

Finance I

Solutions to Assignment 1 (and more)

3. Big Bock Brewery shows the following information on its 2000 income statement: sales = \$70,000; costs = \$42,000; other expenses = \$1,750; depreciation expense = \$3,000; interest expense = \$7,000; current taxes = \$4,165; tax rate = 34%; dividends = \$3,200. In addition, you're told that the firm issued \$1,415 in new equity during 2000 and redeemed \$3,000 in outstanding long-term debt.

(a) What is the 2000 operating cash flow?

Answer: Big Bock Brewery's income statement for 2000 is as in Table 1. Operating cash flow in 2000 is given by

$$\text{EBIT} + \text{depreciation} - \text{current taxes} = 23,250 + 3,000 - 4,165 = \$22,085 .$$

(b) What is the 2000 cash flow to creditors?

Answer: \$7,000 in interest has been paid to creditors and \$3,000 in debt has been redeemed. No new debt has been issued and thus the cash flow to creditors, CF(B), is

$$\text{CF(B)} = 7,000 + 3,000 = \$10,000.$$

(c) What is the 2000 cash flow to stockholders?

Answer: Stockholders received \$3,200 in dividends and \$1,415 of new equity has been issued. Hence the cash flow to stockholders, CF(S), is

$$\text{CF(S)} = 3,200 - 1,415 = \$1,785 .$$

Big Bock Brewery
2000 Income Statement

Sales	\$70,000
Cost of goods sold	42,000
Depreciation	3,000
Other expenses	<u>1,750</u>
Earnings before interest and taxes (EBIT)	\$23,250
Interest	<u>7,000</u>
Taxable income	\$16,250
Taxes (34%)	5,525
Current taxes	\$4,165
Deferred taxes	<u>\$1,360</u>
Net income	<u><u>\$10,725</u></u>
Dividends	\$3,200
Addition to retained earnings	\$7,525

Table 1: Big Bock Brewery's 2000 income statement.

- (d) If net fixed assets increased by \$2,500 during the year, what is the addition to NWC?

Answer: Cash flow from assets, $CF(A)$, is given by

$$CF(A) = \text{Operating cash flow} - \text{Net capital spending} - \text{Additions to NWC} .$$

Since $CF(A) = CF(B) + CF(S)$, we know from (b) and (c) that $CF(A) = \$11,785$.

If net fixed assets increased by \$2,500 while depreciation was \$3,000, net capital spending is \$5,500, which gives us

$$\begin{aligned} \text{Additions to NWC} &= \text{Operating cash flow} - \text{Net capital spending} - CF(A) \\ &= 22,085 - 5,500 - 11,785 \\ &= \$4,800 . \end{aligned}$$

4. You have the following information about some firm: sales = \$17,000; costs = \$9,000; addition to retained earnings = \$3,000; dividends paid = \$400; interest expense = \$950; tax rate = 35%. Calculate the depreciation expense.

Big Bock Brewery
2000 Income Statement

Sales	\$17,000
Cost of goods sold	9,000
Depreciation	<u>?</u>
Earnings before interest and taxes (EBIT)	?
Interest	<u>950</u>
Taxable income	?
Taxes (35%)	<u>?</u>
Net income	<u><u>?</u></u>
Dividends	\$400
Addition to retained earnings	\$3,000

Table 2: Income statement for question 4.

Answer: An income statement for such firm would be as in Table 2. Since the sum of Dividends and Addition to retained earnings gives Net income, we have Net income = \$3,400. Tax rate is 35% and thus net income is obtained from

$$\text{Net income} = (1 - 0.35) \times \text{Taxable income},$$

which gives us

$$\text{Taxable income} = \frac{\text{Net income}}{1 - 0.35} = \frac{3,400}{0.65} = \$5,230.77 .$$

Adding Interest to Taxable income gives EBIT, that is

$$\text{EBIT} = 5,230.77 + 950 = \$6,180.77 .$$

Hence Depreciation is given by

$$17,000 - 9,000 - 6,180.77 = \$1,819.23 .$$

5. Harvest Corp. is obligated to pay its creditors \$1,800 during the year. What is the value of shareholders' equity if total assets equal \$2,000? What if total assets equal \$1,600?

