Chpater-4: Solutions to Problems

P4-1. Depreciation

LG 1; Basic

Depreciation Schedule			
Year	**Cost(1)**	**Percentages from Table 4.2 (2)**	**Depreciation [(1) × (2)] (3)**
Asset A			
1	$17,000	33%	$ 5,610
2	$17,000	45	7,650
3	$17,000	15	2,550
4	$17,000	7	1,190
Asset B			
1	$45,000	20%	$ 9,000
2	$45,000	32	14,400
3	$45,000	19	8,550
4	$45,000	12	5,400
5	$45,000	12	5,400
6	$45,000	5	2,250

P4-2. Depreciation

LG 1; Basic

Depreciation Schedule Cork stopper machine			
Year	**Cost (1)**	**Percentages from Table 4.2 (2)**	**Depreciation [(1) × (2)] (3)**
1	$10,000	33%	$ 3,300
2	$10,000	45	4,500
3	$10,000	15	1,500
4	$10,000	7	7000

P4-3. MACRS depreciation expense, taxes, and cash flow

LG 1, 2; Challenge

a. Depreciation expense = $80,000 × 0.20 = $16,000 (MACRS depreciation percentages found on Table 4.2 in the text.)

b. New taxable income = $430,000 − $16,000 = $414,000

Tax liability = $113,900 + [($414,000 − $335,000) × 0.34] = $113,900 + $26,860
= $140,760

Original tax liability before depreciation expense:

Tax liability = $113,900 + [($430,000 − $335,000) × 0.34] = $113,900 + $32,300
= $146,200

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Tax savings = $146,200 – $140,760 = $5,440

P4-4. Depreciation and accounting cash flow

LG 1, 2; Intermediate

a. Operating cash flow

Sales revenue	$400,000
Less: Total costs before depreciation, interest, and taxes	290,000
Depreciation expense	34,200 (= 0.19 x $180,000)
Earnings before interest and taxes	$ 75,800
Less: Taxes at 40%	30,320
Net profit after taxes	$ 45,480
Plus: Depreciation	34,200
Cash flow from operations	$ 79,680

b. Depreciation and other noncash charges serve as a tax shield against income, increasing annual cash flow.

P4-5. Classifying inflows and outflows of cash

LG 2; Basic

Item	Change ($)	I/O	Item	Change ($)	I/O
Cash	+100	O	Accounts receivable	–700	I
Accounts payable	–1,000	O	Net profits	+600	I
Notes payable	+500	I	Depreciation	+100	I
Long-term debt	–2,000	O	Repurchase of stock	+600	O
Inventory	+200	O	Cash dividends	+800	O
Fixed assets	+400	O	Sale of stock	+1,000	I

Note 1: Think of cash in terms of money in a checking account.

Note 2: As a non-cash charge depreciation is not really an I/O at all, but it will be reported as a positive amount on the statement of cash flows.

P4-6. PROBLEM SET-1 ASSIGNMENT QUESTION

P4-7. Cash receipts

LG 4; Basic

	April	May	June	July	August
Sales	$65,000	$60,000	$70,000	$100,000	$100,000
Cash sales (0.50)	$32,500	$30,000	$35,000	$ 50,000	$ 50,000
Collections:					
Lag 1 month (0.25)		16,250	15,000	17,500	25,000
Lag 2 months (0.25)			16,250	15,000	17,500
Total cash receipts			$66,250	$ 82,500	$ 92,500

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P4-8. Cash disbursement schedule

LG 4; Basic

	February	March	April	May	June	July
Sales						
Disbursements	$500,000	$500,000	$560,000	$610,000	$650,000	$650,000
Purchases (0.60)	$300,000	$336,000	$366,000	$390,000	$390,000	
Cash			36,600	39,000	39,000	
1-month delay (0.50)			168,000	183,000	195,000	
2-month delay (0.40)			120,000	134,400	146,400	
Rent			8,000	8,000	8,000	
Wages & salary						
Fixed			6,000	6,000	6,000	
Variable			39,200	42,700	45,500	
Taxes					54,500	
Fixed assets			75,000			
Interest					30,000	
Cash dividends			12,500			
Total Disbursements			$465,300	$413,100	$524,400	

