

Cost of Capital – Part Three: Making Investment Decisions

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Making good investment decisions is an incredibly difficult task. Executives and boards have to peer into the future to make predictions about profitability and reinvestment, for which an accurate cost of capital is critical. In the first two installments of this series on cost of capital, we investigated [how risk affects opportunity cost calculations](#), and subsequently how those calculations should [amend your assumed cost of capital](#).

Then, as our favorite food processing executive found out in the last Insight article, those same executives and boards must calculate the correct cost of capital, one that adequately accounts for the risks of that investment to the business’s shareholders. With all those figures in hand, the benefit of a project can be fairly evaluated.

“But!” cries the food executive, “How can I possibly perform these calculations for every business decision I make? I need to evaluate hundreds of possible investments a year! Even buying a new truck to replace a hulking piece of rusting steel is an investment decision.” In despair and with a whimper, he silently curses the gods of finance who made the world so complicated.

Tricks of the Trade

“The world is not that complicated,” reassures the executive’s friend over drinks at the two’s favorite bar. The friend is a former business owner who sold his own business to a private equity group a few years ago and now sits on the board. “I’ve learned a few tricks from these private equity guys about evaluating investments. Have you heard of EBITDA multiples and payback periods?”

Our food processing executive furls his eyebrows and thinks back: “Yes, I did learn something about that a long time ago.” Unsure of himself, he asks his friend, “How were they calculated again?” His friend asks the bartender for a pen and writes down on a napkin:

EBITDA Multiple =

$$\frac{\text{Investment Cost}}{\text{Pretax cash profit}} = \frac{\text{Debt} + \text{Equity}}{\text{"Normal" EBITDA}}$$

and-

Payback period =

$$\frac{\text{Investment Cost}}{\text{Avg. annual cash flow}} = \frac{\text{Debt} + \text{Equity}}{\text{Avg. EBITDA} - \text{Avg. Reinvestment}}$$

“If you can estimate the normal EBITDA an investment should produce, you can calculate either the multiple or the payback period. If those numbers are lower than your target, that’s great! You can just go ahead and make the investment,” explains the friend.

“Whew!” sighs our executive. “That’s terrific. Now I don’t have to worry about calculating and recalculating the cost of capital. But what multiple and payback period means I’m making a good investment?”

His friend confidently posits “Ah, you’ll make good investments if your payback period is four years or less and the EBITDA multiple is less than five or six.”

Happy as a clam, the food processing executive finishes his drink and heads back to the office, ready to tackle the list of investment projects his board asked him to investigate. With his new tools, he thinks, he should be able to make yes or no decisions in no time at all.

All Tricks are Shortcuts, and All Shortcuts are Useful, Sometimes

After a few hours of working out the details on various investment projects and calculating their payback periods or EBITDA multiples, whichever he could, the executive looks at his list and gut checks his work:

Hmmm. These rules my friend told me don't make a lot of sense. By these calculations, my payback period for buying a fleet of delivery trucks to move food from my manufacturing facility to my warehouse is four years, but trucks only last five years or so before my employees decide they are too old to drive, and we have to sell them. So maybe I'll get all my money back and have a little extra over five years, but that doesn't seem like a good investment. On the other hand, if I install a new machine to increase capacity in the plant, my EBITDA multiple will be six—right on the edge of my friend's hurdle—but that machine will last for a long time and the company will earn a lot of money over many years. These conclusions don't make a lot of sense to me. I'll call up my other friend and ask him what he thinks.

So the food executive rings back to the academic who helped him calculate the correct cost of capital for the (long-ago rejected) warehouse investment: *"I've been trying to make investment decisions using EBITDA multiples and payback periods, but the results don't add up. What am I doing wrong?"*

"Well," chirps our favorite academic (since there is only one in our story, let's pretend he is our favorite, despite our natural aversion to people who spend too much time in small spaces with too many dense books), *"you are calculating all your*

metrics correctly, it's just that your hurdles—the four year payback and the six times multiple—actually need to be different for different investments." *"Not again,"* groans our executive.

The academic continues, *"And they need to be different than your friend's numbers because his business is in a different industry than yours. You see, using multiples and payback periods are really ways to simplify the much more exacting calculation of expected return and comparing that to the cost of capital."*

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"Not again," groans our executive.