Answer: Total equity is \$200 if total assets are \$2,000 and zero if total assets are \$1,600.

6. Prepare a balance sheet for Bean Co. as of December 31, 2001, based on the following information: cash = \$180,000; patents and copyrights = \$525,000; accounts payable = \$500,000; accounts receivable = \$125,000; tangible net fixed assets = \$3,000,000; inventory = \$330,000; notes payable = \$120,000; accumulated retained earnings = \$2,750,000; long-term debt = \$525,000.

Answer: If you use the numbers above only, your balance sheet won't balance. Note that there is item, Common stock, that is not listed in the question. You must then use Common stock that have a balance that balances. The result is as in Table 3.

Bean Co.

December 31, 2001 Balance Sheet (\$ in 000)

<i>Assets</i>		<i>Liabilities and Owners' Equity</i>	
Current assets		Current liabilities	
Cash	\$180	Accounts payable	\$500
Accounts receivable	125	Notes payable	<u>120</u>
Inventory	<u>330</u>		
Total current assets	<u>\$635</u>	Total current liabilities	<u>\$620</u>
		Long-term debt	<u>\$525</u>
Fixed assets		Owners' equity	
Tangible net fixed assets	\$3,000	Common stock	\$265
Patents and copyrights	<u>\$525</u>	Accumulated retained earnings	<u>2,750</u>
Total fixed assets	<u>\$3,525</u>	Total equity	<u>\$3,015</u>
Total assets	<u><u>\$4,160</u></u>	Total liabilities and equity	<u><u>\$4,160</u></u>

Table 3: Balance sheet for Bean Co.

7. During 2000, Mattawa Canoes Inc. has sales of \$700,000. Cost of goods sold, administrative and selling expenses, and depreciation expenses were \$400,000, \$200,000, and \$60,000, respectively. In addition, the company had an interest expense of \$55,000 and a tax rate of 35% (ignore and tax loss carry-back or carry-forward provisions). Find Mattawa's net income for 2000. Find Mattawa's operating cash flow. Explain the discrepancy between these two values.

Answer: The 2000 income statement for Mattawa Canoes Inc. is given in Table 4.

Since taxable income is negative, Mattawa does not pay any taxes. We ignore carry-back or carry-forward provisions here. Let's now calculate Mattawa's operating cash flow, which is given by

$$\text{EBIT} + \text{depreciation} - \text{taxes} = 40,000 + 60,000 - 0 = \$100,000.$$

That is, operating cash flow is positive even though net income is negative. This is due to the size of depreciation, a non-cash expense, and the size of interest expense, that we consider a financing expense, not an operating expense. Moreover, a negative taxable income implies that no taxes are being paid, and tax is a cash outflow. If no taxes are paid, operating cash flow can only be positive if EBIT is positive.

Mattawa Canoes Inc.

2000 Income Statement

Sales	\$700,000
Cost of goods sold	(400,000)
Selling expenses	(200,000)
Depreciation	<u>(60,000)</u>
Earnings before interest and taxes (EBIT)	\$40,000
Interest	<u>(55,000)</u>
Taxable income	(\$15,000)
Taxes (35%)	<u>(0)</u>
Net income	<u><u>(\$15,000)</u></u>

Table 4: Income statement for question 4.

21. **Calculating Cash Flows** Bush Corporation had the following operating results for 2000: sales = \$6,100; cost of goods sold = \$4,500; depreciation expense = \$800; interest expense = \$100; dividends paid = \$150. At the beginning of the year, net fixed assets were \$4,000, current assets were \$1,000, and current liabilities were \$750. At the end of the year, net fixed assets were \$4,200, current assets were \$1,550, and current liabilities were \$900. The tax rate for 2000 was 34 percent.

a. What is net income for 2000?

