Return on Investment

Turning Accounting Rules to Management Tools

By Walter E. Palmer, CPP, CFE

Over the past ten years, *ROI, return on investment, profit center, not cost center,* and *value-added* have become significant buzzwords in the loss prevention industry. While not unique to our industry…these concepts are also important in other staff functions, such as information technology and finance… I can't imagine ROI has gotten any more attention than it has in our industry. Most LP professionals agree this is a step in the continuing evolution towards higher levels of involvement in our organizations, increased professionalism of our industry, and a more business-oriented mindset.

However, based on my observations and discussions with others in our industry, I believe there is a lack of understanding about what we are talking about. Most people who say "we are a value-added function of the company and make decisions based on ROI" don't know a NPV from an IRR.

Is it absolutely necessary to know the actual mechanics of these financial measures to understand the concept?

Absolutely not.

Will it improve our ability to make good capital investment decisions, defend our projects to the CFO during budget approval, and give us greater confidence in the application of the ROI concept?

Absolutely.

What Is Capital Budgeting?

The term *capital budgeting* refers to the process of planning expenditures that will generate income (or savings) that is expected to flow into the organization over a multiyear period. In other words, capital budgeting is a way to decide where to spend your money when considering long-term projects. This is in contrast to expense budgeting, which is deciding on where to spend money for short-term, day-to-day expenses.

There are four primary steps in capital budgeting:

- Determining the initial costs of the project,
- Estimating incremental cash flow,
- Financial analysis of the project, and
- Selection of most favorable projects.

Determining Initial Costs

This step is probably the simplest part of your analysis. It includes the invoice price of new items (machinery, equipment, services, etc.), any sales taxes, and the additional expenses associated with the implementation of the

Cost of Asset = $75,000	Year 1	Year 2	Year 3	Year 4	Year 5
Sales (+2% each year)	$10,000,000	$10,200,000	$10,404,000	$10,612,080	$10,824,322
Baseline Shrink (%)	3.0%	3.0%	3.0%	3.0%	3.0%
Baseline Shrink ($)	$300,000	$306,000	$312,120	$318,362	$324,730
Shrink Reduction (%)	25%	25%	25%	25%	25%
New Shrink ($)	$225,000	$229,500	$234,090	$238,772	$243,547
Savings ($ @ retail)	$75,000	$76,500	$78,030	$79,591	$81,182
Cost / Retail Ratio	0.57	0.57	0.57	0.57	0.57
Savings ($ @ cost)	$42,750	$43,605	$44,477	$45,367	$46,274
Less Expenses	$10,000	$10,200	$10,404	$10,612	$10,824
Less Depreciation	$15,000	$15,000	$15,000	$15,000	$15,000
Savings Before Taxes (SBT)	$17,750	$18,405	$19,073	$19,755	$20,450
Tax (34%)	$6,035	$6,258	$6,485	$6,717	$6,953
Net Savings	$11,715	$12,147	$12,588	$13,038	$13,497
Plus Depreciation	$15,000	$15,000	$15,000	$15,000	$15,000
Cash Flow	$26,715	$27,147	$27,588	$28,038	$28,497

Figure 1

project, such as packing, delivery, installation, and inspection. The justification for including all the costs indicated, rather than recording some of them as expenses, is that every one of these costs is an integral part of making the asset usable by the organization.

Once you know how much it costs to implement a project, you can compare the initial investment with future benefits and make a judgment as to whether or not the project is worth undertaking.

Estimating Incremental Cash Flow

The *cash-flow statement* is a way of systematically estimating the financial benefits of your project over its useful life. In the LP industry, the cash flow is usually in the form of savings through shrinkage reduction or risk avoidance.

Your cash-flow projection should only include those estimated cash inflows and outflows that are directly related to the project itself. As a starting point, you can use the cash-flow projections that currently exist for your business, simply adding in the changes that you expect the project to bring. Then you can compare your original statement (without the project) to your new statement (with the project), to gauge the likely results of moving forward with your plans.

