

## Aerocomp, Inc.

As she headed toward her boss's office, Emily Hamilton, chief operating officer for the Aerocomp Corporation – a computer services firm that specialized in airborne support – wished she could remember more of her training in financial theory that she had been exposed to in college. Emily had just completed summarizing the financial aspects of four capital investment projects that were open to Aerocomp during the coming year, and she was faced with the task of recommending which should be selected. What concerned her was the knowledge that her boss, Kay Marsh, a “street smart” chief executive, with no background in financial theory, would immediately favor the project that promised the highest gain in reported net income. Emily knows that selecting projects purely on that basis would be incorrect; but she was not sure of her ability to convince Kay, who tended to assume financiers thought up fancy methods just to show how smart they were.

As she prepared to enter Kay's office, Emily pulled her summary sheets from her briefcase and quickly reviewed the details of the four projects, all of which she considered to be equally risky.

- A. A proposal to add a jet to the company's fleet. The plane was only six years old and was considered a good buy at \$300,000. In return, the plane would bring over \$600,000 in additional revenue during the next five years with only about \$56,000 in operating costs. (See Table 1 for details)

Table 1 Financial analysis of Project A: Add a twin-jet to the company's fleet

	<i>Initial Expenditures</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Net cost of new plane	\$300,000					
Additional revenue		\$43,000	\$76,800	\$112,300	\$225,000	\$168,750
Additional operating costs		11,250	11,250	11,250	11,250	11,250
Depreciation		45,000	66,000	63,000	63,000	63,000
Net increase in income		(13,250)	(450)	38,050	150,750	94,500
Less: Tax at 33%		0	0	12,557	49,748	31,185
Increase in aftertax income		(13,250)	(450)	\$25,494	\$101,003	\$63,315
Add back depreciation		\$45,000	\$66,000	\$63,000	\$63,000	\$63,000
Net change in cash flow	(\$300,000)	\$31,750	\$65,550	\$88,494	\$164,003	\$126,315

- B. A proposal to diversify into copy machines. The franchise was to cost \$700,000, which would be amortized over a 40-year period. The new business was expected to generate over \$1.4 million in sales over the next five years, and over \$800,000 in aftertax earnings. (See Table 2 for details)

Table 2 Financial analysis of Project B: Diversify into copy machines

	<i>Initial Expenditures</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Net cost of new franchise	\$700,000					
Additional revenue		\$87,500	\$175,000	\$262,500	\$393,750	\$525,000
Additional operating costs		26,250	26,250	26,250	26,250	26,250
Amortization		17,500	17,500	17,500	17,500	17,500
Net increase in income		43,750	131,250	218,750	350,000	481,250
Less: Tax at 33%		14,438	43,313	72,188	115,500	158,813
Increase in aftertax income		\$29,313	\$87,938	\$146,563	\$234,500	\$322,438
Add back depreciation		\$17,500	\$17,500	\$17,500	\$17,500	\$17,500
Net change in cash flow	(\$700,000)	\$46,813	\$105,438	\$164,063	\$252,000	\$339,938

C. A proposal to buy a helicopter. The machine was expensive and, counting additional training and licensing requirements, would cost \$40,000 a year to operate. However, the versatility that the helicopter was expected to provide would generate over \$1.5 million in additional revenue, and it would give the company access to a wider market as well. (See Table 3 for details)

Table 3 Financial analysis of Project C: Add a helicopter to the company's fleet

	<i>Initial</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
	<i>Expenditures</i>					
Net cost of new helicopter	\$800,000					
Additional revenue		\$100,000	\$200,000	\$300,000	\$450,000	\$600,000
Additional operating costs		40,000	40,000	40,000	40,000	40,000
Depreciation		120,000	176,000	168,000	168,000	168,000
Net increase in income		(60,000)	(16,000)	92,000	242,000	392,000
Less: Tax at 33%		0	0	30,360	79,860	129,360
Increase in aftertax income		(\$60,000)	(\$16,000)	\$61,640	\$162,140	\$262,640
Add back depreciation		\$120,000	\$176,000	\$168,000	\$168,000	\$168,000
Net change in cash flow	(\$800,000)	\$60,000	\$160,000	\$229,640	\$330,140	\$430,640

