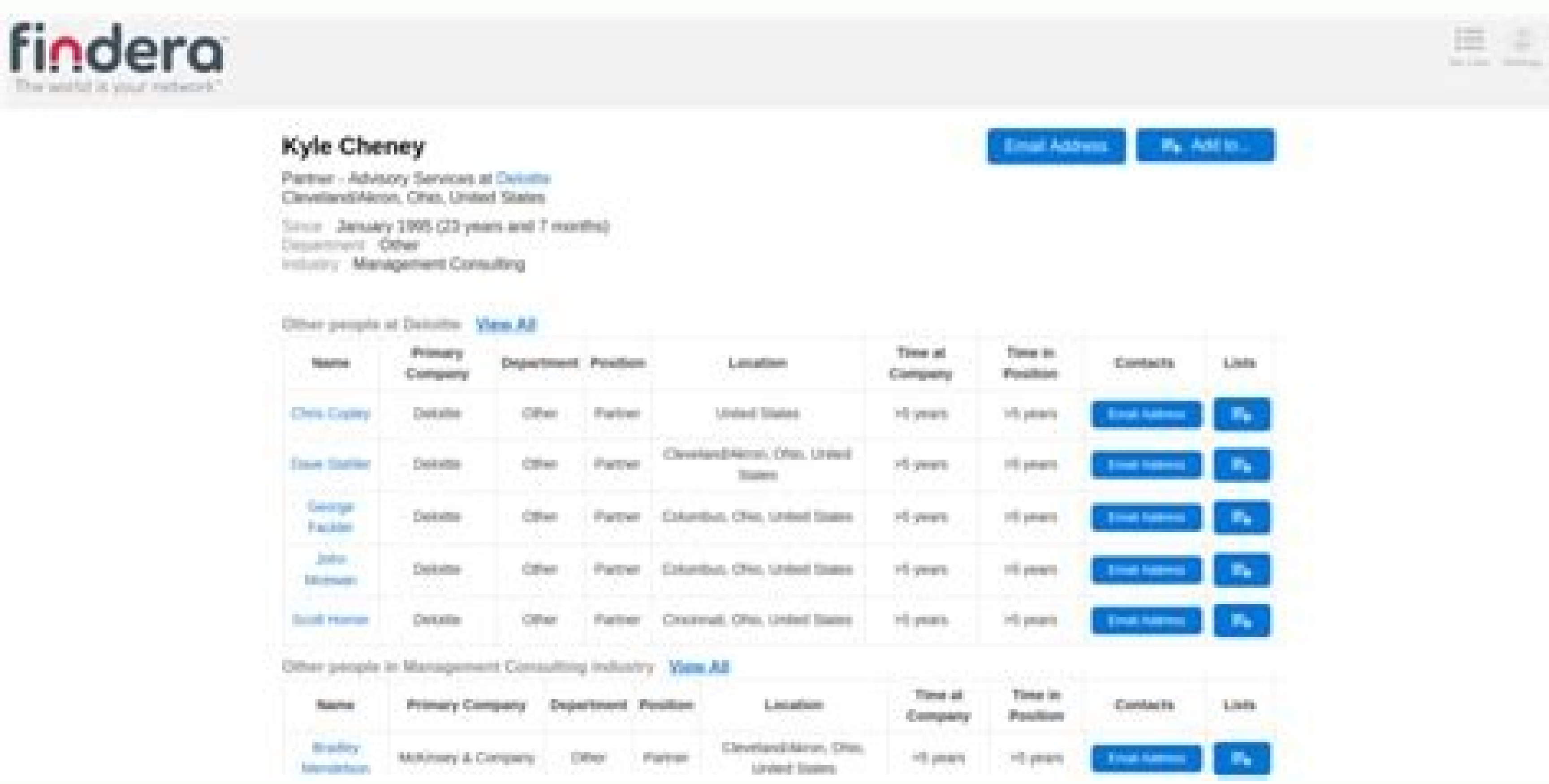
61812983484 19226383.638889 12809804.77907 63742424778 137190098.09091 29837263.8 54954124.518519 21207462336 93333188100 54186307.923077 28601656.492308 27851528754 35532155.956522 8988082620 15034548.131313 138100217.90909 103466347.5 82763711698 18936107.454545 6076057912 45024682544
5890273.8666667 2626328.5121951 131410300158 21915302.171875 12614011.977778 30898989.48 7126995.0625 31845844212 752374385 33121138.134615 65438734508 32203096205

Chapter 11 capital budgeting cash flows solutions pdf software

After-tax proceeds from sale of new asset =		
Proceeds from sale of new machine	$75,000	
− Tax on sale of new machine[1]	(14,360)	
Total after-tax proceeds—new asset		$60,640
− After-tax proceeds from sale of old asset		
Proceeds from sale of old machine	15,000	
− Tax on sale of old machine[2]	(6,000)	
− Total after-tax proceeds—old asset		(9,000)
+ Change in net working capital		25,000
Terminal cash flow		$76,640



After-tax proceeds from sale of new asset 3-Year* Proceeds from sale of proposed asset $10,000 * Tax on sale of proposed asset 16,880 Total after-tax proceeds—new $26,880 Change in net working capital 30,000 Terminal cash flow $56,880 $197 5-Year* $10,000 400 $9,600 30,000 $39,600 $195 $111 7-Year* $10,000 4,000 $ 6,000 30,000 $36,000 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 * 1. This is a conventional cash flow pattern, where the subsequent cash inflows vary, which is referred to as a mixed stream. Book value of asset Proceeds from sale $10,000 $52,200 $42,200 (0.40) Book value of asset $10,000 $9,000 $1,000 (0.40) Book value of asset $10,000 $0 $10,000 (0.40) [1 (0.20 0.32 0.19)] $180,000 $52,200 $10,000 ($42,200) loss $16,880 tax benefit [1 (0.20 0.32 0.19 0.12 0.12)] $180,000 $1,000 recaptured depreciation $400 tax liability $0 $10,000 recaptured depreciation $4,000 tax liability $9,000 b. Sunk costs and opportunity costs LG 2; Basic a. Year Revenues Calculation of Operating Cash Flows Net Profits Expenses Depreciation before Taxes Taxes Net Profits after Taxes 1 2 3 4 5 6 $1,600,000 1,600,000 1,600,000 1,600,000 1,600,000 0 $800,000 800,000 800,000 800,000 800,000 0 $216,000 57,600 229,200 321,600 321,600 66,000 c. tax savings @40% 110 Net Incremental Cash Flows Cash flows: (000) Revenues $50 Expenses 40 Less taxes @40% (36) Depr. The $1,000,000 development costs should not be considered part of the decision to go ahead with the new production. Terminal cash flow: (A) After-tax proceeds form sale of new asset Proceeds from sale of new asset Tax on sale of new assetl Total proceeds—new asset After-tax proceeds from sale of old asset Proceeds from sale of old asset Tax on sale of old asset2 Total proceeds—old asset Change in net working capital Terminal cash flow 1 $12,000 (3,840) 8,160 $20,000 (6,800) 13,200 (1,000) 400 (600) 4,000 $11,560 (1,000) 400 (600) 6,000 $18,600 Book value of Hoist A at end of year 5 $2,400 $12,000 $2,400 $9,600 recaptured depreciation $9,600 0.40 $3,840 tax Book value of Hoist B at end of year 5 $3,000 $20,000 $3,000 $17,000 recaptured depreciation $17,000 0.40 $6,800 tax 2 Book value of existing hoist at end of year 5 $0 $1,000 $0 $1,000 recaptured depreciation $1,000 0.40 $400 tax d. Year Calculation of Operating Cash Inflows Profits before Depreciation Net Profits Net Profits and Taxes Depreciation before Taxes Taxes after Taxes New Grinder 1 $43,000 2 43,000 3 43,000 4 43,000 5 43,000 6 0 Existing Grinder 1 $26,000 2 24,000 3 22,000 4 20,000 5 18,000 6 0 Operating Cash Inflows $22,000 35,200 20,900 13,200 13,200 5,500 $21,000 7,800 22,100 29,800 29,800 5,500 $8,400 3,120 8,840 11,920 11,920 2,200 $12,600 4,680 13,260 17,880 17,880 3,300 $34,600 39,880 34,160 31,080 31,080 2,200 $11,400 7,200 7,200 3,000 0 0 $14,600 16,800 14,800 17,000 18,000 0 $5,840 6,720 5,920 6,800 7,200 0 $8,760 10,080 8,880 10,200 10,800 0 $20,160 17,280 16,080 13,200 