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### CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

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- o Hurdle rates
- o Internal rate of return
- o Payback
- o Net present value
- o Lease versus buy decisions
- o Build versus buy decisions
- o Application to computer hardware and software decisions
- o Project budgeting
- o Post-implementation audit

MR. FRANK S. IRISH: There is much misunderstanding of the mathematics of rates of return and a lot of use and abuse of terminology. Numerical precision is not greatly important in project analysis. Generally, we are dealing with numbers that are only vaguely accurate, and insisting on mathematical precision is foolish. On the other hand, a misunderstanding of a particular aspect of the mathematics of rate of return can cause major difficulties.

The most commonly used measure is the internal rate of return (IRR). The concept essentially involves solving a present-value equation. A key aspect of IRR is that the data used are limited to cash-flow and cash-equivalent items. Things such as the asset value of buildings, amount of depreciation, and deferred expense items have no place in an IRR calculation. IRR looks directly at the cash-flow effects of the projection on the organization. Once the cash-flow projections have been determined, it's relatively simple mathematically to solve for the rate of return that equates the present value of cash flows to zero.

Another generally used measure is return on equity (ROE). This measure looks at capital outlays from the point of view of an investment officer who is putting the company's money into a venture of some sort. In this case, the amount and timing of the investment and the amount

\*Mr. Bauer, not a member of the Society, is Director of Data Processing Planning of General American Life Insurance Company.

## PANEL DISCUSSION

and timing of the investment and the amount and timing of the dividends returned are the key elements of the equation. The equity the investment builds up is also important.

Payback period is another measure of return often referenced in the literature. Although much simpler and rudimentary than the IRR and ROE, it is still important for the practitioner to understand. The payback period simply involves determining the number of years it takes to recoup the initial investment without interest. It is possible to translate the payback period into at least a rough internal rate of return measure. As such, it can be used as a rule of thumb for at least some preliminary evaluation of projects.

One of the important differences between ROE and IRR is that the former is constructed in terms of an external venture into which we put capital from time to time. Not all of the capital is needed immediately; some is set aside as "working capital." When the venture begins to produce profits, not all the profits are immediately paid back to the investor; some stay on as "retained earnings," which is another form of working capital. ROE is constructed to address the question of whether the working capital is well managed, which is something that would be important in an external venture. But in IRR, for internal projects, we don't include a working capital concept; rather we assume the project uses only the capital it needs at the moment.

A misconception often exists that IRR is a multiyear rate of return, and ROE is a single-year rate of return. I don't agree with this. I view them both as being, in essence, multiyear discounting concepts.

Another rate of return in frequent use is return on investment (ROI). This is similar to ROE except that the debt capital as well as investment capital enters into the equation.

New developments in rate of return calculations have taken these measures and adapted them so that they are appropriate for use in life insurance pricing and financial analysis of life insurance companies. These adaptations generally work by way of bringing in a measure of required surplus (that is, the insurance and investment risks involved in the venture) in order to achieve a rate of return appropriate for insurance but comparable to those measures used outside of insurance. A discussion of these adaptations, although interesting, is probably outside of our topic for today. We are going to assume that, for purposes of project analysis and capital budgeting, our principal measure is the IRR.

An equally useful way of looking at a project is the net present value (NPV) approach. This involves taking the IRR equation and turning it around so it becomes an NPV equation. This is then used to evaluate present values in terms of a standard target rate of return (often known as the hurdle rate). The NPV approach does not seem to have caught on in corporate decision making, probably because rates of return seem intuitively more plausible and useful. Nonetheless, the NPV approach has much to recommend it. For example, IRR equations can run into solution difficulties in cases where the rate of return is

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

close to a singularity. One can even devise cases where the equation has multiple solutions. NPV is also extremely useful because, unlike the rate of return measures, it produces an additive result. That is, the NPV for project A and NPV for project B add up to the NPV for project A plus project B. The mathematical complications resulting from combinations of projects can sometimes produce strange results if one is working strictly with rates of return. Finally, NPV is an excellent tool to have in one's pocket as a fallback position. When rate of return calculations seem to produce illogical results, one can often use NPV methods to analyze the situation and come closer to the truth. To put it another way, the NPV approach is less subject to some of the common errors that may occur (error in understanding or perception) than is the case with rate of return methods.

An important concept lying behind these methods is opportunity cost. The phrase opportunity cost emphasizes that, in project evaluation, we are not trying to determine a rate of return abstractly. Rather, we are looking at alternative uses of our resources as the measure against which we will compare the costs of this particular project. The opportunity cost concept can reveal important insight into project values. It can, of course, be an extremely difficult concept to apply, since it may require knowledge of alternative uses of resources deeply embedded in the company's strategic approach. In its simplest application, the opportunity cost approach for a life insurance company is a matter of assuming that if a company doesn't do a proposed project, it would take the money and invest it in high quality corporate bonds. This becomes the default alternative. If we start with the kind of return the company would obtain from an investment of that kind, we can get an idea as to the rate of return the company might require from a proposed project.

This simple concept, however, runs into at least two difficulties in practice. One is the impact of federal income taxes. Under the 1959 Tax Act, a marginal tax should be deducted from the bond rate of return. Under the new tax law, this is still the case, although there are complications. The second problem is that, although these concepts are pure cash-flow concepts, in practice, you can't always get everything into pure cash-flow terms. An example is the charge-back of computer time, which is likely to be based on depreciation and all sorts of noncash items. All you can do is try to devise simple rules that approximate the cash-flow effect on the company.

A sophisticated approach to defining a hurdle rate might account for the effect of project expenses on surplus. Using surplus should generally carry a higher price tag than using assets. The cost of using surplus is something pricing actuaries are usually familiar with, and it might be worthwhile for project managers to go to them in order to learn what the appropriate rate might be. In any case, the objective is to come up with an opportunity cost that is appropriate in the context of your company's particular situation.