D. A proposal to begin operating a fleet of trucks. Ten would be bought for only \$51,000 each, and the additional business would bring in almost \$700,000 in new sales in the first two years alone. (See Table 4 for details)

Table 4 Financial analysis of Project D: Add fleet of trucks

	<i>Initial</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
	<i>Expenditures</i>					
Net cost of new trucks	\$510,000					
Additional revenue		\$382,500	\$325,125	\$89,250	\$76,500	\$51,000
Additional operating costs		19,125	19,125	25,500	31,875	38,250
Depreciation		76,500	112,200	107,100	107,100	107,100
Net increase in income		286,875	193,800	(43,350)	(62,475)	(94,350)
Less: Tax at 33%		94,669	63,954	0	0	0
Increase in aftertax income		\$192,206	\$129,846	(\$43,350)	(\$62,475)	(\$94,350)
Add back depreciation		\$76,500	\$112,200	\$107,100	\$107,100	\$107,100
Net change in cash flow	(\$510,000)	\$268,706	\$242,046	\$63,750	\$44,625	\$12,750

In her mind, Emily quickly went over the evaluation methods she had used in the past: payback, internal rate of return, and net present value. Emily knew that Kay would add a fourth, size of reported earnings, but she hoped she could talk Kay out of using it this time. Emily herself favored the net present value method, but she had always had a tough time getting Kay to understand it.

One additional constraint that Emily had to deal with was Kay's insistence that no outside financing be used this year. Kay was worried that the company was growing too fast and had piled up enough debt for the time being. She was also against a stock issue for fear of diluting earnings and her control over the firm. As a result of Kay's prohibition of outside financing, the size of the capital budget this year was limited to \$800,000, which means that only one of the four projects under consideration could be chosen. Emily was not too happy about that, either, but she had decided to accept it for now, and concentrate on selecting the best of the four.

As she closed her briefcase and walked toward Kay's door. Emily reminded herself to have patience; Kay might not trust financial analysis, but she would listen to sensible arguments. Emily only hoped her financial analysis sounded sensible!

**Questions:**

1. Refer to Tables 1 through 4. Add up the total increase in aftertax income for each project. Given what you know about Kay Marsh, to which project do you think she will be attracted?
2. Compute the payback period, internal rate of return (IRR), net present value (NPV), and profitability index of all four alternatives based on cash flow. Use 10% for the discount rate in your calculations.
3.
  - a. According to the payback method, which project should be selected?
  - b. What are the disadvantages of this method?
4.
  - a. According to the IRR method, which project should be chosen?
  - b. What are the major disadvantages of the IRR method?
  - c. If Kay had not put a limit on the size of the capital budget, would the IRR method allow acceptance of all four alternatives? If not, which one(s) would be rejected and why?
5.
  - a. According to the NPV method, which project should be chosen? How does this differ from the answer under the IRR?
  - b. If Kay had not put a limit on the size of the capital budget, under the NPV method which projects would be accepted? Do the NPV and IRR both reject the same project(s)? Why?
  - c. Given all the facts of the case, are you more likely to select Project A or C?

## The Lazy Mower: Is It Really Worth It?

If there was one thing the folks at Innovative Products Inc. (IPI) knew well, it was how to come up with useful and unique products in the midst of economic adversity. With current year revenues considerably lower and profit margins shrinking due to severe price competition, the firm's engineers had been pushed really hard to develop a prototype of a useful, and hopefully, highly profitable "unique" product. Then, last month, the design team unveiled a fully-tested prototype of their latest innovation, the "remote-controlled" lawn mower, nick-named the "The Lazy Mower."