10,800 0 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 Calculation of Incremental Cash Inflows Year 1 2 3 4 5 6 c. Year Initial investment 1 2 3 4 5 b. Initial investment—basic calculation LG 3, 4; Intermediate Installed cost of new asset Cost of new asset Installation costs Total installed cost (depreciable value) After-tax proceeds from sale of old asset Proceeds from sale of old asset Tax on sale of old asset Total after-tax proceeds—old asset Initial investment $ 35,000 5,000 $40,000 ($25,000) 7,680 ($17,320) $22,680 Book value of existing machine $20,000 (1 (0.20 0.32 Recaptured depreciation $20,000 $5,800 $14,200 Capital gain $25,000 $20,000 $5,000 Tax on recaptured depreciation $14,200 (0.40) $5,680 Tax on capital gain $5,000 (0.40) 2,000 Total tax $7,680 0.19)) $5,800 P11-13. Calculating initial investment LG 3, 4; Challenge a. Book value $80,000 (0.71 $80,000) $23,200 b. Terminal cash flow—replacement decision LG 6; Challenge After-tax proceeds from sale of new asset Proceeds from sale of new machine $75,000 l Tax on sale of new machine (14,360) Total after-tax proceeds—new asset After-tax proceeds from sale of old asset Proceeds from sale of old machine (15,000) 2 Tax on sale of old machine 6,000 Total after-tax proceeds—old asset Change in net working capital Terminal cash flow 1 2 Book value of new machine at end of year 4: [1 (0.20 0.32 0.19 0.12) ($230,000)] $75,000 $39,100 $35,900 (0.40) Book value of old machine at end of year 4: $0 $15,000 $0 $15,000 (0.40) $60,640 (9,000) 25,000 $76,640 $39,100 $35,900 recaptured depreciation $14,360 tax liability $15,000 recaptured depreciation $6,000 tax benefit CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-23. Personal finance: Sunk and opportunity cash flows LG 2; Intermediate a. Recaptured depreciation Tax on ordinary gain $7,000 $4,100 $2,900 (0.40) $4,100 $1,640 c. Determining incremental operating cash flows LG 5; Intermediate Year 1 Revenues: (000) New buses $1,850 Old buses 1,800 Incremental revenue $50 Expenses: (000) New buses $460 Old buses 500 Incremental expense $ (40) Depreciation: (000) New buses $ 600 Old buses 324 Incremental depr. Book value and recaptured depreciation Answer: Book value $175,000 Recaptured depreciation E11-5. Finding the initial investment Answer: $20,000 Purchase price of new machinery $3,000 Installation costs $4,500 After-tax proceeds from sale of old machinery $18,500 Initial investment E11-4. Cash flow (NPAT PBDT NPBT NPAT (1) $592,000 (2) $688,000 (3) $584,000 (4) $528,000 (5) $528,000 (6) $472,000 depreciation) Profits before depreciation and taxes Net profits before taxes Net profits after taxes P11-17. $ 40,000 8,000 48,000 $ 54,000 6,000 60,000 (18,000) 3,488 (14,512) 4,000 $37,488 (18,000) 3,488 (14,512) 6,000 $51,488 Book value of old asset: ($32,000) * Initial Investment Installed cost of new asset Cost of new asset Installation costs Total proceeds, sale of new asset After-tax proceeds from sale of old asset Proceeds from sale of old asset Tax on sale of old asset * Total proceeds, sale of old asset Change in working capital Initial investment [1 (0.20 0.32 0.19)] A B $9,280 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 b. Initial investment: Installed cost of new asset Cost of the new machine Installation costs Total cost of new machine After-tax proceeds from sale of old asset Proceeds from sale of existing machine Tax on sale of existing machine* Total after-tax proceeds from sale Increase in net working capital Initial investment $1,200,000 150,000 $1,350,000 (185,000) (79,600) (264,600) 25,000 $1,110,400 * Book value $384,000 $185,000 $384,000 $199,000 loss from sale of existing press $199,000 loss from sale (0.40) $79,600 Calculation of Operating Cash Flows New Machine Reduction in Net Profits Year Operating Costs Depreciation before Taxes Taxes 1 2 3 4 5 6 $350,000 350,000 350,000 350,000 350,000 0 $270,000 