P4-9. Cash budget—basic

LG 4; Intermediate

	March	April	May	June	July
Sales	$50,000	$60,000	$70,000	$80,000	$100,000
Cash sales (0.20)	$10,000	$12,000	$14,000	$16,000	$ 20,000
Lag 1 month (0.60)			36,000	42,000	48,000
Lag 2 months (0.20)			10,000	12,000	14,000
Other income			2,000	2,000	2,000
Total cash receipts			$62,000	$72,000	$ 84,000
Disbursements					
Purchases			$50,000	$70,000	$ 80,000
Rent			3,000	3,000	3,000
Wages & salaries			6,000	7,000	8,000
Dividends				3,000	
Principal & interest				4,000	
Purchase of new equipment					6,000
Taxes due				6,000	
Total cash disbursements			$59,000	$93,000	$97,000

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Total cash receipts	$62,000	$72,000	$84,000
Total cash disbursements	59,000	93,000	97,000
Net cash flow	$ 3,000	($21,000)	($13,000)
Add: Beginning cash	5,000	8,000	(13,000)
Ending cash	$ 8,000	($13,000)	($26,000)
Minimum cash	5,000	5,000	5,000
Required total financing (notes payable)		$18,000	$31,000
Excess cash balance (marketable securities)	$ 3,000	0	0

The firm should establish a credit line of at least $31,000, but may need to secure three to four times this amount based on scenario analysis.

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P4-10. Personal finance: Preparation of cash budget

LG 4; Basic

Sam and Suzy Sizeman Personal Budget for the Period October—December 2013				
		October	**November**	**December**
Income				
Take-home pay		$4,900	$4,900	$4,900
Expenses	Percent			
Housing	30.0%	$1,470	$1,470	$1,470
Utilities	5.0%	245	245	245
Food	10.0%	490	490	490
Transportation	7.0%	343	343	343
Medical/Dental	0.5%	25	25	25
Clothing	3.0%	147	147	440
Property taxes	11.5%		564	
Appliances	1.0%	49	49	49
Personal care	2.0%	98	98	98
Entertainment	6.0%	294	294	1,500
Savings	7.5%	368	368	368
Other	5.0%	245	245	245
Excess cash	4.5%	221	221	221
Total expenses		$3,995	$4,559	$5,494
Cash surplus or (deficit)		$ 905	$ 341	$ (594)
Cumulative cash surplus or (deficit)		$ 905	$1,246	$ 652

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P4-11. PROBLEM SET-1 ASSIGNMENT QUESTION

P4-12. Cash flow concepts

LG 4; Basic

Note to instructor: There are a variety of possible answers to this problem, depending on the assumptions the student might make. The purpose of this question is to have a chance to discuss the difference between cash flows, income, and assets.

Transaction	Cash Budget	Pro Forma Income Statement	Pro Forma Balance Sheet
Cash sale	X	X	X
Credit sale	X	X	X
Accounts receivable are collected	X		X
Asset with a five-year life is purchased	X		X
Depreciation is taken		X	X
Amortization of goodwill is taken		X	X
Sale of common stock	X		X
Retirement of outstanding bonds	X		X
Fire insurance premium is paid for the next three years	X		X

P4-13. Cash budget—scenario analysis

LG 4; Intermediate

a.

Trotter Enterprises, Inc.
Multiple Cash Budgets ($000)

	October			November			December		
	Pessi-mistic	Most Likely	Opti-mistic	Pessi-mistic	Most Likely	Opti-mistic	Pessi-mistic	Most Likely	Opti-mistic
Total cash receipts	$260	$342	$462	$200	$287	$366	$191	$294	$353
Total cash disbursements	285	326	421	203	261	313	287	332	315
Net cash flow	−25	16	41	(3)	26	53	(96)	(38)	38
Add: Beginning cash	(20)	(20)	(20)	(45)	(4)	21	(48)	22	74
Ending cash:	−45	(4)	21	(48)	22	74	(144)	(16)	112
Financing	63	22		66			162	34	
	$ 18	$ 18	$ 21	$ 18	$ 22	$ 74	$ 18	$ 18	$112

b. Under the pessimistic scenario Trotter will definitely have to borrow funds, up to $162,000 in December. Their needs are much smaller under their most likely outcome. If events turn out to be consistent with their optimistic forecast, the firm should have excess funds and will not need to access the financial markets.