Let's take a look at an example of a simplified cash-flow projection for a sample LP-related project. Let's say that you are thinking of purchasing new equipment, such as EAS, ink tags, or CCTV, that has a useful life of five years. You believe buying and installing this equipment will lower shrinkage significantly. The equipment will cost $75,000 to purchase, install, and bring into use. This is your initial cost.

The next step is to construct a cash-flow statement as illustrated in figure 1. We begin with what we know or have planned. The store we are going to use this equipment in currently does $10 million in sales per year and is budgeted to increase sales by 2 percent each year. The store's historical retail shrinkage performance has consistently been 3.0 percent of sales, and you believe this will continue if you do not purchase this new equipment. Therefore, 3.0 percent will be used as our *baseline* shrinkage figure.

Next, you project the income or savings you expect if you invest in this project. Based on your knowledge of this equipment or your experience with it when you've installed it in similar situations, you are confident it will reduce shrinkage by 25 percent and keep it there. Therefore, the savings from this project will be the difference between what shrinkage would have been over the next five years (baseline) and the estimate of the new shrinkage rate, which is 25 percent lower. Since we look at shrinkage as a cost, we need to convert the savings at retail to cost by multiplying by our *cost-to-retail ratio.*

In order to maintain this equipment, there are certain expenses that will be incurred each year. This could be service, maintenance, replacement of components, or upgrades. We need to reduce our projected savings by these expenses. For purposes of this analysis, let's assume it will take $10,000 in expenses to administer the program, and that number will increase in proportion to sales performance.

The next step is one that many people miss—the impact of taxes. We need to calculate the impact of taxes on our estimated cash flow because, if our previous projection comes true and we really do increase the bottom line for this store as a result of the project, Uncle Sam will want his fair share of the additional profits. This is usually 34 percent.

But before we calculate the tax amount, we need to factor in the favorable tax impact of depreciation. Depreciation is the allocation, for accounting and tax purposes, of the purchase costs of fixed assets over a number of years. All costs incurred in acquiring an asset and getting it up and operating are depreciable, including actual price, taxes, broker's fees, labor, and freight. This allows you to avoid paying taxes on the depreciable figure, thus lowering your tax burden.

Calculation of depreciation can be a topic in its own right as there are a number of different ways that accountants use to determine depreciation, such as *accelerated cost recovery system (ACRS), straight line, sum of the year's digits* method, and the *double declining balance*

method. For the purposes of our discussion and analysis, I recommend the use of the straight-line depreciation method. This method of depreciation assumes the same amount of expense will be allocated in each year of the asset's useful life and is calculated by dividing the initial cost of the asset by its useful life, in this case $15,000 per year over five years.

Finally, once you've calculated the tax impact, you add the depreciation figure back in, since it is an accounting device only, that is, you didn't have to spend an additional $15,000 on the project each year. Figure 1 shows the cash-flow statement we just constructed.

One thing to note is that a number of assumptions have been made, such as baseline shrinkage rate, amount of reduction, and sales plan. Don't let anyone fool you—capital budgeting and financial analysis are not exact sciences. The results you actually achieve will not match your analysis exactly. However, if you make good assumptions, your analysis will be directionally correct.

Now that we've created a projected cash-flow statement for your project, we can use some financial analysis tools to see whether the project makes sense.

Financial Analysis of Major Projects

At the simplest level, you'll want to make sure that the total costs of any major project you undertake are less than the total benefits resulting from the project. You could simply add up the costs, then add up the expected revenue increases and cost savings over the next few years, and compare the two. However, if you did that, you'd be ignoring the fact that many of the costs will be incurred at the beginning of the project, while many of the revenues or cost savings will occur later, over a period of months or years.

There are a number of more formal ways to evaluate the costs or benefits that a major purchase or project will bring to your company. The most commonly used are the *payback period, net present value (NPV),* and *internal rate of return (IRR)* methods.