Answer: Taxable income is $6,100 - 4,500 - 800 - 100 = \700 . Net income is then $(1 - 0.34) \times 700 = \462 .

b. What is the operating cash flow for 2000?

Answer: EBIT is \$800. Taxes paid are \$238. Hence operating cash flow is $800 + 800 - 238 = \$1,362$.

c. What is the cash flow from assets for 2000? Is this possible? Explain.

Answer: Net capital spending is $4,200 - 4,000 + 800 = \$1,000$, and change in net working capital is $1,550 - 900 - (1,000 - 750) = \400 . Hence cash flow from assets is $1,362 - 1,000 - 400 = -\$38$. Even though operating cash flow and net income are positive, the firm invested heavily in fixed assets and net working capital, requiring \$38 for creditors and/or stockholders. Keep in mind that cash flow from assets tells us whether the firm raised funds or distributed funds on a net basis.

d. If no new debt was issued during the year, what is the cash flow to creditors? What is the cash flow to stockholders? Explain and interpret the positive and negative signs of your answers in (a) through (d).

Answer: If no new debt was issued during the year, the cash flow to creditors is \$100, i.e. the interest expense. On the stockholders' side, a dividend of \$150 has been paid. Since the net amount of money raised by the firm in 2000 is \$38, this means that \$288 has been raised through equity. That is,

$$CF(A) = -\$38 = \underbrace{\$100}_{CF(B)} + \underbrace{\$150 - \text{net new equity}}_{CF(S)},$$

which implies that net new equity is \$288.

25. **Net Fixed Assets and Depreciation** On the balance sheet, the net fixed assets (NFA) account is equal to the gross fixed assets (FA) account, which records the acquisition cost of fixed assets, minus the accumulated depreciation (AD) account, which records the total depreciation taken by the firm against its fixed assets. Using the fact that $NFA = FA - AD$, show that the expression given in the chapter for net capital spending, $NFA_{\text{end}} - NFA_{\text{beg}} + D$ (where D is the depreciation expense during

the year), is equivalent to $FA_{\text{end}} - FA_{\text{beg}}$.

Answer:

$$\begin{aligned}
 NFA_{\text{end}} - NFA_{\text{beg}} + D &= FA_{\text{end}} - AD_{\text{end}} - (FA_{\text{beg}} - AD_{\text{beg}}) + D \\
 &= FA_{\text{end}} - FA_{\text{beg}} - (AD_{\text{end}} - AD_{\text{beg}}) + D \\
 &= FA_{\text{end}} - FA_{\text{beg}} - D + D \\
 &= FA_{\text{end}} - FA_{\text{beg}} .
 \end{aligned}$$

	1999	2000
Sales	\$2,050	\$2,200
Depreciation	295	295
Cost of goods sold	705	801
Other expenses	170	140
Interest	137	158
Cash	1,075	1,099
Accounts receivable	1,423	1,603
Short-term notes payable	208	195
Long-term debt	3,600	4,200
Net fixed assets	9,015	9,230
Accounts payable	1,129	1,095
Inventory	2,530	2,600
Dividends	250	275

Table 5: Information for questions 26 and 27.

26. **Financial Statements** Draw up an income statement and balance sheet for Value Debt Airlines , Inc. for 1999 and 2000, using the information contained in Table 5 (assume a tax rate of 34 percent).

Answer: The income statements for Value Debt Airlines are depicted in Table 6:

The balance sheets for Value Debt Airlines in 1999 and 2000 are depicted in Table 7

27. **Calculating Cash Flow** For 2000, calculate the cash flow from assets, cash flow to creditors, and cash flow to shareholders.