Generally, project analysis should be carried out within a framework of "capital budgeting." This phrase can mean anything from a simple desire to do good project analysis, all the way up to a completely

## PANEL DISCUSSION

separate system of budgeting, cutting across all operating departments. I usually mean the latter when I speak of "capital budgeting."

It is particularly true in the insurance industry that our accounting practices push us in the direction of expensing everything; that is, counting all spending as a current expense. Our budget systems reflect this and, as a result, reward the manager who works only on projects with near-term payoffs and ignores those with greater long-term significance. A separate capital budget can avoid this problem and allow a manager to put resources into long-term objectives without breaching his operating budget guidelines.

Capital budgeting systems are expensive, particularly in terms of management time allotted to them. Top management has got to believe in this in order to make it work. In other words, top management has to feel that one-budget (or operational budget) systems lead to significant misallocation of company resources.

A formal capital budgeting system will treat project approval as a corporate concern. In an operational budget system, the decision might have been made at the departmental level. Centralizing project approval is necessary and has its advantages, but it does take the focus of the process away from those who are most familiar with the advantages of the project. Written project documents and committees of various kinds consequently proliferate.

To manage this process and to achieve good decisions on projects is obviously difficult. In theory, every project (including not only data processing projects, but also new product ventures and research projects) is competing for funds with every other project in the company. This is an ideal for which we should strive but one which we will never completely achieve. Unfortunately, management systems designed to deal with complex situations rarely achieve their ideal.

Implicit in this discussion is the concept of an overall cap on the amount to be spent on projects. There are certain nonmonetary considerations that may place limits on certain projects, such as the number of programmers and systems analysts. But beyond this, management is going to want an overall monetary limit. This can arise from real financial considerations, or it might simply be a matter of disliking an unlimited development budget. The debate on the budget cap can be revealing in terms of management attitudes and corporate strategies. An advantage of a formal capital budgeting system is that it forces this decision to be explicit. The decision makers, at the corporate level, will be conscious of the trade-off between a budget limit and the projects the company must forego.

Using this type of budget limits leads to various ways of rationing capital within the company. One of the most obvious is to raise the required rate of return. This will make all projects compete against one another, but the idea of raising and lowering hurdle rates in order to control overall spending is difficult to implement. Nonetheless, it is valid to let the availability of funds have some influence over the choice of hurdle rate.

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

Finally, an essential part of a capital budgeting system is the post-audit (or follow-up) process. The prime purpose of the post-audit is not to stop projects that have gotten out of hand, although that can sometimes happen. Nor is the object to take corrective action, since other monitoring systems can usually do this better. Rather, a review of costs at the end of the development phase and of benefits a few years after implementation can serve as one of the few checks we have on the capital budgeting process itself. After all, capital budgeting starts from assuming that someone can reasonably estimate project costs. We know this really isn't so, and all capital budgeting systems have the problem of revising project budgets halfway into the project. But to the extent that we can check on our decision making process after the fact, we gain insight into what are, after all, some difficult decisions.

MR. RICHARD A. BAUER: Take the particular situation involving a string of disk drives that were originally purchased in April 1983 for a cost of \$222,493. The depreciation method used on the books for this string of disk drives is the five-year sum-of-digits. There is a need in June 1985 to procure a string of new D model disk drives at a cost of \$200,247.

The alternatives include the purchase of the new string of disk drives or a two-year lease-back of the original string of disks, and leasing the new string of disks for three years. The general idea behind this particular lease package is that we can rid ourselves of the older technology disk in two years, and obtain for the next three years a bargain lease rate for the new disk.

### Input Data

Our tax rate will be 36.8 percent. We will use an investment tax credit (ITC) rate of 10 percent. The after-tax new-money rate for this example will be 6.75 percent. The lease alternative will include a \$5,618 monthly lease for the existing equipment beginning June 1985 for a 24-month period and a \$1,040 lease for the new technology disk beginning June 1985 for a 36-month period. The leases have no purchase option and, at the end of the lease period, the equipment either is leased for an additional period or returned to the leasing company. In order to keep the purchase alternative and the lease alternative on an equal footing, we will sell the existing equipment and needed equipment at the end of the lease period for 20 percent and 40 percent of their initial purchase value, respectively.

### The Purchase Alternative -- Tax Effects

For tax purposes, we always used the accelerated cost recovery system (ACRS) depreciation method. The majority of data processing equipment has a depreciation life of five years with the yearly depreciation amount being 15 percent and 22 percent, followed by three years of 21 percent each. The ACRS depreciation method is used generally only for tax purposes. On the regular company books, the method used may be sum-of-digits or straight-line depreciation. The ACRS depreciation rule states that the full 15 percent first-year

## PANEL DISCUSSION

depreciation is taken in the first calendar year regardless of the month of purchase. This means 15 percent is taken in the year of purchase regardless of whether the purchase was made on January 2 or December 31. The second ACRS depreciation rule states that there is no depreciation allowed in the year of sale, regardless of the month of sale. Thus, if a piece of equipment was purchased in December and sold just thirteen months later in January, the depreciation allowed would be 37 percent (two years). Similarly, if a piece of equipment was bought in January and sold thirty-five months later, the same 37 percent depreciation would be allowed. Note the depreciation allowed is calculated considering calendar time and length of ownership. In these two cases, two years' depreciation was allowed even with such different time periods.

Another important consideration is the gain on sale, which equals the resale value minus the tax book value. The amount of value on the regular company books, perhaps using the sum-of-digit or straight-line method, has no bearing on the gain on sale for tax purposes.