432,000 256,500 162,000 162,000 67,500 $80,000 82,000 93,500 188,000 188,000 67,500 $32,000 32,800 37,400 75,200 75,200 27,000 Net Profits after Taxes $48,000 49,200 56,100 112,800 112,800 40,500 Cash Flow $318,000 382,800 312,600 274,800 274,800 27,000 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 Year 1 2 3 4 5 6 Year 1 2 3 4 5 6 Depreciation $152,000 96,000 96,000 40,000 0 0 Existing Machine Net Profits before Taxes Taxes $152,000 96,000 96,000 40,000 0 0 $60,800 38,400 38,400 16,000 0 0 Net Profits after Taxes Cash Flow $91,200 57,600 57,600 24,000 0 0 $60,800 38,400 38,400 16,000 0 0 Incremental Operating Cash Flows New Machine Existing Machine Incremental Cash Flow $318,000 382,800 312,600 274,800 274,800 27,000 $60,800 38,400 38,400 16,000 0 0 Terminal cash flow: After-tax proceeds from sale of new asset Proceeds from sale of new asset Tax on sale of new asset* Total proceeds—sale of new asset After-tax proceeds from sale of old asset Change in net working capital Terminal cash flow $257,200 344,400 274,200 258,800 274,800 27,000 $200,000 (53,000) $147,000 0 25,000 $172,000 * Book value of new machine at the end of year 5 is $67,500 200,000 $67,500 $132,500 income from sale of old machine 132,500 0.40 $53,000 tax liability b. Year (1) (2) (3) (4) (5) (6) PBDT Depr. The criterion is that the IRR must equal or exceed the cost of capital; therefore, 12.24% is the lowest acceptable IRR. Current Assets Cash Accounts receivable Inventory Net change b. Here, David and Ann have decided to rent out their home, and all the costs associated with getting the home in ―rentable‖ condition would be relevant. Categorizing a firm's expenditures Answer: In this case, the tuition reimbursement should be categorized as a capital expenditure since the outlay of funds is expected to produce benefits over a period of time greater than 1 year. Based on both decision criteria, the project should be accepted. Operating cash flows Maint. This is a nonconventional cash flow pattern, which has several cash flow series of equal size, which is referred to as an embedded annuity. d. Classification of project costs and cash flows Answer: $3.5 billion already spent—sunk cost (irrelevant) $350 million incremental cash outflow—relevant cash flow $15 million per year cash inflow—relevant cash flow $450 million for satellites—opportunity cost and relevant cash flow E11-3. E11-2. Depreciation LG 5; Basic Year 1 2 3 4 5 6 $ 50,000 70,000 $ 120,000 Depreciation Schedule Depreciation Expense $68,000 68,000 68,000 68,000 68,000 68,000 0.20 0.32 0.19 0.12 0.12 0.05 $13,600 21,760 12,920 8,160 8,160 3,400 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-16. P11-6. An opportunity cost or cash flow is one that can be realized from an alternative use of an existing asset. Projects with usable lives equal to the number of years of cash inflows are also included in the end-of-chapter problems. Expenses (excluding Profits before depreciation Depreciation Revenue and interest) and Taxes Year New Lathe 1 2 3 4 5 6 Old Lathe 1–5 b. $276 Incremental depr. Net profits after taxes plus depreciation expense. Loss on sale of existing asset Tax benefit $1,500 $2,900 $ 1,400 (0.40) ($1,400) $ 560 P11-14. Integrative—determining relevant cash flows LG 3, 4, 5, 6; Challenge a. If Masters Golf Products does not proceed with the new line of clubs they will not receive the $250,000. Opportunity cost—Covol will not have to spend any funds for floor space but the lost cash inflow from the rent would be a cost to the firm. Sunk cost—The funds for the tooling had already been expended and would not change, no matter whether the new technology would be acquired or not. Across the four years, $96,950 will be spent in excess of the anticipated sales price in year 4. Incremental profits before depreciation and tax $1,200,000 $480,000 $720,000 each year b. 2. P11-20. P11-5. Initial investment at