payments can be settled by issuing common equity that does not have any required payments.

**Problem: Rights Offering at Quaker**

**Subscription Price**

(.75) (8) = 6

**Number of New Common Shares**

12,000,000 / 6 = 2,000,000

**Number of Rights to Buy One Common Share**

10,000,000 / 2,000,000 = 5

Yes, Dunne retains the same ownership %age by exercising her rights.

**Number of Shares Purchased**

((10,000,000) (.4)) / 5 = 800,000

**%age Ownership**

= = .40 or 40%

No, the value of Dunne’s investment is not diluted by the drop in common share price due to the low subscription price. Her shares continue to be worth 40% of the value of the company after the rights issue. Why? The value of the company increased by CAD12,000,000 when the new shares were sold. It is arbitrary whether this was raised by selling 2,000,000 shares at CAD 6, 1,500,000 shares at CAD 8, or any other combination. The overall value of the firm will remain the same as will the value of a shareholder’s investment relative to the value of the firm.

**New Company Common Share Price**

= = 7.6667

**Value of Dunne’s 40% Share**

(4,000,000 + 800,000) (7.6667) = 36,800,160

**Value of the Company**

(10,000,000) (8) + (2,000,000) (6) = 92,000,000

or

(10,000,000 + 2,000,000) (7.6667) = 92,000,400 (rounding error)

**Value of Dunne’s 40% Share in the Company**

= = .40

3.

No, Roberts’ ownership %age is diluted by not exercising the rights.

(10,000,000) (.05) = 500,000

= = .0417 or 4.17%

No, the value of Roberts’ investment is not diluted. It is equal to the previous investment as the value of the rights compensates for the drop in the common share price.

**Value of Robert’s 5% Share before Rights Issue**

(500,000) (8) = 4,000,000

**Value of Roberts’s Investment after Selling Rights**

(500,000) (7.6667) + (500,000) () = 4,000,017

The formula for valuing a right is:

Theoretical value of a right =

1. Taking 75 % of the current market price to determine the subscription price is arbitrary. The subscription price is usually set well below the current market price to ensure that the rights will be exercised in case there is a large decrease in the market value of the share before the exercise date.

**Problem: Appropriate Forms of Debt and Equity Financing**

1. A **syndicated loan** allows several credit unions or other institutional investors to pool their capital and share risk.
2. A **bridge loan** can provide financing until the proceeds of the private bond placement are received.
3. **Project financing** that establishes a special purpose vehicle (SPV) and employs non-recourse financing to reduce risk can be employed.
4. The food critic can use their popularity to raise **crowdfunding** from local fans. Contributors may receive debt or equity securities in the company or a reward such as a meal voucher.
5. **Mezzanine debt financing** that is subordinate to the existing debt can provide the funds required. It will likely be convertible into common shares if the company does not make its principal and interest payments, so losing control is still a potential issue.
6. **Securitization** can be used to sell the leases when they are originated so financing is not required. The leasing company can maintain a relationship with its customers and continue to earn fee income servicing the contracts.
7. A **bridge loan** can provide funding for payroll and other operating expenses until the third round of venture capital financing is received.
8. A **joint venture** can be formed with another company(s) that has sufficient capital to produce and market the product internationally.
9. A **sale-leaseback** agreement can be negotiated to finance the tractor-trailers.
10. **Project financing** can be used by the government development group to limit their risk and access external financing and management expertise.
11. The entrepreneur can use **self-funding** for the equity component of the investment and negotiate a bank loan for the remainder. A loan is easier to secure if the client is a member of a successful **franchise**.
12. The entrepreneur can apply to an **incubator** or **accelerator** program to help them raise angel or venture capital.
13. The controlling shareholders can limit the mature company’s growth to a level that is supportable by its **retained earnings** to avoid losing control and high issuance costs.

1. **Business Development Bank of Canada** can provide the flexible loan terms and collateral requirements desired because of their non-profit status and goal of promoting employment and economic development by aiding small businesses.
2. **Export Development Corporation** can provide the financing needed to accept this export order because of their non-profit status and goal of promoting employment and economic development by promoting exports.
3. A **bridge loan** can provide financing to buy out the existing partner until the new partner invests in the firm.
4. **Private equity placement** using an Offering Memorandum or selling shares to Accredited Investors, friends, family, business associates, employees, directors, officers, or consultants can be used to raise funds.
5. **Corporate venture capital** can be sought as the firm sponsoring the fund will probably buy out the company if it is successful. This provides the entrepreneur with a simple exit strategy.
6. **Loan prepayment privileges**, **callable bonds with limited call or refund protection**, or **floating interest rates** will protect the company from falling interest rates.
7. An **ESOP** will promote labour-management harmony by increasing employee ownership. ESOPs and **DRIPs** will help establish a core group of investors that will likely remain loyal during a take-over attempt.
8. **Crowdfunding** can be used by the band to raise funds to produce the album and cover initial tour costs. Contributors can be given a free album and/or concert ticket(s).
9. **Preferred shares** can give the flexibility to delay dividend payments during an economic downturn without triggering bankruptcy.
10. Equity can be raised using **non-voting, restricted, or multi-voting shares**.
11. The company can remain private and use **private placements** with one or more institutional investors to raise the needed capital.
12. **Public debt and equity placements** will probably result in the lowest interest rate due to the liquidity of the public markets. Flexible bond or debenture agreements can be negotiated if the company has a strong credit rating.
13. A **personal or limited or full third-party guarantee** can be provided to compensate for low-quality collateral.