### The Purchase Alternative -- Cash Flows

Exhibits 1 and 2 illustrate the cash flows for the first alternative. The depreciation for the old equipment from its purchase date of April 1983 to June 1985 is shown for clarity. In 1983, the equipment existed for nine months and we prorated the 15 percent depreciation over those nine months, that's the \$3,708. There was also an investment tax credit in April 1983 of \$22,249 and a purchase price of \$222,493. Again, all of the data before June 1985 is shown just for clarity and has no part in the present-value analysis.

The alternatives we wish to consider begin in June 1985. Column D shows the ACRS depreciation through December 1986 for the equipment purchased in April 1983 and that we will sell in June 1987. Column E shows three years' ACRS depreciation for the years 1985 through 1987. Since we are selling that equipment in June 1988, there is no depreciation after the end of 1987. Column F shows the gain on sale for the selling of the equipment in June 1987 and June 1988. Again, that is the resale value minus the accumulated ACRS depreciation. Column G is just a total of columns D, E, and F. These totals are not cash flows, but they do produce a tax effect shown in column H. The June 1985 total tax effect of negative \$8,185 produces a positive cash-flow tax effect of \$3,012. These tax effects are true cash flows. The purchase of the new equipment will produce an investment tax credit of \$20,025. This is equal to 10 percent of the purchase price of the equipment. Since we are not keeping the equipment for the full five-year depreciation schedule, there is an ITC recapture which is a negative cash flow in June 1987 and June 1988. In our particular case, this is a return of 20 percent of the ITC on the older technology equipment and 40 percent of the ITC on the newer technology equipment. Of course, the purchase of the new equipment in June 1985 creates a negative cash flow of \$200,247, and the sale price for the older and the newer technology equipment produces positive cash flows in June 1987 and June 1988 of \$44,499 and \$80,099, respectively.

EXHIBIT 1

-----PURCHASE-----													
MONTHS	DEPREC EQUIPMENT ONE	DEPREC EQUIPMENT TWO	GAIN ON SALE	TOTAL TAX EFF	TAX EFFECTS	PURCHASE/ 11C SALE PRICE	CASH FLOW	SUM CASH FLOW	PRESENT VALUE	SUM PRES VALUE			
C	D	E	F	G= SUM(D..F)	H= -B-CSX	I	J	K= SUM(H..J)	L	M	N		
1 04-83	(3,700)			(3,700)		22,249	(222,493)						
2 05-83	(3,708)			(3,708)									
3 06-83	(3,708)			(3,708)									
4 07-83	(3,708)			(3,708)									
5 08-83	(3,708)			(3,708)									
6 09-83	(3,708)			(3,708)									
7 10-83	(3,708)			(3,708)									
8 11-83	(3,708)			(3,708)									
9 12-83	(3,708)			(3,708)									
10 01-84	(4,079)			(4,079)									
11 02-84	(4,079)			(4,079)									
12 03-84	(4,079)			(4,079)									
13 04-84	(4,079)			(4,079)									
14 05-84	(4,079)			(4,079)									
15 06-84	(4,079)			(4,079)									
16 07-84	(4,079)			(4,079)									
17 08-84	(4,079)			(4,079)									
18 09-84	(4,079)			(4,079)									
19 10-84	(4,079)			(4,079)									
20 11-84	(4,079)			(4,079)									
21 12-84	(4,079)			(4,079)									
22 01-85	(3,894)			(3,894)									
23 02-85	(3,894)			(3,894)									
24 03-85	(3,894)			(3,894)									
25 04-85	(3,894)			(3,894)									
26 05-85	(3,894)			(3,894)									

## EXHIBIT 2

MONTHS	DEPREC	DEPREC	GAIN ON	TOTAL	TAX	PURCHASE /	CASH	SUM CASH	PRESENT	SUM PRES		
	EQUIPMENT	EQUIPMENT									SALE	TAX EFF
	ONE	TWO										
	C	D	E	F	B = SUM(D..F)	H = -B+C3X	I	J	Y = SUM(H..J)	L	M	N
27 06-85	(3,894)	(4,291)			(8,185)	3,012	20,025	(200,247)	(177,210)	(177,210)	(176,219)	(176,219)
28 07-85	(3,894)	(4,291)			(8,185)	3,012			3,012	(174,198)	2,978	(173,241)
29 08-85	(3,894)	(4,291)			(8,185)	3,012			3,012	(171,186)	2,962	(170,279)
30 09-85	(3,894)	(4,291)			(8,185)	3,012			3,012	(168,173)	2,945	(167,334)
31 10-85	(3,894)	(4,291)			(8,185)	3,012			3,012	(165,163)	2,929	(164,405)
32 11-85	(3,894)	(4,291)			(8,185)	3,012			3,012	(162,151)	2,912	(161,493)
33 12-85	(3,894)	(4,291)			(8,185)	3,012			3,012	(159,139)	2,896	(158,597)
34 01-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(156,355)	2,862	(155,935)
35 02-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(153,571)	2,847	(153,289)
36 03-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(150,787)	2,832	(150,657)
37 04-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(148,003)	2,817	(148,039)
38 05-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(145,219)	2,803	(145,437)
39 06-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(142,436)	2,588	(142,849)
40 07-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(139,652)	2,574	(140,275)
41 08-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(136,868)	2,559	(137,716)
42 09-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(134,084)	2,545	(135,171)
43 10-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(131,300)	2,531	(132,640)
44 11-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(128,516)	2,517	(130,124)
45 12-86	(3,894)	(3,671)			(7,565)	2,784			2,784	(125,732)	2,502	(127,621)
46 01-87		(3,504)			(3,504)	1,290			1,290	(124,443)	1,153	(126,469)
47 02-87		(3,504)			(3,504)	1,290			1,290	(123,153)	1,146	(125,322)
48 03-87		(3,504)			(3,504)	1,290			1,290	(121,864)	1,140	(124,182)
49 04-87		(3,504)			(3,504)	1,290			1,290	(120,574)	1,134	(123,049)
50 05-87		(3,504)			(3,504)	1,290			1,290	(119,284)	1,127	(121,922)
51 06-87		(3,504)	(2,225)		(5,729)	2,108	(4,450)	44,499	42,157	(77,127)	36,641	(85,281)
52 07-87		(3,504)			(3,504)	1,290			1,290	(75,838)	1,115	(84,166)
53 08-87		(3,504)			(3,504)	1,290			1,290	(74,548)	1,108	(83,058)
54 09-87		(3,504)			(3,504)	1,290			1,290	(73,259)	1,102	(81,956)
55 10-87		(3,504)			(3,504)	1,290			1,290	(71,969)	1,096	(80,859)
56 11-87		(3,504)			(3,504)	1,290			1,290	(70,679)	1,090	(79,770)
57 12-87		(3,504)			(3,504)	1,290			1,290	(69,390)	1,084	(78,686)
58 01-88					0	0			0	(69,390)	0	(78,686)
59 02-88					0	0			0	(69,390)	0	(78,686)
60 03-88					0	0			0	(69,390)	0	(78,686)
61 04-88					0	0			0	(69,390)	0	(78,686)
62 05-88					0	0			0	(69,390)	0	(78,686)
63 06-88			(4,005)		(4,005)	1,474	(8,010)	80,099	73,563	4,173	39,776	(18,910)