various sale prices LG 3, 4; Intermediate Installed cost of new asset: Cost of new asset Installation cost Total installed cost After-tax proceeds from sale of old asset Proceeds from sale of old asset Tax on sale of old asset* Total after-tax proceeds Initial investment Book value of existing machine * (a) (b) (c) (d) $24,000 2,000 26,000 $24,000 2,000 26,000 $24,000 2,000 26,000 $24,000 2,000 26,000 (11,000) 3,240 (7,760) $18,240 (7,000) 1,640 (5,360) $20,640 (2,900) 0 (2,900) $23,100 (1,500) (560) (2,060) $23,940 $10,000 [1 (0.20 0.32 0.19)] Tax Calculations: a. Book value ($60,000 0.31) $18,600 b. f. (1) (2) After-tax proceeds from sale of new asset Proceeds from sale of new asset $ 9,000 $170,000 * Tax on sale of proposed asset 0 (64,400) Change in net working capital 30,000 30,000 Terminal cash flow $39,000 $135,600 1. Change in net working capital calculation LG 3; Basic a. Terminal cash flow—end of year 4 Proceeds from the sale of boat Year 4 $(9,600) $(6,000) $(15,600) $40,000 d. Tax calculations LG 3, 4; Intermediate Current book value $200,000 [(0.52 ($200,000)] (a) Capital gain Recaptured depreciation Tax on capital gain Tax on depreciation Recovery Total tax $96,000 (b) (c) (d) $ 20,000 104,000 8,000 $0 54,000 0 $0 0 $0 (16,000) 0 41,600 $ 49,600 21,600 $21,600 0 $0 (6,400) ($6,400) P11-10. The cash outlays done before David and Ann decided to rent out their home would be classified as sunk costs. Calculation of Operating Cash Inflows Profits before Depreciation and Taxes Depreciation Net Profits before Taxes Taxes Hoist A 1 2 3 4 5 6 $21,000 21,000 21,000 21,000 21,000 0 $9,600 15,360 9,120 5,760 5,760 2,400 $11,400 5,640 11,880 15,240 15,240 2,400 $4,560 2,256 4,752 6,096 6,096 960 $6,840 3,384 7,128 9,144 9,144 1,440 $16,440 18,744 16,248 14,904 14,904 960 Hoist B 1 2 3 4 5 6 $22,000 24,000 26,000 26,000 26,000 0 $12,000 19,200 11,400 7,200 7,200 3,000 $10,000 4,800 14,600 18,800 18,800 3,000 $4,000 1,920 5,840 7,520 7,520 1,200 $6,000 2,880 8,760 11,280 11,280 1,800 18,000 22,080 20,160 18,480 18,480 1,200 Existing Hoist 1 2 3 4 5 6 $14,000 14,000 14,000 14,000 14,000 0 $3,840 3,840 1,600 0 0 0 $10,160 10,160 12,400 14,000 14,000 0 $4,064 4,064 4,960 5,600 5,600 0 $6,096 6,096 7,440 8,400 8,400 0 $9,936 9,936 9,040 8,400 8,400 0 Year Net Profits Operating after Cash Taxes Inflows Calculation of Incremental Cash Inflows Incremental Hoist B Existing Hoist Hoist A Cash Flow Hoist B Year Hoist A 1 2 3 4 5 $16,440 18,744 16,248 14,904 14,904 $18,000 22,080 20,160 18,480 18,480 $9,936 9,936 9,040 8,400 8,400 $6,504 8,808 7,208 6,504 6,504 $8,064 12,144 11,120 10,080 10,080 6 960 1,200 0 960 1,200 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 c. Summary of cash flows Year zero End of year 1 End of year 2 End of year 3 End of year 4 Cash Flow $(74,550) $(15,600) $(15,600) $(15,600) $24,400 e. $34,600 39,880 34,160 31,080 31,080 2,200 Incremental Operating Cash Flow $20,160 17,280 16,080 13,200 10,800 0 $14,440 22,600 18,080 17,880 20,280 2,200 Terminal cash flow: After-tax proceeds from sale of new asset Proceeds from sale of new asset Tax on sale of new asset* Total proceeds from sale of new asset After-tax proceeds from sale of old asset Proceeds from sale of old asset Tax on sale of old asset Total proceeds from sale of old asset Change in net working capital Terminal cash flow * d. Calculation of Operating Cash Flow Year (1) (2) (3) (4) (5) (6) Old Machine PBDT Depreciation NPBT Taxes NPAT Depreciation Cash flow $14,000 6,000 $ 8,000 3,200 $ 4,800 6,000 $10,800 $16,000 6,000 $10,000 4,000 $ 6,000 6,000 $12,000 $20,000 2,500 $17,500 7,000 $10,500 2,500 $13,000 $18,000 0 $18,000 7,200 $10,800 0 $10,800 $14,000 0 $14,000 5,600 $ 8,400 0 $ 8,400 $0 0 0 0 $0 0 $0 New Machine PBDT Depreciation NPBT Taxes NPAT Depreciation Cash flow $30,000 16,000 $14,000 5,600 $ 8,400 16,000 $24,400 $30,000 25,600 $ 4,400 1,760 $ 2,640 25,600 $28,240 $30,000 15,200 $14,800 5,920 $ 8,880 15,200 $24,080 $30,000 9,600 $20,400 8,160 $12,240 9,600 $21,840 $30,000 9,600 $20,400 8,160 $12,240 9,600 $21,840 $0 4,000 $4,000 1,600 $2,400 4,000 $1,600 Incremental After-tax cash flows $13,600 $16,240 $11,080 $11,040 $13,440 $1,600 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 c. ** P11-19. Initial investment: Installed cost of new press Cost of new press After-tax proceeds from sale of old asset Proceeds from sale of existing press Taxes on sale of existing press* Total after-tax proceeds from sale Initial investment $2,200,000 (1,200,000) 480,000 (720,000) $1,480,000 * Book value $0 $1,200,000 $0 $1,200,000 income from sale of existing press $1,200,000 income from sale (0.40) $480,000 b. Sales price of old equipment $35,000 Book value of old equipment 18,600 Recapture of depreciation $16,400 Taxes on recapture of depreciation $16,400 0.40 $6,560 Sale price of old roaster $35,000 Tax on recapture of depreciation (6,560) After-tax proceeds from sale of old roaster $28,440 c. If the usable life is less than the normal recovery period, the asset has not been depreciated fully and a tax benefit may be taken on the loss; therefore, the terminal cash flow is higher. Ethics problem LG 2; Intermediate The person who came up with the idea for a new investment may have an selfish interest in seeing the project approved, or may simply be emotionally vested in the project. & repair 12 months at $800 Docking fees 12 months at $500 Operating cash flows Year 1 $(9,600) $(6,000) $(15,600) Year 2 $(9,600) $(6,000) $(15,600) Year 3 $(9,600) $(6,000) $(15,600) c. tax savings 110 Net operating cash inflows $164 2 3 4 5 6 $1,850 1,800 $50 $1,830 1,790 $40 $1,825 1,785 $40 $1,815 1,775 $40 $1,800 1,750 $50 $460 510 $ (50) $468 520 $ (52) $472 520 $ (48) $485 530 $ (45) $500 535 $ (35) $ 960 135 $825 $ 570 0 $570 $ 360 0 $360 $ 360 0 $360 $ 150 0 $150 330 228 144 144 60 $50 50 (40) 330 $40 52 (37) 228 $40 48 (35) 144 $40 45 (34) 144 $50 35 (34) 60 $390 $283 P11-21. Expansion versus replacement cash flows LG 3; Intermediate a. Integrative—complete investment decision LG 1, 2, 3, 4, 5, 6; Challenge a. Initial investment Total cost of new boat Add: Taxes (6.5%) Initial investment $(70,000) (4,550) $(74,550) b. For simplification, 5-year-lived projects with 5 years of cash inflows are typically used throughout this chapter. P11-22. Over the same time period, the disposable income is only $96,000. Relevant Cash Flows ($28,000) 4,000 6,000 8,000 10,000 4,000 An expansion project is simply a replacement decision in which all cash flows from the old asset are zero. c. Payback period 2 years $440,000 704,000 418,000 264,000 264,000 110,000 ($62,400 $360,000 96,000 382,000 536,000 536,000 110,000 ($647,200) $144,000 38,400 152,800 214,400 214,400 44,000 2.1 years d. Cost of new machine Less sales price of old machine Plus tax on recapture of depreciation Initial investment $ 500,000 (200,000) 17,600 $ 317,600 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-12. g. If cash flows were adjusted for their timing, and noting that the proceeds from the sale of the new boat comes in first at the end of year 4, Jan and Deana are in a position where they will have to increase their disposable income in order to accommodate boat ownership. Opportunity cost—Forgoing the sale of the crane costs the firm $180,000 of potential cash inflows. PV of cash inflows: CF0 $1,480,000, CF1 $656,000, CF2 $761,600, CF3 CF4 $585,600, CF5 585,600, CF6 $44,000 Set I 11 Solve for NPV $959,152 Year 1 2 3 4 5 6 CF PVIF11%,n PV $656,000 761,600 647,200 585,600 585,600 44,000 0.901 0.812 0.731 0.659 0.593 0.535 $ 591,056 618,419 473,103 385,910 347,261 23,540 $2,439,289 $647,200, Cash Flow $656,000 761,600 647,200 585,600 585,600 44,000 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 $0 e. P11-3. The $250,000 sale price of the existing line is an