Answer: The operating cash flow for 2000 is given by

$$\text{EBIT} + \text{depreciation} - \text{taxes} = 964 + 295 - 274 = \$985.$$

The change in net working capital from 1999 to 2000 is

$$\begin{aligned} \text{NWC}_{2000} - \text{NWC}_{1999} &= (5,302 - 1,290) - (5,028 - 1,337) \\ &= 4,012 - 3,691 = \$321. \end{aligned}$$

The net capital spending is

$$\text{NFA}_{2000} - \text{NFA}_{1999} + \text{depreciation in 2000} = 9,230 - 9,015 + 295 = \$510,$$

where NFA_x denotes net fixed assets in year x . Hence cash flow from assets, CF(A) , is given by

$$\text{CF(A)} = 985 - 321 - 510 = \$154.$$

Long-term debt has increased by \$600 from 1999 to 2000, and interest payment in 2000 is \$158. Hence cash flow to bondholders, CF(B) , is $158 - 600 = -\$442$. Using the identity

$$\text{CF(A)} = \text{CF(B)} + \text{CF(S)},$$

where CF(S) is cash flow to shareholders, we have

$$\text{CF(S)} = \text{CF(A)} - \text{CF(B)} = 154 - (-442) = 596.$$

28. Mary Song, an Alberta investor, receives \$10,000 in dividends, \$10,000 in interest and a \$10,000 in capital gain. Use the information in Table 2.5 in *Fundamentals of Finance* to calculate the aftertax cash flow from each investment. Ms. Song's federal tax rate is 29 percent. Assuming that Ms. Song's cash flows in Problem 23 came from equal investments of \$30,000 each, find her *aftertax* rate of return on each investment.

Answer: Taxes paid on dividends are

$$10,000 \times 1.25 \times (0.29 - 0.1333) \times (1 + 0.44) = \$2,820.60.$$

Taxes paid on interest income are

$$10,000 \times 0.29 \times (1 + 0.44) = \$4,176.$$

Taxes paid on capital gain are

$$\frac{1}{2} \times 10,000 \times 0.29 \times (1 + 0.44) = \$2,088.$$

The aftertax return on the investment that returned dividends is then

$$\frac{10,000 - 2,820.60}{30,000} = 23.9\% ,$$

the aftertax return on the investment that returned interest is then

$$\frac{10,000 - 4,176}{30,000} = 19.4\% ,$$

and the aftertax return on the investment that returned a capital gain is then

$$\frac{10,000 - 2,088}{30,000} = 26.4\% .$$

29. **CCA** Mississauga Manufacturing Ltd. just invested in some new processing machinery to take advantage of more favourable CCA rates in a new federal budget. The machinery qualifies for 25 percent CCA rate and has an installed cost of \$1,800,000. Calculate the CCA and UCC for the first five years.

Answer: See Table 8.

30. **UCC** A piece of newly purchased industrial equipment costs \$414,000. It is Class 8 property. Calculate the annual depreciation allowances and end-of-year book values (UCC) for the first five years.

Answer: See Table 9. Note that the depreciation rate for Class 8 assets is 20%.

31. **CCA and UCC** Our new computer system cost us \$180,000. We will outgrow it in three years. When we sell it, we will probably get only 20 percent of the purchase price. CCA on the computer will be calculated at 30 percent rate (Class 10). Calculate the CCA and UCC values for five years. What will be the aftertax proceeds from the sale assuming the asset class is continued? Assume a 40 percent rate.

Answer: See Table 10 for the CCA and UCC values. UCC value for the computer system at the end of the third year is \$74,970. If the system's market value is 20 percent of \$180,000 at that time, then it should be sold for \$36,000, which is \$38,970 below UCC value. Since the asset class is continued, there is no tax consequences at the time of the sale, and thus the aftertax proceeds from the sale are \$30,000. Note that the difference between UCC value and market value, \$38,970, will depreciate until the respective asset class is terminated (which may never happen).