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

### The Purchase Alternative

It is then a simple matter to sum the cash flows in column K and to accumulate the cash flow and the present values. For this particular example, the purchase ends up with the negative cash flow of \$18,910.

### The Lease Alternative -- Tax Effects

For the lease alternative, we are going to consider that we sell an existing string of older technology disks and that we lease back that string for two years and also lease a string of new technology disks for three years -- the idea being to get rid of the older technology disk at the end of the additional two years. One of the tax effects for this alternative is the gain or loss for selling the older technology disks to the leasing company. The sale price was determined between General American and the leasing company to be approximately the book value of the equipment in June 1985 using the five-year sum-of-digits depreciation method. However, the gain or loss for tax purposes will be based on the ACRS depreciation method.

Another tax effect is the lease payments. The lease payments are a direct cash flow in and of themselves, but they also have a tax effect.

### The Lease Alternative -- Cash Flows

Exhibit 3 shows the various cash flows in the lease alternative.

Since we are selling the existing equipment in June 1985, the ACRS depreciation schedule ends December 1984. The sale price established was \$80,484. This produces a gain on sale, which is actually a loss, of \$59,587. This large loss is for tax purposes only. On the company's regular books, the value of the equipment was close to the sale price of \$80,484. The lease prices established by the leasing company show a lease for the older technology equipment of \$5,618 and a bargain lease price for the newer technology equipment of \$1,040. Also, for the newer equipment, we took the option of having the ITC pass through to the lessee. The ITC recapture is still appropriate in both cases: in the case of the older equipment since we retained possession of the equipment (even though title passed to the leasing company), and in the case of the newer technology equipment because we obtained the ITC through a pass-through option. The tax effect is shown in column V and is the tax rate times the sum of columns P through S. This includes the gain on sale and the two leases. The cash flow (column W) is the sum of the leases, the sale of equipment, the ITC, and the tax effect. The leases are a cash flow, and they produce a tax effect. Note, particularly, the large positive cash flows due to the sale of the equipment, the ITC, and the tax effect of the gain on sale. This is a first-month, total cash flow to the company of \$118,266.

### The Lease Alternative

The sum of the cash flows and the sum of the present values show that the lease alternative has a positive cash-flow effect to the company of

