The Building Blocks of ROI

How to Calculate and Understand Return on Investment

Excerpted from

Financial Intelligence for Entrepreneurs: What You Really Need to Know About the Numbers

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Financial intelligence is all about understanding how the financial side of business works and how financial decisions are made. The principles discussed in this chapter are the foundation of how some decisions—those relating to capital investment—are made in a business.

Most of us need little introduction to the fundamental principle of finance known as the *time value of money.* The reason is that we take advantage of it every day in our personal finances. We take out home mortgages and car loans. We run up big balances on our credit cards. When the debt gets too high, we refinance. Meanwhile, we're putting our own savings into interest-bearing checking or savings accounts, money-market funds, treasury bills, and stocks and bonds. Those of us who are entrepreneurs put some of our own money into a business, and we probably borrow money so that we can put still more into the business. We are a nation of borrowers, but we are also a nation of savers, lenders, and investors. Since all these activities reflect the time value of money, it's a safe bet that most of us have a gut-level understanding of the idea. Those who don't are likely to wind up on the losing end of the principle, which can be expensive indeed.

At its simplest, the principle of the time value of money says this: a dollar in your hand today is worth more than a dollar you expect to collect tomorrow—and it's worth a whole lot more than a dollar you hope to collect ten years from now. The reasons are obvious. You know you have today's dollar, whereas a dollar you expect to get tomorrow (let alone in ten years)

is a little iffy. There's risk involved. What's more, you can buy something today with the dollar you have. If you want to spend the dollar you hope to have, you have to wait until you have it. Given the time value of money, anyone who lends money to somebody else expects to be paid interest, and anybody who borrows money expects to pay interest. The longer the time period and the higher the risk, the larger the interest charges are likely to be.

The principle is the same, of course, even if *interest* isn't the term used and even if there is no fixed expectation about what the return will be. Say your uncle Charlie buys stock in your software start-up. He's not going to get any interest on his investment, and he may never receive a dividend—but he hopes that the stock will eventually be worth far more than what he paid for it. In effect, he is lending your company money with the expectation of a return on his investment. When and if the return materializes, he can calculate it in percentage terms just as if it were really interest.

This is the basic principle that underlies a business's decisions about capital investments, which we will discuss in this part. The business has to spend cash that it has now in hopes of realizing a return at some future date. If you want to figure out whether it's worth buying a new machine or a new software application—tasks that we'll show you how to do in these pages—you will be relying on calculations that involve the time value of money.

FUTURE VALUE AND PRESENT VALUE

While the time value of money is the basic principle, the three key concepts you'll be using in analyzing capital expenditures are *future value*, *present value*, and *required rate of return.* You may find them confusing at first, but none of them is too complicated. They're simply ways to calculate the time value of money. If you can understand these concepts and use them in your decision making, you'll find yourself thinking more creatively—maybe we should say more artistically—about financial matters, just the way the pros do.

Future Value

Future value is what a given amount of cash will be worth in the future if it is loaned out or invested. In personal finance, it's a concept often used in

retirement planning. Perhaps you have $50,000 in the bank at age thirty-five, and you want to know what that $50,000 will be worth at age sixty-five. That's the future value of the $50,000.

In the investment world, an analyst looking at public companies might project the value of a company's stock in two years if earnings grow at some given percentage a year. That future-value calculation can help her advise clients about whether the company is a good investment. In your company, you might be putting together a stock-option plan for key managers, and you might use future value to help determine the value of the stock in the future if you meet company goals.

Figuring future value offers a broad canvas for financial artists. Look at that retirement plan, for example. Do you assume an average 3 percent return over the next thirty years, or do you assume an average of 6 percent? The difference is substantial: at 3 percent your $50,000 will grow to slightly more than $121,000 (and never mind what inflation will have done to the value of a dollar in the meantime). At 6 percent it will grow to more than $287,000. It's tough to decide what's the right interest rate to use: how on earth can anyone know what interest rates will prevail over the next thirty years? At best, calculating future value that far out is educated guesswork—an exercise in artistry.

The stock analyst is in a somewhat better position because she is looking out only two years. Still, she has more variables to contend with. *Why* does she think earnings might grow at 3 percent or 5 percent or 7 percent or some other rate entirely? And what happens if they do? If earnings grow at only 3 percent, for instance, investors might lose interest and sell their shares, and the stock's price-to-earnings ratio might decline. If earnings grow at 7 percent, investors might get excited, buy more stock, and push up that ratio. And of course, the market itself will have an effect on the stock's price, and nobody can reliably predict the market's overall direction. Again, we're back to educated guesswork.