Each of these methods has its advantages and drawbacks, so generally more than one are used for any given project. And no financial formula, or combination of formulas, should be used to the exclusion of common sense. For example, a project may "fail" your tests under some or all of these methods, but you might decide to go forward with it anyway because of its value as part of your long-range business plan.

Payback Period Analysis

The payback-period method is the simplest way of looking at one or more major project ideas. It simply tells you how long it will take to earn back the money you'll spend on the project. The formula is *Cost of Project ÷ Annual Cash Inflow = Payback Period.*

Thus, if a project cost $75,000 and was expected to return $20,000 annually, the payback period would be $75,000 ÷ $20,000 = 3.75 years.

If the return from the project is expected to vary from year to year, you can simply add up the expected returns for each succeeding year, until you arrive at the total cost of the project. For example, in our previous cash-flow example, the project costs $75,000 and the expected returns were as follows:

Year	*Cash Flow*
1	$26,715
2	$27,147
3	$27,588
4	$28,038
5	$28,497

The project would be completely paid for in approximately two years and 9 months, because $75,000 (cost of project) is equal to all of the first two years' revenues, plus $21,138, which is equal to about 76 percent of the third year's revenues.

Under the payback method of analysis, projects or purchases with shorter payback periods rank higher than those with longer paybacks. The theory is that projects with shorter paybacks are more liquid, and thus less risky. They allow you to recoup your investment sooner, so you can reinvest the money elsewhere. Moreover, with any project there are a lot of variables that grow increasingly fuzzy as you look out into the future. With a shorter payback period, there's less chance that market conditions, interest rates, the economy, or other factors affecting your project will drastically change. Generally, a payback period of three years or less is preferred.

There are a couple of drawbacks to using the payback-period method. For one thing, it ignores any benefits that occur after the payback period, so a project that returns $1 million after a six-year payback period is ranked lower than a project that returns $10,000 after a five-year payback. But the major criticism is that a straight payback method ignores the time value of money. To get around this problem, you should also consider the *net present value* and *internal rate of return* of the project.

Net Present Value

The net present value method (NPV) of evaluating a major project allows you to consider the time value of money. Essentially, it helps you find the value in "today's dollars" of the future cash flows of a project. Then, you can compare that amount with the amount of money needed to implement the project.

If the NPV is greater than zero, the project will be profitable for you (assuming, of course, that your estimated cash flow is reasonably close to reality). If you have more than one project on the table, you can compute the NPV of both, and choose the one with the greatest difference between NPV and cost.

In order to calculate the value of the future cash flows in today's dollars, you need to know your *cost of capital*. What is your cost of capital for purposes of analyzing a major purchase decision? In simplest terms, it is the cost of the money

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you'll use to make your purchase. Where will you get the $75,000 that is needed for your project?

If you are planning to finance the purchase and you know what the interest rate on the loan would be, the answer is simple. The rate charged on the loan can be considered the cost of capital for the project. Therefore, if the loan rate were 10 percent, that would be your cost of capital.

If you are not financing your purchase, there is still a cost involved in the form of equity cost to your company. This is the basis behind several financial formulas *such as weighted average cost of capital (WACC)* and *accelerated present value (APV)*. The good news is that you usually don't have to determine the cost of capital for yourself. Most companies set a predetermined cost of capital for all capital projects that you can get from the finance department.

How do you compute NPV? The easiest way is to use a good financial calculator. If you don't have one, or don't want to take the time to learn how to use one, you can use a present-value table. Note that whenever you do time value of money calculations to find a present or future value (such as NPV), you'll need to specify a cost of capital rate, also known as a *discount factor (DF)*. The discount factor is used to reduce the cash flows from future years into today's dollars.