EXHIBIT 3

-----LEASE-----											
MONTHS	BAIN ON SALE	DEPREC EQUIPMENT ONE	LEASE1	LEASE2	SALE OF EQUIPMENT	ITC	TAX EFF OF SALE AND LEASE	CASH FLOW	SUM CASH FLOW	PRESENT VALUE	SUM PRES VALUE
C	P	Q	R	S	T	U	V=SUM(P...S) W=-C3X SUM(R...V)	M=	X	Y	Z
27 06-85	(59,687)		(5,618)	(1,040)	80,484	20,025	24,415	118,266	118,266	117,604	117,604
28 07-85			(5,618)	(1,040)			2,450	(4,208)	114,058	(3,596)	114,008
29 08-85			(5,618)	(1,040)			2,450	(4,208)	109,850	(3,576)	110,432
30 09-85			(5,618)	(1,040)			2,450	(4,208)	105,642	(3,556)	106,875
31 10-85			(5,618)	(1,040)			2,450	(4,208)	101,434	(3,536)	103,339
32 11-85			(5,618)	(1,040)			2,450	(4,208)	97,226	(3,516)	99,823
33 12-85			(5,618)	(1,040)			2,450	(4,208)	93,018	(3,497)	96,326
34 01-86			(5,618)	(1,040)			2,450	(4,208)	88,811	(3,477)	92,849
35 02-86			(5,618)	(1,040)			2,450	(4,208)	84,603	(3,458)	89,391
36 03-86			(5,618)	(1,040)			2,450	(4,208)	80,395	(3,438)	85,952
37 04-86			(5,618)	(1,040)			2,450	(4,208)	76,187	(3,419)	82,533
38 05-86			(5,618)	(1,040)			2,450	(4,208)	71,979	(3,400)	79,133
39 06-86			(5,618)	(1,040)			2,450	(4,208)	67,771	(3,381)	75,752
40 07-86			(5,618)	(1,040)			2,450	(4,208)	63,563	(3,362)	72,390
41 08-86			(5,618)	(1,040)			2,450	(4,208)	59,356	(3,343)	69,047
42 09-86			(5,618)	(1,040)			2,450	(4,208)	55,148	(3,325)	65,722
43 10-86			(5,618)	(1,040)			2,450	(4,208)	50,940	(3,306)	62,416
44 11-86			(5,618)	(1,040)			2,450	(4,208)	46,732	(3,288)	59,128
45 12-86			(5,618)	(1,040)			2,450	(4,208)	42,524	(3,269)	55,859
46 01-87			(5,618)	(1,040)			2,450	(4,208)	38,316	(3,251)	52,608
47 02-87			(5,618)	(1,040)			2,450	(4,208)	34,108	(3,233)	49,376
48 03-87			(5,618)	(1,040)			2,450	(4,208)	29,901	(3,215)	46,161
49 04-87			(5,618)	(1,040)			2,450	(4,208)	25,693	(3,197)	42,964
50 05-87			(5,618)	(1,040)			2,450	(4,208)	21,485	(3,179)	39,785
51 06-87				(1,040)			(4,450)	383	(5,107)	(3,837)	35,949
52 07-87				(1,040)				383	(657)	(491)	35,458
53 08-87				(1,040)				383	(657)	(488)	34,970
54 09-87				(1,040)				383	(657)	(486)	34,484
55 10-87				(1,040)				383	(657)	(483)	34,001
56 11-87				(1,040)				383	(657)	(480)	33,521
57 12-87				(1,040)				383	(657)	(477)	33,044
58 01-88				(1,040)				383	(657)	(475)	32,569
59 02-88				(1,040)				383	(657)	(472)	32,097
60 03-88				(1,040)				383	(657)	(469)	31,628
61 04-88				(1,040)				383	(657)	(467)	31,161
62 05-88				(1,040)				383	(657)	(464)	30,697
63 06-88							(8,010)	0	(8,010)	(5,625)	25,071

1061

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

\$25,071. Comparing the purchase and lease alternatives, one sees the lease is favorable to the company by \$43,981.

### Comments

In this particular example, on the sale of the older technology equipment to the lessor, there was no book loss, although there was a large tax loss on the sale. It is important that one reviews the remaining book value of electronic data processing (EDP) equipment on the company's "regular" books. It is easy for the "regular" book value to become out of sync with the "street" value of the equipment.

An unrealistic assumption was made regarding the two alternatives. To bring both alternatives to an end, the equipment was sold at the end of the period in the purchase case, and the equipment was given back to the leasing company in the lease case. More realistically, the equipment, if purchased, would be kept for some time beyond the analysis period. In the case of the lease, the newer technology equipment would probably have been leased again at a somewhat higher lease price than the original lease, or the newer technology leased equipment would be purchased through some sort of a negotiated sale.

It is important to know if you are working with a lease that is classified as a capital lease or as an operating lease. In our illustrations, the lease was considered to be an operating lease. We can do this because we considered the two leases as a combined lease. A capital lease has a different accounting and evaluation procedure. According to the Financial Accounting Standards Board (FASB) Statement No. 13, a capital lease occurs if any of the following is true:

1. The lease transfers ownership of the property to the lessor by the end of the lease,
2. The lease contains a bargain purchase option,
3. The lease term is equal to 75 percent or more of the economic life of the leased property, or
4. The present value, at the beginning of the lease, equals or exceeds 90 percent of the excess of the fair market value of the leased property to the lessor at the inception of the lease over any related ITC retained by the lessor and expected to be realized by him.

Since none of these occurred in our illustration, we had an operating lease.

It is interesting to note the effect these alternatives have on computer rates and data processing budgets. Many of the tax effects do not make it back to the data processing operating statements. Also, depreciation schedules are not the same for the regular books and for the tax books. For the regular books, the sum-of-digits or straight-line method generally is used. For the tax books, the ACRS method is used. Depreciation is not a cash flow, but it does influence

## PANEL DISCUSSION

data processing budgets and computer rates. Depreciation also influences after-tax present-value analysis in that it produces a tax effect. Finally, the gain or loss for tax purposes is not the same as a gain or loss on the "regular" books.

What does this all net out to? Well, the present-value analysis may show the lease as being the best alternative based on the total company after-tax present value. Indeed, this is what the current analysis has shown. However, the impact on the data processing budget or on computer rates may show just the opposite result.

Which alternative did General American choose? We haven't come to a conclusion yet. While the lease alternative looks better from an after-tax present-value viewpoint, I suspect the purchase alternative has an advantage in that we would really not sell the equipment at the times used in this illustration. We would probably sell the older technology equipment two to three years after June 1985 and sell the newer technology equipment four to six years after June 1985. The cash flows in these later periods are very favorable to purchase.

I hesitate to prepare five-to six-year cash flow analyses. There are just too many unknowns out that far. The effect on computer rates is a real question that must be dealt with.

MR. RICHARD K. KISCHUK: Every company needs to have at least a limited planning process for capital expenditures. But by going much beyond this, many companies may be putting the cart before the horse.

Capital budgeting is a process for allocating capital to various activities. In order to do this, it is necessary to have some idea of which activities might be the most attractive, so a company must have some form of strategic planning. Before enhancing their capital budgeting process, many companies should focus on improving their strategic planning process first.

Capital budgeting techniques can tell you whether a given capital investment will be likely to cover the cost of capital, but it will not tell you whether an activity is worth doing in the first place. Only good strategic planning will tell you that; if an activity does not make good strategic sense, it is not worth the effort of making a cost-benefit analysis or looking at financing alternatives.