In fact, every calculation of future value involves a series of assumptions about what will happen between now and the time that you're looking at. Change the assumptions, and you get a different future value. The variance in return rates is a form of financial risk. The longer the investment outlook, the more estimating is required, hence the higher the risk.

Present Value

Present value is the concept used most often in capital expenditure analysis. It's the reverse of future value. Say you believe that a particular investment in growing your business will generate $100,000 in cash flow per year over the next three years. If you want to know whether the investment is worth whatever it is going to cost you, you need to know what that $300,000 would be worth right now. If the $300,000 payoff is worth (say) only $270,000 right now, you don't want to spend $275,000 on the investment.

Just as you use a particular interest rate to figure future value, you also use an interest rate to "discount" a future value and bring it back to present value. To take a simple example, the present value of $106,000 one year from now at 6 percent interest is $100,000. We are back to the notion that a dollar today is worth more than a dollar tomorrow. In this example, $106,000 next year is worth $100,000 today.

Present-value concepts are widely used to evaluate investments in equipment, real estate, business opportunities, and even mergers and acquisitions. But you can see the art of finance clearly here as well. To figure present value, you have to make assumptions *both* about the cash the investment will generate in the future *and* about what kind of an interest rate can reasonably be used to discount that future value.

Required Rate of Return

When you're figuring what interest rate to use in calculating present value, remember that you're working backward. You are assuming your investment will pay off a certain amount in the future, and you want to know how much is worth investing now to get that amount at a future date. So your decision about the interest or discount rate is essentially a decision about what interest rate you need to make the investment at all. You might not invest $100,000 now to get $102,000 in a year (a 2 percent rate), but you might very well invest $100,000 now to get $120,000 in a year (a 20 percent rate). Larger companies typically set a hurdle rate—the return they require before they will make the investment—but they typically set it higher for riskier projects than for less risky ones. Smaller companies like your own may not have an explicit hurdle rate, but you always have an implicit one;

after all, you will inevitably decide to make some investments and not others based on how much you expect the investments to return.

There is always some judgment involved in establishing a hurdle rate, but the judgment isn't wholly arbitrary. One factor is the opportunity cost involved. Your company, like any other, has only so much cash, and you have to make judgments about how best to use its funds. That 2 percent return is unattractive because you could do better just by buying a treasury bill, which might pay 3 percent or 4 percent with almost no risk. The 20 percent return may well be attractive—it's hard to make 20 percent on most investments—but it obviously depends on how risky the venture is. A second factor is your cost of capital. If you borrow money, you have to pay interest. If you use funds from equity investments in the business, your own or somebody else's, you and the other shareholders expect a return. The proposed investment has to add enough value to the company that debtholders can be repaid and the owners kept happy. An investment that returns less than the company's cost of capital won't meet these two objectives—so your hurdle rate should always be higher than the cost of capital.

That said, decisions about hurdle rates are rarely a matter of following a formula. You will have to evaluate how risky a given investment is, how it is likely to be financed, and what your company's overall situation is. You will have to determine whether the investment can generate a return at least comparable to what you can get elsewhere at a similar level of risk. You have to know how tight the company's cash position is, how much risk you are comfortable with, and what's going on in the marketplace you operate in. Then you have to make judgments—assumptions—about what

Opportunity Cost

In everyday language, this phrase denotes what you had to give up to follow a certain course of action. If you spend all your money on a fancy vacation, the opportunity cost is that you can't buy a car. In business, opportunity cost often means the potential benefit forgone from not following the financially optimal course of action.

kind of hurdle rate makes sense. High-growth companies typically use a high hurdle rate because they must invest their money where they think it will generate the level of growth they need. More stable, low-growth companies typically use a lower hurdle rate.