opportunity cost. 0 tax liability $2,900 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 d. It is best to have an objective third party be responsible for cash flow projections. NPBT Tax NPAT $720,000 400,000 320,000 128,000 192,000 $720,000 640,000 80,000 32,000 48,000 $720,000 380,000 340,000 136,000 204,000 $720,000 240,000 480,000 192,000 288,000 $720,000 240,000 480,000 192,000 288,000 $720,000 100,000 620,000 248,000 372,000 c. Consequently, if the costs exceed the expected disposable income. Integrative—investment decision LG 1, 2, 3, 4, 5, 6; Challenge a. Book value and taxes on sale of assets LG 3, 4; Intermediate a. 3. If a loan is needed, the monthly interest payment would be another burden. Initial investment: Installed cost of new asset Cost of new asset Installation costs Total cost of new asset After-tax proceeds from sale of old asset Proceeds from sale of old asset Tax on sale of old asset* Total proceeds from sale of old asset Change in working capital Initial investment * $105,000 5,000 $110,000 (70,000) 16,480 (53,520) 12,000 $ 68,480 Book value of old asset: [1 (0.20 0.32)] $60,000 $28,800 $70,000 $28,800 $41,200 gain on sale of asset $31,200 recaptured depreciation 0.40 $12,480 $10,000 capital gain 0.40 4,000 Total tax of sale of asset $16,480 b. P11-4. Calculating initial investment LG 3, 4; Intermediate a. e. It is important to recall from Chapter 4 that under the Tax Reform Act of 1986, MACRS depreciation results in n 1 years of depreciation for an n-year class asset. Book value LG 3; Basic Asset A B C D E Installed Cost Accumulated Depreciation Book Value $ 950,000 40,000 96,000 350,000 1,500,000 $ 674,500 13,200 79,680 70,000 1,170,000 $275,500 26,800 16,320 280,000 330,000 P11-8. Personal finance: Determining relevant cash flows for a cash budget LG 3, 4, 5, 6; Challenge Jan and Deana Cash Flow Budget Purchase of Boat a. Book value of the asset $180,000 0.05 $9,000; no taxes are due Tax ($170,000 $9,000) 0.4 $64,400. Sunk costs and opportunity costs LG 2; Intermediate a. Sale Price Capital Gain Tax on Capital Gain Depreciation Recovery Tax on Recovery Total Tax $100,000 56,000 23,200 15,000 $20,000 0 0 0 $8,000 0 0 0 $56,800 32,800 0 (8,200) $22,720 13,120 0 (3,280) $30,720 13,120 0 (3,280) CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-9. $656,000 (1 IRR)1 $761,600 (1 IRR)2 $647,200 (1 IRR)3 $585,600 (1 IRR)4 $585,600 (1 IRR)5 $44,000 (1 IRR)6 $1,480,000 IRR 35% Calculator solution: 35.04% The NPV is a positive $959,289 and the IRR of 35% is well above the cost of capital of 11%. P11-29. Book value $325,000 (1 0.20 – 0.32) $325,000 0.48 $156,000 Sales price of old equipment $200,000 Book value of old equipment 156,000 Recapture of depreciation $ 44,000 Taxes on recapture of depreciation $44,000 0.40 $17,600 After-tax proceeds $200,000 $17,600 $182,400 c. (B) Year 5 relevant cash flow—Hoist A: Operating cash flow Terminal cash flow Total inflow $ 6,504 11,560 $18,064 Year 5 relevant cash flow—Hoist B: Operating cash flow Terminal cash flow Total inflow $10,080 18,600 $28,680 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-28. Relevant cash flows—no terminal value LG 3, 4, 5; Challenge a. The sunk costs or cash outlays are expenditures that have been made in the past and have no effect on the cash flows relevant to a current situation. Terminal cash flows—various lives and sale prices LG 6; Challenge a. However, there is no attempt here to measure satisfaction of ownership. Yes, in computing the terminal cash flow, the net working capital increase should be reversed. Changes in current asset accounts Inventory Accounts receivable Net change Changes in current liability accounts Net change Change in net working capital d. Personal finance: Incremental operating cash inflows LG 5; Challenge Richard and Linda Thomson Incremental Operating Cash Flows Replacement of John Deere Riding Mower Year 1 Year 2 Year 