To make this more clear, look at the stages a company might go through in becoming strategically managed. In stage one, there is generally no strategic planning. Financial plans are usually in the form of annual budgets, and these are developed as projections from historical results. There is generally no effective allocation of resources. At this stage, companies are often organized functionally, making it difficult to determine how much capital and other resources might be devoted to various businesses.

As companies progress to stage two, they begin to do a limited amount of strategic planning. However, planning is mainly internally focused and is still based on a functional organization. At this stage, financial

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

planning may be in the form of long-range forecasts. Resource allocation is based on momentum. Most of the resources are allocated to the largest profit centers; it is usually difficult for emerging profit centers to acquire resources.

As a company moves to stage three, strategic planning becomes well developed. Planning has an external focus and is concerned with developing a sustainable competitive advantage. Creative alternatives are looked at in developing corporate strategy, and resources are allocated in support of the company's strategic direction. Thus, resources might be withdrawn from a large profit center which is judged to be relatively unattractive. At the same time, a very small, attractive profit center might receive a large percentage of the total resources.

It generally takes at least three to five years for a company to make the transition from stage two to stage three. This is the point where it makes sense to begin developing a capital budgeting process. Otherwise, a company may develop a strategic plan, only to find it is not being implemented because resources are flowing to the wrong areas.

Finally, as a company moves into stage four, strategic planning becomes fully developed. Competitive strategies become very sophisticated. All elements of the organization are being integrated toward developing and maintaining a sustained competitive advantage. Few companies have achieved this stage of strategic management, even including companies outside the insurance industry.

At Lincoln National, we feel we have progressed to the third stage of strategic management. Our goal is to move to stage four within the next several years.

If a company is engaged in many businesses, it becomes difficult to manage strategically within a functional organization. At Lincoln National, we are organized around strategic business units (SBUs). Our SBUs tend to be defined on the basis of marketing distribution systems, rather than on a product basis. For example, we have several SBUs marketing life insurance products, each through a different distribution system -- career agents, brokers, independent property/casualty agents, employers, direct response, banks, financial planners, and so on.

Each SBU is organized as a separate business and has its own management team which is held accountable for its performance. While there are a number of shared corporate services, SBUs are billed monthly for the services they use. In many cases, SBUs have the alternative of contracting for the same services from a third party.

This organization structure is critical. It allows corporate management to evaluate the performance of each business and to control the allocation of resources based on the relative attractiveness of each SBU. Strategic planning is the basic tool we use to evaluate the attractiveness of each business unit for investment of corporate resources. An SBU is judged to be "attractive" if it can both achieve a sustainable

## PANEL DISCUSSION

competitive advantage and earn an ROE that equals or exceeds our cost of capital. Our cost of capital changes continually because of changes in external interest rates and changes in our capital mix. To give our managers a fixed target, we have set a 15 percent ROE as our goal.

To manage capital, we need a process to ensure that capital is flowing to the most attractive areas and expected returns are being realized. Each SBU must develop an annual financial plan. This is a five-year plan. Key elements include the amount of capital each SBU plans to use annually and the ROE it expects to earn each year.

Three different versions of the financial plan are produced each year as the financial plan is negotiated between corporate and SBU managements.

During the following year, financial results are reported monthly. Our financial reporting system develops income statements and balance sheets for every SBU. So each month, we can monitor the actual amount of capital used and the actual return on that capital for every SBU. Management can react quickly if actual results begin to deviate significantly from plan.

In many cases, several SBUs operate within a single company, particularly at Lincoln National Life. To develop balance sheets for each SBU, we need a way of allocating surplus among business units monthly. We do this by applying our required surplus formula to every business unit each month.

Only by coincidence will the total required surplus for all of the SBUs be the same as the total surplus for the company. The residual surplus, positive or negative, is maintained in an unallocated surplus account.

These elements of our planning process give us the ability to assess the relative attractiveness of various businesses for capital investment; plan the amount of investment in each business unit; monitor the actual amount of capital being used and the return on that capital; and take management action during the year if results are deviating significantly from plan. Rather than "capital budgeting", I like to use the term "strategic management of capital" to describe this process.

In looking at the attractiveness of businesses for investment, we also look at businesses we are not currently involved in. When we find a new business which might be attractive, this leads to a "buy versus build" decision. Should we build the business from scratch, or should we enter the business through acquisition?

Much has been written about "buy versus build" decisions from a financial perspective. However, strategic considerations tend to be most important. For example, it may take too long to build a start-up business. Barriers to entry may be prohibitive. A start-up may be too risky. In these cases, entry through acquisition may be the best approach.

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

On the other hand, there may not be any attractive companies available for acquisition, or the cost of an acquisition may be too high. Also, acquisitions are not without risk. Recent studies have shown that most acquisitions do not fulfill original expectations.

One way out of this dilemma is to think in terms of joint ventures and networking relationships. To be successful in the financial services business today, it takes a variety of skills and resources -- money, customer base, marketing skills, investment skills, data processing and technical skills, underwriting and pricing skills, and so on. Few organizations can be large enough and diverse enough to possess all of the skills and resources that may be needed to take advantage of all attractive opportunities. Joint ventures and networks provide the opportunity for diverse organizations to work together on the basis of the unique skills and resources they bring to the venture.

These ventures require careful structuring to maintain an entrepreneurial culture and to provide the right financial incentives for all parties. But they appear to be the wave of the future; this is a way for companies of even modest size to participate in today's opportunities in financial services.

The idea that only very large companies will have sufficient capital to exploit these opportunities is incorrect. With good strategic planning, careful allocation of capital and other resources, and clever structuring of joint ventures and networking relationships, almost any company can prosper in today's environment.