33. **UCC** Tor-Van Construction specializes in large projects in Toronto and Vancouver. In 2000, Tor-Van invested \$675,000 in new excavating equipment (Class 22). At the same time the firm sold some older equipment on the secondhand market for \$75,000. When it was purchased in 1996, the older equipment cost \$225,000. Calculate the UCC for the asset pool in Class 22 in each year from 1996 through 2000.

Answer: CCA and UCC values can be seen in Table 11. For year 2000, the half-year rule is applied to net acquisitions in the class, i.e.

$$\text{UCC}_{2000} = \frac{1}{2}(675,000 - 75,000) + 21,093.75 = 321,093.75 .$$

Value Debt Airlines

1999 Income Statement

Sales	\$2,050
Cost of goods sold	705
Depreciation	295
Other expenses	<u>170</u>
Earnings before interest and taxes (EBIT)	\$880
Interest	<u>137</u>
Taxable income	\$743
Taxes (34%)	<u>253</u>
Net income	<u><u>\$490</u></u>
Dividends	\$250
Addition to retained earnings	\$240

Value Debt Airlines

2000 Income Statement

Sales	\$2,200
Cost of goods sold	801
Depreciation	295
Other expenses	<u>140</u>
Earnings before interest and taxes (EBIT)	\$964
Interest	<u>158</u>
Taxable income	\$806
Taxes (34%)	<u>274</u>
Net income	<u><u>\$532</u></u>
Dividends	\$275
Addition to retained earnings	\$257

Table 6: Income statements for Value Debt Airlines.

Value Debt Airlines

1999 and 2000 Balance Sheets

	<i>Assets</i>		<i>Liabilities and Owners' Equity</i>	
	1999	2000	1999	2000
Current assets			Current liabilities	
Cash	\$1,075	\$1,099	Accounts payable	\$1,129 \$1,095
Accounts receivable	1,423	1,603	Notes payable	<u>208</u> <u>195</u>
Inventory	<u>2,530</u>	<u>2,600</u>		
Total	\$5,028	\$5,302	Total	\$1,337 \$1,290
			Long-term debt	3,600 4,200
Fixed assets			Owners' equity	<u>9,106</u> <u>9,042</u>
Net fixed assets	<u>\$9,015</u>	<u>\$9,230</u>		
Total assets	<u>\$14,043</u>	<u>\$14,532</u>	Total liabilities and equity	<u>\$14,043</u> <u>\$14,532</u>

Table 7: Balance sheets for Value Debt Airlines.

Year	Beginning UCC	CCA	Ending UCC
1	\$900,000.00	\$225,000.00	\$1,575,000.00
2	1,575,000.00	393,750.00	1,181,250.00
3	1,181,250.00	295,312.50	885,937.50
4	885,937.50	221,484.38	664,453.12
5	664,453.12	116,113.28	498,339.84

Table 8: CCA and UCC for Mississauga Manufacturing Inc.

Year	Beginning UCC	CCA	Ending UCC
1	\$207,000.00	\$41,400.00	\$372,600.00
2	372,600.00	74,520.00	298,080.00
3	298,080.00	59,616.00	238,464.00
4	238,464.00	47,692.80	190,771.20
5	190,771.20	38,154.24	152,616.96

Table 9: CCA and UCC for question 30.

Year	Beginning UCC	CCA	Ending UCC
1	\$90,000.00	\$27,000.00	\$153,000.00
2	153,000.00	45,900.00	107,100.00
3	107,100.00	32,130.00	74,970.00
4	74,970.00	22,491.00	52,479.00
5	52,479.00	15,743.70	36,735.30

Table 10: CCA and UCC for question 31.

Year	Beginning UCC	CCA	Ending UCC
1996	\$112,500.00	\$56,250.00	\$168,750.00
1997	168,750.00	84,375.00	84,375.00
1998	84,375.00	42,187.50	42,187.50
1999	42,187.50	21,093.75	21,093.75
2000	321,093.75	160,546.88	160,546.88

Table 11: CCA and UCC for question 33.