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P4-14. Multiple cash budgets—scenario analysis

LG 4; Intermediate

(a) and (b)

Brownstein, Inc.
Multiple Cash Budgets
($000)

	1st Month			2nd Month			3rd Month		
	Pessi-mistic	**Most Likely**	**Opti-mistic**	**Pessi-mistic**	**Most Likely**	**Opti-mistic**	**Pessi-mistic**	**Most Likely**	**Opti-mistic**
Sales	$ 80	$100	$120	$ 80	$100	$120	$80	$100	$120
Sale of asset							8	8	8
Purchases	(60)	(60)	(60)	(60)	(60)	(60)	(60)	(60)	(60)
Wages	(14)	(15)	(16)	(14)	(15)	(16)	(14)	(15)	(16)
Taxes	(20)	(20)	(20)						
Purchase of fixed asset				(15)	(15)	(15)			
Net cash flow	$(14)	$ 5	$ 24	$ (9)	$ 10	$ 29	$14	$ 33	$ 52
Add: Beginning cash	0	0	0	(14)	5	24	(23)	15	53
Ending cash:	$(14)	$ 5	$ 24	$(23)	$ 15	$ 53	$ (9)	$ 48	$105

c. Considering the extreme values reflected in the pessimistic and optimistic outcomes allows Brownstein, Inc. to better plan its borrowing or investment requirements by preparing for the worst case scenario.

P4-15. Pro forma income statement

LG 5; Intermediate

a.

Pro Forma Income Statement
Metroline Manufacturing, Inc.
for the Year Ended December 31, 2013
(percent-of-sales method)

Sales	$1,500,000
Less: Cost of goods sold (0.65 × sales)	975,000
Gross profits	$ 525,000
Less: Operating expenses (0.086 × sales)	129,000
Operating profits	$ 396,000
Less: Interest expense	35,000
Net profits before taxes	$ 361,000
Less: Taxes (0.40 × NPBT)	144,400
Net profits after taxes	$ 216,600
Less: Cash dividends	70,000
To retained earnings	$ 146,600

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b.

Pro Forma Income Statement Metroline Manufacturing, Inc. for the Year Ended December 31, 2013 (based on fixed and variable cost data)	
Sales	$1,500,000
Less: Cost of goods sold	
Fixed cost	210,000
Variable cost (0.50 × sales)	750,000
Gross profits	$ 540,000
Less: Operating expense:	
Fixed expense	36,000
Variable expense (0.06 × sales)	90,000
Operating profits	$ 414,000
Less: Interest expense	35,000
Net profits before taxes	$ 379,000
Less: Taxes (0.40 × NPBT)	151,600
Net profits after taxes	$ 227,400
Less: Cash dividends	70,000
To retained earnings	$ 157,400

c. The pro forma income statement developed using the fixed and variable cost data projects a higher net profit after taxes due to lower cost of goods sold and operating expenses. Although the percent-of-sales method projects a more conservative estimate of net profit after taxes, the pro forma income statement that classifies fixed and variable cost is more accurate.

P4-16. Pro forma income statement—scenario analysis

LG 5; Challenge

a.