MR. NICHOLSON: We didn't discuss the differences between mutual companies and stock companies in terms of looking at capital expenditures, particularly in regard to the availability of capital as a resource. From their differing perspectives, I thought Mr. Irish and Mr. Kischuk might want to comment on the relative availability of capital in their companies, and how that might effect their evaluations of various capital expenditure proposals.

MR. KISCHUK: Recently, we've been doing some additional thinking on our capital budgeting process, and one conclusion we've reached is that capital is not a scarce resource for us. The scarce resource is attractive business opportunities. So we've placed a lot of emphasis on trying to uncover ideas within the organization for attracting business opportunities. Our feeling is, if the opportunity is attractive enough or if it develops a high enough rate of return, then we ought to be able to raise the capital from someplace in order to fund that opportunity. Now, having thought along those lines for quite a while, and thinking about this particular panel, it occurred to me that this kind of reasoning might not apply to mutual companies, since it might not be as easy to raise capital for these opportunities in a mutual company.

MR. IRISH: That's quite right. A mutual company has different considerations in raising capital. A stock company can float a stock issue to raise capital, but a mutual company has to depend on what is essentially retained earnings. Many mutual companies that are growing

## PANEL DISCUSSION

rapidly are not throwing off enough earnings to support that growth. In this case, their surplus, or their capital, is limiting. Other mutual companies that are not growing as rapidly might feel this surplus is quite adequate for the task and is not limiting.

Another consideration for a mutual company is linked to the opportunity cost concept. Capital invested in a project or acquisition alternatively might be used to pay policyholder dividends. This can be an important equity consideration in a mutual company. You have to consider how your policyholder's are affected by a capital expenditure; will it require some of their dividends to be held back? It all adds up to a different set of considerations for mutual companies. I'm not sure the actual hurdle rates end up that much different in many cases.

MR. THOMAS F. EASON: Mr. Irish remarked that using company surplus should carry a higher price than assets. Could you elaborate on that in the context of the general panel presentation?

MR. IRISH: The concept of investing surplus is one that is gaining rapidly in our profession. The surplus required to support an operation is considered an investment in that operation and one on which a return must be made. The return required is a return consistent with other equity returns in the general business world. From a stock company's point of view, we want to make an adequate rate of return for our stockholders. From a mutual company's point of view, we want to make an adequate return for our policyholders. In either case, anything that uses surplus is something that should earn the kind of return banks earn on their capital or manufacturing companies earn on their equity. This is typically a higher rate, let's say 12-15 percent after taxes, than you get from the investment of assets, which is typically 7-9 percent after taxes.

MR. EASON: I'm not sure if I agree with such a financially oriented determination. It seems to me that you have to address the question of what the company's objectives are. If your objective is, as ours is, to provide more insurance to more people of the type we are in business to provide, I'm not sure it's simply a matter of looking at what you can make on the surplus that you could invest in new business. If I had taken that view in my prior company, when competition was increasing heavily on whole life products six years ago, we would have quit selling business because we could not have a product that would make sense in the marketplace and begin to approach the kind of bond yields available in the late 1970s. So I understand what you say from an intellectual and investment point of view, but I'm not sure what you say is the real world in a mutual company in business to provide insurance.

MR. IRISH: In a mutual company, we sometimes reach the position where continued healthy growth of the company is given a higher priority by management than making a reasonable return on surplus. In one sense, this is logical and businesslike; in another sense this is, to some extent, an abandonment of the mutual concepts.

MR. KISCHUK: This question raises another issue, and that is how strategic and financial management have to be combined. If you read

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

the classic textbooks on financial management, they all tell your life is simple. If you go through an IRR analysis or value analysis to determine all the products that provide a return at least as great as the hurdle rate, you do those projects providing a greater return, and you don't do those projects providing a lesser return. The problem is if you do that, and you look at the projects making the cut based on the hurdle rate, you probably have a random group of projects that strategically don't fit together for you. That's why you can't just rely on capital budgeting to determine what you're going to do.

MR. EASON: Mr. Kischuk, you discussed the opportunities for smaller-and medium-sized companies to participate, and you talked about joint ventures a bit. There are several major companies seeking to provide services in connection with administration of the new wave of products. My company, the Union Central, is providing client-company types of services for those who want to get into a couple of product lines where we can develop some expertise. Would you elaborate on that general subject and relate it to capital budgeting from the point of view of a company that might be interested in a joint venture, client-company relationship, or some other business arrangement?

MR. KISCHUK: If a company does a financial evaluation for getting into a new product line or a new business venture, and if it takes into account the computer systems that might be required, capital, resources, and so on, it might be quick to conclude that getting into that business is beyond its means. Yet that company may have a customer base, marketing skills, or other unique attributes that might be in demand by others who are looking to get into that business. A logical way to go is to try to look for a joint venture partner; somebody with deep pockets or somebody who may already have developed the data processing systems needed or whatever other skills might be missing. It could be that the combination of two or more joint venture partners, under the right arrangement and the right incentives, might be what is needed to approach that particular business or market. Also, these kinds of arrangement are particularly helpful for arrangements that involve diverse types of financial institutions, for example, life and property/casualty companies, banks, savings and loans, thrift institutions, data processing companies, and so forth.

MR. EASON: Mr. Bauer, has General American looked into the capital budgeting considerations of purchasing personal computers? How would you proceed with such an analysis? More specifically, assume there's a field force that has first-generation personal computers. The company wants to install newer, more powerful machines while discarding the old. What are the pitfalls and the approaches you might employ?