All the assumptions you explicitly make when doing the hard calculations are condensed into a single number—your hurdle—in the simpler approach. EBITDA multiples and payback periods are rules of thumb. They are useful in certain circumstances."

The executive contemplates what his friend said and suddenly realizes: *"So you mean that if I target an EBITDA multiple of six or less, I am really assuming a certain cost of capital, life of an asset, reinvestment needs, and growth of my profits?"*

"Exactly," confirms the academic. The executive continues, *"So if I am buying a fleet of trucks that have only five-year lives, I need to use a different payback period for that than if I am buying a machine with a twenty-year life. I still need to earn an adequate return on my investment in trucks, it's just that I have to earn that return in a much shorter period. So, my payback needs to come even faster."*

The academic smiles and offers, *"You see, a payback period can be thought of as the rate of return on a long-lived asset. If you can pay back the initial investment in five years and continue that rate of return forever, you would average 20% earnings each year on your initial investment. If you can pay back the investment in four years in the same conditions, you would earn an average of 25% each year on your investment. So, picking a payback period target just means you are making an assumption about your cost of capital and the life of the investment."*

"In the case of my company's potential investment in expanding capacity, I can be fine with a five-year payback period if my cost of capital is 20%," mulls our executive out loud. *"That equipment will be in operation for a long time, so I'll continue to earn the 20% return I need each year. On the other hand, if I invest in the truck fleet, I still need to earn 20% return each year—I need to double the investment during its five-year life. If I can sell the trucks for half of their initial value five years from now, then I need to earn only one and a half times the investment between now and then, which means I need to return 30% each year. So, my payback period hurdle on the trucks is more like three years."*

"I'd say the cost of capital is probably different between buying the new machine versus buying the trucks because there are

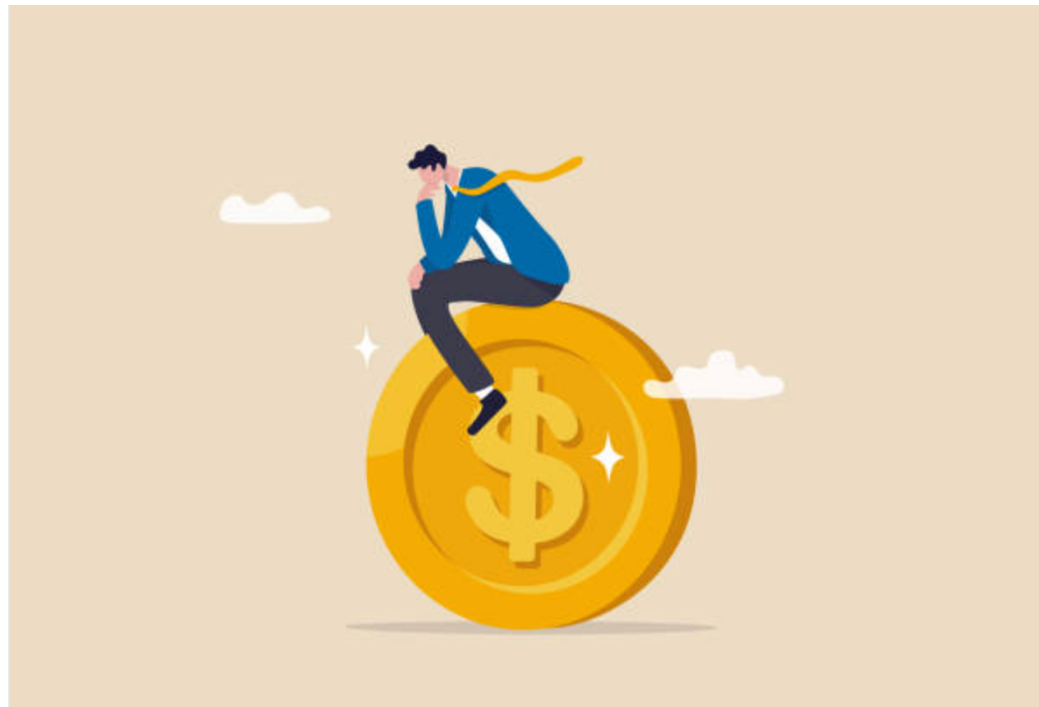
different levels of risk, but otherwise, I fully agree,” coaches the academic.