Pro Forma Income Statement Allen Products, Inc. for the Year Ended December 31, 2013			
	Pessimistic	**Most Likely**	**Optimistic**
Sales	$900,000	$1,125,000	$1,280,000
Less cost of goods sold (45%)	405,000	506,250	576,000
Gross profits	$495,000	$ 618,750	$ 704,000
Less operating expense (25%)	225,000	281,250	320,000
Operating profits	$270,000	$ 337,500	$ 384,000
Less interest expense (3.2%)	28,800	36,000	40,960
Net profit before taxes	$241,200	$ 301,500	$ 343,040
Taxes (25%)	60,300	75,375	85,760
Net profits after taxes	$180,900	$ 226,125	$ 257,280

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b. The simple percent-of-sales method assumes that all costs are variable. In reality some of the expenses will be fixed. In the pessimistic case this assumption causes all costs to decrease with the lower level of sales when in reality the fixed portion of the costs will not decrease. The opposite occurs for the optimistic forecast since the percent-of-sales assumes all costs increase when in reality only the variable portion will increase. This pattern results in an understatement of costs in the pessimistic case and an overstatement of profits. The opposite occurs in the optimistic scenario.

c.

Pro Forma Income Statement
Allen Products, Inc.
for the Year Ended December 31, 2013

	Pessimistic	Most Likely	Optimistic
Sales	$900,000	$1,125,000	$1,280,000
Less cost of goods sold:			
Fixed	250,000	250,000	250,000
Variable (18.3%)[a]	164,700	205,875	234,240
Gross profits	$485,300	$ 669,125	$ 795,760
Less operating expense			
Fixed	180,000	180,000	180,000
Variable (5.8%)[b]	52,200	65,250	74,240
Operating profits	$253,100	$ 423,875	$ 541,520
Less interest expense	30,000	30,000	30,000
Net profit before taxes	$223,100	$ 393,875	$ 511,520
Taxes (25%)	55,775	98,469	127,880
Net profits after taxes	$167,325	$ 295,406	$ 383,640

[a]Cost of goods sold variable percentage = ($421,875 – $250,000) / $937,500
[b]Operating expense variable percentage = ($234,375 – $180,000) / $937,500

d. The profits for the pessimistic case are larger in part (a) than in part (c). For the optimistic case, the profits are lower in part (a) than in part (c). This outcome confirms the results as stated in part (b).

P4-17. Pro forma balance sheet—basic

LG 5; Intermediate

a.

Pro Forma Balance Sheet
Leonard Industries
December 31, 2013

Assets	
Current assets	
Cash	$ 50,000
Marketable securities	15,000
Accounts receivable (0.10)	300,000
Inventories (0.12)	360,000
Total current assets	$725,000
Net fixed assets	658,000[1]

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Total assets	$1,383,000

Pro Forma Balance Sheet
Leonard Industries
December 31, 2013

Liabilities and stockholders' equity	
Current liabilities	
Accounts payable (0.14)	$ 420,000
Accruals	60,000
Other current liabilities	30,000
Total current liabilities	$ 510,000
Long-term debts	350,000
Total liabilities	$ 860,000
Common stock	200,000
Retained earnings	270,000[2]
Total stockholders' equity	$ 470,000
External funds required	53,000[3]
Total liabilities and stockholders' equity	$1,383,000

[1]	Beginning gross fixed assets	$ 600,000
	Plus: Fixed asset outlays	90,000
	Less: Depreciation expense	(32,000)
	Ending net fixed assets	$ 658,000
[2]	Beginning retained earnings (Jan. 1, 2013)	$ 220,000
	Plus: Net profit after taxes ($3,000,000 × 0.04)	120,000
	Less: Dividends paid	(70,000)
	Ending retained earnings (Dec. 31, 2013)	$ 270,000
[3]	Total assets	$1,383,000
	Less: Total liabilities and equity	1,330,000
	External funds required	$ 53,000

b. Based on the forecast and desired level of certain accounts, the financial manager should arrange for credit of $53,000. Of course, if financing cannot be obtained, one or more of the constraints may be changed.

c. If Leonard Industries reduced its 2013 dividend to $17,000 or less, the firm would not need any additional financing. By reducing the dividend, more cash is retained by the firm to cover the growth in other asset accounts.

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P4-18. Pro forma balance sheet

LG 5; Intermediate

a.

