PART 4

Capital Budgeting and Resource Allocation

CASE 17

The Investment Detective

The essence of capital budgeting and resource allocation is a search for good investments in which to place the firm's capital. The process can be simple when viewed in purely mechanical terms, but a number of subtle issues can obscure the best investment choices. The capital-budgeting analyst, therefore, is necessarily a detective who must winnow bad evidence from good. Much of the challenge is in knowing what quantitative analysis to generate in the first place.

Suppose you are a new capital-budgeting analyst for a company considering investments in the eight projects listed in **Exhibit 1.** The chief financial officer of your company has asked you to rank the projects and recommend the "four best" that the company should accept.

In this assignment, only the quantitative considerations are relevant. No other project characteristics are deciding factors in the selection, except that management has determined that projects 7 and 8 are mutually exclusive.

All the projects require the same initial investment, $2 million. Moreover, all are believed to be of the same risk class. The firm's weighted average cost of capital has never been estimated. In the past, analysts have simply assumed that 10% was an appropriate discount rate (although certain officers of the company have recently asserted that the discount rate should be much higher).

To stimulate your analysis, consider the following questions:

1. Can you rank the projects simply by inspecting the cash flows?
2. What criteria might you use to rank the projects? Which quantitative ranking methods are better? Why?
3. What is the ranking you found by using quantitative methods? Does this ranking differ from the ranking obtained by simple inspection of the cash flows?
4. What kinds of real investment projects have cash flows similar to those in **Exhibit 1?**

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EXHIBIT 1 | Projects' Free Cash Flows (dollars in thousands)

Project number: Initial investment		1 ($2,000)	2 ($2,000)	3 ($2,000)	4 ($2,000)	5 ($2,000)	6 ($2,000)	7 ($2,000)	8 ($2,000)
Year	1	$330	$1,666		$ 160	$280	$2,200*	$1,200	($350)
	2	330	334*		200	280		900*	(60)
	3	330	165		350	280		300	60
	4	330			395	280		90	350
	5	330			432	280		70	700
	6	330			440*	280			1,200
	7	330*			442	280			$2,250*
	8	$1,000			444	280*			
	9				446	280			
	10				448	280			
	11				450	280			
	12				451	280			
	13				451	280			
	14				452	280			
	15			$10,000*	($2,000)	$280			
Sum of cash flow benefits		$3,310	$2,165	$10,000	$3,561	$4,200	$2,200	$2,560	$4,150
Excess of cash flow over initial investment		$1,310	$165	$8,000	$1,561	$2,200	$200	$560	$2,150

*Indicates year in which payback was accomplished.

CASE 18

Worldwide Paper Company

In December 2006, Bob Prescott, the controller for the Blue Ridge Mill, was considering the addition of a new on-site longwood woodyard. The addition would have two primary benefits: (1) eliminate the need to purchase shortwood from an outside supplier and (2) create the opportunity to sell shortwood on the open market as a new market for Worldwide Paper Company (WPC). Thus, the new woodyard would allow the Blue Ridge Mill not only to reduce its operating costs, but also to increase its revenues. The proposed woodyard utilized new technology that allowed tree-length logs, called longwood, to be processed directly, whereas the current process required shortwood, which had to be purchased from a nearby mill. The Shenandoah Mill, which was owned by a competitor, had excess capacity that allowed it to produce more shortwood than needed for its own pulp production and to sell the excess production to several different mills, including the Blue Ridge Mill. Thus, adding the new longwood equipment would mean that Prescott would no longer need to use the Shenandoah Mill as a shortwood supplier and that the Blue Ridge Mill would instead compete with the Shenandoah Mill by selling on the shortwood market. The question for Prescott was whether these expected benefits were enough to justify the $18-million capital outlay plus the incremental investment in working capital over the six-year life of the investment.

Construction would start within a few months, and the investment outlay would be spent over two calendar years: $16 million in 2007 and the remaining $2 million in 2008. When the new woodyard began operating in 2008, it would significantly reduce the operating costs of the mill. These operating savings would come mostly from the difference in the cost of producing shortwood on-site versus buying it on the open market, and were estimated to be $2.0 million for 2008 and $3.5 million per year thereafter. Prescott also planned on taking advantage of the excess production capacity by selling shortwood on the open market as soon as possible. For 2008, he expected to show revenues of approximately $4 million as the facility came on-line and began to break into the new market. He expected shortwood sales to reach $10 million in 2009 and continue at the $10-million level through 2013. Prescott estimated

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that the cost of goods sold (before including depreciation expenses) would be 75% of revenues and SG&A would be 5% of revenues.

In addition to the capital outlay of $18 million, the increased revenues would necessitate higher levels of inventories and accounts receivable. The total net working capital (NWC) would average 10% of annual revenues. Therefore, the amount of NWC investment each year would equal 10% of incremental sales for the year. At the end of the life of the equipment, in 2013, all the net working capital would be recoverable, whereas only 10%, or $1.8 million (before taxes), of the capital investment would be recoverable.

Taxes would be paid at a 40% rate, and depreciation was calculated on a straight-line basis over the six-year life, with zero salvage. WPC accountants had told Prescott that depreciation charges could not begin until 2008, when all the $18 million had been spent and the machinery was in service. Because he did not have a good feel for how inflation would affect his analysis, Prescott had decided not to include it.

WPC had a company policy to use its corporate cost of capital (15%) to analyze such investment opportunities. Unfortunately, the company had not changed its cost of capital for 10 years, and Prescott felt uneasy using an outdated figure. He was particularly uncomfortable with the 15% figure because it was computed when 30-year Treasury bonds were yielding 10%, whereas they were currently yielding less than 5%. To estimate Worldwide's current weighted average cost of capital, Prescott had gathered the information presented in **Exhibit 1.**

EXHIBIT 1 | Cost-of-Capital Information

Interest Rates: December 2006

Bank loan rates (LIBOR)		**Market risk premium**	
1-year	5.38%	Historical average	6.0%
Government bonds		**Corporate bonds (10-year maturities):**	
1-year	4.96%	Aaa	5.37%
5-year	4.57%	Aa	5.53%
10-year	4.60%	A	5.78%
30-year	4.73%	Baa	6.25%

Worldwide Paper Financial Data

Balance-sheet accounts ($ millions)	
Bank loan payable (LIBOR + 1%)	500
Long-term debt	2,500
Common equity	500
Retained earnings	2,000
Per-share data	
Shares outstanding (millions)	500
Book value per share	$ 5.00
Recent market value per share	$24.00
Other	
Bond rating	A
Beta	1.10
Tax rate	40%