Surveys of retailers and customers, conducted by the marketing department, indicated that demand would be excellent, provided the price was lower than a riding lawn mower. The testing and development phases took almost 3 years and the final product passed all safety hazard tests with flying colors. After the unveiling, the product was exhibited at various home shows nationwide and received raving reviews. Full production had not yet started; however, because there had been a change in CEOs and the new CEO was highly conservative.

Before being given the "go ahead" to go into full-scale production of the Lazy Mower, the design team had to present a detailed feasibility study to the Capital Investment Committee (CIC), which was chaired by the Vice President of Finance, Pete Fieldstone. As was typical in a major undertaking of this type, the proposal had to include detailed cost and revenue estimates with sufficient documentation to substantiate the numbers.

Having been involved with more than a few of these kinds of proposals before, the head of the Design team, Dan Conklin, knew that he had better take every possible factor into consideration and be prepared for a tough and demanding question and answer session at the next committee meeting. Luckily for Dan, his assistant, Ron Howard, who had recently earned his Chartered Financial Analyst (CFA) designation, was an experienced and dependable employee. Prior to being hired by CPC three years ago, Ron had worked for another large engineering company for over 10 years. "Ron, we have to dot all the 'i's" and cross all the 't's" on this one!" said Dan. "Or else, the big guys are going to tear us apart, coz we're talking major dollars here. Their main question is going to be, IS IT REALLY WORTH IT?"

So Dan and Ron began collecting the necessary information. They knew that to have a comprehensive feasibility study they would have to include the following:

1. Pro Forma statements showing expected annual revenues, variable costs, fixed costs, and net cash flows over the economic life of the project with appropriate supporting documentation;
  2. Break-Even Analysis;
  3. Sensitivity of the cash flows to alternative scenarios of sales growth and profit margins;
- Based on the data provided by the Marketing department, they prepared Table 1, showing the expected unit sales of the Lazy Mower over its 10-year economic life and the expected selling price per unit. Note that the price of \$1,000 per unit was estimated to gradually drop to \$900 per unit over the 10-year period reflecting competitive pressures. Depreciation for this project was based on the 7-year MACRS rate as shown in Table 2. The cost of equipment, including shipping, handling, and installation, was estimated at \$20 million. It was estimated that after 10 years, the equipment and tools could be sold for \$4 million.

**Table 1** Projected Unit Sales and Price for Lazy Mower

Year	Unit Sales	Unit Price
1	30,000	\$1,000
2	34,000	1,000
3	38,800	1,000
4	38,000	950
5	36,000	950
6	36,000	950
7	35,500	950
8	35,000	900
9	34,500	900
10	34,000	900

**Table 2** Modified ACRS Depreciation Allowances

Year	3-Year	5-Year	7-Year
1	33.33%	20.00%	14.29%
2	44.44	32.00	24.49
3	14.82	19.20	17.49
4	7.41	11.52	12.49
5		11.52	8.93
6		5.76	8.93
7			8.93
8			4.45

The manufacturing would be done in an unused plant of the firm. Similar plant locations could be leased for \$10,000 per month. Fixed costs were estimated to be \$1,500,000 per year while variable production costs per unit were expected to be \$400. To get the project under way, additional inventory of \$500,000 would be required. The company would increase its accounts payable by \$600,000 and its accounts receivable by \$1,000,000. Dan and Ron estimated that each year thereafter, the net working capital of the firm would amount to 5% of sales. The discount rate is 14%. Interest expenses on debt raised to fund the project were estimated to be \$400,000 per year. The company's tax rate was expected to remain constant at 34%.

**Questions:**

1. How should the annual interest expense of \$400,000 be treated? Explain.
2. Let's say that the company had spent \$500,000 in developing the prototype of the Lazy Mower. How should Dan and Ron treat this item in their report? Explain.
3. Prepare a Pro Forma Statement showing the annual cash flows resulting from the Lazy Mower project.
4. Use a scenario analysis to show how the cash flows would change if the sales forecasts were 15% worse (Pessimistic) and 15% better (Optimistic) than the stated forecast (Base). Compute the IRR and the NPV for the project under each scenario.