MR. BAUER: We have many personal computers in the field right now in that situation. If we wanted to go to a newer technology -- faster machines, larger storage, or more functionality -- our systems development area would do a standard cost-benefit analysis to relate the cost to benefits tangibly. We rarely go back to relating it to additional premium or additional sales or whatever, but we try to relate the expenses to any savings in time or aggravation that might occur. We

## PANEL DISCUSSION

have a capital budgeting plan that is developed along with our annual plans. At the beginning of the year, every cost center along with its operating budget must say up front what its capital budgeting items will be. This includes personal computers, copiers, or anything over \$1,000. If that list is approved, any deviation from that list needs an officer's signature to make the additional capital expenditures.

MR. DAVID E. SUNDERLAND: I'm curious about the sensitivity of the hurdle rate to the decision of which alternative is better. Is it conceivable that picking a different hurdle rate could reverse the desirability of the alternatives, and how sensitive is the hurdle rate to the net result?

MR. IRISH: The use of the NPV method at different hurdle rates gives you a great deal of insight into what's going on. You can get the situation where one project is preferable to another at a certain hurdle rate, and the situation might reverse itself at a different hurdle rate. The question of which hurdle rate to choose is not merely a matter of increasing it until you have knocked out all the projects you want to knock out. It can also make a difference in the ranking of projects.

MR. SUNDERLAND: In Mr. Bauer's example, assuming all other things are equal after the illustrated time period, it seems obvious that the lease-back is the most desirable alternative from an NPV basis. It is conceivable that one of those two alternatives might have reversed itself as to its attractiveness if you used an ROE concept?

MR. IRISH: One difference is that an ROE calculation would consider book value. That might make a difference although I can't evaluate it quantitatively. In many cases where surplus is considered your scarce resource, sometimes you have to bring in book value considerations, and it may affect your decision.

MR. BAUER: Book value is important. We have had cases where there was a large book loss or gain. It doesn't figure into the present-value analysis; it's sort of a side factor. Also, that difference in book value exists anyway. Realizing that, the company should do something to get its book values in sync with the street value of the equipment. That's why I cautioned about taking a look at your data processing equipment. We have right now, on our company's books, some terminals we put on seven-year, straight-line depreciation three years ago. They're not quite up to their book value as far as street value right now. We made that discovery, and we're going to make an adjustment for it. If we were going to try to get rid of that equipment, there's no reason to include it in the analysis because that particular transaction has to occur anyway.

MR. KISCHUK: We've found some of the same things, and because of that, you learn to appreciate the value of technology forecasting in this kind of process. Otherwise you could wind up buying a mainframe, only to find out that the next day IBM comes out with a new mainframe at twice the capacity and half the cost, and the value of the mainframe you just bought plummets by about 75 percent. I don't know anybody who can forecast technology perfectly, and part of the solution is to

## CAPITAL BUDGETING/EVALUATION OF CAPITAL EXPENDITURES

monitor what you have on your books and where you discover you're carrying a book value significantly above the market value, face up to the write-off and take it.

MR. DANIEL J. FITZGERALD: Is it appropriate to consider the acquisition of a general agency from another company as an appropriate use of capital? If so, how do you go about measuring the rate of return on that investment of capital?

MR. IRISH: I have done some experiments with problems of that type by using an opportunity cost approach, which looks at how much it would take to develop that productive capacity internally. The costs to hire the agents and train them and to set up a new agency and train a new general agent are enormous.

MR. KISCHUK: That can be an appropriate use of capital. Part of the value of doing something like this is that it can tie into your strategic plan. For example, in a given business, you might determine the volume of business is too low, and you haven't achieved a critical mass. Or you're trying to bolster your market position in a given area, and if you don't do that, you may not be viable in that area. You may need to acquire a direct response agency in order to participate in the bank marketplace. Many times the alternative to not doing something like that may mean you're not viable in a particular business, and that cost can be enormous. Therefore, you may just have to occasionally step outside pure financial analysis and consider the strategic consequences of not doing something and factor that into the analysis as well.

MR. NICHOLSON: Another way to look at the acquisition of a general agency is to use a future-business-capacity calculation such as is used in a value-added approach. The capital required to acquire the general agency should reflect its future business capacity. Its future business capacity can be established by discounting future profits on future sales of the agency to the date of acquisition. The discount rate used in these calculations should reflect the rate of return the company expects to earn on a capital investment of this type.

MR. FITZGERALD: Quite often when we deal with data processing issues, data processing people will use the phrase "take a leap of faith." This translates to "try not to justify the investment in technology based upon its rate of return where that technology can be used as a competitive weapon." How would you respond to this kind of reasoning?

MR. BAUER: We do that all the time, particularly regarding the Information Center. We get new equipment, and if we want to try it out, we do a lot of prototyping. It's a cheap way of taking a look at equipment and seeing how it grabs our clients. For much of this equipment, people will say they need it to run their businesses, and they're willing to buy it. Increasingly, if the Vice President of a particular area signs off on it, we'll usually let him or her have it. The larger the request, the more information we request. Prototyping is a way of introducing a piece of equipment into one part of the company and letting it try it out. Many times you don't even know

## PANEL DISCUSSION

what you want to use that piece of equipment for, or what the benefit will be until you get it. Once you get it, you find you're going to do all sorts of things with it that you had no knowledge of when you first thought of it. Therefore, a post-evaluation, say six months after you got the equipment, will help you determine if you're doing the right thing.

MR. KISCHUK: It should be obvious that when you get into a situation like that, there's absolutely no way you can attach cash flows to that kind of an investment because you know hardly anything about what it's used for or what the benefits might be.

One approach is to try to limit the investment in something like that and take a look at it after the limit is reached. Then look at your increased level of knowledge and invest a little bit more. In each stage, evaluate where you are. At some point, you might even know enough to do a present-value, cash-flow analysis.