Payback Periods Vs. EBITDA Multiples

“Ok, so I should not invest in the truck fleet, since I think the payback period on that investment is four years but I need to be paid back in three in order to earn an adequate return on investment,” states the food processing executive. “But how should I think about the six times normal EBITDA that I calculated on the plant volume expansion opportunity? Is that good or bad?”

...being on one side of a hurdle or another does not mean an investment is likely to provide an adequate return or not. It could be the case that with further precision, a marginal investment turns out to be a bad decision, or a rejected investment could generate real benefit to the shareholders.

“Well, just like the payback period target, an EBITDA multiple target encapsulates a bunch of assumptions (readers can refer to our previous article [What's in a Multiple?](#) for the details). The most important ones for you to think about, since you already have an approximation for the cost of



capital, are the growth rate and the required reinvestment.”

“That’s easy enough! My business works with healthy foods and we have been growing rapidly. So, it is reasonable to assume we will continue to grow profits at 5% each year for a long time. Investment in working capital for that growth and maintaining the existing equipment costs around 25% of EBITDA each year. What does that mean I should be using for an EBITDA multiple hurdle?” asks the executive.

The academic pulls out his calculator and figures:

Hurdle Multiple =

$$\frac{1 - \text{Reinvestment rate}}{\text{Cost of capital} - \text{Growth rate}} = \frac{1 - 25\%}{20\% - 5\%} = 5$$

He reports this to the executive, who is dismayed. “But my friend uses an EBITDA multiple of 6 as the target!”

“Well,” counters the academic, “that is because of a difference in cost of capital,

growth rate, or reinvestment between the businesses.”

Our favorite executive sighs and concedes the math is right. “My friend runs an asset-light software business, so I guess that makes sense. There’s very little reinvestment.” He sadly crosses the volume expansion opportunity off of his growth list and says goodbye to the academic.

Using Investing Rules of Thumb in our Uncertain World

As our executive found out, rules of thumb are much simpler to use than sitting down and calculating the actual benefit of every investment. It is convenient to be able to quickly determine that investing in a fleet of trucks does not provide enough return because the payback period is too long.

On the other hand, all of the numbers the executive used to calculate the payback period are estimates. The future profitability of the trucking investment and

the plant expansion are inherently uncertain. That means being on one side of a hurdle or another does not mean an investment is likely to provide an adequate return or not.

The third bucket consists of investment opportunities that are near the hurdle. The uncertainty in predicting the future cash flows of the opportunity and the correct cost of capital mean that the investment could swing either way.

It could be the case that with further precision, a marginal investment turns out to be a bad decision, or a rejected investment could generate real benefit to

the shareholders. The right framework, in our opinion, is to use rules of thumb to sort investments into three buckets.

Investment opportunities that have a payback period or EBITDA multiple greatly below the target are highly likely to be beneficial for the company. There is ample margin of error for an executive or board's assumptions to be incorrect but still provide an adequate return. Similarly, investment opportunities with very long payback periods or very high EBITDA multiples compared to the hurdle are unlikely to prove to be beneficial even with significant additional study. Management teams and boards do not need to spend much time and energy trying to precisely determine the expected return investment opportunities that fall in either of those two buckets.

The third bucket consists of investment opportunities that are near the hurdle. The uncertainty in predicting the future cash flows of the opportunity and the correct cost of capital mean that the investment could swing either way. Assuming executives and boards have already exhausted themselves of the obvious, highest-returning opportunities, these are

the investments that they should spend considerable time and resources to investigate. It may even be appropriate to hire external experts to assist with the evaluation (for example, in the acquisition of a business, we recommend being very certain the return is beneficial before wiring tens or hundreds of millions of dollars).

As we bring this series on cost of capital to a close, we hope that we've been able to bridge the gap from academic principles to real-life use. Navigating the tricks and rules and shortcuts is challenging, but so many workarounds exist because the underlying principles are complex. Luckily for business owners, most opportunities fall into "obvious yes" or "obvious no" buckets as described in this article, for which shortcuts are sufficient. But for more complicated edge cases, where the answer depends on the details, we're ready to dive in to assist.

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