3 Year 4 Year 5 Savings from new and improved mower $500 $ 500 $500 $500 $500 Annual maintenance cost 120 120 120 120 120 * Depreciation 360 576 342 216 216 Savings (loss) before taxes 20 (196) 38 164 164 Taxes (40%) 8 (78) 15 66 66 Savings (loss) after taxes 12 (118) 23 98 98 Depreciation 360 576 342 216 216 Incremental operating cash flow $372 $ 458 $365 $314 $314 * MACRS Depreciation Schedule Year Base MACRS Year 1 $1,800 20.0% Year 2 1,800 32.0% Year 3 1,800 19.0% Year 4 1,800 12.0% Year 5 1,800 12.0% Year 6 1,800 5.0% Depreciation $360 576 342 216 216 90 Year 6 — 0 90 (90) (36) (54) 90 $ 36 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-18. $124, 250 $50,750 $110,000 $50, 750 $59,250 Initial investment Answer: Initial investment purchase price installation costs – after-tax proceeds from sale of old asset change in net working capital $55,000 $7,500 – $23,750 $2,000 $40,750 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 Solutions to Problems Note: The MACRS depreciation percentages used in the following problems appear in Chapter 4, Table 4.2. The percentages are rounded to the nearest integer for ease in calculation. New Grinder Existing Grinder Book value of asset at end of year 5 $29,000 $5,500 $23,500 0.40 Year 5 relevant cash flow: Operating cash flow Terminal cash flow Total inflow $29,000 (9,400) 19,600 0 0 0 12,000 $31,600 $5,500 $23,500 recaptured depreciation $9,400 $20,280 31,600 $51,880 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-26. Incremental operating cash inflows LG 5; Intermediate a. CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-30. h. Incremental operating cash inflows—expense reduction LG 5; Intermediate Year (1) Incremental expense savings Incremental profits before dep. Depreciation $40,000 41,000 42,000 43,000 44,000 0 $30,000 30,000 30,000 30,000 30,000 0 $10,000 11,000 12,000 13,000 14,000 0 $2,000 3,200 1,900 1,200 1,200 500 $35,000 $25,000 $10,000 0 Net Profits before Taxes $8,000 7,800 10,100 11,800 12,800 (500) $10,000 Taxes $3,200 3,120 4,040 4,720 5,120 (200) $4,800 4,680 6,060 7,080 7,680 (300) $6,800 7,880 7,960 8,280 8,880 200 $4,000 $6,000 $6,000 Calculation of incremental cash inflows Year 1 2 3 4 5 6 New Lathe Old Lathe $6,800 7,880 7,960 8,280 8,880 200 $6,000 6,000 6,000 6,000 6,000 0 Incremental Cash Flows $800 1,880 1,960 2,280 2,880 200 Operating Net Profits Cash after Tax Inflows CAPITAL BUDGETING PROBLEMS: CHAPTER 11 c. Year Cash Flow This is a conventional cash flow pattern, where the cash inflows are of equal size, which is referred to as an annuity. Accruals $ (20,000) Accounts payable 40,000 Notes payable 15,000 $ 35,000 $ 85,000 Cost of new roaster $130,000 Less after-tax proceeds from sale of old roaster 28,440 Plus change in net working capital 85,000 Initial investment $186,560 P11-15. Current Liabilities $15,000 150,000 10,000 $155,000 Accounts payable Accruals $90,000 40,000 $130,000 Net working capital current assets current liabilities NWC $155,000 $130,000 NWC $25,000 Analysis of the purchase of a new machine reveals an increase in net working capital. Opportunity cost—The development of the computer programs can be done without additional expenditures on the computers; however, the loss of the cash inflow from the leasing arrangement would be a lost opportunity to the firm. b. P11-1. P11-27. The higher the sale price, the higher the terminal cash flow. CF0 $1,110,400, CF1 257,200, CF2 $344,400, CF3 $274,200, CF4 $258,800, CF5 $274,800 172,000 $446,800 Set I 9% Solve for NPV = $100,900.39 $257,200 $344,400 $274,200 $258,800 $446,800 $1,110,400 c. Sunk cost—The money for the storage facility has already been spent, and no matter what decision the company makes there is no incremental cash flow generated or lost from the storage building. Relevant cash flows for a marketing campaign LG 3, 4, 5, 6; Challenge Marcus Tube Calculation of Relevant Cash Flow ($000) Calculation of Net Profits after Taxes and Operating Cash Flow: with Marketing Campaign 2013 2014 2015 2016 Sales CGS (@ 80%) Gross profit Less: Less: Operating expenses General and administrative (10% of sales) Marketing campaign Depreciation Total operating expenses Net profit before taxes Less: Taxes 40% Net profit after taxes Depreciation Operating CF $20,500 16,400 $ 4,100 $21,000 16,800 $ 4,200 $21,500 17,200 $ 4,300 $22,500 18,000 $ 4,500 $23,500 18,800 $ 4,700 $ 2,050 150 500 $ 2,100 150 500 $ 2,150 150 500 $ 2,250 150 500 $ 2,350 150 500 2,700 2,750 2,800 2,900 3,000 $ 1,400 560 $ 1,450 580 $ 1,500 600 $ 1,600 640 $ 1,700 680 $ 840 500 $ 1,340 $ 870 500 $ 1,370 $ 900 500 $ 1,400 $ 960 500 $ 1,460 $ 1,020 500 $ 1,520 Without Marketing Campaign Years 2013–2017 Net profit after taxes Depreciation Operating cash flow Year 2013 2014 2015 2016 2017 $ 900 500 $1,400 Relevant Cash Flow ($000) With Marketing Without Marketing Incremental Campaign Campaign Cash Flow $1,340 1,370 1,400 1,460 1,520 2017 $1,400 1,400 1,400 1,400 1,400 $(60) (30) 0 60 120 CAPITAL BUDGETING PROBLEMS: CHAPTER 11 P11-24. Since the NPV 0 and the IRR cost of capital, the new machine should be purchased. Operating expenditure—lease expires within one year Capital expenditure—patent rights exist for many years Capital expenditure—research and development benefits last many years Operating expenditure—marketable securities mature in under one year Capital expenditure—machine will last over one year Capital expenditure—building tool will last over one year Capital expenditure—building will last for more than one year Operating expenditure—market changes require obtaining another report within a year P11-2. and taxes* Depreciation Net profits before taxes Taxes Net profits after taxes Operating cash inflows** (2) (3) (4) (5) (6) $16,000 $16,000 $16,000 $16,000 $16,000 $0 16,000 9,600 16,000 15,360 16,000 9,120 16,000 5,760 16,000 5,760 0 2,400 6,400 2,560 640 256 6,880 2,752 10,240 4,096 10,240 4,096 2,400 960 3,840 384 4,128 6,144 6,144 1,440 13,440 15,744 13,248 11,904 11,904 960 * Incremental profits before depreciation and taxes will increase the same amount as the decrease in expenses. Sunk costs (cash flows): Replace water heater Replace dish washer Miscellaneous repairs and maintenance Opportunity costs cash flows: Rental income Advertising House paint and power wash P11-7. In either case, this individual may have an incentive to make overly optimistic cash flow projections. Relevant cash flow and timeline depiction LG 1, 2; Intermediate a. Installed cost of new asset Cost of new asset $76,000 Installation costs 4,000 Total cost of new asset After-tax proceeds from sale of old asset Proceeds from sale of old asset (55,000) * Tax on sale of old asset 16,200 Total proceeds, sale of old asset Initial investment $80,000 (38,800) $41,200 * Book value of old machine: [1 (0.20 0.32 0.19)] $50,000 $55,000 $14,500 $14,500 $40,500 gain on asset $35,500 recaptured depreciation $5,000 capital gain 0.40 Total tax on sale of asset $14,200 2,000 $16,200 0.40 b. This money has already been spent and cannot be retrieved so it is a sunk cost. P11-11. Classification of expenditures LG 2; Basic a. CAPITAL BUDGETING PROBLEMS: CHAPTER 11 c. This means that in actual practice projects will typically have at least one year of cash flow beyond their recovery period. Recaptured depreciation Capital gain $10,000 $11,000 $2,900 $10,000 $7,100 $1,000 Tax on ordinary gain Tax on capital gain Total tax $7,100 $1,000 (0.40) (0.40) $2,840 400 $3,240 b. The ownership of the boat is virtually just an annual outflow of money. P11-25. CAPITAL BUDGETING PROBLEMS: CHAPTER 11 Answers to Warm-Up Exercises E11-1. $0 (1 IRR)1 (1 IRR)2 (1 IRR)3 (1 IRR)4 (1 IRR)5 IRR 12.2% Calculator solution: 12.24% d. 12.24%. This increase should be treated as an initial outlay and is a cost of acquiring the new machine.