The table below takes the cash flows we developed for our $75,000 project and shows the appropriate discount factor. We have used a 12-percent discount rate or cost of capital. By multiplying the cash flow times the discount factor, we arrive at the *present value (PV)* of the future cash flows. This represents the future savings in terms of today's dollars.

Year	*Cash Flow*	*DF(12%)*	*PV*
1	$26,715	0.8929	$23,854
2	$27,147	0.7972	$21,642
3	$27,588	0.7118	$19,637
4	$28,038	0.6355	$17,818
5	$28,497	0.5674	$16,169
	$137,985		$99,120

You can see that the sum of the cash flows is $137,985, but when discounted at 12 percent, it totals only $99,120. By subtracting out our original $75,000 investment, we find the NPV is $24,120. This means that we would add that amount to the company's bottom line over the course of the next five years by making this purchase.

Internal Rate of Return

The internal rate of return (IRR) method of analyzing a major purchase or project also allows you to consider the time value of money. Instead of expressing the result in dollars, as the NPV does, it expresses results in terms of a rate. Once you know the rate, you can compare it to the rates you could earn by investing your money in other projects or investments.

If the internal rate of return is less than the cost of capital used to fund your project, the project will clearly be a money loser. However, it's not uncommon for a business to insist that in order to be acceptable, a project must be expected to earn an IRR that is several percentage points higher than the cost of capital to compensate the company for its risk, time, and trouble associated with the project.

How do you compute the IRR? You can also use the present-value table. One problem with the IRR is that it can be difficult and time-consuming to calculate, especially if the expected cash inflows vary greatly from year to year. But the basic premise is that the IRR is the cost of capital that would make the NPV for the project equal to zero. In the example we have been working with, the IRR is 24 percent. If we were to go back to our NPV analysis and use that figure for the cost of capital, the NPV would equal zero.

The decision rule calls for comparing the IRR from the proposed project to the cost of capital. If IRR exceeds the cost of capital, the project is accepted, while if the IRR is less than the cost of capital, the project is rejected. If capital is scarce, the firm can rank projects based on their IRR (cost of capital) ratio, or if the various projects have similar or identical cost of capital, the firm can simply rank IRR.

Choosing Among Alternative Projects

Of the three methods of analyzing a major purchase, which one is the best? While the payback period method is the easiest to compute, most accountants would prefer to look at the net present value and the internal rate of return. These methods take into consideration the greatest number of factors, and in particular, they are designed to allow for the time value of money. If the net present value is negative, or if the internal rate of return is less than the cost of capital, the project should be rejected as not financially feasible (unless the project is one that's required by law, such as a safety upgrade).

Occasionally, when you're looking at a number of projects that are competing for your time and money, the NPV and IRR methods will yield different answers to the question, "Which project is best?" The issue is not whether to reject projects when NPV is negative or IRR is less than the cost of capital. The issue is project selection when capital is scarce, and so the firm must rank alternative projects and select the best. However, these different tools can yield different project rankings.

In particular:

- NPV leads to the highest ranking for large, profitable projects.
- IRR can overstate the attractiveness of highly profitable projects because the IRR algorithm assumes that excess cash flows are reinvested in the project and yield an IRR return, which may not be plausible. In addition, IRR and NPV can yield ranking differences for projects that differ substantially in terms of the magnitude and timing of cash flows.
- Conflicts over ranking differences are usually decided in favor of NPV.

If you find that understanding ROI and capital budgeting is still a bit confusing, don't worry. There are many subtleties and aspects to the financial concepts presented here. I would encourage you to use this article as a stepping off point for further study. Ask your friends in the finance department about the methods they use when evaluating capital projects, what the organization's cost of capital is, and what evaluation criteria they use for saying "yes" to a project. As a result, I believe you will find greater success in evaluating and selling your programs to senior management. ■

Walter E. Palmer is a partner in Contact, Inc., a loss prevention consulting, training, and education provider. He was formerly director of loss prevention for Kids "R" us and Babies "R" Us.