Pro Forma Balance Sheet Peabody & Peabody December 31, 2014	
Assets	
Current assets	
Cash	$ 480,000
Marketable securities	200,000
Accounts receivable	1,440,000
Inventories	2,160,000
Total current assets	$4,280,000
Net fixed assets	4,820,000[1]
Total assets	$9,100,000
Liabilities and stockholders' equity	
Current liabilities	
Accounts payable	$1,680,000
Accruals	500,000
Other current liabilities	80,000
Total current liabilities	$2,260,000
Long-term debts	2,000,000
Total liabilities	$4,260,000
Common equity	4,065,000[2]
External funds required	775,000
Total liabilities and stockholders' equity	$9,100,000

[1]Beginning net fixed assets (January 1, 2014) $4,000,000

Plus: Fixed asset outlays 1,500,000

Less: Depreciation expense (680,000)

Ending net fixed assets (December 31, 2014) $ 4,820,000

[2]Note: Common equity is the sum of common stock and retained earnings.

Beginning common equity (January 1, 2013) $3,720,000

Plus: Net profits after taxes (2013) 330,000

Net profits after taxes (2014) 360,000

Less: Dividends paid (2013) (165,000)

Dividends paid (2014) (180,000)

Ending common equity (December 31, 2014) $4,065,000

b. Peabody & Peabody must arrange for additional financing of at least $775,000 over the next two years based on the given constraints and projections.

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P4-19. PROBLEM SET-1 ASSIGNMENT QUESTION

P4-20. Integrative—pro forma statements

LG 5; Challenge

a.

Pro Forma Income Statement Provincial Imports, Inc. for the Year Ended December 31, 2013 (percent-of-sales method)	
Sales	$6,000,000
Less: Cost of goods sold (0.35 × sales + $1,000,000)	3,100,000
Gross profits	$2,900,000
Less: Operating expenses (0.12 × sales + $250,000)	970,000
Operating profits	$1,930,000
Less: Interest expense	200,000
Net profits before taxes	$1,730,000
Less: Taxes (0.40 × NPBT)	692,000
Net profits after taxes	$1,038,000
Less: Cash dividends (0.40 × NPAT)	415,200
To Retained earnings	$ 622,800

b.

Pro Forma Balance Sheet Provincial Imports, Inc. December 31, 2013 (Judgmental Method)			
Assets		**Liabilities and Equity**	
Cash	$ 400,000	Accounts payable	$ 840,000
Marketable securities	275,000	Taxes payable (same percentage as prior year)	138,400[1]
		Notes payable	200,000
Accounts receivable	750,000	Other current liabilities	6,000
Inventories	1,000,000	Current liabilities	$1,184,400
Current assets	$2,425,000	Long-term debt	500,000
Net fixed assets	1,646,000[2]	Common stock	75,000
		Retained earnings	1,997,800[3]
		External funds required	313,800
		Total liabilities and	
Total assets	$4,071,000	stockholders' equity	$4,071,000

[1] Taxes payable for 2012 are nearly 20% of the 2012 taxes on the income statement. The pro forma value is obtained by taking 20% of the 2013 taxes (0.2 × $692,000 = $138,400).

[2] Net fixed assets (January 1, 2013)	$1,400,000
Plus: New computer	356,000
Less: Depreciation	(110,000)
Net fixed assets (December 31, 2013)	$1,646,000

[3] Beginning retained earnings (January 1, 2013)	$1,375,000
Plus: Net profit after taxes	1,038,000

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Less: Dividends paid	(415,200)
Ending retained earnings (December 31, 2013)	$1,997,800

c. Using the judgmental approach, the external funds requirement is $313,800.

P4-21. Ethics problem

LG 3; Intermediate

Investors welcome increased transparency, accountability, and integrity. It is probable that investors will appreciate dissemination of negative information, although we would expect the stock price to drop immediately. Reputation effects should help the company, and possibly its stock price, in the long run. Any information release such as this would likely be seen as signaling an ethical stance on the part of the company, especially in light of the fact that the stock price would likely fall.

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