A word on the calculations involving these concepts: in the following chapter, we'll show you a formula or two. But you don't need to work it all out by hand; you can use a financial calculator, find a book of tables, or just go online. For instance, type "future-value calculator" into Google, and you'll get several sites where you can figure simple future values. To be sure, real-world calculations aren't always so easy. Maybe you think the investment you're considering will generate $100,000 in cash in the first year and 3 percent more in each of the subsequent years. Now you have to figure the increase, make assumptions about whether the appropriate discount rate should change from one year to the next, and so forth. If your company is big enough to have a CFO, he or she will do these calculations. Otherwise, you may want to seek help from your accountant or financial adviser. Usually, these finance professionals will have a spreadsheet or template with the appropriate formulas embedded, so that you or they can plug in the numbers. But you do have to be aware of the concepts and assumptions that they'll use in the process. If you're just plugging in numbers without understanding the logic, you won't understand why the results turn out as they do, and you won't know how to make them turn out differently by starting with different assumptions.

Cost of Capital

Financial analysts figure a company's cost of capital by (1) figuring the cost of its debt (the interest rate), (2) estimating the return expected by shareholders, and (3) taking a weighted average of the two. Say a company can borrow at 4 percent (after taking into account the fact that it can deduct interest payments from its taxes), and its shareholders expect a 16 percent return. Say it's financed 25 percent by debt and 75 percent by equity. The cost of capital is simply (25%)(4%) + (75%)(16%) = 13%. If an investment isn't projected to return more than 13 percent, it isn't likely to be funded.

We know plenty of entrepreneurs who get excited about an opportunity and who make decisions because it *feels* right. One of Joe's business partners, for instance, once proposed a significant capital investment. He asked Joe to do some analysis to confirm the decision. Joe replied that he was glad to do an analysis but asked what would happen if the analysis showed that the company shouldn't make the investment. His partner let him know that the analysis in that case would be wrong—he was sure the investment was needed. Joe declined to do the analysis just to justify a decision that was already made.

This is a common phenomenon: often people analyze investments only to justify them. We recommend that you do the analysis and take into account what it tells you before you decide to make capital investments in your business. That is financial intelligence in action.

So let's put these concepts to work.

Part Six
TOOLBOX

A STEP-BY-STEP GUIDE TO ANALYZING CAPITAL EXPENDITURES

You've been talking with your banker about getting a loan for a new piece of equipment for the plant, or maybe for a new marketing campaign. He's receptive, but he wants more data. "Sounds good," he says. "Write me up an ROI analysis. I'll look at it as soon as it's ready."

Don't panic. Here's a step-by-step guide to preparing your proposal:

1. Remember that ROI means return on investment—just another way of saying, "Prepare an analysis of this capital expenditure." The banker wants to know whether the investment will generate enough cash so that you can pay back the loan and still create value for your company.

2. Collect all the data you can about the cost of the investment. In the case of a new machine, total costs would include the purchase price, shipping costs, installation, factory downtime, debugging, and so on. Note where you must make estimates. Treat the total as your initial cash outlay. You will also need to determine the machine's useful life, not an easy task (but part of the art we enjoy so much!). You might talk to the manufacturer and to others who have purchased the equipment to help you answer that question.

3. Determine the benefits of the new investment, in terms of what it will save the company or what it will help the company earn. A calculation for a new machine should include any cost savings from greater output speed, less rework, a reduction in the number of people required to operate the equipment, increased sales because customers are

happier, and so on. The tricky part here is that you need to figure out how all these factors translate into an estimate of cash flow. Don't be afraid to ask for help from your accountant or financial adviser. Many finance professionals have been trained in this kind of thing, and they should be willing to help.

4. If you have determined a hurdle rate for your company, calculate the net present value of the project using this hurdle rate. If you haven't yet established a rate, decide on one. (It obviously needs to be higher than the interest rate on the loan you are applying for.)

5. Calculate payback and internal rate of return as well. You may get questions about what they are from your banker, so you need to have the answers ready.

6. Write up the proposal. Keep it brief. Describe the project, outline the costs and benefits (both financial and otherwise), and describe the risks. Discuss how it fits with your company's strategy or competitive situation. Include your NPV, payback, and IRR calculations in case there are questions about how you arrived at your results.

Business owners sometimes go overboard in writing up capital expenditure analyses. It's probably human nature: we all like new things, and it's usually pretty easy to make the numbers turn out so that the investment looks good. But we advise conservatism and caution. Explain exactly where you think the estimates are good and where you think they may be shaky. Do a sensitivity analysis, and show (if you can) that the estimate makes sense even if cash flows don't materialize at quite the level you hope. A conservative proposal is one that is likely to fly—and one that is likely to add the most to the company's value in the long run.